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The Availability of Organically Reared Livestock in the European Union

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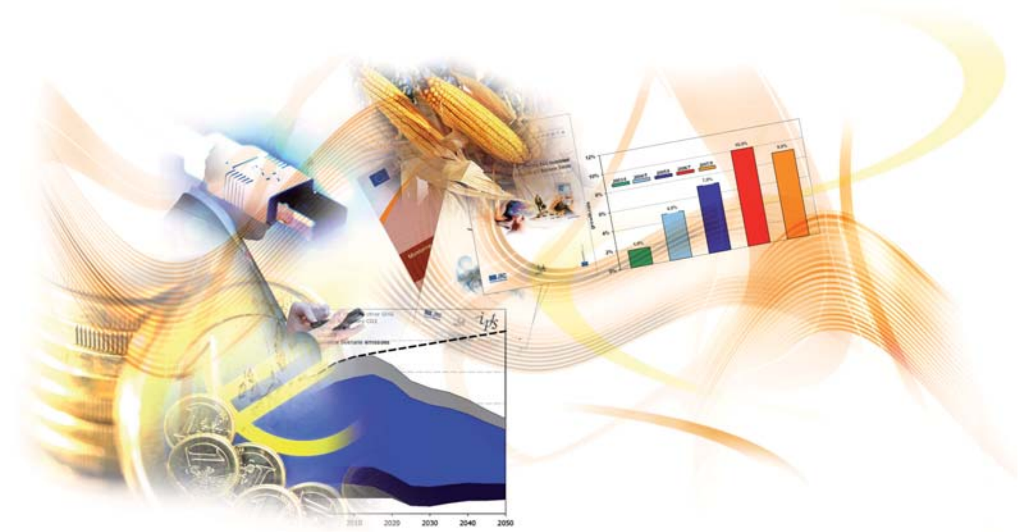
Editors: Sergio Gomez y Paloma



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The mission of the JRC-IPTS is to provide customer-driven support to the EU policy-making process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/technological dimension.

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Executive Summary

In order to develop the legislative rules on organic livestock production, DG AGRI requested a comprehensive study to evaluate the current situation in the Member States as respects availability of organic livestock. Therefore, JRC/IPTS launched a study to carry out an economic analysis to assess the availability of organically reared livestock in the EU-25 and to evaluate the impact of the removal of the derogation that livestock must come from production units in the organic production system on the economic sustainability of the organic livestock sector in selected EU Member States.

A case study methodology was used to carry out this economic analysis, focusing on pig, egg and broiler production systems in selected EU Member States.

The first regulation on organic farming (Council Regulation EEC No 2092/91) was drawn up in 1991, laying down the rules for farmers wishing to claim official recognition of their organic status. Since 1991, this Regulation has been amended on numerous occasions, in particular in August 1999 by Council Regulation (EC) No 1804/1999, which extended its scope to cover organic livestock production. According to this Regulation organic livestock production should take place in organic conditions; namely that livestock must come from production units in the organic production system and throughout their life, this system of production must be applied.

However, at the time of implementing these harmonised rules for organic livestock production, the current development of the sector was such that there was not a sufficient range of organically reared livestock species (including both livestock species for production and livestock species for breeding) and breeds available on the market. Section 3 of Part B of Technical Annex I provides a number of derogations to the general principle of organic production, including a derogation that livestock must come from production units in the organic production system (hereafter referred to as 'the derogation').

These derogations have been extended and slightly amended on a number of occasions in recent years. However, it is acknowledged that these derogations cannot be extended indefinitely without justification. Moreover, the European Action Plan for Organic Food and Farming clearly states that end dates of the transitional periods for the derogations should be respected to ensure the integrity of organic agriculture.

The study found that most countries make full use of the derogation on sourcing non-organic livestock. However, the extent to which this derogation is used was found to vary considerably by livestock species and Member State. The notable exceptions to this general rule were:

- Organic broiler production. In Austria (virtually) all organic broiler production takes place without using the derogation and the UK a significant proportion of organic broiler production takes place without using the derogation.
- Organic egg production. In the UK a significant proportion of organic egg production takes place without using the derogation.
- Organic pig production. In Germany, the Netherlands and the UK, a significant proportion of organic pig production takes place without using the derogation. In Portugal, organic pig production was also found to take place without using the derogation, but significantly the organic replacements used were found to originate from units within the organic production

system itself and throughout its life this system of production is applied.

In most of the mentioned countries (with the exception of pigs in Portugal) organic production without the use of the derogation on the origin of animals has tended to evolve in response to specific rules within those countries which prevent producers from taking full advantage of the derogation. In contrast, in those countries where national law and certification bodies permit the use of this derogation, organic production using non-organic livestock has tended to continue.

In general, the main reasons put forward to explain why producers in the case study countries still take advantage of the derogation and use non-organic animals were based on the need for producers to maintain the relative cost competitiveness and because there was considered to be a lack of availability of organically reared livestock in terms of both the numbers and the diversity of appropriate breeds/strains.

No evidence was found that the transition from an organic production system which makes use of the derogation to an organic system which does not make use of the derogation would have any significant impact on technical and economic performance. However, in the medium to long-term there may be some loss in potential genetic gain, as closed herds and flocks are unlikely to be able to maintain the same level of genetic improvement in their breeding programmes over time relative to that achieved in commercial breeding herds/ flocks. Thus, this would result in a widening of the performance gap between non-organic and organic systems in the medium to long-term.

As the transition from an organic production system which makes use of the derogation to an organic system which does not make use of the derogation did not entail a change in labour requirement, the economic sustainability of the farming systems in terms of labour productivity would likely remain unchanged.

Looking at the impact on financial performance of the transition from an organic production system which makes use of the derogation to an organic system which does not make use of the derogation, the only resulting quantifiable impact concerned an increase in the cost of replacement organic livestock and thus on profit (gross margin). Based on gross margin analysis, the organic egg sector seemed less able to withstand the likely impact of a transition to an organic production system that does not make use of the derogation compared with the organic poultry and pig sectors. However, there was real evidence that organic production systems which do not make use of the derogation were sustainable, at least in the short term, in some countries and sectors.

Finally it was noted that the profitability (gross margin) of an organic system which does not make use of the derogation was more sensitive to changes in market prices for organic products than to the cost of organically reared livestock per se. The sustainability of organic systems which do not make use of the derogation in the long-term is therefore considered to be dependent on the evolution of the price premium for organic produce relative to non-organic produce and the associated price and demand elasticities.

Based on the evidence from the case studies, this report suggests that the derogations provided for in Annex 1, Part B.3 to Council Regulation (EC) No 2092/91 are working as intended in that the setting of these Community standards has provided the basis for a number of Member States to start to introduce the higher requirements needed to facilitate organic production without the need for the derogation. It is particularly worth noting that where such shifts towards not using the derogation has occurred, these have generally been in Member States which have a relatively substantial market in place for organic products (e.g. Austria, Germany and the UK) and also where national legislation or certification body standards have mandated such a shift. This suggests strongly that organic producers have tended not to use the derogation as and when the sector in a particular Member State considers the conditions for such a move are sustainable.

However, it is acknowledged that the sustainability of not needing to use the derogation is dependent on the size of the current gene pool for the different organically reared livestock breeds/strains and species (including both livestock species for production and livestock species for breeding). Furthermore, an organic system which does not make use of the derogation in terms of may have cost implications in terms of increased bio-security associated with breeding stock (particularly poultry). Thus, it is likely that sanitary issues will limit the size of the current gene pool of organically reared breeds/strains. Thus, from a supply perspective there is concern that without further (temporary) extension of the aforementioned derogations, certain organic livestock enterprises may become unsustainable (in terms of the low availability of, and relatively higher price for, organically reared livestock breeds/strains and species), and may disappear.

In conclusion, the further elaboration of rules (e.g. the removal or upgrading of one or more of the derogations) concerning the origin of animals for organic production might therefore be seen as running against the need for 'subsidiarity' in Community decision making as well as potentially endangering the viability of those organic livestock sectors and countries where the sector is still at the infant stage of development. In other words a shift away from an organic production system which makes use of the derogation can take place when the demand response and size of the market are such as to allow producers to operate without requiring the full use of the derogations set out in Council Regulation (EC) No 2092/91[1].

The report is available in printed version as well as online (http://ipts.jrc.ec.europa.eu/publications). The study was requested by the Commission's Directorate-General for Agriculture and Rural Development and carried out by Agra CEAS Consulting, Centre for European Agricultural Studies with the European Commission's Joint Research Centre (Institute for Prospective Technological Studies, IPTS).

1 Thus, for example, the sector must be relatively secure in the belief that any cost increase resulting from a move to organic production system B will be absorbed by the market.

1. Introduction and Objectives

1.1 Introduction

1.1.1 Concept of organic livestock production

There are many definitions of what is meant by the term 'organic' in relation to agriculture. Many simple definitions often describe organic production as a system of managing agricultural holdings that implies major restrictions on the use of synthetic chemical fertilisers and pesticides (see for example: Baillieux and Scharpe, 1994). Instead, organic production only uses organic based fertilisers (such as manure and vegetable-based compost) and natural pesticides (such as predator animal species), and specifically for livestock it places limitations on the use of antibiotics and other animal health products; these products should be used for curing animals only rather than enhancing yields (Legg and Viatte, 2001).

Other definitions of organic production go beyond the biophysical aspects to include other matters such as animal welfare, biodiversity and social justice (IFOAM, 1998). In this respect, Lampkin, *et al.* (1999) assert that organic production is best thought of as referring not to the type of inputs used per se, but to the concept of the farm as an organism, in which all the components (the soil minerals, organic matter, micro-organisms, insects, plants, animals and humans) interact to create a coherent, self-regulating and stable whole. This definition is reflected in many European countries, where organic agriculture is known as ecological or biological agriculture, reflecting the reliance on ecosystem management rather than external inputs.

Such a systems approach to organic production is noted by Alrøe, *et al.* (1998) and Codex Alimentarius Commission (2004). In Alrøe, *et al.'s* (1998:15) holistic definition of such a systems approach, organic production is described as a:

"self-sufficient and sustainable agro-ecosystem in equilibrium…[which]…is based as far as possible on local, renewable resources".

Similarly, Codex Alimentarius Commission (2004) describes it as a:

"holistic management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. It emphasises the use of management practices in preference to the use of off-farm inputs, taking into account that regional conditions require locally adapted systems. This is accomplished by using, where possible, cultural, biological and mechanical methods, as opposed to using synthetic materials, to fulfil any specific function within the system".

Although these definitions are broad, they are in line with the Community Standards for organic livestock production in the EU concerning the origin of animals (as laid down in Regulation (EEC) No 2092/91 (and amended by Regulation (EC) No 1804/1999)), which is central to this Study. As discussed in Section 1.1.3, this Regulation suggests that organic livestock production should take place in organic production systems which would essentially satisfy Alrøe, *et al.'s* (1998) definition for organic production to be self-sufficient and sustainable and Codex Alimentarius Commission's (2004) definition that organic production should emphasise the use of management practices (such as closed herds and flocks) in preference to the use of off-farm inputs (such as buying in replacement animals).

Furthermore, the Regulation necessitates that the breed of animal must be carefully chosen so that the animals are adapted to their environment and resistant to certain diseases. This would satisfy Alrøe, *et al.'s* (1998) definition for organic production to be based as far as possible on local, renewable resources and Codex Alimentarius Commission's (2004) definition to take into account that regional conditions require locally adapted systems.

However, the OECD (2003) implies that the transposition of such a systems approach into (voluntary or compulsory) standards at a regional or certification body level is difficult, noting that standards are more prescriptive about on-farm production methods than about how inputs (such as the origin of animals) should be dealt with. This in part reflects the fact that incorporating wider concerns than production methods into definitions of, and standards for, organic farming is highly problematic at the producer level (OECD, 2003). In this respect, Rigby and Cáceres (2001) state that standards are far more able to refer to prohibited inputs than to specify precise criteria for the assessment as to whether producers are acting in a manner that is 'socially just' or 'ecologically responsible'.

Acknowledging this, Part B.3 of Technical Annex 1 of the aforementioned Regulation allows for derogations which permit bringing non-organic livestock into an organic production unit when a herd or flock is first established, restocked or reconstituted. The use of non-organic livestock goes against Alrøe, *et al.'s* (1998) definition that organic production should be self-sufficient and sustainable and Codex Alimentarius Commission's (2004) definition that emphasises the use of management practices in preference to the use of off-farm inputs. In addition, both definitions highlight the need to, as far as possible, use local, renewable resources (Alrøe, *et al.* 1998) and take into account that regional conditions require locally adapted systems (Codex Alimentarius Commission, 2004), such as the use of traditional animal breeds.

1.1.2 Definitions of organic livestock production

The previous discussion on the concept of organic livestock production (Section 1.1.1) identified that in practice it is possible to take advantage of derogations (hereafter referred to as the 'derogation') which permit bringing non-organic livestock into an organic production unit (when a herd or flock is first established, restocked or reconstituted). Thus, different organic production systems can therefore be defined based on the extent to which organic producers make use of the derogation on the use of non-organic livestock. A brief description of each of these organic production systems in the context of this Study is provided below (and in more detail in Section 3.3).

Organic production system A. This organic production system is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of any of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) (origin of animals) which permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted. Thus, in organic production system A livestock must come from production units in the organic production system and throughout their life, this system of production must be applied (Annex I, Part B, No. 3.2. of Council Regulation (EC) No 2092/91). Only livestock already present in a livestock production unit can be converted when the farm enters into organic farming for the first time (Annex I, Part B, No. 3.3. of Council Regulation (EC) No 2092/91)[2,3].

2 The category of livestock that are converted and included as the organic livestock has to have an initial source, as is the case for the example of organic pig production that takes place in organic production system A in Portugal (Section 6.7).

3 This Study found that organic production system A was rare and only existed in a few cases. Specifically, the only case study country where such a system was found was Portugal, for a specific, local pig production system. The term 'organic production system A' in this Study has therefore only been used to describe this particular Portuguese organic pig production system (Section 6.7).

Organic production system B[4]. This organic production system is defined as those livestock farming systems which do not take advantage of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) for *production* animals[5]. But for reproduction (i.e. breeding) purposes these systems permit non-organic animals to be brought into an organic reproduction unit when a herd or flock is renewed, restocked or reconstituted, *provided* that this is restricted to *breeding* animals[6] as regards livestock and to certain *production* animals for poultry[7]. It should be noted that this definition is not in line with Annex 1 Part B 3.2, which states that livestock, whether for *breeding* or *production*, must come from production units which comply with the livestock rules laid down in Article 6 and in the aforementioned Annex. Specifically, it notes that throughout their life this system must be applied, whether it concerns production, parent or grandparent-stock (i.e. the definition of organic production system A).

Organic production system C[8]. This organic production system is defined as those livestock farming systems which permit non-organic *production* and *breeding* livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted in line with the derogations foreseen in Annex I, Part B, No. 3.4, 3.6, 3.8, 3.9, 3.10 and 3.11.

1.1.3 EU organic livestock regulation

The first regulation on organic farming (Council Regulation EEC No 2092/91) was drawn up in 1991, laying down the rules for farmers wishing to claim official recognition of their organic status. The objective of this Regulation is to set up a harmonised framework for the production, labelling and inspection of agricultural products and foodstuffs in order to increase consumer confidence in such products and ensure fair competition between producers.

Since 1991, this Regulation has been amended on numerous occasions, in particular in August 1999 by Council Regulation (EC) No 1804/1999, which extended its scope to cover organic livestock production (namely for cattle, sheep, goats, pigs, horses and poultry species). Council Regulation (EC) No 1804/1999 covers a range of issues concerning the livestock sector, such as the origin of animals, feedstuffs,

4 With respect to the bringing in of animals into organic production system B for laying hens, broilers and pigs (i.e. the specific organic livestock production systems being analysed in this Study), the following definitions for organic production system B have been used:

- *Laying hens*. Organic chicks/pullets reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age are brought into production flocks. Their grandparent flocks need not be managed organically.
- *Broilers*. Organic chicks reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age are brought into production flocks. Their grandparent flocks need not be managed organically.
- *Pigs*. Organic breeding gilts reared from parent (multiplier/reproduction) herds that are under permanent organic management are brought into production herds. The production piglets are born and reared in the organic production herd. The breeding gilts brought into the parent herds are reared from grandparent herds that need not be managed organically. For in-herd multiplication (nucleus herds), organic breeding gilts must have been brought in.

5 Production animal means an animal that is kept for the purpose of the production of meat, milk, eggs or wool.

6 Breeding animals or parent, multiplier or reproduction stock means, in general, animals that are not kept primarily for the purpose of the production of meat, milk, eggs or wool, but for the production of offspring used for producing these products.

7 As defined in Annex I, Part B, No. 3 (which is defined more fully in Section 1.1.3).

8 With respect to the bringing in of animals into organic production system C for laying hens, broilers and pigs (i.e. the specific organic livestock production systems being analysed in this Study), the following definitions for organic production system C have been used:

- Laying hens. Non-organic production pullets are brought into production flocks at a maximum 18 weeks of age and thereafter managed organically. Their parent flocks need not be managed organically. Or, where non-organic chicks are bought in at 1 or 3 days of age (depending on national/private standards) and thereafter managed organically.
- Broilers. Non-organic production chicks are brought into production flocks at 1 or 3 days of age (depending on national/private standards) and thereafter managed organically. Their parent flocks need not be managed organically.
- Pigs. Non-organic gilts are brought into production herds for breeding and thereafter managed organically. The production herds are under permanent organic management. Their parent herds need not be managed organically.

Box 1.1: Principles of organic livestock production - origin of animals

"In the choice of breeds or strains, account must be taken of the capacity of animals to adapt to local conditions; their vitality, and their resistance to disease. In addition, breeds or strains of animals shall be selected to avoid specific diseases or health problems associated with some breeds or strains used in intensive production (e.g. porcine stress syndrome, PSE Syndrome, sudden death, spontaneous abortion, difficult births requiring caesarean operations, etc.). Preference is to be given to indigenous breeds and strains." (Point 3.1).

"Livestock must come from production units which comply with the rules on the various types of livestock production laid down in Article 6 and in this Annex. Throughout their life, this system of production must be applied." (Point 3.2).

Source: Excerpt from Council Regulation (EEC) No 2092/91, Technical Annex I, Part B, Section 3.

disease prevention and veterinary treatments, animal welfare, husbandry practices and the management of manure.

The Technical Annexes to Council Regulation EEC No 2092/91 set out the details concerning its implementation for farmers wishing to claim official recognition of their organic status. In particular, Part B of Technical Annex I to Regulation (EEC) No 2092/91, as amended by Regulation (EC) No 1804/1999, lays down Community Standards for organic livestock production[9]. These include rules on the *origin of the animals* which are set out in Section 3 of Part B of Technical Annex I and which form the focus of this Study.

Specifically, there are two principal rules governing the *origin of animals* set out in Section 3 of Part B of Technical Annex I (Box 1.1). The first rule concerns the choice of breeds and strains so that animals used for organic production are adapted to their environment and build up resistance to certain diseases. The second rule concerns the general principle that animals must come from farms that comply with the rules governing organic production. In other words, organic livestock production should take place in organic production system A [10].

However, at the time of implementing these harmonised rules for organic livestock production, the current development of the sector was such that there was not a sufficient range of organically reared livestock species (including both livestock species for production and livestock species for breeding) and breeds available on the market. Section 3 of Part B of Technical Annex I therefore provides a number of derogations to the general principle that organic livestock production should take place in organic production system A and hence allow organic livestock production to take place in organic production system C[11]. As previously noted, one of the principles of organic livestock production is that animals must come from farms which comply with the rules of organic production systems and that throughout the animals' life these production systems must be applied.

9 The general principles applicable to organic livestock production require recognition of the interdependence between animals and the soil; consequently, landless production is not an option and livestock must have access to a free-range area and the number of animals per unit of area must be limited.

10 Organic production system A is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of the derogations foreseen in Annex I, Part B. 3 (origin of the animals) which permit non-organic livestock to be brought into an organic production unit when a herd or flock is first established, restocked or reconstituted.

11 Organic production system C is defined (as laid down in Annex 1, Part B of Council Regulation (EC) No 1804/1999) as those livestock farming systems which permit non-organic livestock to be brought into an organic production unit when a herd or flock is first established, restocked or reconstituted.

Box 1.2: Principles of organic livestock production – first derogation on origin of animals

"By way of a first derogation, subject to the prior approval by the inspection authority or body, livestock existing on the livestock production unit, not complying with the rules of this Regulation can be converted." (Point 3.3).

Source: Excerpt from Council Regulation (EEC) No 2092/91, Technical Annex I, Part B, Section 3.

Box 1.3: Principles of organic livestock production – second derogation on origin of animals

"By way of a second derogation, when a herd or flock is constituted for the first time and organically reared animals are not available in sufficient numbers, non-organically reared livestock may be brought into an organic livestock production unit, subject to the following conditions:

- *chicks for the production of eggs and poultry for meat production must be less than three days old,*
- *young buffalo for breeding purposes must be less than six months old,*
- *calves and foals for breeding purposes must be reared according to the rules of this Regulation as soon as they are weaned and in any case they must be less than six months old,*
- *lambs and kids for breeding purposes must be reared according to the rules of this Regulation as soon as they are weaned and in any case must be less than 60 days old,*
- *piglets for breeding purposes must be reared according to the rules of this Regulation as soon as they are weaned and they must weigh less than 35 kg." (Point 3.4).*

"This derogation must be authorised beforehand by the inspection authority or body." (Point 3.5).

Source: Excerpt from Council Regulation (EEC) No 2092/91, Technical Annex I, Part B, Section 3.

The first derogation permits the use of existing non-organically reared animals for use on a production unit, which is to be converted for organic production (Box 1.2).

The second derogation permits bringing non-organically reared livestock onto organic production units when a herd or flock is first established, subject to a number of conditions (Box 1.3).

The third derogation permits bringing non-organically reared livestock onto organic production units when a herd or flock is renewed or reconstituted, subject to a number of conditions (Box 1.4).

The fourth derogation permits bringing some non-organically reared livestock onto organic production units for supplementing natural growth and for the renewal of the herd or flock, subject to a number of conditions (Box 1.5).

The fifth derogation permits bringing non-organic male animals for breeding purposes onto organic production units, subject to a number of conditions (Box 1.6).

These derogations have been extended and slightly amended on a number of occasions in recent years[12]. This is because it is acknowledged that the sustainability of organic production system A (and B) is dependent on the size of the current gene pool for the different organically reared livestock breeds/strains and species (including both livestock species for production and livestock species for breeding). As set out

12 See for example: Commission Regulation (EC) No 2277/2003 of 22 December 2003 and Commission Regulation (EC) No 2254/2004 of 27 December 2004.

Box 1.4: Principles of organic livestock production – third derogation on origin of animals

"By way of a third derogation, the renewal or reconstitution of the herd or flock shall be authorised by the control authority or body when organically reared animals are not available, and in the following cases:

(a) high mortality of animals caused by health or catastrophic circumstances;
(b) pullets for egg production and poultry for meat production less than three days old;
(c) piglets for breeding purposes, which must be reared according to the rules of this regulation as soon as they are weaned and must weigh less than 35 kg.

Case (c) is authorised for a transitional period expiring on 31 July 2006." (Point 3.6).

"Notwithstanding the provisions laid down in Paragraph 3.4. and 3.6., non-organically reared pullets for egg production of not more than 18 weeks may be brought into an organic livestock unit when organically reared pullets are not available, subject to following conditions:

– prior authorisation of the competent authority, and
– from 31 December 2005, the provisions laid down in paragraphs 4 (Feed) and 5 (Disease prevention and veterinary treatment) of this Annex I shall apply to non-organically reared pullets intended to be brought into organic livestock units.' (Point 3.7).

Source: Excerpt from Council Regulation (EEC) No 2092/91, Technical Annex I, Part B, Section 3.

Box 1.5: Principles of organic livestock production – fourth derogation on origin of animals

"By way of a fourth derogation, subject to a maximum of 10% of adult equine or bovine (including bubalus and bison species) livestock and 20% of the adult porcine, ovine and caprine livestock, livestock may be brought in, as female (nulliparous) animals, from non-organic-production stock farms per year, for supplementing natural growth and for the renewal of the herd or flock, when organically reared animals are not available, and only when authorised by the control authority or body." (Point 3.8).

"The percentages laid down in the above derogation shall not apply to production units with less than 10 equine or bovine animals, or with less than five porcine, ovine or caprine animals. For these units, any renewal as mentioned above shall be limited to a maximum of one animal per year." (Point 3.9).

"These percentages may be increased, up to 40% following the opinion and agreement of the inspection authority or body, in the following special cases:

– when a major extension to the stock farm is undertaken,
– when a breed is changed,
– when a new livestock specialisation is developed,
– when breeds are in danger of being lost to farming. Animals of those breeds must not necessarily be nulliparous." (Point 3.10).

Source: Excerpt from Council Regulation (EEC) No 2092/91, Technical Annex I, Part B, Section 3.

Box 1.6: Principles of organic livestock production – fifth derogation on origin of animals

"By way of a fifth derogation, males for breeding may be brought in from non-organic-production stock-farms provided that the animals are subsequently reared and always fed in accordance with the rules laid down in this Regulation." (Point 3.11).

Source: Excerpt from Council Regulation (EEC) No 2092/91, Technical Annex I, Part B, Section 3.

in Section 3 of Part B of Technical Annex I (Box 1.1), the first principle rule governing the origin of animals for use in organic systems concerns the choice of breeds and strains so that animals used for organic production are adapted to their environment, to build up resistance to certain diseases. However, due to the relatively small size of the organic sector and the niche demand within this sector, the current gene pool of 'local' and 'traditional' breeds/strains for use in organic production system A and B is still relatively undeveloped, even in the non-organic sector. Thus, from a *supply* perspective there is concern that without further (temporary) extension of the aforementioned derogations, certain organic livestock enterprises may become unsustainable due to a lack of organic parent-stock for breeding organic replacements[13], and may disappear.

However, it is acknowledged that this derogation cannot be extended indefinitely without justification. From a producer demand perspective there is concern that organic production system C could potentially undermine the principles of organic production and this may lead to a reduction in consumer confidence for organic produce. Any such reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply.

Moreover, Action 9 of the European Action Plan for Organic Food and Farming (European Commission, 2004) proposes action concentrating on *"ensuring the integrity of organic agriculture by reinforcing the standards and maintaining the foreseen end dates of the transitional periods"*.

1.2 Study objectives

As noted in Section 1.1.3, the derogations were necessary because the sustainability of organic production system A (and B) is dependent on the supply of suitable organic livestock species. Whether there is still a lack of organic parent-stock for breeding organic replacements is the focus of this research. From a supply perspective there is concern that if there is still a lack of organic parent-stock, a further temporary extension of the aforementioned derogation may be necessary. This is because certain organic livestock enterprises may become unsustainable, both in terms of the low availability of and price for organically reared livestock species, and therefore may disappear.

A review of relevant literature suggests that this derogation has been necessary as there has been and may still be a lack of organic parent-stock for breeding organic replacements, see for example: Lampkin (1997), Nauta (2001), Nauta, *et al*. (2001) and Nauta, *et al*. (2003). Most organic livestock producers in the EU have traditionally taken advantage of the derogation and use non-organic livestock for reasons of availability and price (Lampkin, 1997). According to Nauta (2001) this has particularly been the case with respect to cattle, pig and poultry production where it has been virtually impossible to find animals that have been bred specifically for organic production systems. Therefore, most organic livestock producers in the EU use non-organic animals supplied by breeding companies.

Based on Alrøe, *et al.'s* (1998) definition of organic production set out in Section 1.1.1, the use of non-organic animals would therefore seem to be in conflict with the principles and aims of organic farming. In particular, the use of non-organic animals supplied by breeding companies would appear to be at odds with the concept of *self-sufficiency* and *sustainability* (i.e. the concept of organic production system A) and using *local, renewable resources* (such as traditional animal breeds rather than commercial breeds).

The overall aim of this Study is to carry out an economic analysis on the *'availability of organically reared livestock in the EU-25'* and to assess

13 Both in terms of the low availability of and relatively high price for such organically reared livestock species.

the current and future sustainability of organic production system A and B. Specifically, this Study focuses on the current and future sustainability of organic production system B with respect to the derogations in points 3.5, 3.6, 3.7, 3.8, 3.9 and 3.10 in Annex I, Part B 3 (origin of animals), which permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted.

The current and future sustainability of organic production system B with respect to the derogations in points 3.3, 3.4 and 3.11 have not been considered in this Study. It was agreed[14] that the derogation in Annex 1 Part B 3.11 (bringing in of non-organic males) would not form part of this Study because of the lack of available (quality) data on male animals. In addition, it was considered important that in order to maintain the genetic potential of these converted herds and flocks, males for breeding must be made available in sufficient numbers if the organic livestock sector is to be/remain sustainable in the short to medium term.

In addition, it was also agreed that the derogations in Annex 1 Part B 3.3 and 3.4 would only be indirectly reported on as all organic livestock has an initial non-organic source. This is because the derogations in points 3.3 and 3.4 are considered necessary to allow non-organic farms to convert to organic livestock systems. Preventing the use of these derogations at the present time would impede the development of the organic livestock sector, particularly in those Member States that are still in their infant stage of development.

Overall, it is intended that this Study will provide a clear perspective of the current and future situation as regards organic production system B *vis-a-vis* organic production system C (i.e. organic production without use of the derogation *vis-à-vis* organic production with the use of the derogation), in order to assist in the development of the legislative rules on organic livestock production.

Thus, the specific objectives of this Study are:

- to provide an assessment of the current state of organically reared livestock in each Member State of the EU-25 and the prospects for the future of the sector.
- to evaluate the impact of a transition from organic production system C to organic production system B on the economic sustainability of the organic livestock sector in selected EU Member States and to examine the need for adapting the current harmonised rules on organically reared livestock laid down in Annex 1, Part B. 3 of Council Regulation (EEC) No 2092/91.

1.3 Structure of the report

This Report is structured in five Sections. Section 2 provides an assessment of the current state of organically reared livestock in each Member State of the EU-25 and the prospects for the future of the sector. Section 3 presents the methodology used in this Study to evaluate the impact of organic production system B on the economic sustainability of the organic livestock sector in selected EU Member States and the result of this assessment is presented in Sections 4 to 6. On the basis of these findings, Section 7 examines the need for adapting the current harmonised rules on organically reared livestock laid down in Annex 1, Part B. 3 of Council Regulation (EEC) No 2092/91.

14 in association with the Steering Group which consisted of representatives from DG JRC (IPTS) and DG Agri (F5).

2. State of the EU Organic Livestock Sector

2.1 Introduction

This Section provides a quantitative and qualitative assessment of the current state of organically reared livestock in each Member State of the EU-25 and the prospects for the future of the sector. As set out in the Terms of Reference to this Study (Appendix 3), this assessment focuses on the following livestock species/categories:

- ruminants (bovine, ovine and caprine);
- equidae;
- porcine;
- poultry (egg and meat); and,
- aquaculture.

For each livestock species/category, organic livestock numbers were collected from primary and secondary data sources for each of the EU-25 Member States, where available. As noted by Padel (2005), it still remains difficult to obtain reliable statistical data on organic livestock numbers in the EU. This assessment was therefore limited to *production* animals[15] as data on organic *breeding (parent) stock* was found to be unavailable.

Before presenting the assessment of the current state of the organically reared livestock sector and its future prospects by Member State (Sections 2.4 to 2.28) and at the EU-25 level (Section 2.29), this introductory section begins with an overview of the development of the EU-25 organic land area (Sections 2.2) and structure of organic agricultural and livestock production (Section 2.3). Although available statistics on the area of land and number of farms that have converted to organic production are only available at the agricultural level and not the livestock sector level, they offer a number of insights into the likely evolution of livestock production in the Member States. This is because land is a necessary input for livestock production.

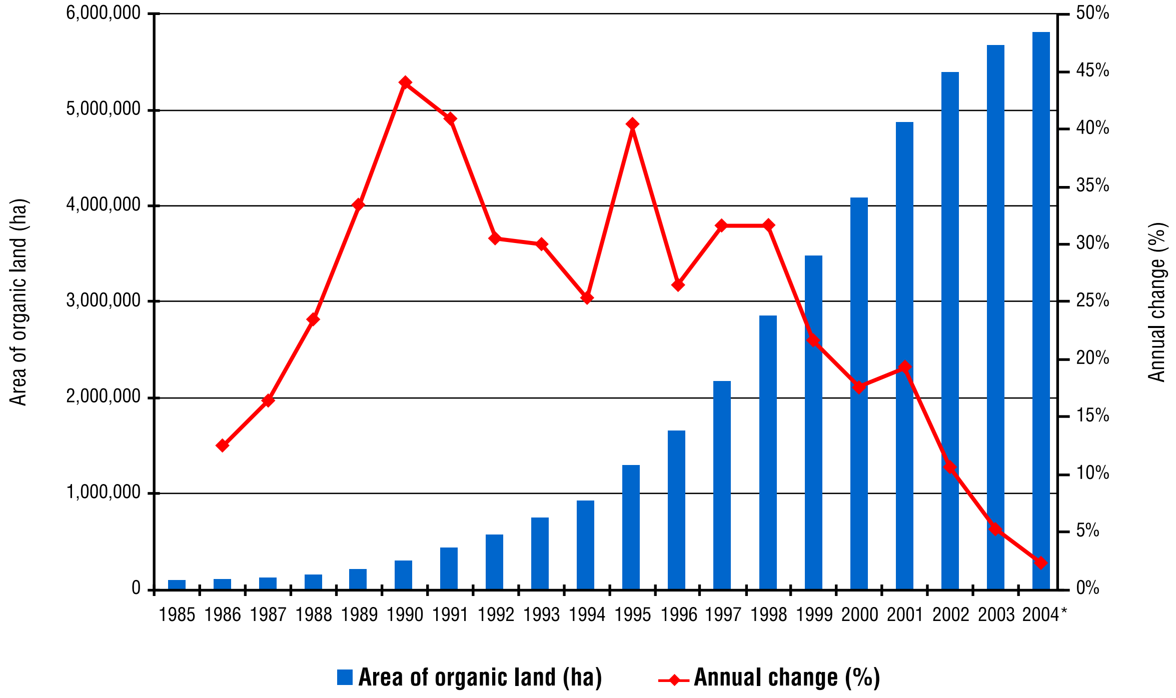
2.2 Organic land area

Since the 1980s, the area of land and number of farms that have converted to organic production in the EU-25 has risen dramatically, with annual increases of up to 45% recorded in the early 1990s. By 2004, 137,334 farms totalling 5.82 million hectares were in organic production (see Table 2.1 for sources) (see Figure 2.1 and Figure 2.2). Much of this growth has been in response to higher prices paid to producers for organic produce, compared to non-organically produced agricultural commodities, and increased payments available to organic farmers under the Common Agricultural Policy's (CAP) Rural Development Programme (RDP).

Despite this rapid growth, organic production is still a relatively small agricultural sector accounting for only 1.4% of total farms and 3.7% of total utilisable agricultural area in the EU-25 (see Table 2.1 for sources). However, as shown in Figure 2.1 and Figure 2.2, the annual rate of increase in the area of organic production and the number of organic farms has been decreasing since its peak in the early 1990s. Moreover, the annual rate of change is currently at its lowest level, with the number of organic farms estimated to have actually fallen in 2003 and 2004. That said, the area of organic production nonetheless shows a positive increase, with certified and policy-supported organic and in-conversion land

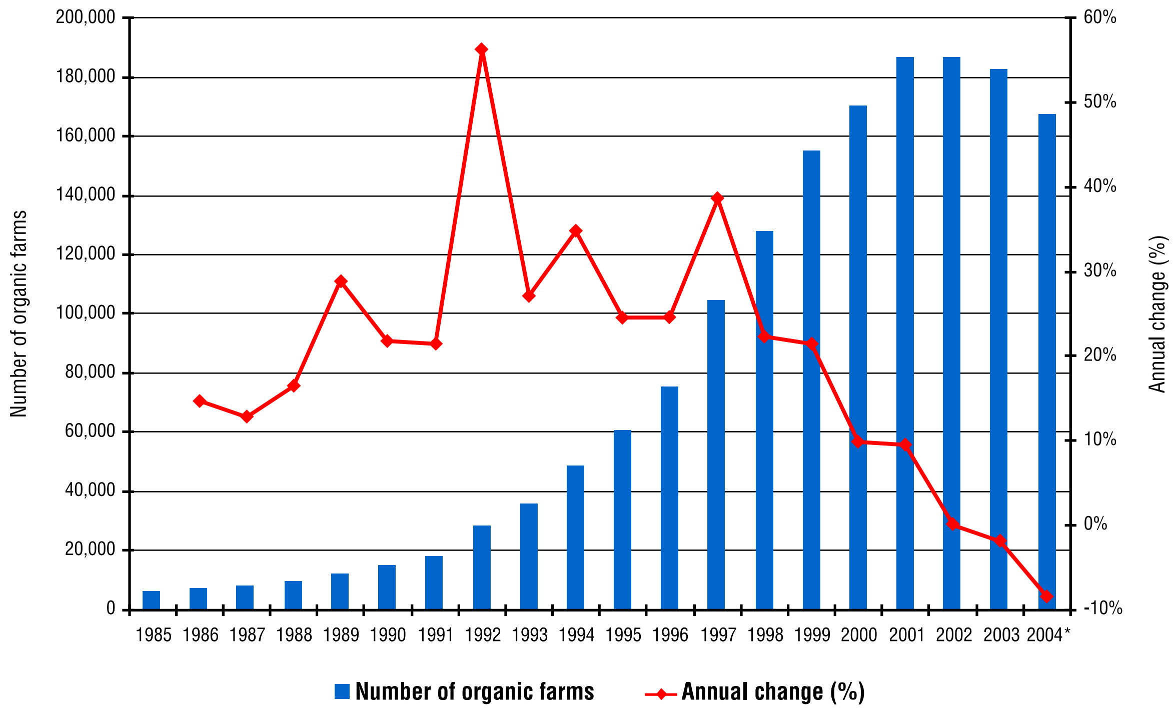
15 *Production* animals in the context of this Study is taken to mean an animal that is kept primarily for the purpose of producing meat, milk, eggs or wool. In contrast, *breeding* animals or parent, multiplier or reproduction stock in the context of this Study are taken to mean animals that are not kept primarily for the purpose of the production of meat, milk, eggs or wool, but for the production of offspring used for producing these products.

Figure 2.1 EU-25 area of certified and policy-supported organic and in-conversion land, 1985-2004 (hectares)



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Figure 2.2 EU-25: number of certified and policy-supported organic and in-conversion farms, 1985-2004



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

area estimated to have increased by 2.3% in 2004 (see Table 2.1 for sources).

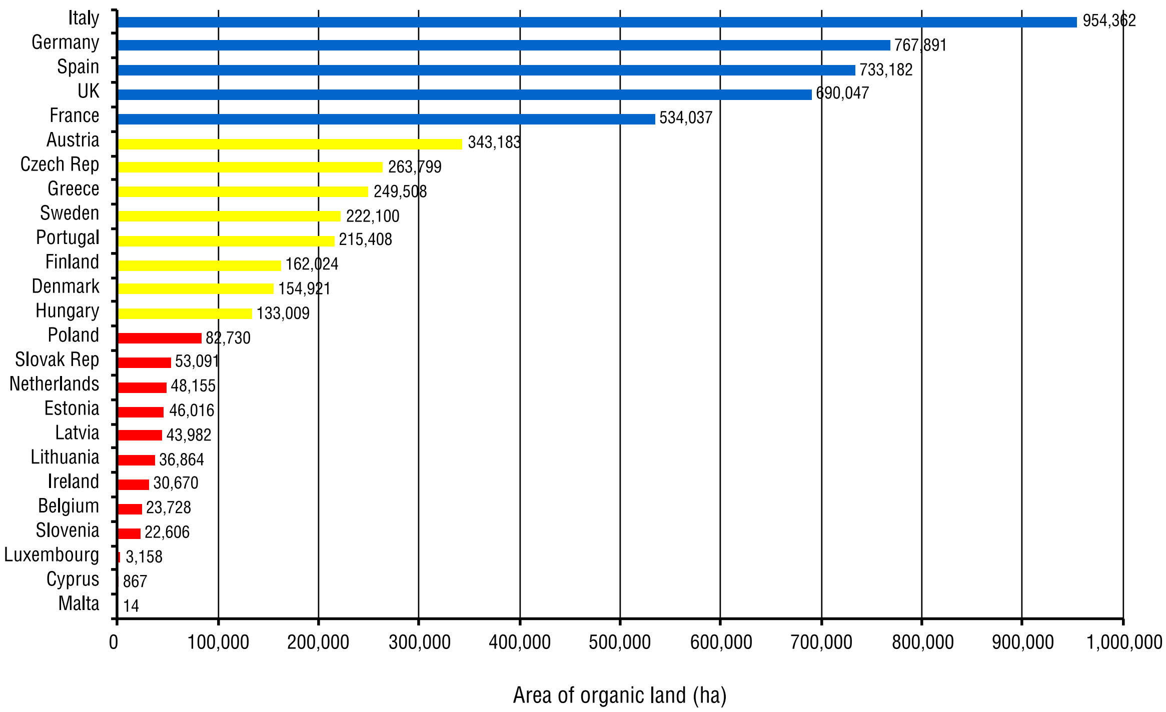
This general trend at the EU level, however, masks considerable differences in the size and number of, and evolution in, organic and in-conversion land area and number of farms at the Member State level. Just under two-thirds (63.3%) of EU-25 organic land area is located in just five Member States; Italy has by far the largest share of total EU-25 organic land area with just under 1 million ha (16.4%), followed by Germany at 0.8 million ha (13.2%), Spain at 0.7 million ha (12.6%), the UK at 0.7 million ha (11.9%) and France at 0.5 million ha (9.2%) (see Figure 2.3 and Table 2.1). The EU-15 accounts for 88.3% of total EU-25 organic land area, while the new Member States account for 11.8% (see Table 2.1 for sources).

In contrast, when looking at the area of organic and in-conversion land as a proportion of each Member State's total utilisable agricultural area (UAA, i.e. both organic and non-organic area), a different trend emerges (see Figure 2.4). The proportion of land that is organic in Austria (10.5%), Italy (7.3%), the Czech Republic (7.3%), Finland (7.2%), Sweden (7.1%), Greece (6.3%), Denmark (5.8%), Estonia (5.8%) and Portugal (5.8%) is relatively high, although these Member States have substantially less organic land area in absolute terms with the notable exception of Italy (see Figure 2.3) (see Table 2.1 for sources).

However, there are a number of Member States in which the proportion of organic land is less than 2%. These include France (1.9%), despite having one of the largest shares of EU-25 organic area, Belgium (1.7%), Lithuania (1.5%), Ireland (0.7%), Poland (0.6%), Cyprus (0.6%) and Malta (0.1%) (see Figure 2.4) (see Table 2.1 for sources).

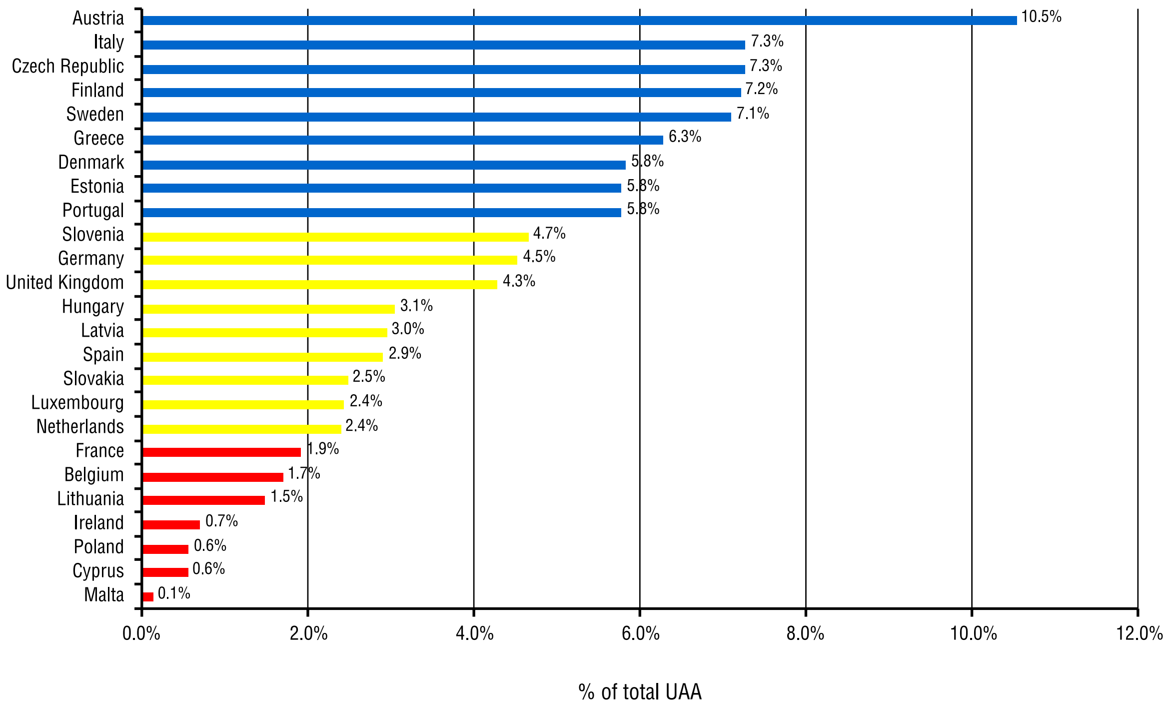
Overall, the EU-25 organic share of utilisable agricultural area (UAA) is 3.7%, with the EU-15 accounting for 4.1% while the new Member States account for 2.3% (see Table 2.1 for sources).

Figure 2.3 EU-25 area of certified and policy-supported organic and in-conversion land, 2004 (hectares)



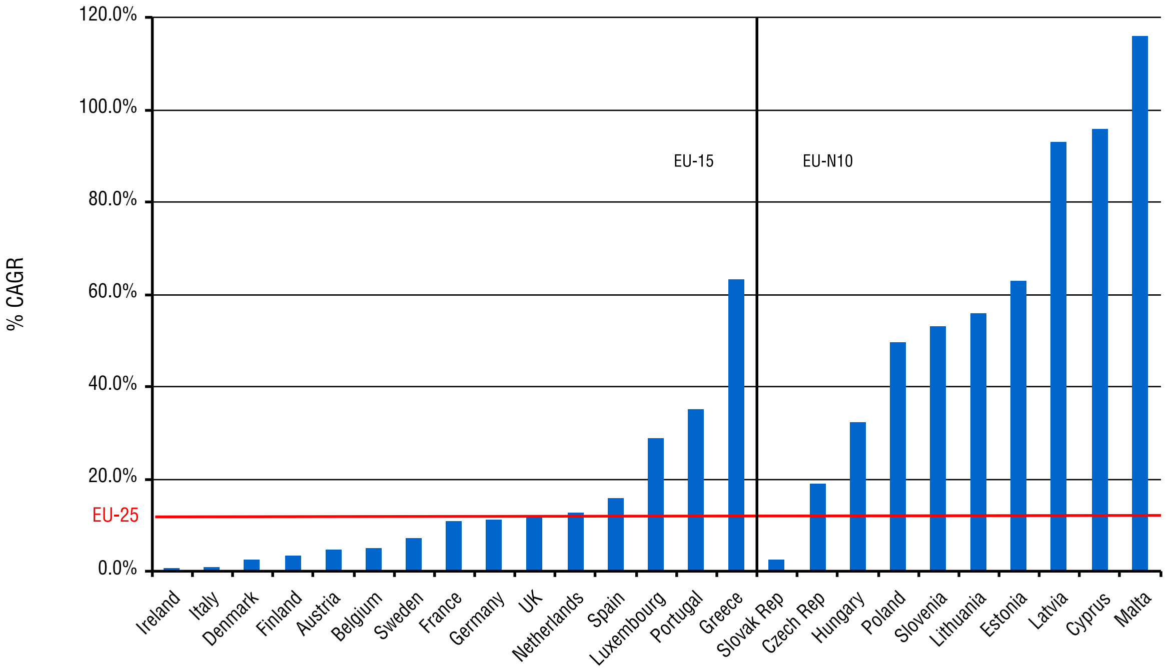
*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Figure 2.4 EU-25 share of certified and policy-supported organic and in-conversion land, of total UAA, 2004 (%)



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Figure 2.5: Compound Annual Growth Rate (CAGR) of organic land area, 1999-2004 (%)



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table 2.1 Number and size of organic farms compared to non-organic farms, 2004[1]

	Organic			Total (organic and non-organic)			Difference in Av. size
	Producers	Area	Av. Size	Producers[2]	UAA[2]	Av. Size	
	No.	Ha	Ha	No.	Ha	Ha	%
Austria	20,257	343,183	16.9	173,220	3,257,220	18.8	-11.0%
Belgium	670	23,728	35.4	53,880	1,394,400	25.9	26.9%
Denmark	3,510[3]	154,921	44.1	48,230	2,658,210	55.1	-24.9%
Finland	4,900	162,024	33.1	74,530	2,244,700	30.1	8.9%
France	12,202[3]	534,037	43.8	606,440	27,795,240	45.8	-4.7%
Germany	14,299	767,891	53.7	410,610	16,981,750	41.4	23.0%
Greece	8,269	249,508	30.2	818,470	3,967,770	4.8	83.9%
Ireland	889[3]	30,670[4]	34.5	135,200	4,371,710	32.3	6.3%
Italy	34,836	954,362	27.4	1,962,540	13,115,810	6.7	75.6%
Luxembourg	66	3,158	47.8	2,440[2*]	129,130[2*]	52.9	-10.6%
Netherlands	1,190	48,155[4]	40.5	84,240	2,007,250	23.8	41.1%
Portugal	1,145[3]	215,408	188.1	357,070	3,725,190	10.4	94.5%
Spain	17,028[3]	733,182	43.1	1,120,840	25,175,260	22.5	47.8%
Sweden	3,562[3]	222,100	62.4	66,810	3,126,910	46.8	24.9%
United Kingdom	4,017[3]	690,047	171.8	244,550	16,105,810	65.9	61.7%
EU-15	**126,840**	**5,132,374**	**40.5**	**6,159,070**	**126,056,360**	**20.5**	**49.4%**
Cyprus	45[5]	867	19.3	44,610	156,380	3.5	81.8%
Czech Republic	836	263,799[4]	315.5	43,920	3,631,550	82.7	73.8%
Estonia	583[5]	46,016[4]	78.9	36,790	795,640	21.6	72.6%
Hungary	1,610	133,009	82.6	712,210	4,352,370	6.1	92.6%
Latvia	1,043[6]	43,982[6]	42.2	126,440	1,489,350	11.8	72.1%
Lithuania	1,178	36,864[e]	31.3	252,880[2*]	2,490,960[2*]	9.9	68.5%
Malta	4[e]	14[4]	3.5	10,880[2*]	10,250[2*]	0.9	-276.8%
Poland	3,500[7]	82,730[4]	23.6	2,465,830[2*]	14,754,880[2*]	6.0	74.7%
Slovenia	1,582	22,606	14.3	77,140[2*]	485,430[2*]	6.3	56.0%
Slovakia	113	53,091[4]	469.8	69,760	2,137,500	30.6	93.5%
EU-N10	**10,494**	**682,978**	**65.1**	**3,840,460**	**30,304,310**	**7.9**	**87.9%**
EU-25	**137,334**	**5,815,352**	**42.3**	**9,999,530**	**156,360,670**	**15.6**	**63.1%**

Sources and Notes: [1] Provisional data (Eurostat, 2006) unless noted ([e] estimate); [2] 2003 data and [2] 2005 data (Eurostat 2005); [3] 2003 data (Eurostat, 2005); [4] Estimates (Lampkin, 2004); [5] 2002 data (SOEL/FIBL, 2002); [6] Zarina (2005); [7] Metera (2005).*

At the EU-25 level, the compound annual growth rate (CAGR) in organic and in-conversion land area between 1999 and 2004 has been 10.8%/year (see Table 2.1 for sources). During this period, there has been growth in all Member States, with particularly strong growth rates in many of the New Member States (see Figure 2.5). The strongest growth rates exceeded 60%/year (CAGR) over the period, notably in Malta (116.0%/year (CAGR)) and Cyprus (96.0%/year (CAGR)) (albeit from very low bases), Latvia (93.3%/year (CAGR)) and Estonia (63.0%/year (CAGR)), as well as in Greece (63.4%/year (CAGR)). CAGRs exceeding the EU-25 average of 10.8%/year also occurred in France (11.1%/year (CAGR)), Germany (11.2%/year (CAGR)), the UK (12.0%/year (CAGR)), the Netherlands (12.8%/year (CAGR)), Spain (15.8%/year (CAGR)), Luxembourg (28.9%/year (CAGR)) and Portugal (35.0%/year (CAGR)) among the EU-15 countries; and also in the Czech Republic (19.0%/year (CAGR)), Hungary (32.5%/year (CAGR)), Poland (49.7%/year (CAGR)), Slovenia (53.0%/year (CAGR)) and Lithuania (56.0%/year (CAGR)) among the EU-N10 countries.

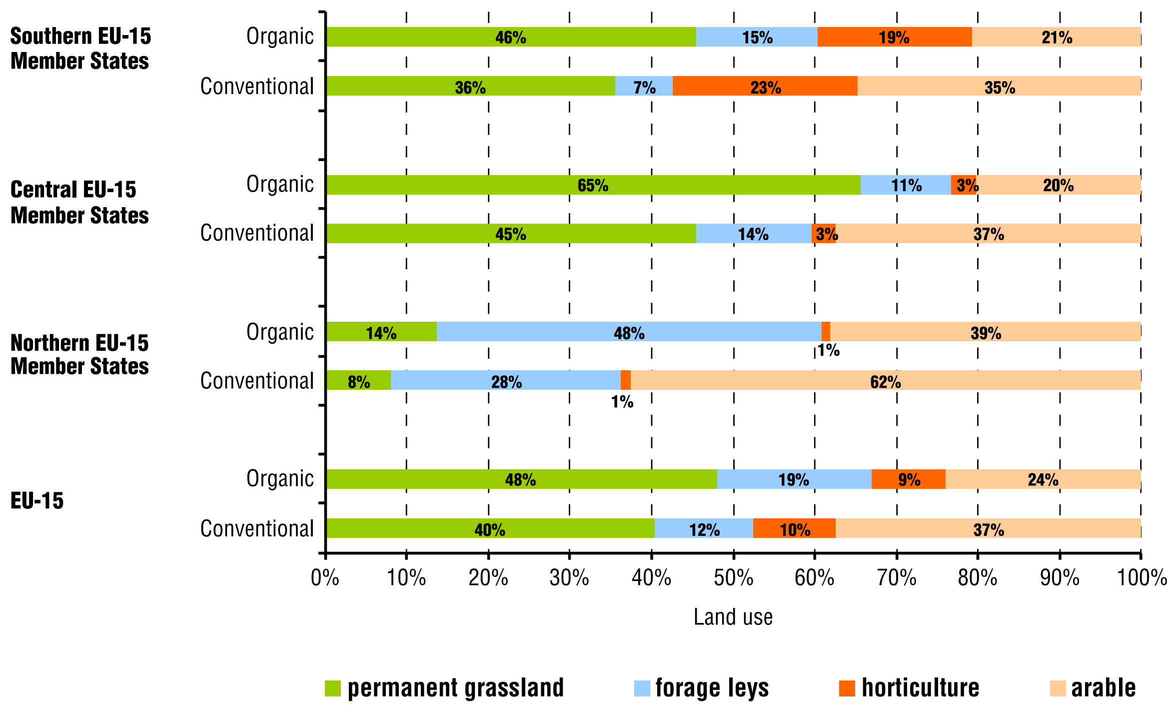
2.3 Structure of organic agricultural and livestock production

There are significant variations in the average size of organic farms among Member States. The largest organic farms, i.e. those exceeding the EU-25 weighted average of 78.2 hectares, are located in Slovakia, the Czech Republic, Portugal, the UK, Hungary and Estonia (Table 2.1).

As shown in Table 2.1, the average size of organic farms in the EU-25 tends to be 63.1% larger than non-organic farms at 42.3 hectares (see notes to Table 2.1). In the EU-15 the average size of an organic farm is 40.5 hectares, 49.4% larger than the average size of a non-organic farms (20.5 ha). With the exception of Austria, Denmark, France and Luxembourg, the average size of organic farms is larger than the average for non-organic farms, with the most marked size differences in Portugal (94.5%), Greece (83.9%), Italy (75.6%) and the UK (61.7%). In the EU-N10 the average size of an organic farm is 65.1 hectares, 87.9% larger than the average size of a non-organic farms (7.9 ha). With the exception of Malta, the average organic farm is more than 50% larger than the average non-organic farm in all EU-N10 member states.

This contrasts with the popular perception of organic farms as small, but again hides significant differences in farm size distribution within each country (Häring, *et al*. 2004). Most countries have a significant organic horticulture sector that is typically characterised by smaller holdings; whereas organic livestock production tends to be dominated by more extensive forms of agriculture compared to non-organic production. For example, in some regions of Portugal, Italy and the UK (Scotland), large areas of rough grazing have been converted to organic production on a limited number of farms, thereby significantly affecting average farm size figures. In contrast, Austria, Denmark, France and Luxembourg are the only EU-15 countries where non-organic farms tend to be larger; and Malta is the only EU-N10 country where the same is true.

Figure 2.6: EU-15: structure of organic production compared to non-organic production, 2002



Source: Häring, et al. (2004).

Table 2.2 EU-15 sub-regions for Figure 2.6 and Figure 2.7

EU-15 sub-region	Member States
Southern Europe	Greece, Italy, Portugal, Spain
Central Europe	Austria, Belgium, France, Germany, Ireland, Luxembourg, Netherlands, UK
Northern Europe	Denmark, Sweden, Finland

Source: Häring, et al. (2004).

As shown in Figure 2.6, organic production in the different regions of the EU-15 tends to have a higher share of extensive agricultural land use types (namely permanent grassland, forages and leys, and pulses) whereas non-organic production tends to have a higher share of intensive land use types (namely arable[16] and horticultural[17] production). This difference in production structure is due to farm organisational changes as a result of conversion to organic production methods, but may also be caused by different distribution of organic farms across regions. These trends are observed in all three greater European regions (see Table 2.2). The strongest increase in arable forage and ley area is observed in Northern and Southern Europe, while surprisingly, in Central Europe the share of arable forage and leys is lower in organic than in non-organic farming (Häring, *et al*. 2004).

Häring, *et al*. (2004) showed that the total average livestock density across all livestock categories in organic farming is only 70% of average livestock density in non-organic farming in the EU and that the higher the share of organic land, the lower the encountered livestock density and *vice versa*[18]. The difference between organic and non-organic livestock density is relatively small for ruminant species (i.e. sheep and goats, cattle and dairy cows), whereas the difference is much greater for pig production. The difference between organic and non-organic poultry stocking density is also small, although this apparent anomaly is likely to be due the exclusion of some large non-organic poultry units from farm survey data because they are registered as non-agricultural firms (e.g. Germany).

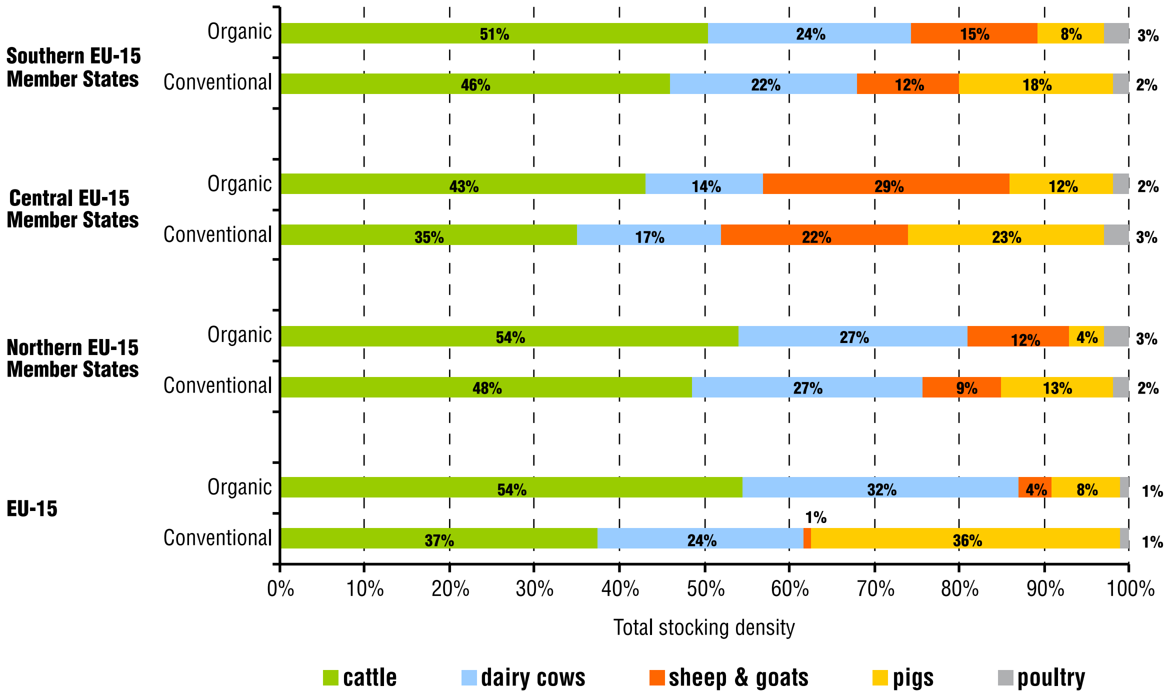
There are regional differences in the contribution of organic livestock to total livestock stocking density (see Figure 2.7). In the EU-15 as a whole, the share of cattle, sheep and goats in total livestock stocking density is higher in organic farming systems compared to non-organic production, as is the case in each of the EU-15 sub-regions (see Table 2.2). By contrast, the contribution of organic pigs to total livestock density is lower in each of the EU-15 sub-regions. On the other hand, the contribution of organic dairy cows to total stocking density is also higher for the EU-15 and the southern EU-15 countries, but identical in the northern EU-15 countries and lower in the central EU-15 countries compared to non-organic production. Finally, the contribution of organic poultry to total stocking density is higher in the southern and northern EU-15 countries, lower in the central EU-15 countries and equal to non-organic production for the EU-15 as a whole.

16 E.g. cereals and root crops.

17 E.g. vegetables, fruits, olives, vine, nurseries, permanent crops under glass and other permanent crops.

18 Häring, *et al*. (2004) showed a significantly ($p = 0{,}008$) negative ($r = -0{,}23$, Pearson's correlation coefficient) interrelation between livestock density and the share of organically farmed area.

Figure 2.7. EU-15 structure of organic production, compared to non-organic production, by EU regions (2002)



Source: Häring, et al. (2004).

2.4 Austria

2.4.1 *Current state of organically reared livestock*

2.4.1.1 Organic land area

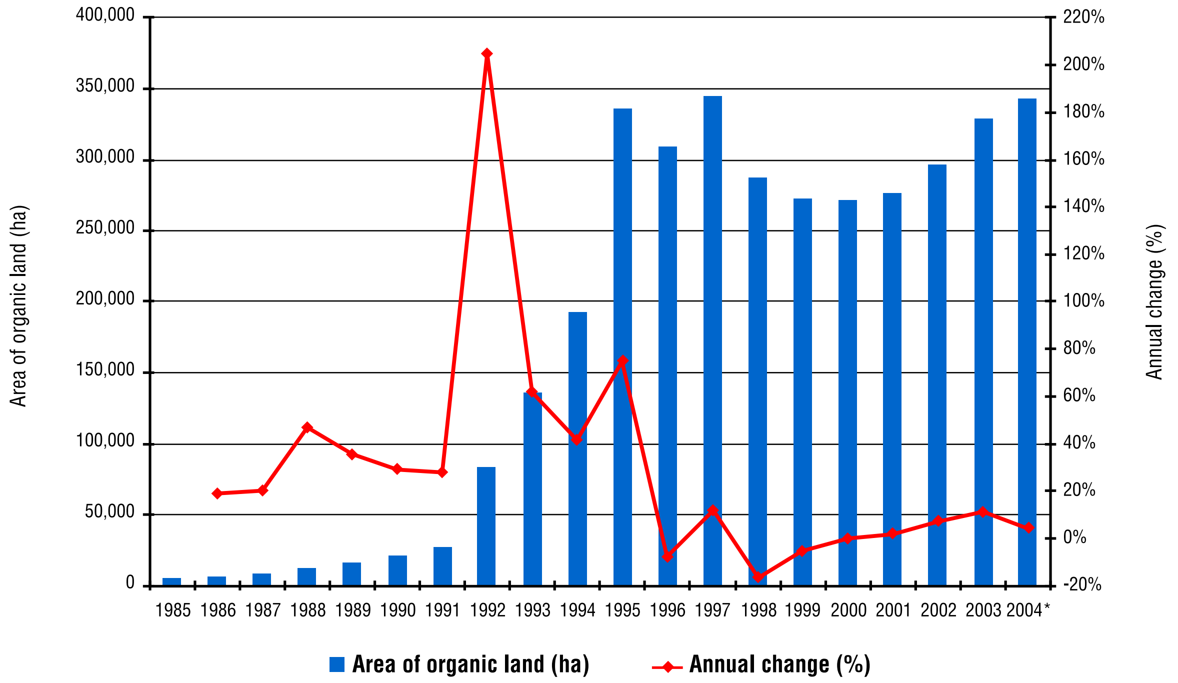
Total certified and policy-supported organic and in-conversion land area in Austria stood at 343,183 hectares in 2004 (see Figure 2.8), having increased from a mere 192,337 hectares 10 years previously. According to Klingbacher and Pohl (2005) there have been three main factors contributing to the rapid conversion of farms over this period:

- federal subsidies for converting and certified organic farms, introduced in 1991 and 1992;
- the introduction of the agri-environmental programme ÖPUL in 1995; and,
- favourable physical and economic conditions for the conversion of many grassland farms.

However, the rapid increase in the area of organic land up to 1997 caused marketing problems. While organic production had increased significantly, the market for organic products had not evolved at the same rate. Wlcek, *et al*. (2003) notes that during 2000 and 2001, some 1,800 farmers (especially in the western alpine regions) reconverted to conventional farming because of problems in marketing their products.

Since 2000 there has been a second period of growth as a result of the implementation of the follow-up ÖPUL agri-environmental programmes in 1998 and 2000, as well as the Action Plans for Organic Farming in 2001 and 2003 (Klingbacher and Pohl, 2005). This latest growth is reported to have mainly occurred as a result of the conversion of arable farms in Eastern Austria, rather than livestock farms. It is noted by Wlcek, *et al*. (2003) that the recent growth in organic arable land, at the expense of an increase in organic grassland, has been driven by the relative increased profitability of organic arable production due to a relatively higher demand for cash crops.

Figure 2.8 Austria: Evolution of certified and policy-supported organic and in-conversion land area, 1985-2004*



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Around two-thirds of Austrian certified organic farms in 2003 were grassland farms, of which approximately 97% have organic cattle (BMLFUW, 2005). The area of permanent grassland (excluding alpine land) used for livestock production has remained relatively stable since 1997 and as would be expected *a priori*, organic livestock numbers have therefore remained relatively stable over the period, although there has been a slight increase in non-grazing livestock species (e.g. pigs and poultry) (InVeKoS[19], 2005) (see next section).

2.4.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Austria was collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006), Foster and Lampkin (2000), Wlcek, *et al.* (2003) and BMLFUW (2005) (see Table A. 3).

Over the period, organic poultry have shown the fastest compound annual growth rate (CAGR) at 15.6%/year (CAGR), followed by organic goats and pigs at 3.4%/year (CAGR) and 3.2%/year (CAGR) respectively.

By contrast, organic sheep numbers decreased by 3.4%/year (CAGR) and organic bovines decreased at a rate of 0.1%/year (CAGR). As mentioned above, the main reason for the decline in sheep and cattle numbers is reported to be problems associated with marketing and specifically for the livestock sectors, a reported lack of investment by dairies and abattoirs. Consequently, during this period around one-third of organically produced dairy and meat products were actually processed, labelled and sold as organic products to the consumer, with the remaining two thirds of organic dairy and meat products effectively sold as conventional (i.e. non-organic) (Agra Europe, 2001).

The contribution of organic livestock to total (organic and non-organic) livestock numbers for

19 Integriertes Verwaltungs- und Kontrollsystem (German: Integrated Administration and Control System (IACS)).

Table 2.3 Share of organic livestock in total livestock population, 2004 (head)

	Equines[1]	Bovines	Sheep	Goats[2]	Pigs	Poultry
Organic	9,872	331,441	79,194	17,244	49,084	848,337
Total	75,347	2,048,771	327,163	69,618	3,139,753	87,777,000
Share	13.1%	16.2%	24.2%	24.8%	1.6%	1.0%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: [1] data for 1999; [2] data for 2001.
Source: Organic data from sources shown in Appendix A2.2; total livestock numbers from Eurostat (2006) and FAO (2006).

2004 are shown in Table 2.3. With the exception of poultry, Austria has a greater share of organic production than the EU-25 average for all other livestock species. Organic sheep and goats have almost a one-quarter share of total production each, while organic equines and bovines have shares of around one-sixth. By contrast, organic pigs and poultry account for less than 2% of total production.

Based on the data presented in Appendix A2.2, the following observations can be made regarding the current state and recent development of organically reared livestock in Austria:

- ***Equines:*** The data available indicates that there were 9,872 organic equines in Austria in 1999, accounting for a share of 13.1% of total equines. No further data was available on the development of organic equine production.
- ***Bovines:*** Approximately 97% of all organic farms had organic cattle in 2003 (BMLFUW, 2005). Total organic bovine numbers have remained relatively unchanged, with a small reduction of 0.1%/year (CAGR) between 1997 and 2004, from 335,021 to 331,441 head. This trend is in line with the reported stability in the area of permanent grassland used for livestock production since 1997. Organic bovines accounted for a share of 16.2% of total bovine production in 2004.
  Organic dairy cow numbers decreased by 1.7%/year (CAGR) over the period, due to a sharp reduction in the number of dairy farms, particularly in the alpine regions in Western Austria between 2000 and 2001. According to Wlcek, *et al*. (2003) this was caused by farmers dropping out of organic production as a result of problems in marketing organic milk and dairy products. In 2000, the degree of self-sufficiency in organic milk was 112% (Hamm, *et al*. 2002).
  By contrast, organic beef cows increased in number by 0.5%/year (CAGR) between 1997 and 2004, with suckler cow numbers increasing by 2.0%/year (CAGR). This increase has been driven by the reduction in dairy cow numbers, in part because of the reported difficult market situation for organic milk and dairy products in recent years (Wlcek, *et al*. 2003)
- ***Sheep and Goats:*** Total organic sheep numbers declined over the period by 3.4% between 1997 and 2004, from 101,118 to 79,194 head. This was caused by problems associated with the marketing of organic meat, as previously described. There was no data available to separate breeding ewe and other sheep numbers from the total. Organic sheep accounted for a share of 24.2% of total sheep production in 2004.
  By contrast, total organic goat numbers increased by 3.4%/year (CAGR) between 1997 and 2001, from 15,060 to 17,244 head. No data for breeding nannies and other goat numbers was available. Organic goats accounted for a share of 24.8% of total goat production in 2001.
- ***Pigs:*** Total organic pig numbers increased by 3.2%/year (CAGR) between 1997 and 2004, from 39,390 to 49,084 head. There was no data available to separate fatteners, breeding sows and other pig numbers from the total. Organic pigs accounted for a share of 1.6% of total pig production in 2004.

- ***Poultry:*** Total organic poultry numbers increased by 15.6%/year (CAGR) between 1997 and 2004, from 308,421 to 848,337 head. There was no data available to separate broiler and laying hen numbers from the total. Organic poultry accounted for a share of 1.0% of total poultry production in 2004.
- ***Aquaculture:*** Organic carp, brown trout and rainbow trout are farmed in Austria (Franz, 2004). There is no information available at the time of data collection on organic aquaculture production volumes.

2.4.1.3 Self-sufficiency

The preceding discussion has clearly shown that the sustainability of growth in the organic livestock sector in Austria over recent years has been a function of both supply and demand led initiatives. As can be seen in Table 2.4, Austria was self-sufficient in organic sheep and goat meat and had an exportable surplus of organic milk, beef, pork, poultry and eggs in 2001. This coincides with the reported problems associated with the marketing of organic production following the rapid conversion of farms during the mid-1990s. In particular, self-sufficiency was at its greatest for dairy and beef products, which were reported to be experiencing the greatest marketing problems, see for example: Agra Europe (2001) and Wlcek, *et al*. (2003).

2.4.2 Prospects for the development of organic livestock

Austria's national share of organic livestock production is one of the highest in the EU-25, although growth in the number of organic livestock appears to have plateau in recent years, with the exception of poultry and to a lesser extent pigs and goats. BMLF (1999) notes that even in Austria, unlimited growth does not seem possible. As a result, Klingbacher and Pohl (2005) believe that the single biggest challenge in Austrian organic agriculture is to maintain both the level and growth in organic production as the organic market in the country matures (i.e. as demand levels off).

Austria's strategy for the future development of the organic livestock sector has been to merge the numerous organic organisations into a single entity called 'Bio Austria'. In doing so, the organic industry aims to offer a more co-ordinated approach to advisory services, quality management, information, and marketing, etc.,

Table 2.4 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	129
Beef (incl. Veal)	124
Sheep and goat meat	100
Pork	114
Poultry	113
Eggs	115

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

and give farmers and processors better service and consumers more security and quality. It is hoped that this will provide the platform from which Austria's organic sector can continue to grow.

However, given the already high penetration rate of the overall livestock sector by the organic sector and the relatively limited overall growth in livestock numbers in recent years, the prospect for further significant growth in organic livestock in the short-term (to 2008), would appear limited, unless there is a parallel significant increase in the demand for organic produce. If any organic livestock species is likely to exhibit significant growth in the short-term, then it is most likely to be poultry, rather than any of the grazing livestock species. This is because the organic poultry sector in Austria is still relatively underdeveloped vis-à-vis that of other EU-25 Member States while current growth is at a higher level.

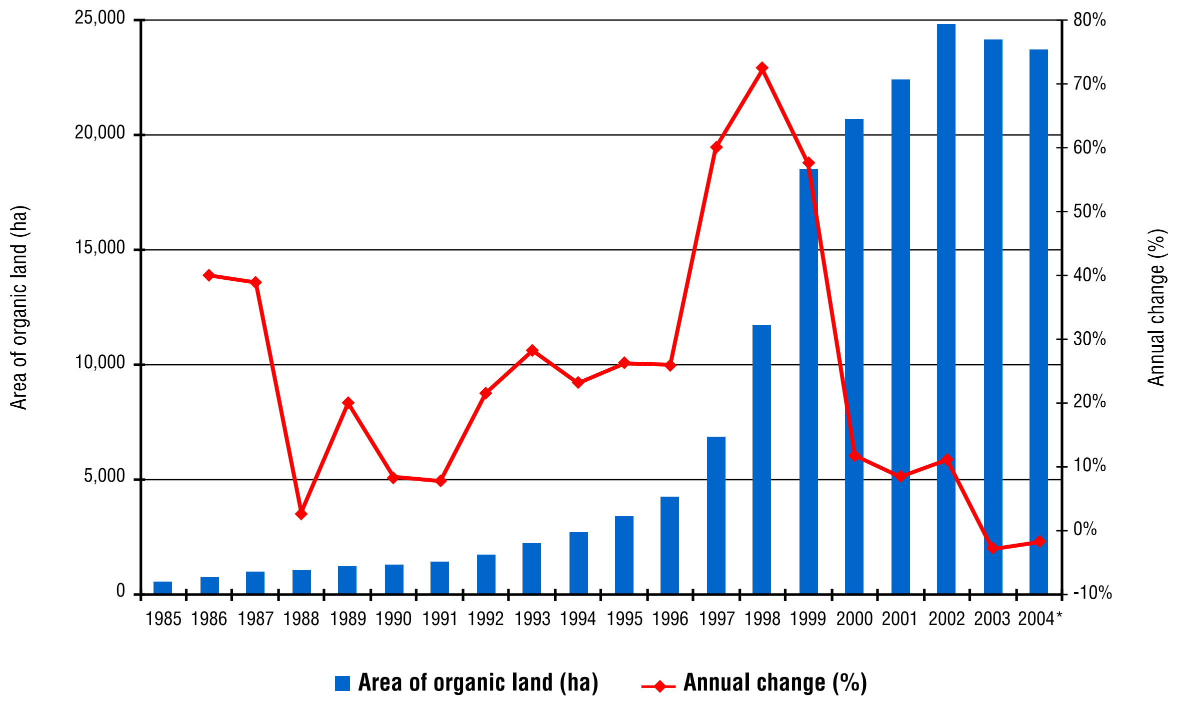
2.5 Belgium

2.5.1 Current state of organically reared livestock

2.5.1.1 Organic land area

Total certified, policy supported and in-conversion organic land in Belgium amounted to 23,728 hectares in 2004 (see Figure 2.9). It experienced rapid growth in the latter part of the 1990s encouraged by state funding through the EU extensification programme from 1989 onwards and later EU-Regulations 2078/92 and 1957/1999. In 1998, the Umbrella organisation for organic farming BioForum was established and subsequently there was an increase in the number of organic conversions. Between 2002 and 2004, the area of organic land started to decline slightly.

*Figure 2.9 Belgium: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

As expected *a priori*, as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production has shown a similar trend over the period (see next section).

2.5.1.2 Structure of the organic livestock sector

Most organic livestock production takes places in the Wallonia region, while the Flanders region is more intensively farmed for arable crops and horticulture.

Information on the number of organic livestock in Belgium has been collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006) and Foster and Lampkin (2000) (see Table A. 4).

During this period, the number of organic livestock increased for all species. Organic poultry have shown the fastest growth by 76.8%/year (CAGR) between 1997 and 2004, followed by organic equines and bovines at 46.8%/year (CAGR) and 33.4%/year (CAGR) respectively. Organic pig and goat numbers increased by 26.9%/year (CAGR) and 24.5%/year (CAGR) respectively, while organic sheep numbers increased by 8.2%/year (CAGR).

According to reports from Belbior, the Belgian organic farming association, organic livestock production increased by 2.4% in 2005 compared to 2004, with organic laying hens, sheep and goat numbers rising, but numbers of organic cattle and pigs declining (Eurofood, 2006(a)).

The shares of organic livestock in total livestock numbers for 2004 using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) are summarised in Table 2.5. Organic goats and poultry have the largest shares of total production at 8.8% and 6.5% respectively, with organic sheep recording a 4.5% share. These organic shares are well above the EU-25 average. The shares of organic bovines, equines and pigs are all less than 2% of total livestock numbers in each sector and below the EU-25 average.

Based on the data presented in Table A. 4, the following observations can be made regarding the current state and recent development of organically reared livestock in Belgium:

- ***Equines:*** Total organic equine numbers increased by 46.8%/year (CAGR) between 1999 and 2004, from 49 to 334 head. Organic equines accounted for a share of 1.0% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 33.4%/year (CAGR) between 1997 and 2004, from 4,288 to 32,190 head. Organic dairy cow numbers increased by 23.4%/year (CAGR) over the period, mainly concentrated in the region of Herverland. Organic beef cows increased in number by 38.7%/year (CAGR), with production occurring mainly in Wallonia and in the Ardennes mountains. Of the organic beef cows, bovine animals for meat production increased fastest by 178.2%/year (CAGR), followed by suckler cow numbers at 2.1%/year (CAGR). Organic bovines accounted for a share of 1.2% of total bovine production in 2002.

Table 2.5 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep[1]	Goats[1]	Pigs	Poultry
Organic	334	32,190	6,521	2,310	8,359	801,080
Total	31,945	2,701,450	146,030	26,237	6,344,751	12,382,000
Share	1.0%	1.2%	4.5%	8.8%	0.1%	6.5%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: [1] data for 2003.
Source: Organic data from sources shown in Table A. 4; total livestock numbers from Eurostat (2006) and FAO (2006).

- ***Sheep and Goats:*** Total organic sheep numbers increased by 8.2%/year (CAGR) between 1999 and 2004, from 4,779 to 7,086 head. Breeding ewe numbers increased by 2.8%/year (CAGR) and numbers of other sheep increased by 28.1%/year (CAGR). Organic sheep accounted for a share of 4.5% of total sheep production in 2004.

  Total organic goat numbers increased by 24.5%/year (CAGR) between 1999 and 2004, from 1,173 to 3,505 head. There is insufficient data available to separate breeding nannies and other goat numbers from this total. Organic goats accounted for a share of 8.8% of total goat production in 2004.
- ***Pigs:*** Total organic pig numbers increased by 26.9%/year (CAGR) between 1999 and 2004, from 2,541 to 8,359 head. Of this total, organic breeding sow and fattening pig numbers increased by 5.1%/year (CAGR) and 27.0%/year (CAGR) respectively, while other pig numbers increased by 168.3%/year (CAGR). Organic pigs accounted for a share of 0.1% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 76.8%/year (CAGR) between 1997 and 2004, from 14,852 to 801,080 head. Of this total, broiler numbers increased by 110.5%/year (CAGR), laying hen numbers increased by 30.2%/year (CAGR), while other poultry numbers increased by 8.7%/year (CAGR) between 1999 and 2004. Organic poultry accounted for a share of 6.5% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Belgium.

2.5.1.3 Self-sufficiency

The growth in the organic livestock sector in Belgium has largely been a function of supply led initiatives, rather than demand driven ones. That said, although Belgium was largely self-sufficient in organic poultrymeat in 2001, it was a net importer of other livestock products (Hamm, *et al*. 2004) (see Table 2.6).

2.5.2 Prospects for the development of organic livestock

With the exception of goats and poultry, organic livestock production in Belgium has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), although based on the total share of organic livestock Belgium is still ranked 4th in the EU-25. The growth of organic livestock numbers has also been high (i.e. >5%/year) and this would be expected to continue in the future, as organic agriculture is still considered to be an opportunity for many Belgian farmers, as it offers better prices for products (Heuschen, *et al*. 2001).

Table 2.6 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	84
Beef (incl. Veal)	75
Sheep and goat meat	n.a.
Pork	82
Poultry	99
Eggs	76

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\textit{sales of each organic product (as organic) for human consumption}}{\textit{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

Belgium's strategy for the future growth of the organic livestock sector in the short term is to promote organic food to consumers and thereby raise awareness and demand for organic livestock products among them. Subsidies of around €460,000 have been approved for a three-year organic food promotion campaign by the Flemish Centre for Agricultural and Fish Marketing (VLAM) (Eurofood, 2006(b)) and it is foreseen that this programme would receive matched funding from the EU, increasing the total budget to €720,000.

However, unless the supply of domestically produced livestock products increases, it is likely that much of the increased demand would be met by imports. Perhaps the greatest potential for future growth of organic livestock numbers exists for grazing livestock species, i.e. sheep, goats and bovines. Given that much of the grassland area in Belgium (mainly in Wallonia) is already extensively farmed and would therefore cost relatively little to convert to organic systems, there is still considerable scope for further organic growth. However, Heuschen, *et al*. (2001) claim that direct and indirect support by the government will be necessary to achieve this.

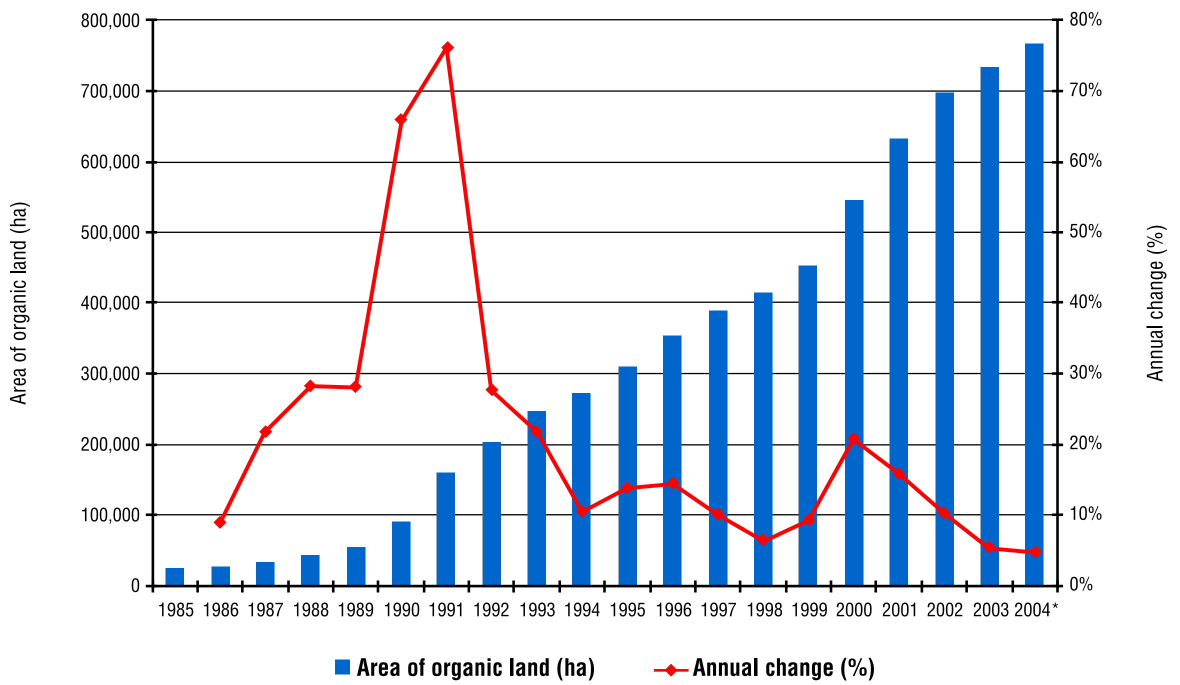
2.6 Germany

2.6.1 Current state of organically reared livestock

2.6.1.1 Organic land area

In 2004, Germany had 767,891 hectares of certified, policy supported and in-conversion organic land (see Figure 2.10), increasing substantially from 272,139 ha decade before. Organic land area increased substantially in the early 1990s, particularly in East Germany after the German reunification in 1990 (previously not allowed in the former German Democratic Republic (GDR)) (Willer, *et al*. 2002), encouraged by state funding through the EU extensification

*Figure 2.10 Germany: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

programme from 1989 onwards and later EU-Regulations 2078/92 and 1957/1999.

As expected *a priori*, as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production has shown a similar trend over the period (see next section).

2.6.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Germany has been collected for the main livestock species for the period 1997 to 2004 using data from Foster and Lampkin (2000), DE-Statis (2005) (see Table A. 5).

The number of organic livestock increased for all species, with organic pigs showing the fastest compound annual growth rate (CAGR) of 22.9%/year, followed by organic sheep at 19.5%/year (CAGR). By contrast, the slowest rate of increase was in the organic equine sector, which increased by 9.2%/year (CAGR).

The shares of organic livestock in total livestock numbers were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.7 below. The largest shares of organic livestock are in the poultry (12.4%), sheep (11.6%) and goat (8.6%) sectors, while the equine and bovine sectors have shares of 4.4% and 3.9% respectively. These organic shares are significantly above the EU-25 average, as can be seen from Table 2.7. By contrast, the share of organic pigs in total production is just 0.5%, although this is slightly above the EU-25 average.

Based on the data presented in Table A. 5, the following observations can be made regarding the current state and recent development of organically reared livestock in Germany:

- ***Equines:*** Total organic equine numbers increased by 9.2%/year (CAGR) between 2001 and 2003, from 17,741 to 23,072 head. Organic equines accounted for a share of 4.4% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 16.9%/year (CAGR) between 1997 and 2003, from 206,723 to 528,266 head. Of this total, organic dairy cow numbers increased by 9.4%/year (CAGR) over the period, while organic beef cows increased in number by 19.6%/year (CAGR). No data was available to separate suckler cows, bovine animals for meat production and other bovines from this total. Organic bovines accounted for a share of 3.9% of total bovine production in 2003.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 19.5%/year (CAGR) between 1997 and 2003, from 95,841 to 279,501 head. There was no data available to separate breeding ewes and other sheep from the total. Organic sheep accounted for a share of 11.6% of total sheep production in 2003.

  Total organic goat numbers increased by 10.2%/year (CAGR) between 1997 and 1999, from 8,909 to 10,811 head. There is insufficient data available to separate breeding nannies and other goat numbers from this

Table 2.7 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines[2]	Sheep[2]	Goats[1]	Pigs[2]	Poultry[2]
Organic	23,072	528,266	279,501	10,811	144,882	1,610,606
Total	525,000	13,514,735	2,410,990	125000	26,414,810	12,964,000
Share	4.4%	3.9%	11.6%	8.6%	0.5%	12.4%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: [1] data for 1999' [2] data for 2003.
Source: Organic data from sources shown in Table A. 5; total livestock numbers from Eurostat (2006) and FAO (2006).

total. Organic goats accounted for a share of 8.6% of total goat production in 1999.

- ***Pigs:*** Total organic pig numbers increased by 22.9%/year (CAGR) between 1997 and 2003, from 41,998 to 144,882 head. Organic pigs accounted for a share of 0.5% of total pig production in 2003.
- ***Poultry:*** Organic broiler numbers increased by 16.0%/year (CAGR) between 1997 and 2003, from 660,503 to 1,610,606 head. Organic laying hen numbers increased by 10.3%/year (CAGR) from 661,761 to 979,752 head. Organic poultry accounted for a share of 12.4% of total poultry production in 2003.
- ***Aquaculture:*** Organic carp, brown trout and rainbow trout are farmed in Germany (Franz, 2004). There is no information available on organic aquaculture production volumes.

2.6.1.3 Self-sufficiency

In 2001 Germany was a net importer of organic poultrymeat and eggs, but had an exportable surplus of organic milk, beef, sheep and goat meat and pork (Hamm, *et al*. 2004) (see Table 2.8).

2.6.2 Prospects for the development of organic livestock

With the exception of organic bovines and pigs, organic livestock production in Germany has a high contribution to total (organic and non-organic) livestock production (i.e. >5% share). The growth of organic livestock numbers has also been high (i.e. >5%/year) and this would be expected to continue, given the German government's ambitious target of increasing the organic share of total agricultural land to 20% by 2010.

In order to achieve this, public aid for organic farming was increased in 2002 and in addition to direct subsidies for farmers, marketing initiatives will also be supported. Under the 'Guideline for the Promotion of the Marketing of Organically Produced Agricultural Products', which was revised in 2002, subsidies are granted for producer-based marketing organisations, for processing and for the development of marketing concepts. It is implemented in all Federal States, many of which have also developed their own programmes to support marketing and other areas of organic farming (Willer, *et al*. 2002).

However, the Organic Food Federation (BÖLW) is reported as saying that organic conversion subsidies have been cut in some German states, which is likely to reduce the growth in organic land area and organic livestock numbers in these regions. Nevertheless, the demand for organic meat is firm and expected to rise from 2006 onwards, according to the German market and price reporting agency ZMP, with demand reported to be particularly strong for pork and beef, and to a lesser extent lamb (Eurofood, 2006(c)).

Table 2.8 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	102
Beef (incl. Veal)	113
Sheep and goat meat	129
Pork	106
Poultry	86
Eggs	77

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\textit{sales of each organic product (as organic) for human consumption}}{\textit{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

According to the Federal Ministry of Consumer Protection, Food and Agriculture (Ministry of Agriculture, 2001), organic livestock farming will continue to increase in importance, due to the growing market and the change in public awareness in favour of sustainable agriculture, particularly since the BSE crisis triggered a public debate in Germany revolving around agricultural production, food processing and agricultural policy.

2.7 Denmark

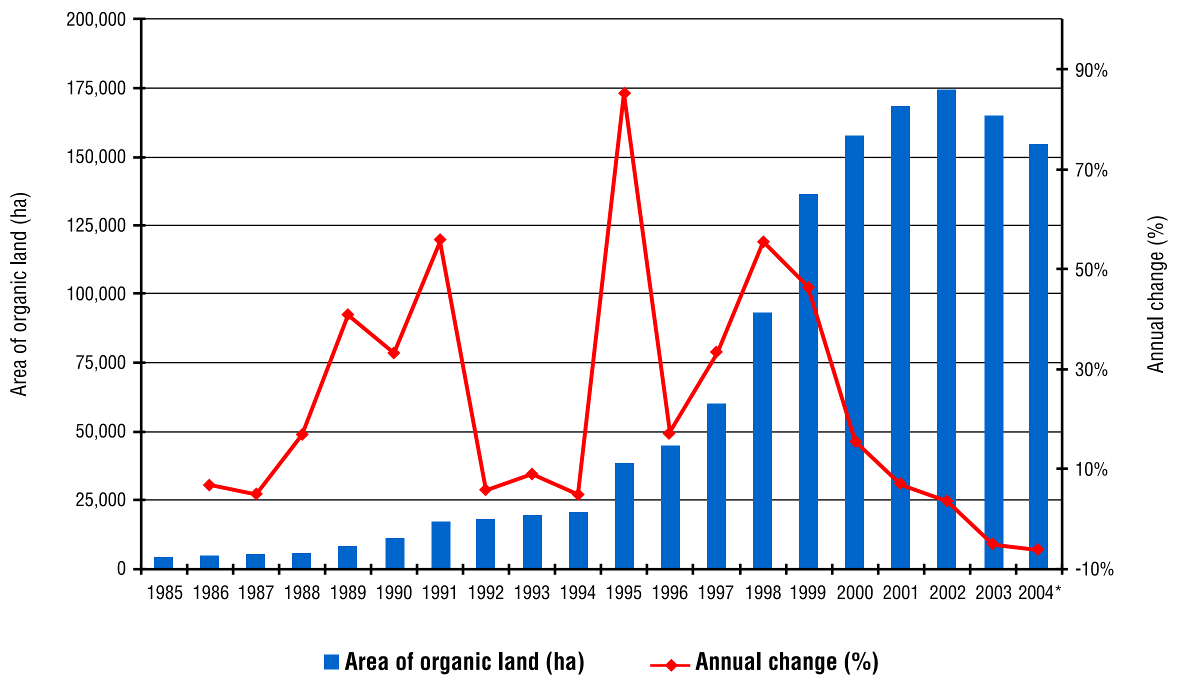
2.7.1 Current state of organically reared livestock

2.7.1.1 Organic land area

In 2004, Denmark had 154,921 hectares of certified, policy supported and in-conversion organic land area, having risen substantially from 20,688 hectares a decade previously (see Figure 2.11). However, since 2002, organic land area has started to decline slightly. Up until 2002, the area classified as organic increased steadily each year from 1985, with the period 1985 to 1995 showing an increase of over 700%. This growth was encouraged by state funding through the EU extensification programme from 1989 onwards and later EU-Regulations 2078/92 and 1957/1999. In 1995 the Council on Organic Food and Agriculture developed the first Action plan for Organic Farming, which was followed by a second five year Action plan in 1999.

As expected *a priori*, as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production has shown a similar trend over the period (see next section).

*Figure 2.11 Denmark: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

2.7.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Denmark has been collected for the main livestock species for the period 1998 to 2004 using data from Eurostat (2006), Foster and Lampkin (2000) and Statistics Denmark (2005) (see Table A. 6).

During this period, the number of organic livestock increased for bovine, sheep, goat and poultry, but decreased for equines and pigs. Organic goats and poultry numbers increased at the fastest compound annual growth rate (CAGR) at 12.0%/year and 12.9%/year (CAGR) respectively, while organic bovines increased in number by 10.9%/year (CAGR) and organic sheep increased by 3.2%/year (CAGR). By contrast, organic equine numbers decreased by 1.9%/year (CAGR), while organic pigs decreased by 0.8%/year (CAGR) over the period.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.9 below. The largest share of organic livestock was in the poultry sector, where just over one-quarter of all poultry are classified as organic, followed by organic sheep and organic bovines at 13.3% and 7.7% respectively. These organic shares are substantially above the EU-25 average for these species, as can be seen from the table below. The organic equine, pig and goat sectors have shares of total livestock of less than 2% and are close to the EU-25 average for these species.

Based on the data presented in Table A. 6, the following observations can be made regarding the current state and recent development of organically reared livestock in Denmark:

- ***Equines:*** Total organic equine numbers decreased by 1.9%/year (CAGR) between 1998 and 2004, from 827 to 735 head. Organic equines accounted for a share of 1.9% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 10.9%/year (CAGR) between 1997 and 2004, from 60,656 to 125,200 head. Of this total, organic dairy cow numbers increased by 9.4%/year (CAGR) over the period, while organic beef cows increased in number by 12.1%/year (CAGR), with suckler cow numbers increasing by 19.3%/year (CAGR). Organic bovines accounted for a share of 7.7% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 3.2%/year (CAGR) between 1997 and 2004, from 9,388 to 11,737 head. Of this total, breeding ewe numbers increased by 3.7%/year (CAGR) between 1998 and 2004 and other sheep numbers increased by 11.8%/year (CAGR) over the same period. Organic sheep accounted for a share of 13.3% of total sheep production in 2004.

  Total organic goat numbers increased by 12.0%/year (CAGR) between 1997 and 2004, from 972 to 2,147 head. Of this total, breeding nanny numbers increased by 14.0%/year (CAGR) between 1998 and 2004, while and other goat numbers decreased by

Table 2.9 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats[1]	Pigs	Poultry
Organic	735	125,200	11,737	1,945	58,361	980,797
Total	39,209	1,631,000	88,000	12,732,035	13,232,000	3,870,000
Share	1.9%	7.7%	13.3%	<0.1%	0.4%	25.3%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: [1] data for 2002.
Source: Organic data from sources shown in Table A. 6; total livestock numbers from Eurostat (2006) and FAO (2006).

Table 2.10 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	111
Beef (incl. Veal)	100
Sheep and goat meat	100
Pork	125
Poultry	125
Eggs	101

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

29.3%/year (CAGR) between 1998 and 2002. Organic goats accounted for a share of <0.1% of total goat numbers in 2002.

- ***Pigs:*** Total organic pig numbers decreased by 0.8%/year (CAGR) between 1997 and 2004, from 61,786 to 58,361 head. Of this total, organic breeding sow and fattening pig numbers increased by 1.2%/year (CAGR) and 2.4%/year (CAGR) respectively, while other pig numbers decreased by 11.8%/year (CAGR) between 1998 and 2004. Organic pigs accounted for a share of 0.4% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 12.9%/year (CAGR) between 1997 and 2004, from 418,310 to 980,797 head. Of this total, broiler numbers increased by 0.6%/year (CAGR), while laying hen numbers increased by 7.8%/year (CAGR) between 1998 and 2004. Other poultry numbers decreased by 3.1%/year (CAGR) over the same period. Organic poultry accounted for a share of 25.3% of total poultry production in 2004.
- ***Aquaculture:*** Some organic trout production takes place in Denmark (Franz, 2004). There is no information available on organic aquaculture production volume.

2.7.1.3 Self-sufficiency

In 2001 Denmark was self-sufficient in organic beef, sheep and goat meat, while producing an exportable surplus of organic milk, pork and poultrymeat (and to a lesser extent eggs) (Hamm, *et al.* 2004) (see Table 2.10).

2.7.2 Prospects for the development of organic livestock

With the exception of organic goats and pigs, organic livestock production in Denmark has a high contribution to total (organic and non-organic) livestock production (i.e. >5% share). The growth of organic livestock numbers in recent years has also been high (i.e. >5%/year) for bovines and goats, but low for equines and pigs (which have been declining recently) and sheep.

According to the Danish Agricultural Advisory Service (Norfelt, 2003), consumers, politicians, companies and farmers are all looking for ways to secure sustainable development in Denmark, to which end organic farming is playing a vital role. The challenge for the organic livestock sector is to maintain the integrity and the quality of the organic products. In order to develop organic farming further, Norfelt (2003) believes that Denmark must exploit its agricultural advantages, such as the high degree of innovation in farming, political and consumer attentiveness and market-oriented retail chains.

Both, the Danish National Organic Association, Økologisk Landsforening, and the Organic Committee of the Danish Farmers' Union, Dansk Landbrug, expect organic food sales to double in Denmark over the next three to five years (Eurofood, 2006(d)). However, in order to capitalise on rising demand for organic food, not only in Denmark, but also in neighbouring markets such as the UK, Sweden and especially Germany, there would need to be a significant increase in the area of organic farmland and organic livestock production. According to Økologisk Landsforening and Dansk Landbrug (Eurofood, 2006(d)), the numbers of all organic livestock species would need to increase, in particular by up to 20,000 more organic dairy cows.

Denmark is therefore well placed for the continued growth of the organic livestock sector, with high growth rates expected particularly for organic bovine numbers (i.e. >5%/year). Given the current political focus on sustainability, the prospects for the conversion of more livestock production to organic systems in the next few years appear positive.

2.8 Spain

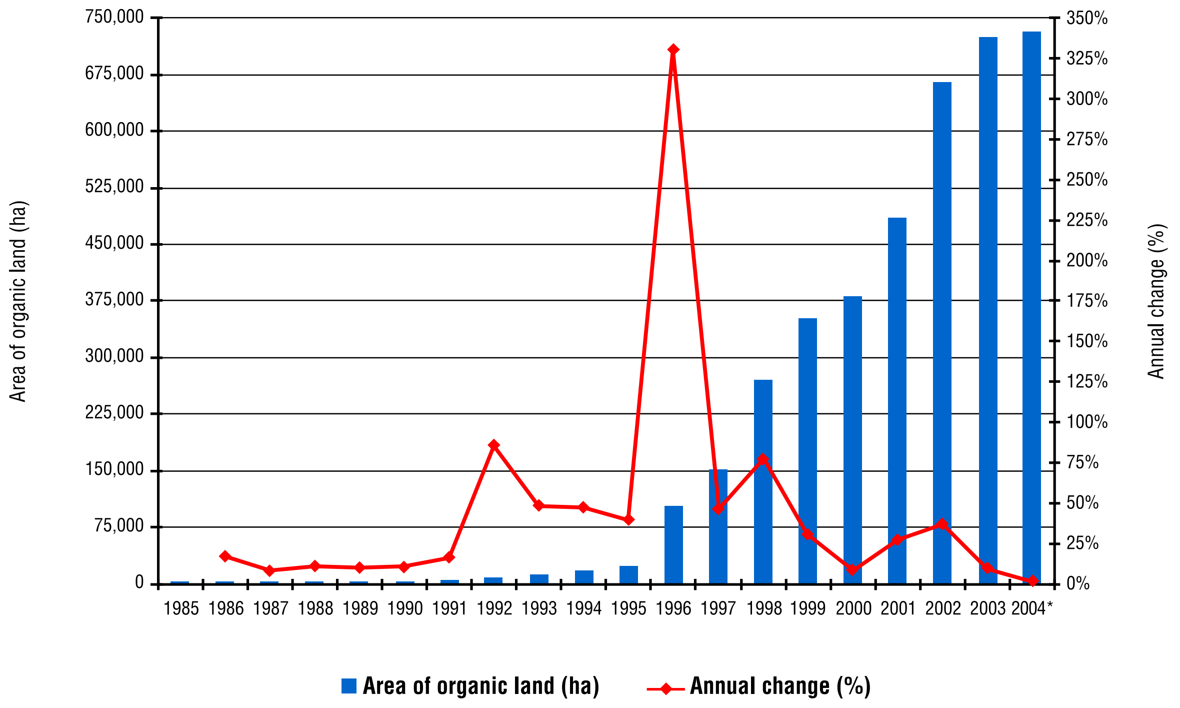
2.8.1 Current state of organically reared livestock

2.8.1.1 Organic land area

Certified, policy supported and in-conversion organic land area in Spain amounted to 733,182 hectares in 2004 (see Figure 2.12). Organic area increased slowly until 1996 when the area increased four-fold from the 1995 area to 103,735 hectares and subsequently continued to rise rapidly, before slowing slightly. This is because State financial support for organic farmers started in 1995, later than in the rest of the European countries.

It would be expected *a priori*, that as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for

*Figure 2.12 Spain: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

livestock production has shown a similar trend over the period. However, data on organic livestock numbers is only available for 2004 (see next section).

2.8.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Spain has been collected for the main livestock species in 1998 using data from Foster and Lampkin (2000) and for 2004 using data from the Spanish Ministry of Agriculture (2005) (see Table A. 7).

During this period, the number of organic livestock increased for sheep, pigs and laying hens, however a complete data series was not available. Organic sheep numbers increased by 196.9%/year (CAGR) between 1998 and 2004, while organic pig numbers increased by 150.8%/year (CAGR). Laying hen numbers increased by 124.9%/year (CAGR) between 2003 and 2004.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.11 below. With the exception of organic poultry, which had a share of 1.6% (compared to an EU-25 average of 1.3%), the organic livestock shares are relatively small at less than 1% for all sectors, indicating that the organic sector is relatively undeveloped in Spain compared to other member states.

Based on the data presented in Table A. 7, the following observations can be made regarding the current state and recent development of organically reared livestock in Spain:

- ***Equines:*** No data on organic equine numbers was available.
- ***Bovines:*** In 2004, there were approximately 53,688 organic bovines, of which 2,338 were organic dairy cows and 51,350 were bovines for meat production. Organic bovines accounted for an estimated share of 0.8% of total bovine production in 2004.
- ***Sheep and Goats:*** Organic sheep numbers increased by 196.9%/year (CAGR) between 1998 and 2004 from 214 to 146,673 head. There was no data available to separate breeding ewe and other sheep numbers from the total. Organic sheep accounted for a 0.6% share of total sheep production in 2004. Organic goats totalled 17,692 in 2004, accounting for a share of 0.6%. Again, there was no data available to separate breeding nannies and other goat numbers from the total.
- ***Pigs:*** Organic pig numbers increased by 150.8%/year (CAGR) between 1998 and 2004 from 34 to 8,455 head. There was no data available to separate breeding sows, fatteners and other pig numbers from the total. The organic share of total pig production was <0.1%.
- ***Poultry:*** Organic laying hen numbers increased by 124.9%/year (CAGR) between 2003 and 2004 from 25,149 to 56,548 head. Organic broilers totalled 38,393 head in 2004. Organic poultry accounted for an estimated share of 1.6% of total poultry production in 2004.

Table 2.11 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines[1]	Sheep	Goats	Pigs	Poultry[1]
Organic	-	53,688	146,673	17,692	8,455	94,941
Total	488,000	6,573,069	22,736,000	2,833,000	25,226,447	6,000,000
Share	-	0.8%	0.6%	0.6%	<0.1%	1.6%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: [1] estimated organic total based on data shown in Table A. 7.
Source: Organic data from sources shown in Table A. 7; total livestock numbers from Eurostat (2006) and FAO (2006).

Table 2.12 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	100
Beef (incl. Veal)	100
Sheep and goat meat	100
Pork	n.a.
Poultry	100
Eggs	100

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

- ***Aquaculture:*** The Spanish company 'Sierra Nevada' is producing fresh, frozen and smoked organic trout. Certification is based on the standards of the Andalusian Committee on Organic Agriculture (C.A.A.E.) (Franz, 2004). There is no information available on organic aquaculture production volume in Spain.

2.8.1.3 Self-sufficiency

In 2001 Spain was self-sufficient in organic milk, beef, sheep and goat meat, poultry and eggs. No data was available for self-sufficiency in organic pork (Hamm, *et al*. 2004) (see Table 2.12).

2.8.2 Prospects for the development of organic livestock

Organic livestock production in Spain has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share). According to Gonzálvez (2003), the long term development of the sector will depend heavily upon improving the inspection and certification procedures in order to comply to the European Union Regulation 2092/91, overcoming barriers in the marketing distribution channels and increasing the availability of information for the consumers in order to enhance national consumption. Furthermore, it is perceived that implicit barriers to the development of organic farming exist through a lack of interest on the part of the national agriculture ministry. Nonetheless, two regional governments (Andalucia and Castilla La Mancha) have drafted regional action plans to develop organic farming, with a grant of €20.8 million provided for organic farming aid in Andalucia already approved by the Spanish ministry of agriculture, aimed encouraging organic farming and aiding research projects (Eurofood, 2005(a)).

While domestic expenditure on (i.e. demand for) organic products is low, with around 20% of the population consuming organic products (compared to 40% in France and 70% in Germany[20], the demand for Spanish organic products on export markets in the UK, Germany and other EU countries is increasing (Eurofood, 2005(a)).

Thus the prospects for the continued development of the organic livestock sector in the short to medium term is generally positive. Given the historic growth of sheep and pig numbers and rising demand for organic livestock products in recent years, the prospects for relatively high growth in organic livestock numbers are good, as well as for other grazing livestock species (i.e. bovines and goats) given the extensive nature of much livestock farming in Spain.

20 Eurofood, 23 March 2006

2.9 Greece

2.9.1 Current state of organically reared livestock

2.9.1.1 Organic land area

Greece had 249,508 hectares of certified, policy supported and in-conversion organic land in 2004, compared to just 1,188 hectares in 1994 (see Figure 2.13). There is no official data on organic agriculture for the period from 1982 to 1992, but commercial organic agriculture started on some farms in the Aegio region in 1982 supplying organic sultanas to a Dutch company. From 1986 organic olives and olive oil were exported to a German company. The organic area increased substantially since the latter half of the 1990s, particularly in 1997 when the area doubled to 10,000 hectares as a result of the introduction of area based subsidies in 1996 and the adoption of EU Regulation 2078/92 (van der Smissen, 2001). After the Copenhagen declaration in 2001, an Action Plan for Organic farming was prepared, resulting in a 217.0% increase in area between 2002 and 2003 to 244,455 hectares.

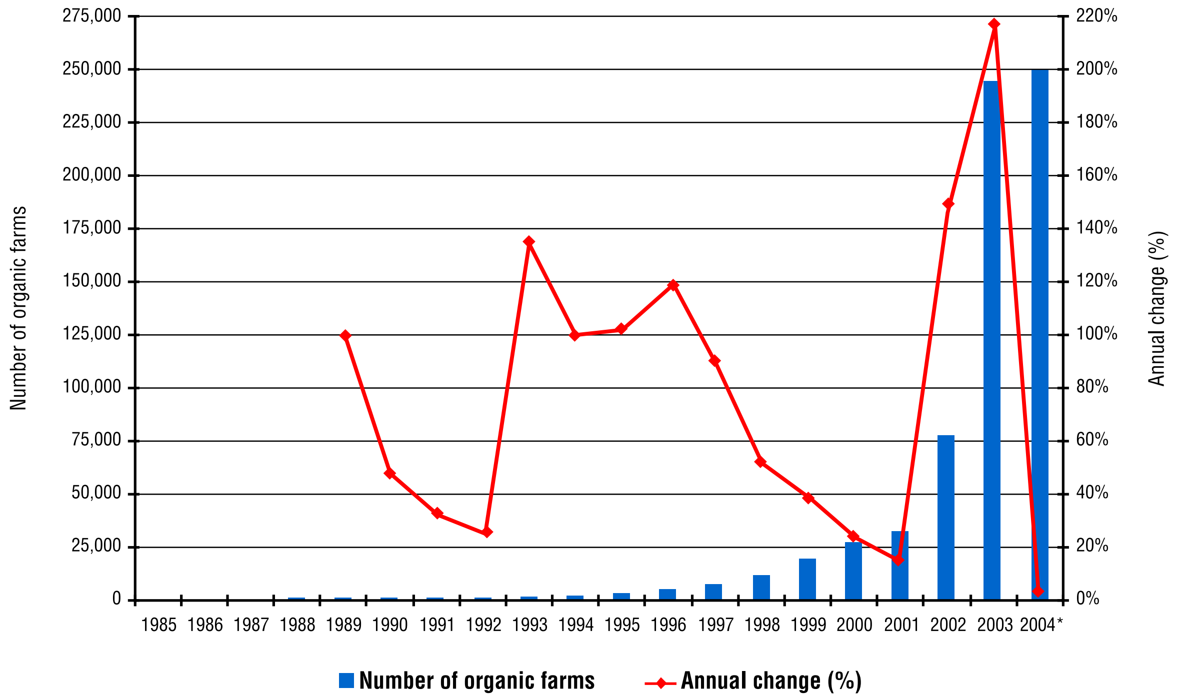
As would be expected a priori, as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production has shown a similar trend over the period (see next section).

2.9.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Greece has been collected for the main livestock species for the period 2000 to 2004 using data from Eurostat (2006) and the Greek Ministry of Agriculture (2005) (see Table A. 8).

During this period, the number of organic livestock increased for all species apart from equines. The fastest compound annual growth rate (CAGR)

*Figure 2.13 Greece: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table 2.13 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic Total	125,000	14,776 640,788	133,619 9,241,000	215,291 5,185,000	27,792 994,000	74,160 1,946,000
Share **EU-25 average**	0.0% 1.3%	2.3% 2.3%	1.4% 2.5%	4.2% 1.5%	2.8% 0.3%	3.8% 1.3%

Source: Organic data from sources shown in Table A. 8; total livestock numbers from Eurostat (2006) and FAO (2006).

of livestock numbers was for pigs at 364.5%/year (CAGR) between 2000 and 2004, followed by organic goats, sheep and bovines at 119.6%/year (CAGR), 92.0%/year (CAGR) and 75.4%/year (CAGR) respectively. By contrast, the slowest rate of increase was in organic poultry at 26.3%/year (CAGR) between 2002 and 2004, while organic equines decreased in number to zero over the same period.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.13 below. The organic shares of goats (4.2%), poultry (3.8%) and pigs (2.8%) were all greater than the EU-25 average in 2004, while the organic bovine share equalled the EU-25 average (2.3%). By contrast, the organic shares of total sheep (1.4%) and equines (<0.1%) were below the EU-25 average. It should be noted that products from animal husbandry, including eggs, Feta cheese and meat of sheep and goats, started to be marketed in the last months of 2000, followed in 2002 by dairy products (e.g. yoghurt) and small quantities of pork and veal (van der Smissen, 2001).

Based on the data presented in Table A. 8, the following observations can be made regarding the current state and recent development of organically reared livestock in Greece:

- ***Equines:*** organic equine numbers increased between 2002 and 2003 from 4 to 45 head, before declining to zero in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 75.4%/year (CAGR) between 2000 and 2004, from 1,560 to 14,776 head. Of this total, organic dairy cow numbers were unchanged over the period (increasing in 2002 and decreasing in 2003 before recovering in 2004); while organic beef cows increased in number by 90.7%/year (CAGR), mainly due to an increase in suckler cow (34.6%/year (CAGR)) and other bovine numbers (479.9%/year (CAGR)), despite a decrease in bovines for meat production (90.9%/year (CAGR)). Organic bovines accounted for a share of 2.3% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 92.0%/year (CAGR) between 2000 and 2004, from 9,830 to 133,619 head. Of this total, breeding ewe numbers increased by 46.8%/year (CAGR) over the period, while other sheep numbers decreased by 28.6%/year (CAGR). Organic sheep accounted for a share of 1.4% of total sheep production in 2004.
  Total organic goat numbers increased by 119.6%/year (CAGR) between 2000 and 2004, from 9,250 to 215,291 head. Of this total, breeding nanny numbers increased by 70.8%/year (CAGR) over the period, while other goat numbers decreased by 23.3%/year (CAGR). Organic goats accounted for a share of 4.2% of total goat production in 2002.
- ***Pigs:*** Total organic pig numbers increased by 364.5%/year (CAGR) between 2002 and 2004, from 1,288 to 27,792 head. Of this total, organic breeding sow and fattening pig numbers increased by 96.7%/year (CAGR) and 153.5%/year (CAGR) respectively between 2000 and 2004, while other pig numbers increased by 161.6%/year (CAGR) between 2002 and 2004, albeit from a very low base. Organic pigs accounted for a share of 2.8% of total pig production in 2002.

- ***Poultry:*** Total organic poultry numbers increased by 26.2%/year (CAGR) between 2002 and 2004, from 46,553 to 74,160 head. Of this total, broiler numbers increased by 26.3%/year (CAGR), while laying hen numbers increased by 29.7%/year (CAGR). By contrast, other poultry numbers decreased by 80.8%/year (CAGR) over the period. Organic poultry accounted for a share of 3.8% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Greece.

2.9.1.3 Self-sufficiency

In 2001 Greece was a net importer of organic beef, but was self-sufficient in organic milk, sheep and goat meat, pork, poultrymeat and eggs (Hamm, *et al*. 2004) (see Table 2.14).

2.9.2 Prospects for the development of organic livestock

Organic livestock production in Greece is still in its infancy, with a low share of total (organic and non-organic) livestock production (i.e. <5% share), with the exception of organic pig production. The growth of organic livestock numbers has, however, been high for all species (i.e. >5%/year) in recent years.

The development of organic farming in recent years demonstrates that in spite of unfavourable production conditions (i.e. droughts in 2002 and 2003), organic agriculture is gaining ground and there is considerable potential for growth in organic livestock numbers in the short to medium-term. However, despite the relative ease of conversion for many producers operating extensive livestock production systems, organic farmers, processors and tradesmen struggle to afford the conversion and associated costs, particularly given the low level of farmer incomes and the small farm size (van der Smissen, 2001). This makes the development of the sector particularly dependent upon government support until the sector becomes firmly established.

Therefore, provided that suitable support measures for the organic sector are realised, given the relatively low share of total production and the targets set by the National Organic Action Plan, the prospects for growth in organic livestock numbers remain positive, with a continuation of high growth rates likely.

2.10 France

2.10.1 Current state of organically reared livestock

2.10.1.1 Organic land area

France had 534,037 hectares of certified, policy supported and in-conversion organic land area in 2004, increasing year-on-year over the whole period between 1985 and 2003 before

Table 2.14 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	100
Beef (incl. Veal)	62
Sheep and goat meat	100
Pork	100
Poultry	100
Eggs	100

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

decreasing slightly in 2004. In contrast with other European countries, organic agriculture in France developed furthest in the nineteen-eighties and by 1985, France was the most important European supplier for organic products, with 40% of European organic land located in France. In the mid-1990s, the number of organic farms stagnated, and the area of organically farmed land grew only very slowly, due to the implementation of EU Regulation 2092/91 and major changes in the organisation of the sector. In 1993, state aid for organic conversion was provided, although at a relatively modest level compared to other EU Member States, which was subsequently increased in 1998. An action plan to support organic production was implemented in 1997, in response to growing domestic demand (20% per year increase) (Reynaud, *et al*. 2001).

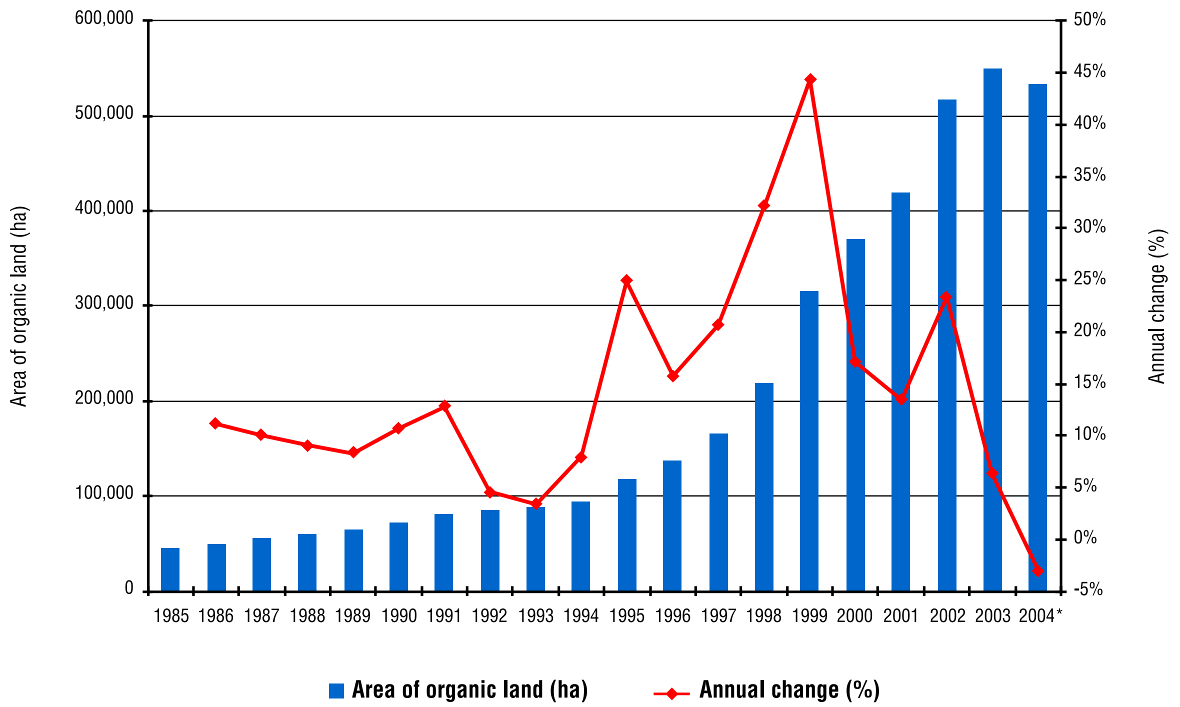
As would be expected *a priori*, as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production has shown a similar trend over the period (see next section).

2.10.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in France has been collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006), Foster and Lampkin (2000) and Agence Bio (2006) (see Table A. 9). During this period, the number of organic livestock increased for all species.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.15 below. The share of organic poultry (2.6%) was greater than the

*Figure 2.14 France: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table 2.15 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines*	Sheep*	Goats*	Pigs[1*]	Poultry[2]
Organic		125,031	127,974	19,754	61,067	6,738,022
Total	380,000	19,253,104	8,898,000	1,242,000	15,241,000	263,477,000
Share		<0.6%	<1.4%	<1.6%	<0.4%	2.6%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

*Notes: * estimated organic total based on data shown in Table A. 9; [1] data for 2001; [2] data for 2003.*
Source: Organic data from sources shown in Table A. 9; total livestock numbers from Eurostat (2006) and FAO (2006) .

EU-25 average in 2004, as were the estimated[21] shares of goats (<1.6%) and pigs (<0.4%). By contrast, the estimated organic shares of sheep (<1.4%) and bovines (<0.6%) were below the EU-25 average.

According to Journo (2001), French concerns about health and food safety issues (such as BSE and dioxin) are driving demand for organic products. Faced with strong demand, the French organic livestock, dairy products and poultry sectors are at a record level of production (Journo, 2001). Milk and dairy products are one of the fastest growing segments of the organic food market. Many of the leading conventional dairies have invested in organic milk production. Rising organic milk production has increased the range of processed value-added organic milk and dairy products. An increasing variety of organic cheeses, butter, yoghurts and fromage frais is widely available in most retail outlets, with some supermarkets selling their own label dairy products.

Meat and poultry is also a rapidly growing sector. Demand has been outstripping supply and retailers are reported to be often out of stock (Journo, 1999 and 2001). As a result, supermarket chains (e.g. Auchan) have been signing contracts with organic meat suppliers (Journo, 2001).

Based on the data presented in Table A. 9, the following observations can be made regarding the current state and recent development of organically reared livestock in France:

- ***Equines:*** No data was available for organic equine numbers over the period and therefore it was not possible to calculate the share of total equine production.
- ***Bovines:*** Organic dairy cow numbers increased by 22.5%/year (CAGR) between 1997 and 2004, from 15,135 to 62,489 head. In response to increasing demand for organic milk and dairy products. Organic suckler cow numbers increased by 25.4%/year (CAGR) over the same period. The estimated total organic bovine share in 2004 was <0.6% of total bovine production.
- ***Sheep and Goats:*** Organic breeding ewe (sheep) numbers increased by 23.5%/year (CAGR) between 1997 and 2004, from 29,216 to 127,974 head. No data for total organic and other organic sheep was available. Organic sheep accounted for an estimated share of <1.4% of total sheep production in 2004.
  Organic breeding nanny (goat) numbers increased by 16.3%/year (CAGR) between 1997 and 2004, from 6,867 to 19,754 head. No data for total organic and other organic goats was available. Organic goats accounted for an estimated share of <1.6% of total goat production in 2004.
- ***Pigs:*** Organic fattening pig numbers increased by 60.9%/year (CAGR) between 1997 and 2001, from 8,782 to 58,889 head, while organic breeding sow numbers increased by 18.4%/year (CAGR) between 2001 and 2004. No data for total organic and other organic pigs was available. Organic pigs accounted for an estimated share of <0.4% of total pig production in 2001.

21 Apart from organic poultry, total organic livestock numbers were estimated from the data collected (see Table A. 9).

- ***Poultry:*** Total organic poultry numbers increased by 14.3%/year (CAGR) between 1997 and 2003, from 3,026,679 to 6,738,022 head. Of this total, organic broiler numbers increased by 3.8%/year (CAGR) between 1998 and 2004, while laying hen numbers increased by 6.0%/year (CAGR) over the same period. Other poultry numbers increased by 3.9%/year (CAGR) between 1998 and 2003. Organic poultry accounted for a share of 2.6% of total poultry production in 2003.
- ***Aquaculture:*** In 2001, the first salmon farm in France obtained certification by EcoCert and is selling its product since July 2002. The Ferme Marine de l'Aber-Wrac'h has also received certification according to the national 'AB' standard. Some organic trout production also takes place (Franz, 2004). There is no information available on organic aquaculture production volume.

2.10.1.3 Self-sufficiency

In 2001 France was a net importer of organic milk and beef, self-sufficient in organic pork and produced an exportable surplus of organic poultrymeat and eggs. No data was available for self-sufficiency in organic sheep and goat meat (Hamm, *et al*. 2004) (see Table 2.16).

2.10.2 Prospects for the development of organic livestock

Organic livestock production in France has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), although based on the total share of organic livestock France is still ranked in the top one-third of the EU-25. The growth of organic livestock numbers in recent years has been high (i.e. >5%/year).

Given the high rate of growth in organic livestock numbers seen in recent years and yet relatively low market penetration, the prospects for a continuation of the recent growth in organic livestock numbers are good, particularly as there are many small farms already operating extensive production systems. However, according to Journo (2005) there are concerns that dairy products, one of the best selling products in the organic sector, are starting to show signs of saturation. That said, there is still good growth opportunities for organic meat and delicatessen products, which until now have failed to produce robust sales (Journo, 2005).

According to Reynaud, *et al*. (2001) the sustainability of the recent growth in organic livestock numbers will largely depend on the

Table 2.16 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	85
Beef (incl. Veal)	98
Sheep and goat meat	n.a.
Pork	100
Poultry	122
Eggs	130

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

demand from consumers, which has wavered in recent years due to a lack of government incentives, high prices for organic food, and the fact that much of France's traditional farm output is already less intensive than elsewhere in Europe.

Current support for the organic sector is offered through the Action Plan for Organic Farming, which according to Reynaud, *et al.* (2001) differs from previous French agricultural policy in that it emphasises quality production rather than high volume and export oriented. In February 2004, the French Ministry of Agriculture announced new measures to support the organic sector. Each agricultural sector must create an "organic agriculture" section in order to convert conventional farmers to the organic sector. The government will spend €4.5 million between 2006 and 2008 to enhance consumers' knowledge of the organic sector and €50 million between 2006 and 2010 to support the conversion from traditional to organic farming, which in more recent years has started to stabilise (see Figure 2.14).

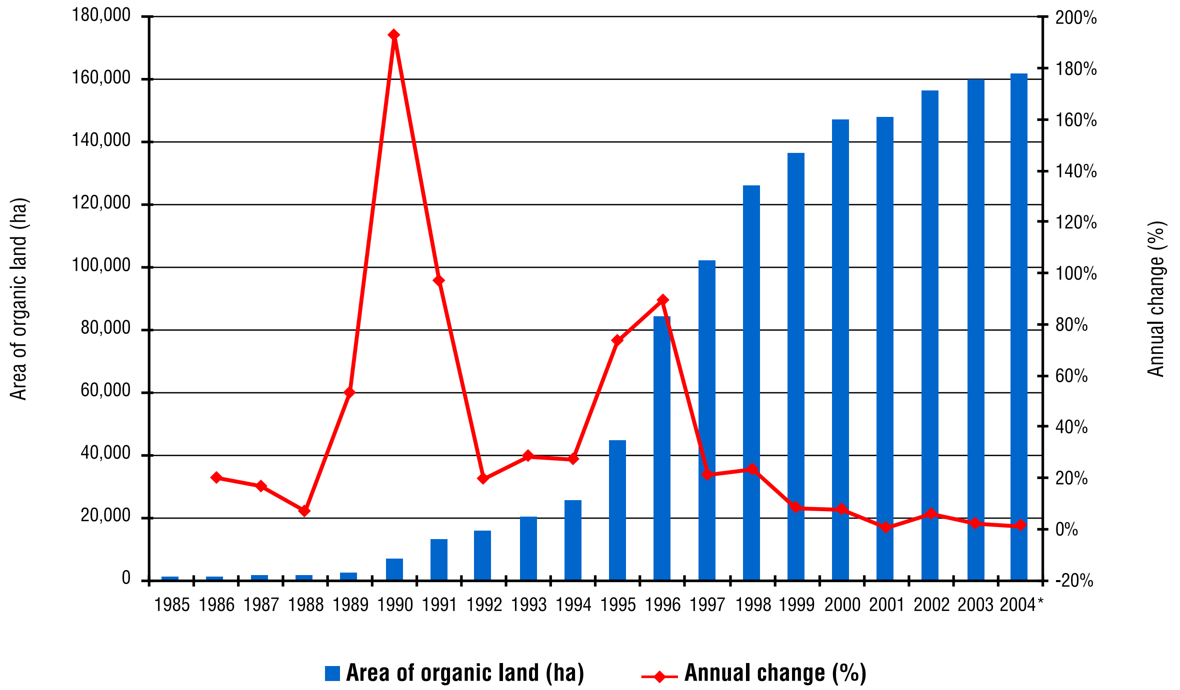
2.11 Finland

2.11.1 Current state of organically reared livestock

2.11.1.1 Organic land area

Finland had 162,024 hectares of certified, policy supported and in-conversion organic land in 2004, compared to just 25,822 hectares a decade previously (see Figure 2.15). The organic area has increased rapidly since 1990, mainly due to conversion aid. EU membership in 1995 started a new wave of farms converting to organic farming. The annual rate of area growth slowed in the early 2000s, indicating that organic area had started to stabilise.

*Figure 2.15 Finland: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

As would be expected *a priori*, as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production has shown a similar trend over the period (see next section).

2.11.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Finland has been collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006), Foster and Lampkin (2000) and Häring (2003) (see Table A. 10).

During this period, the number of organic livestock increased for all species except pigs and goats. With the exception of equines (86.6%/year (CAGR)), organic poultry numbers have shown the fastest compound annual growth rate (CAGR) at 30.7%/year, followed by organic bovines at 16.1%/year (CAGR) between 1997 and 2004. By contrast, the slowest rate of increase was in organic sheep (4.5%/year (CAGR)), while organic goats and pigs decreased by 9.3%/year (CAGR) and 9.8%/year (CAGR) respectively.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.17 below. The share of organic sheep (6.0%) in total production was greater than the EU-25 average in 2004, while the organic pig share (2.8%) was very close to the EU-25 average. By contrast, the organic shares of total bovines (1.9%), goats (0.8%), poultry (0.1%) and equines (<0.1%) were below the EU-25 average.

Based on the data presented in Table A. 10, the following observations can be made regarding the current state and recent development of organically reared livestock in Finland:

- ***Equines:*** Total organic equine numbers increased by 86.6%/year (CAGR) between 2001 and 2004, albeit from just 2 to 13 head. Organic equines are not significant in Finland, accounting for a share of <0.1% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 16.1%/year (CAGR) between 1997 and 2004, from 6,324 to 18,029 head. Of this total, organic dairy cow numbers increased by 5.4%/year (CAGR) over the period, while organic beef cows increased in number by 24.4%/year (CAGR); with suckler cow numbers increasing by 9.2%/year (CAGR) and bovines for meat production and other bovine numbers decreasing by 3.3%/year (CAGR) and 8.4%/year (CAGR) respectively. Organic bovines accounted for a share of 1.9% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 4.5%/year (CAGR) between 2000 and 2004, from 3,609 to 4,296 head. Of this total, breeding ewe numbers increased by 5.2%/year (CAGR) over the period, while other sheep numbers decreased by 12.9%/year (CAGR). Organic sheep accounted for a share of 6.0% of total sheep production in 2004.

  Total organic goat numbers decreased by 9.3%/year (CAGR) between 1997 and 2004, from just 73 to 37 head. Of this total, breeding nanny numbers decreased

Table 2.17 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	13	18,029	4,296	37	2,554	74,485
Total	61,000	960,492	72,000	4,700	1,440,700	129,902,000
Share	<0.1%	1.9%	6.0%	0.8%	0.2%	0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 10; total livestock numbers from Eurostat (2006) and FAO (2006).

by 12.6%/year (CAGR) between 2000 and 2004, while other goat numbers decreased by 20.5%/year (CAGR) over the same period. Organic goats accounted for a share of 0.8% of total goat production in 2004.

- ***Pigs:*** Total organic pig numbers decreased by 9.8% between 1997 and 2004, from 5,245 to 2,554 head. Of this total, organic breeding sow and fattening pig numbers decreased at annual rates of 0.9% and 4.0% respectively between 1998 and 2004, while other pig numbers decreased by 42.9%/year (CAGR) between 2000 and 2004. Organic pigs accounted for a share of 0.2% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 30.7% between 1997 and 2004, from 11,418 to 74,485 head. Of this total, broiler numbers decreased by 100.0% between 2001 and 2004, while laying hen numbers increased by 23.8%/year (CAGR) between 1998 and 2004. Other poultry numbers decreased by 60.5%/year (CAGR) between 2000 and 2004. Organic poultry accounted for a share of 0.1% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Finland.

2.11.1.3 Self-sufficiency

In 2001 Finland was self-sufficient in organic milk, beef, sheep and goat meat, pork, poultrymeat and eggs (Hamm, *et al*. 2004) (see Table 2.18).

2.11.2 Prospects for the development of organic livestock

Organic livestock production in Finland has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), with the notable exception of organic sheep production. The growth of organic livestock numbers in recent years has been high (i.e. >5%/year), with the exception of sheep, goats and pigs. The high share of organic sheep production reflects the relatively low overall size of the sheep population in Finland and the low growth rate is due to the climatic limitations on grazing livestock production in general.

In June 2001, the Ministry of Agriculture and Forestry launched an action plan for development of organic production for the years 2002-2006. Significantly, the action plan emphasised the development of organic livestock production and proposed a special aid programme for organic livestock producers. A minimum target of a 10% (220,000 hectares) share of agricultural area in organic production by 2006 was also set. Subsequently, an agricultural strategy for the period 2000-2010 was published by the Ministry, setting a target of 15% of arable area to be under organic management by 2015, aimed

Table 2.18 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	100
Beef (incl. Veal)	100
Sheep and goat meat	100
Pork	100
Poultry	100
Eggs	100

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

partly at increasing the supply of organic cereals for livestock feed in order to promote the organic livestock sector.

The short grazing period of less than 120 days in Southern Finland is a limiting factor for the development of the organic sheep and goat sectors, which are expected to have limited potential for further growth in numbers and market share. However, the targeted elements of the National Action Plan for livestock production provide good prospects for the continued development of organic livestock numbers and increasing the organic share of total livestock numbers in the short and medium-term, particularly in the bovine and poultry sectors. Thus the prospects for the sector look positive, despite the climatic limitations on grazing livestock production in general.

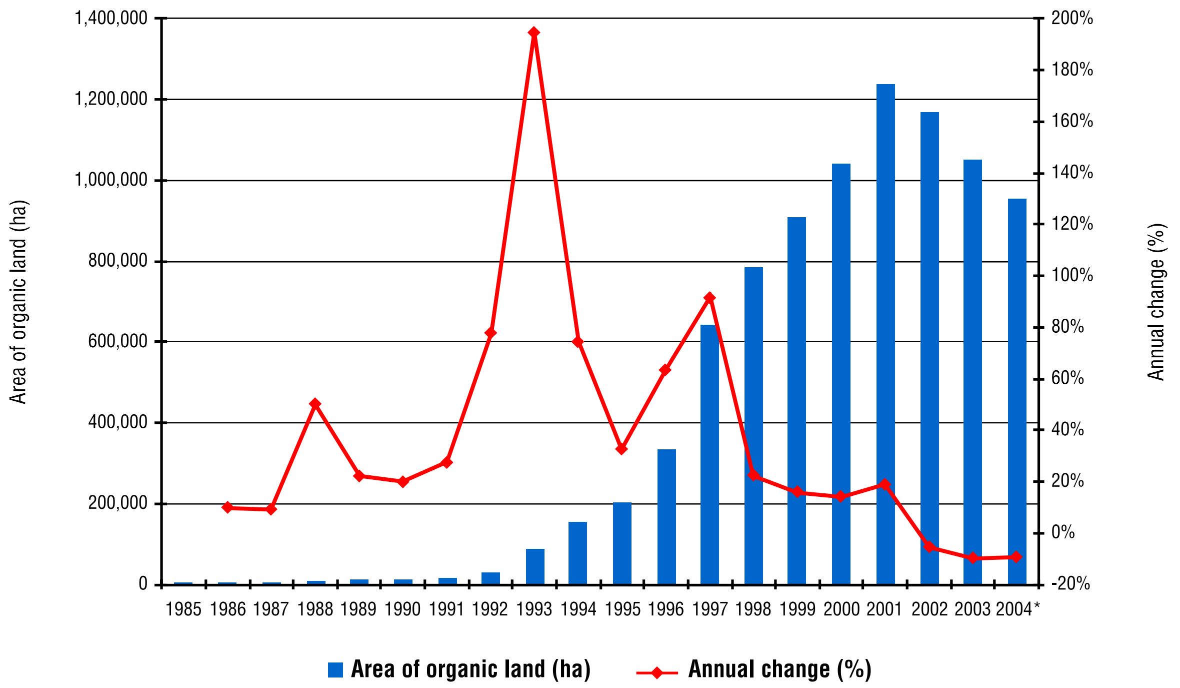
2.12 Italy

2.12.1 Current state of organically reared livestock

2.12.1.1 Organic land area

Italy had a very large area of certified, policy supported and in-conversion organic land in 2004, amounting to 954,362 hectares, a substantial increase from the 154,120 hectares recorded a decade previously (see Figure 2.16). Italy experienced a very sizeable increase in area throughout the 1990s, encouraged by state funding through the EU extensification programme from 1989 onwards and later EU-Regulations 2078/92 and 1957/1999. However, since 2001 the organic land area has declined. The decrease is, however, not due to a market crisis, even though market growth has slowed

*Figure 2.16 Italy: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

due to a stagnating economy, but because many farms (especially in Southern Italy and on the Islands (Sicily and Sardinia)) converted to organic farming mainly because of the state subsidies. Since these are no longer available in many regions, many farms have left the organic control system. However, for the most part farmers continue farming organically, but sell their products with no label in the non-organic market (Pinto and Zanoli, 2004).

2.12.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Italy has been collected for the main livestock species for the period 2001 (2000 for bovines) to 2004 using data from Eurostat (2006) and Sistema di Informazione Nazionale sull'Agricoltura Biologica (2006) (see Table A. 11).

During this period, the number of organic livestock increased for all species except bovines, which decreased by 10.5%/year (CAGR). Organic poultry, goats and equines numbers increased by 49.1%/year (CAGR), 29.3%/year (CAGR) and 29.4%/year (CAGR) respectively, while organic sheep and pig numbers increased to a lesser extent by 18.4%/year (CAGR) and 1.4%/year (CAGR) respectively.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.19 below. The organic shares of poultry (7.6%), sheep (6.2%), goats (5.8%), bovines (3.1%) and equines (1.5%) were all greater than the EU-25 average in 2004, while the organic pig share equalled the EU-25 average (0.3%).

Based on the data presented in Table A. 11, the following observations can be made regarding the current state and recent development of organically reared livestock in Italy:

- ***Equines:*** Total organic equine numbers increased by 29.4%/year (CAGR) between 2001 and 2004, from 2,205 to 4,773 head. Organic equines accounted for a share of 1.5% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers decreased by 10.5% between 2000 and 2004, from 334,930 to 215,022 head. Of this total, organic dairy cow numbers decreased by 18.6%/year (CAGR) over the period, while organic beef cows decreased in number by 8.1%/year (CAGR). Organic bovines accounted for a share of 3.1% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 18.4% between 2001 and 2004, from 301,601 to 499,978 head, although numbers actually peaked in 2002 at 608,687 head. Breeding ewe numbers increased by 15.9% between 2003 and 2004, while other sheep numbers increased by 12.5% over the same period. Organic sheep accounted for a share of 6.2% of total sheep production in 2004.
- Total organic goat numbers increased by 29.3% between 2001 and 2004, from 26,290 to 56,815 head, although peaking in 2003 at 101,211 head. Breeding nanny numbers decreased by 62.7% between 2003 and 2004, while other goat numbers increased by 144.2% over the same period. Organic goats accounted for a share of 5.8% of total goat production in 2002.

Table 2.19 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	4,773	215,022	499,978	56,815	26,508	2,152,295
Total	323,000	6,858,255	8,106,000	978,000	9,083,881	28,193,000
Share	1.5%	3.1%	6.2%	5.8%	0.3%	7.6%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 11; total livestock numbers from Eurostat (2006) and FAO (2006).

- ***Pigs:*** Total organic pig numbers increased by 1.4% between 2001 and 2004, from 25,435 to 26,508 head. Of this total, numbers of organic breeding sows decreased by 20.1%/year (CAGR) between 2002 and 2004, while fattening pig and other pig numbers increased by 50.5% and 54.2% respectively over the same period. Organic pigs accounted for a share of 0.3% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 49.1%/year (CAGR) between 2001 and 2004, from 648,693 to 2.15 million head. Of this total, broilers and other poultry numbers increased by 89.9%/year (CAGR) and 3.2%/year (CAGR) between 2002 and 2004, while laying hen numbers decreased by 2.9%/year (CAGR) over the same period. Organic poultry accounted for a share of 7.6% of total poultry production in 2004.
- ***Aquaculture:*** Some organic trout production takes place in Northern Italy (Franz, 2004). There is no information available on organic aquaculture production volume.

2.12.1.3 Self-sufficiency

In 2001 Italy was a net importer of organic milk, beef, sheep and goat meat, pork, poultrymeat and eggs. The highest rate of self-sufficiency was for milk at 90% (Hamm, *et al.* 2004) (see Table 2.20).

2.12.2 Prospects for the development of organic livestock

Organic livestock production in Italy has a high contribution to total (organic and non-organic) livestock production (i.e. >5% share), with the notable exception of organic bovine and pig production. Similarly, the growth of organic livestock numbers in recent years has been high (i.e. >5%/year), again with the exception of organic bovine and pig numbers.

The fact that a substantial amount of livestock production in Italy operates under low-input extensive systems demonstrates the considerable potential for the continued development of organic livestock numbers in the short and medium-term. However, in recent years there has been a decrease in organic area, which according to Pinto and Zanoli (2004) is due to a lack of subsidy. Despite this, organic livestock numbers have generally increased, with the exception of bovines.

Looking at the prospects for the sector, Italy's strategy for the development of organic livestock numbers has been to set up a new non-commercial umbrella organisation called FederBio to act as a co-ordinator for growers, inspection and control bodies, researchers, traders and consumer associations. FederBio is based in Bologna and replaces FIAO (the Italian Federation of Organic Agriculture) (Eurofood, 2005(b)).

Table 2.20 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	90
Beef (incl. Veal)	74
Sheep and goat meat	0
Pork	86
Poultry	81
Eggs	84

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\textit{sales of each organic product (as organic) for human consumption}}{\textit{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

Table 2.21 Funding for organic programmes under Regulation EC 1071/2005 (€)

Organisation	Total budget				EC contribution			
	Year 1	Year 2	Year 3	Total	Year 1	Year 2	Year 3	Total
S'Atra Sardigna	544,434	544,434	544,434	1,633,302	272,217	272,217	272,217	816,651

Source: Regulation EC1071/2005.

Greater consumption of organic products, in particular organic milk and dairy products, organic meat, organic eggs and organic honey is being promoted by a €7.5 million three-year international campaign known as BioBenessere (organic wellbeing) (Eurofood, 2005(c)).

In addition, the organic organisation S'Atra Sardigna plans to spend a total of €1.63 million over three years to promote organic food products (see Table 2.21). The funding under Regulation EC1071/2005 will be co-financed by the national government and the EU, with the aim of promoting awareness and demand for organic products, thereby potentially stimulating an increase in domestic organic production, including the production of organic livestock.

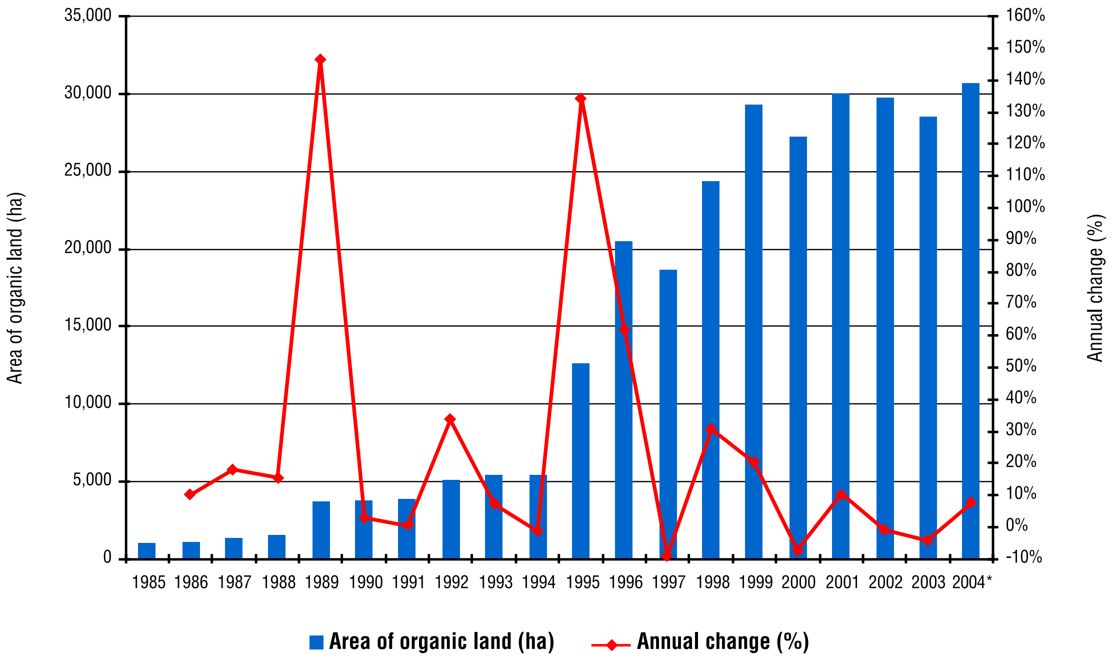
2.13 Ireland

2.13.1 Current state of organically reared livestock

2.13.1.1 Organic land area

Ireland had 30,670 hectares of certified, policy supported and in-conversion organic land in 2004, a substantial increase over the 5,390 hectares recorded a decade previously. As shown in Figure 2.17, organic area increased substantially over the period from 1,000 hectares in 1985, more than doubling in 1989 to 3,700 hectares and again in 1995 to 12,634 hectares, due to the implementation of EEC Regulation 2092/91 in 1993. Between 1994 and 2000, the Department of Agriculture, Food and Rural Development

*Figure 2.17 Ireland: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

operated the Rural Environment Protection Scheme (Ireland's agri-environment programme under EU-Regulation 2078/92), which included measures to promote the development of the organic beef and lamb sectors (Gibney, 2000). Since 2000, the area of organic land has remained relatively stable.

It would be expected a priori, that as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production would have shown a similar trend over the period. However, data on organic livestock is only available for 2002 (see next section).

2.13.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Ireland has been collected for the main livestock species for 2002, the only year for which information was available, using data from the Irish Department of Agriculture and Food (2005) (see Table A. 12).

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.22 below. The organic share of goats (10.5%) was greater than the EU-25 average in 2002, whereas the shares of organic sheep (0.5%), bovines (0.3%), poultry (<0.1%), pigs (<0.1%) and equines (<0.1%) were all below the EU-25 average.

Based on the data presented in Table A. 12, the following observations can be made regarding the current state and recent development of organically reared livestock in Ireland:

- ***Equines:*** No data for organic equine numbers were available and therefore no calculation of the share of total production was possible.
- ***Bovines:*** In 2002, there were 17,807 organic bovines, of which 649 were organic dairy cows and 17,158 were beef cows. Despite measures to promote the development of bovine production under EU Regulation 2078/92, the share of organic bovines in total production in 2002 was 0.3%. However, demand for organic beef is relatively low as Ireland is a net exporter of beef and veal (see Table 2.23).
- ***Sheep and Goats:*** There were 31,596 organic sheep, of which 31,077 were breeding ewes in 2002. Despite measures to promote the development of sheep production under EU Regulation 2078/92, the share of organic sheep in total production in 2002 was 0.7%. There were 831 organic goats, of which 581 were breeding nannies in 2002. The share of organic goats in total production in 2002 was 10.3%.
- ***Pigs:*** The total number of organic pigs in 2002 was 329, of which 67 were breeding sows. The share of organic pigs in total production in 2002 was <0.1%.
- ***Poultry:*** Organic poultry numbers totalled 24,322 in 2002, of which 1,935 were broilers, 18,793 were laying hens and 3,594 were other poultry. The share of organic poultry in total production in 2002 was <0.1%.
- ***Aquaculture:*** Irish organic mussels certified by Naturland have been on the market since the

Table 2.22 Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines[1]	Sheep[1]	Goats[1]	Pigs[1]	Poultry[1]
Organic		17,807	31,596	831	329	24,322
Total	78,500	6,662,459	6,019,050	7,880	1,775,495	121,700,000
Share		0.3%	0.5%	10.5%	<0.1%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: [1] data for 2002.
Source: Organic data from sources shown in Table A. 12; total livestock numbers from Eurostat (2006) and FAO (2006).

end of 1999. The mussels are rope grown and are farmed in the Southwest of Ireland (Franz, 2004). Currently, about 50% of the total world-wide organic salmon production takes place in Ireland. The Irish Salmon Producers Group predicts a production share of 10% for organic salmon in Ireland by 2010. Organic carp, brown trout and rainbow trout are also farmed (Franz, 2004). There was no data available on the volume of aquaculture products produced.

2.13.1.3 Self-sufficiency

In 2001 Ireland was self-sufficient in organic pork and eggs, with a large exportable surplus of organic beef. In contrast, Ireland was a net importer of organic milk. No data was available for self-sufficiency of organic sheep, goat and poultry meat (Hamm, *et al*. 2004) (see Table 2.23).

2.13.2 Prospects for the development of organic livestock

Organic livestock production in Ireland has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), with the exception of organic goat production. The Irish strategy for the development of the organic livestock sector is based around direct support for organic production and the conversion of farms under the Irish Action Plan for Organic farming, which sets a target for the conversion of 20% of agricultural area to organic farming of by the year 2010. This is intended to enable the potential for growth in Irish organic agriculture and increase supply to meet domestic demand.

While organic sales are reported to be growing at a double-digit rate in Ireland, imports still account for a 70% sales share (Eurofood, 2006(e)). Thus, given the high demand for organic produce that is currently mainly satisfied by imports and the significance of the livestock sector in Irish agriculture, the prospects for substantial growth in organic livestock numbers in coming years look favourable.

2.14 Luxembourg

2.14.1 Current state of organically reared livestock

2.14.1.1 Organic land area

Luxembourg had 3,158 hectares of certified, policy supported and in-conversion organic land in 2004, an increase over the 538 hectares recorded a decade previously (see Figure 2.18). The early growth in organic land area was relatively slow from 1988 onwards, triggered by the foundation of the organic producer organisations and encouraged by state funding through the EU extensification programme from 1989 onwards and after the implementation of EU-Regulation 2078/92. The most rapid

Table 2.23 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	63
Beef (incl. Veal)	244
Sheep and goat meat	n.a.
Pork	100
Poultry	n.a.
Eggs	100

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

growth occurred from 2000 onwards after the implementation of EU Regulation 1957/1999 saw organic area increase by nearly 200% between 2000 and 2004.

The majority (99.4% in 1999) (bio-LABEL, 2000) of organic area is grassland for livestock production and the number of organic livestock farms has followed a similar development trend.

2.14.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Luxembourg has been collected for the main livestock species for the period 1997 to 2002 using data from Eurostat (2006) and Foster and Lampkin (2000) (see Table A. 13), although no data was available between 1999 and 2001.

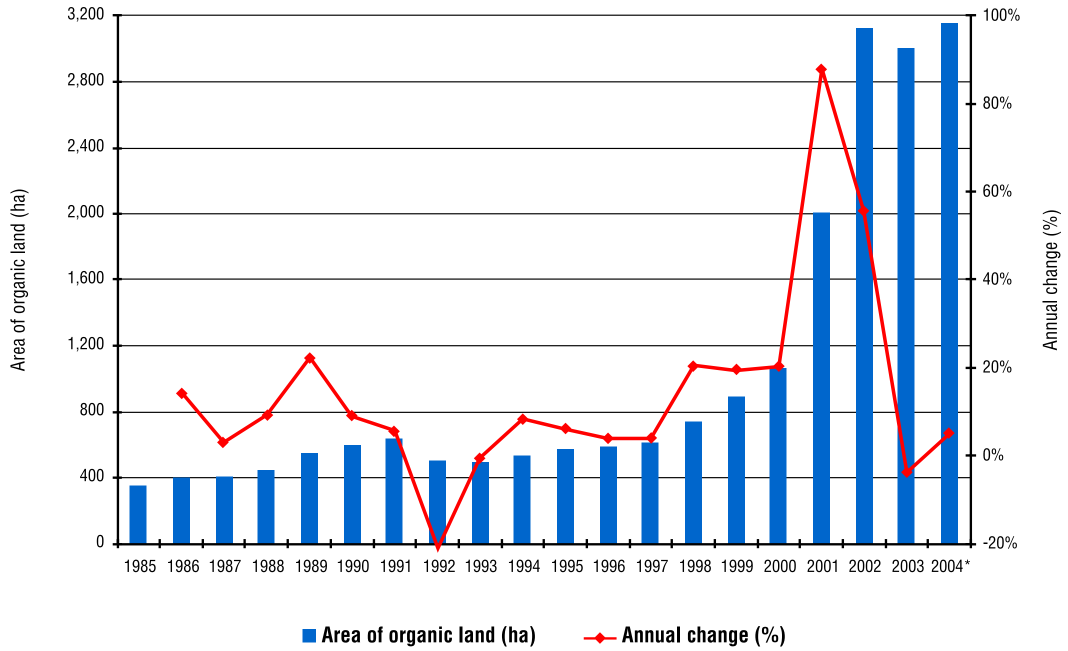
During this period, the number of organic livestock increased for all species, with organic pigs showing the fastest compound annual growth rate (CAGR) of 61.1% per year, followed by organic goats at 58.5%/year (CAGR), albeit from a very low base. By contrast, the slowest rate of increase was in the organic bovine sectors, which increased by 8.7%/year (CAGR).

The shares of organic livestock in total livestock numbers for 2002 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.24 below. Only the organic shares of sheep (5.2%) and pigs (0.6%) were greater than the EU-25 average in 2002, with the rest falling below the average.

Based on the data presented in Table A. 13, the following observations can be made regarding the current state and recent development of organically reared livestock in Luxembourg:

- ***Equines:*** In 2002, there were 25 organic equines, accounting for a share in total production of 0.8%. No data for other years was available.

*Figure 2.18 Luxembourg: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table 2.24 Share of organic livestock in total livestock population, 2002 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	25	952	444	10	434	6,959
Total	3,117	192,439	8,476	1,823	77,834	3,621,000
Share	0.8%	0.5%	5.2%	0.5%	0.6%	0.2%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 13; total livestock numbers from Eurostat (2006) and FAO (2006).

Table 2.25 Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	30
Beef (incl. Veal)	80
Sheep and goat meat	96
Pork	91
Poultry	33
Eggs	14

Note: The degree of self-sufficiency for each product was calculated: as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

- ***Bovines:*** Total organic bovine numbers increased by 8.7% between 1997 and 2002, from 628 to 952 head. Of this total, organic dairy cow numbers increased by 6.0%/year (CAGR) over the period, while organic beef cows increased in number by 9.7%/year (CAGR). Organic bovines accounted for a share of 0.5% of total bovine production in 2002.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 36.4%/year (CAGR) between 1997 and 2002, from 94 to 444 head. There was no data available to separate breeding ewes and other sheep from the total. Organic sheep accounted for a share of 5.2% of total sheep production in 2002.
  Total organic goat numbers increased from 1 to 10 over the period, an annual increase of 58.5%. There was no data available to separate breeding ewes and other sheep from the total. Organic goats accounted for a share of 0.5% of total goat production in 2002.
- ***Pigs:*** Total organic pig numbers increased by 61.1%/year (CAGR) between 1997 and 2002, from 40 to 434 head. Organic pigs accounted for a share of 0.6% of total pig production in 2002.
- ***Poultry:*** Total organic poultry numbers increased by 43.0%/year (CAGR) between 1997 and 2002, from 1,164 to 6,959 head. Organic poultry accounted for a share of 6.8% of total poultry production in 2002.
- ***Aquaculture:*** There is no information available on organic aquaculture in Luxembourg.

2.14.1.3 Self-sufficiency

In 2001 Luxembourg was a net importer of organic milk, beef, sheep and goat meat, pork, poultrymeat and eggs. The highest rate of self-sufficiency was for sheep and goat meat at 96% (Hamm, *et al*. 2004) (see Table 2.25).

2.14.2 Prospects for the development of organic livestock

Organic livestock production in Luxembourg has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), with the notable exception of organic sheep production. The growth of organic livestock numbers in recent years has generally been high (i.e. >5%/year) for all.

According to Aendekerk (2002), as the number of organic farms increases, so efforts to market products will become more necessary to maintain the sector. To this end, project 'Oikopolis' consolidated several organic enterprises under one umbrella organisation in 2000, which has helped to increase awareness and promote organic produce on the domestic market.

Given that the average farm size is small and operates relatively extensive production systems, the potential for organic conversion at relatively minor cost is high, particularly in the grazing livestock sectors. Organic sheep numbers are expected to continue to increase at a high rate (i.e. >5%/year) if recent trends continue, while organic bovine, goat, pig and poultry numbers would also be expected to increase at a relatively high rate, albeit from a low base. Furthermore, surveys indicate that between 14% and 19% of young farmers are considering converting to organic agriculture (Aendekerk, 2002). Given the changing age structure of agriculture across Europe, this can be considered a positive indicator for the future uptake of organic farming in Luxembourg.

2.15 Netherlands

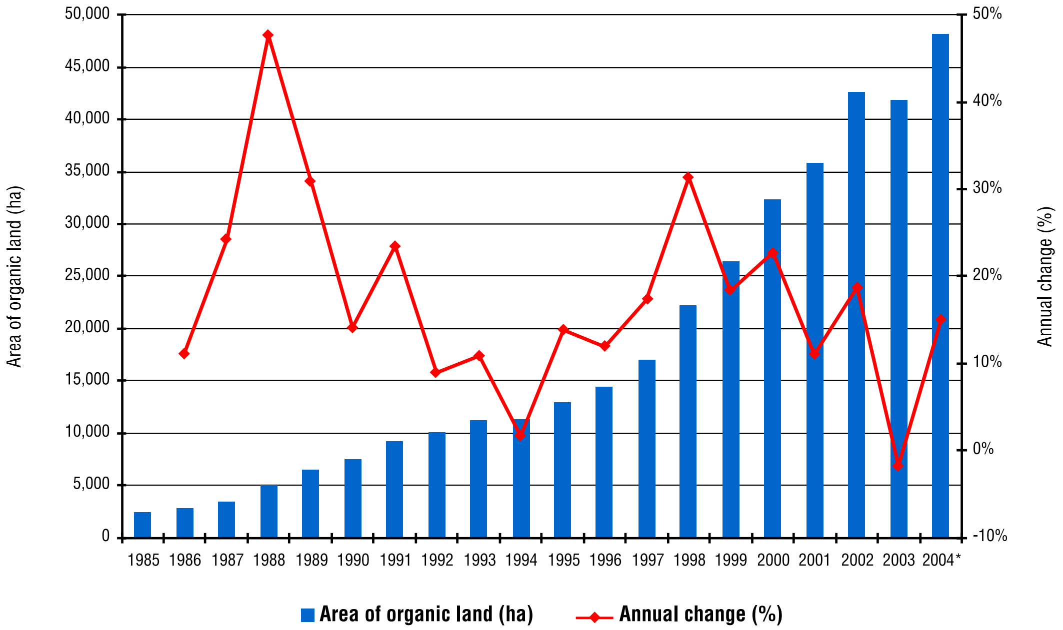
2.15.1 Current state of organically reared livestock

2.15.1.1 Organic land area

In 2004, there were 48,155 hectares of certified, policy supported and in-conversion organic land in the Netherlands, a substantial increase over the 11,340 hectares recorded a year previously (see Figure 2.19). The organic area has increased year-on-year since 1985, particularly since 1992 when state conversion subsidies were introduced, the only exception being a slight drop in 2003.

According to data from Skal (2006), in 2001 livestock farms accounted for 44.8% of the total number of organic farms, while many of the organic farms in the Netherlands are mixed. As

*Figure 2.19 Netherlands: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

expected a priori, the development in the number of organic livestock farms has shown a similar trend over the (see next section).

2.15.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in the Netherlands has been collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006) and Statistics Netherlands (2006) (see Table A. 14).

During this period, the number of organic livestock increased for all species except sheep which decreased by 9.2%. Organic pigs and poultry numbers increased the fastest at 27.3%/year (CAGR) and 27.1%/year (CAGR) respectively, followed by organic goats and bovines at 16.5%/year (CAGR) and 7.8%/year (CAGR) respectively. By contrast, the slowest rate of increase was in the organic equine sector (0.7%/year (CAGR)).

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.26 below. The organic shares of poultry (44.9%) and goats (7.2%) were substantially higher than the EU-25 average in 2004, while the organic pig share equalled the EU-25 average (0.3%). By contrast, the organic shares of total bovines (0.9%), equines (0.7%) and sheep (0.6%) were below the EU-25 average.

Based on the data presented in Table A. 14, the following observations can be made regarding the current state and recent development of organically reared livestock in the Netherlands:

- ***Equines:*** Total organic equine numbers increased by 0.7%/year (CAGR) between 1998 and 2001, from 819 to 836 head. Organic equines accounted for a share of 0.7% of total equine production in 2001.
- ***Bovines:*** Total organic bovine numbers increased by 7.8%/year (CAGR) between 1998 and 2004, from 22,162 to 34,841 head. Of this total, organic dairy cow numbers decreased by 0.5%/year (CAGR), while organic beef cows increased in number by 21.3%/year (CAGR), with suckler cow numbers increasing by 0.2%/year (CAGR). Organic bovines accounted for a share of 0.9% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers decreased by 9.2%/year (CAGR) between 1998 and 2004, from 18,004 to 10,115 head. Organic breeding ewes decreased by 3.7% between 2003 and 2004, while other organic sheep numbers increased by 14.0%/year (CAGR) over the same period. Organic sheep accounted for a share of 0.6% of total sheep production in 2004.
  Total organic goat numbers increased by 16.5%/year (CAGR) between 1997 and 2004, from 7,366 to 21,473 head. Organic breeding nannies decreased by 2.1%/year (CAGR) between 2003 and 2004, while other organic goat numbers increased by 8.4%/year (CAGR) over the same period. Organic goats accounted for a share of 7.2% of total goat production in 2004.
- ***Pigs:*** Total organic pig numbers increased by 27.3%/year (CAGR) between 1997 and 2004, from 5,401 to 29,268 head. Organic fattening pigs and breeding sows decreased

Table 2.26: Share of organic livestock in total livestock population, 2004 (head)

	Equines[1]	Bovines	Sheep	Goats	Pigs	Poultry
Organic	836	34,841	10,115	21,473	29,268	453,244
Total	115,166	3,736,000	1,700,000	300,000	11,220,773	1,010,000
Share	0.7%	0.9%	0.6%	7.2%	0.3%	44.9%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: 1 data for 2001.
Source: Organic data from sources shown in Table A. 14; total livestock numbers from Eurostat (2006) and FAO (2006).

by 21.2%/year (CAGR) (2002-2004) and 16.6%/year (CAGR) (2003-2004) respectively, while other organic pig numbers decreased by 89.1% between 2002 and 2004. Organic pigs accounted for a share of 0.3% of total pig production in 2004.

- ***Poultry:*** Total organic poultry numbers increased by 27.1%/year (CAGR) between 1997 and 2004, from 84,770 to 453,244 head. Of this total, organic broilers decreased by 100.0%/year (CAGR) between 2002 and 2004, while organic laying hens and other poultry numbers increased by 26.8%/year (CAGR) over the same period and 252.7%/year (CAGR) between 1998 and 2004. Organic poultry accounted for a share of 44.9% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in the Netherlands.

2.15.1.3 Self-sufficiency

In 2001 the Netherlands was self-sufficient in sheep and goat meat, while producing an exportable surplus of organic milk, poultrymeat and eggs. By contrast, the Netherlands was a net importer of organic beef and pork (Hamm, *et al.* 2004) (see Table 2.27).

2.15.2 Prospects for the development of organic livestock

Organic bovine, sheep and pig production in the Netherlands have a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), whereas organic goat and poultry production have a high contribution to total (organic and non-organic) livestock production (i.e. >5% share). The growth of organic livestock numbers in recent years has been high (i.e. >5%/year) for all species with the exception of organic sheep (which declined in recent years).

The aim of the government is to have 10% of the Dutch agricultural area in use for organic production by 2010. According to Melita (2001), if the organic production and sales channels continue to develop and the negative environmental effects of conventional food production are increasingly taxed leading to higher food prices, then organic farming will continue to grow. However, LEI (2003) notes that at current growth rates it does not appear likely that this objective can be realised.

On the production side, LEI (2003) suggest that a lack of (seasonal) labour and the drop in income during the two-year conversion period (during which time produce cannot be sold as organic) are obstacles to growth for the organic livestock sector.

On the supply side, a lack of consumer demand for organic products is also a major obstacle to the development of the organic livestock sector in the Netherlands, at least as far as the domestic market is concerned.

Table 2.27: Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	125
Beef (incl. Veal)	52
Sheep and goat meat	100
Pork	98
Poultry	106
Eggs	222

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

Consumer demand is reported to be low due to the perception that prices are too high and sales of organic products in the Netherlands have increased by only 2-3% per year in recent years (Eurofood, 2006(f)). However, the Dutch government plans to increase organic sales growth to 5% per year (Eurofood, 2006(g)), although a recent government funded project designed to reveal how much of a price premium consumers might be willing to pay for organic products has shown that lower prices alone are not enough to persuade consumers in the Netherlands to buy more organic products until the price cuts reach 25-30% (Eurofood, 2006(g)).

2.16 Portugal

2.16.1 Current state of organically reared livestock

2.16.1.1 Organic land area

The area of certified, policy supported and in-conversion organic land in Portugal amounted to 215,408 hectares in 2004 (see Figure 2.20). Expansion in area was quite slow from 1985 to around 1993, when total area had reached 3,060 hectares. By the time of Portugal's accession to the EU in 1996, this area had trebled to 9,191 hectares.

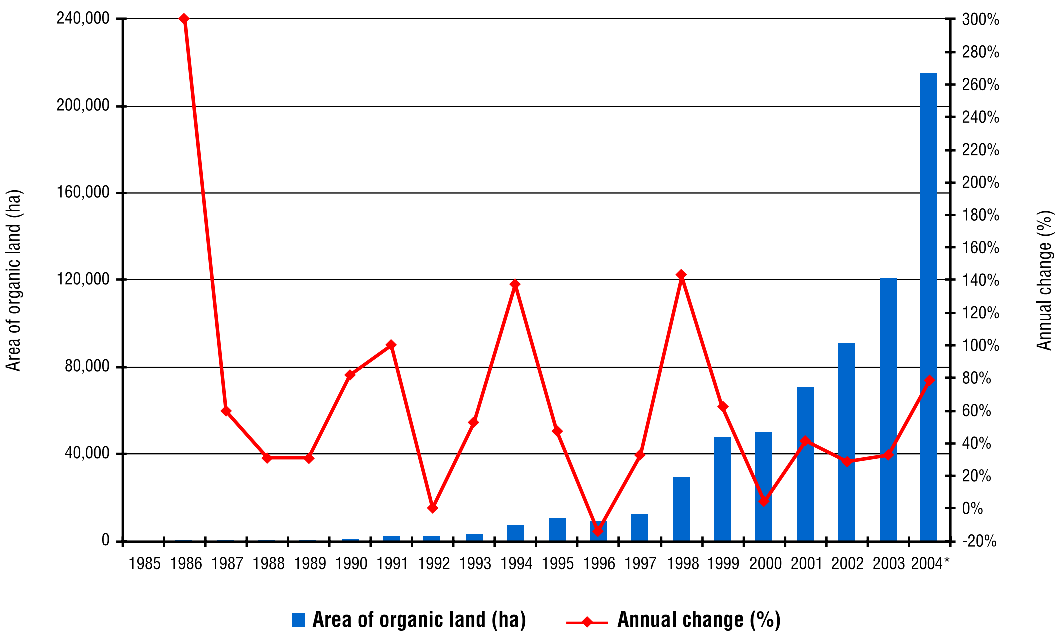
The increase in the number of certified organic farmers has been particularly strong in the districts along the Spanish border (Trás-os-Montes, Beira Interior and Alentejo) where the traditional farming systems are perfectly adapted to the regions, allowing for relatively easy conversion to organic farming (Firmino, 2000).

It would be expected a priori, that as organic land area is a pre-requisite for organic livestock production, the development in the number of organic livestock farms and the area used for livestock production would have shown a similar trend over the period.

2.16.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Portugal has been collected for the

*Figure 2.20 Portugal: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

main livestock species for the 2002 and 2004 using data Eurostat (2006) (see Table A. 15).

During this period, the number of organic livestock increased for all species. Organic poultry and bovines increased at the fastest compound annual growth rate (CAGR) of 159.1%/year (CAGR) and 157.4%/year (CAGR) over the period, followed by organic goats (82.0%), pigs (77.1%), sheep (73.5%) and equines (30.1%).

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.28 below. The organic shares of bovines (3.8%), sheep (3.2%) and pigs (0.4%) were greater than the EU-25 average in 2004, while the organic shares of equines (0.1%), goats (0.9%) and poultry (0.1%) were below the EU-25 average.

Based on the data presented in Table A. 15, the following observations can be made regarding the current state and recent development of organically reared livestock in Portugal:

- ***Equines:*** Total organic equine numbers increased by 30.1% between 2002 and 2004, from 107 to 181 head. Organic equines accounted for a share of 0.1% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 157.4% between 2002 and 2004, from 8,202 to 54,351 head. No data was available to separate dairy and beef cows form the total. Organic bovines accounted for a share of 3.8% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 73.5% between 2002 and 2004, from 38,072 to 114,664 head. No data was available to separate breeding ewes and other sheep from the organic total. Organic sheep accounted for a share of 3.2% of total sheep production in 2004.
  Total organic goat numbers increased by 82.0% between 2002 and 2004, from 1,440 to 4,769 head. No data was available to separate breeding nannies and other goats from the organic total. Organic goats accounted for a share of 0.9% of total goat production in 2004.
- ***Pigs:*** Total organic pig numbers increased by 77.1% between 2002 and 2004, from 3,091 to 9,695 head. No data was available to separate breeding sow, fatteners and other pigs from the organic total. Organic pigs accounted for a share of 0.4% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 159.1% between 2002 and 2004, from 7,024 to 47,158 head. No data was available to separate broilers, laying hens and other poultry from the organic total. Organic poultry accounted for a share of 0.1% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Portugal.

2.16.1.3 Self-sufficiency

In 2001 Portugal was self-sufficient in organic beef, sheep and goat meat, pork and poultrymeat. By contrast, Portugal was a net

Table 2.28: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	181	54,351	114,664	4,769	9,695	47,158
Total	182,000	1,442,686	3,541,170	546,727	2,347,852	42,000,000
Share	0.1%	3.8%	3.2%	0.9%	0.4%	0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 15; total livestock numbers from Eurostat (2006) and FAO (2006).

importer of organic milk (albeit with a self-sufficiency of 93%) and in particular organic eggs (Hamm, *et al*. 2004) (see Table 2.29).

2.16.2 Prospects for the development of organic livestock

Organic livestock production in Portugal has a low contribution to total (organic and non-organic) livestock production (i.e. <5% share), whereas the growth of organic livestock numbers in recent years has been high (i.e. >5%/year) for all species.

According to Firmino (2000), since organic farming has developed relatively recently, there is still considerable scope for growth, particularly as the predominantly extensive livestock production systems can be converted at relatively little cost to the producer. However, according to Geoideia (1999) future prospects could be improved if producers were to create co-operatives to rationalise their activities and create marketing networks, so that the prices are not influenced by the high profit margins obtained by middlemen and large supermarkets.

2.17 Sweden

2.17.1 Current state of organically reared livestock

2.17.1.1 Organic land area

In 2004, 222,100 hectares were classified as certified, policy supported and in-conversion organic land in Sweden, a substantial increase over the 48,039 hectares recorded a decade before (see Figure 2.21). The biggest increase of organic farming happened after Sweden entered the EU in 1995, due to the introduction of the EU support programmes.

According to data from KRAV (2005), in 1999, 67.5% of organic area was grass/clover leys for livestock production. As would be expected a priori, the development in the number of organic livestock has shown a similar increasing trend over the period (see next section).

2.17.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Sweden has been collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006), Foster and Lampkin (2000) and the Swedish certifications body KRAV (2005) (see Table A. 16).

During this period, the number of organic livestock increased for all species, with organic poultry, pigs and bovines increasing at the fastest compound annual growth rate (CAGR) of 27.0%/year (CAGR), 19.0%/year (CAGR) and 17.8%/year (CAGR) respectively. Organic sheep and goats increased more slowly by 7.7%/year (CAGR) and 5.1%/year (CAGR) respectively.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data

Table 2.29: Self-sufficiency in organic livestock products, 2001

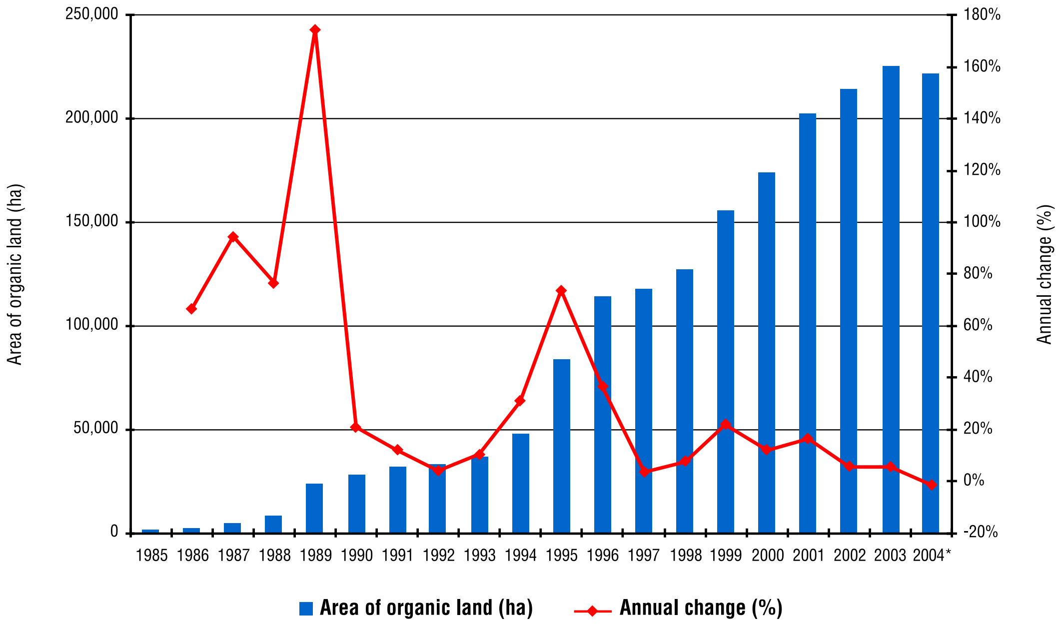
Product	Self-sufficiency (%)
Milk	93
Beef (incl. Veal)	100
Sheep and goat meat	100
Pork	100
Poultry	100
Eggs	2

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

*Figure 2.21 Sweden: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.30 below. All organic livestock shares, with the exception of equines were significantly higher than the EU-25 average in 2004.

Based on the data presented in Table A. 16, the following observations can be made regarding the current state and recent development of organically reared livestock in Sweden:

- ***Equines:*** No data for organic equine numbers were available and therefore no calculation of the share of total production was possible.
- ***Bovines:*** Total organic bovine numbers increased by 17.8% between 1997 and 2004, from 29,114 to 91,515 head. Of this total, organic dairy cow numbers increased by 10.0%/year (CAGR) over the period, while organic beef cows increased in number by 21.4%/year (CAGR), with both suckler cow and bovine animals for meat production numbers increasing by 8.1% and 3.8%/year (CAGR) respectively. Organic bovines accounted for a share of 5.8% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 7.7% between 1997 and 2004, from 22,724 to 38,193 head. Of this total, breeding ewe numbers increased by 9.1%/year (CAGR) over the period, while

Table 2.30: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic		91,515	38,193	664	22,207	391,971
Total	95,660	1,590,049	460,500	5,600	1,869,210	6,820,000
Share		5.8%	8.3%	11.9%	1.2%	5.7%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 16; total livestock numbers from Eurostat (2006) and FAO (2006).

other sheep numbers increased by 6.8%/year (CAGR). Organic sheep accounted for a share of 8.3% of total sheep production in 2004.

Total organic goat numbers increased by 5.1% between 1997 and 2004, from 469 to 664 head. Of this total, breeding nanny numbers decreased by 83.7% between 2003 and 2004, while other sheep numbers decreased by 8.7% over the same period. Organic goats accounted for a share of 11.9% of total goat production in 2004.

- ***Pigs:*** Total organic pig numbers increased by 19.0% between 1997 and 2004, from 6,573 to 22,207 head. Of this total, organic breeding sow numbers increased by 10.1% over the period, while fattening pigs increased by 1.6% between 2003 and 2004. Other organic pigs decreased by 6.1% between 2003 and 2004. Organic pigs accounted for a share of 1.2% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 27.0% between 1997 and 2004, from 73,643 to 391,971 head. Of this total, broiler numbers increased by 7.4%/year (CAGR) over the period, while laying hen numbers increased by 33.5%/year (CAGR). Other organic poultry numbers increased by 625.0% between 2003 and 2004. Organic poultry accounted for a share of 5.7% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Sweden.

2.17.1.3 Self-sufficiency

In 2001 Sweden was self-sufficient in organic milk, beef and egg production, while producing an exportable surplus of sheep, goat and pig meat. By contrast, Sweden was a net importer of organic poultrymeat (Hamm, *et al*. 2004) (see Table 2.31).

2.17.2 Prospects for the development of organic livestock

Organic livestock production in Sweden has a high contribution to total (organic and non-organic) livestock production (i.e. >5% share) and the growth of organic livestock numbers in recent years has also been high (i.e. >5%/year) for all species.

Organic agriculture has definitely established itself as a serious alternative to existing conventional agricultural systems in Sweden. With positive interest from consumers, farmers and policy makers, and with national targets set for the period to 2010, there is every indication that organic agriculture will continue to grow. According to Källander (2002), surveys indicate that between 40% and 45% of conventional farmers in Sweden are interested in organic conversion.

The Swedish government's strategy for the development of the organic livestock sector involves national targets for land area, market share and food consumption share. By 2010, Sweden aims to increase the area of land

Table 2.31: Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	100
Beef (incl. Veal)	100
Sheep and goat meat	117
Pork	118
Poultry	83
Eggs	100

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

Table 2.32: Funding for organic programmes under Regulation EC 1071/2005 (€)

Organisation	Total budget				EC contribution			
	Year 1	Year 2	Year 3	**Total**	Year 1	Year 2	Year 3	**Total**
Ekocentrum	147,000	329,000	0	**476,000**	73,500	164,500	0	**238,000**

Source: Regulation EC1071/2005.

under organic management by 15% to around 400,000 hectares. According to Wilhelm (2005), 16% of Swedish farmland is currently eligible for EU environmental aid, but only half of this is certified as organic. The target contribution of organic dairy, beef, lamb and egg production is 10% of total production by 2010 and the target contribution of organic food consumption at canteens and cafeterias at public institutions and authorities is at least 25% over the same period. Achieving this latter target would require a ten-fold increase in consumption over the period and according to the Swedish organic certification body KRAV, imports of organic foods would have to increase sharply (Eurofood, 2006(h)).

The Swedish organic market already relies heavily on imports, reported to be partly because the number of Swedish organic producers has decreased due to high production costs and tough national rules for organic production (Eurofood, 2006(h)). In order to boost domestic production, as well as maintain demand for organic products, the Swedish Consumer Board plans to carry out a marketing campaign using co-funded EU and national subsidies under Regulation EC1071/2005. Part of the funds will also be used to promote an increase in domestic organic production, including the production of organic livestock.

Given the high rate of growth (i.e. >5%/year) seen in organic livestock numbers of all species in recent years, the relatively high contribution to total livestock numbers and the strong consumer demand for organic products, future prospects for the sector look positive.

2.18 UK

2.18.1 Current state of organically reared livestock

2.18.1.1 Organic land area

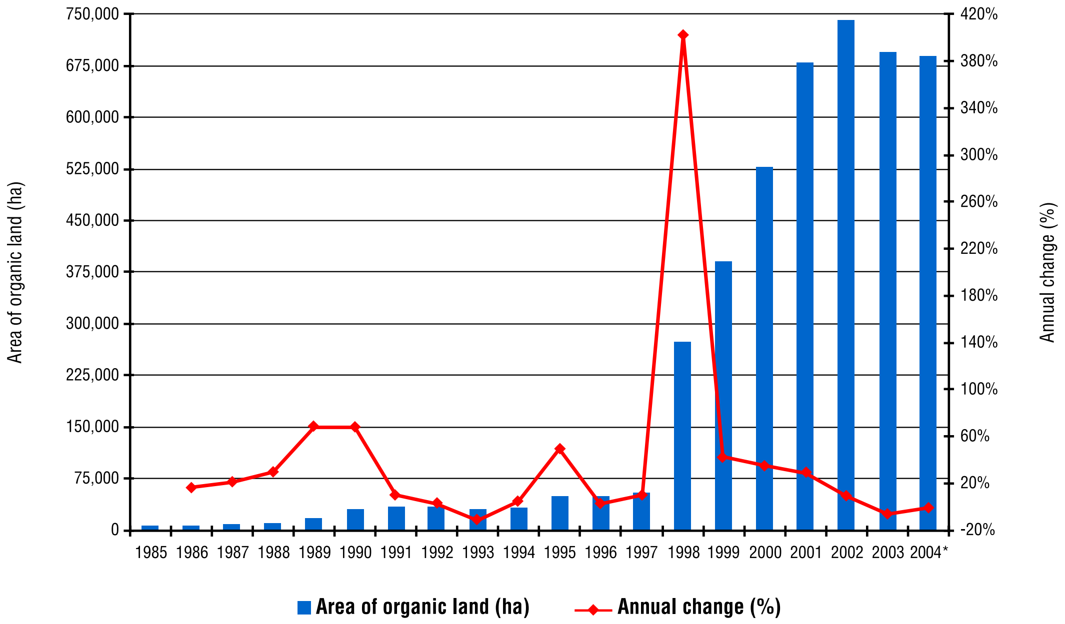
The area of certified, policy supported and in-conversion organic land in the UK in 2004 amounted to 690,047 hectares, a dramatic increase over the 32,476 hectares recorded a decade previously (see Figure 2.22). Apart from 1993, 2003 and 2004, the area has increased every year since 1985, encouraged by state funding through the EU extensification programme from 1989 onwards and later EU-Regulations 2078/92 and 1957/1999, with the largest year-on-year increase occurring in 1998, when organic area increased by 402% from 54,670 hectares in 1997 to 274,519 hectares. Since 2002, organic area has started to decline, indicating that the market may have matured.

In April 2002, 92.5% of all organic land area was grassland (permanent pasture, temporary leys and rough grazing) for livestock production (87.9% in 2003; 89.0% in 2004). In addition, much of the area classed as in conversion would be grass, due to the requirement for fertility building during the conversion period (Soil Association, 2004). Thus the development in the number of organic livestock has shown a similar trend to that of land area over the period (see next section).

2.18.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in the UK has been collected for the main livestock species for the period 1997 to 2004 using data from Eurostat (2006), the Soil Association (2004) and Defra (2005) (see Table A. 17).

*Figure 2.22 UK: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

During this period, the number of organic livestock increased for all species, although there was no data for organic equines. Organic pigs, bovines and poultry having shown the fastest compound annual growth rate (CAGR) of 50.7%/ year, 42.1%/year (CAGR) and 33.6%/year (CAGR) respectively, while organic goat and sheep numbers increased by 32.9%/year (CAGR) and 7.4%/year (CAGR) respectively.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006) and are summarised in Table 2.33 below. The organic shares of sheep (2.8%), poultry (1.6%) and pigs (1.1%) were all greater than the EU-25 average in 2004, while the organic bovine (1.9%) and goat (0.6%) shares were below the EU-25 average.

Based on the data presented in Table A. 17, the following observations can be made regarding the current state and recent development of organically reared livestock in the UK:

- ***Equines:*** No data for organic equine numbers were available and therefore no calculation of the share of total production was possible.
- ***Bovines:*** Total organic bovine numbers increased by 42.1% between 2001 and 2004, from 70,100 to 200,959 head. Of this total, organic dairy cow numbers increased by

Table 2.33: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic		200,959	687,863	513	55,199	2,662,347
Total	184,000	10,487,895	24,688,410	91,548	4,973,968	168,155,000
Share		1.9%	2.8%	0.6%	1.1%	1.6%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 17; total livestock numbers from Eurostat (2006) and FAO (2006).

42.2%/year (CAGR) between 1997 and 2004, while organic beef cows decreased in number by 7.1%/year (CAGR) between 2003 and 2004, with suckler cow numbers increasing by 17.3%/year (CAGR) between 1997 and 2004. Organic bovines accounted for a share of 1.9% of total bovine production in 2004.

- ***Sheep and Goats:*** Total organic sheep numbers increased by 7.4%/year (CAGR) between 2001 and 2004, from 554,717 to 687,863 head. Of this total, breeding ewe numbers decreased by 5.0%/year (CAGR) over the same period, while other sheep numbers increased by 44.8% between 1997 and 2004. Organic sheep accounted for a share of 2.8% of total sheep production in 2004.

  Total organic goat numbers increased by 32.9%/year (CAGR) between 1997 and 2004, from 70 to 513 head. No data to separate organic breeding nannies and other goat numbers for the total was available. Organic goats accounted for a share of 0.6% of total goat production in 2004.
- ***Pigs:*** Total organic pig numbers increased by 50.7%/year (CAGR) between 2001 and 2004, from 16,143 to 55,199 head. Of this total, fattening and other pig numbers increased by 27.8%/year (CAGR) between 1997 and 2004 and 550.6% between 2003 and 2004, while organic breeding sows decreased by 47.3% between 2003 and 2004. Organic pigs accounted for a share of 1.1% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 33.6%/year (CAGR) between 1997 and 2004, from 350,000 to 2.662 million head. Of this total, broiler numbers increased by 38.5%/year (CAGR) between 1997 and 2004, while laying hen and other poultry numbers increased by 23.9%/year (CAGR) and 39.5%/year (CAGR) respectively between 2001 and 2004. Organic poultry accounted for a share of 1.6% of total poultry production in 2004.
- ***Aquaculture:*** In 2003/04, organic aquaculture production experienced further growth, topping 3,400 tonnes, driven mainly by organic salmon production, which reached 3,117 tonnes. The market is maturing and appears to be stabilising, with more sustainable growth predicted for 2004/05. Organic trout (rainbow and brown) production grew at a slower rate of 6%, reaching 318 tonnes in 2003/04 (Soil Association, 2004). Organic mussels (Franz, 2004(a)), carp, brown trout and rainbow trout (Franz, 2004(b)) are also currently farmed in the UK. There was no data available on the volume of aquaculture products produced.

2.18.1.3 Self-sufficiency

In 2001 the UK was a net importer of organic milk, beef, sheep and goat meat, pork, poultrymeat and eggs. The highest rates of self-sufficiency was in organic milk (97%) and sheep and goat meat (94%) (Hamm, *et al*. 2004) (see Table 2.34).

2.18.2 Prospects for the development of organic livestock

The contribution of organic bovine, sheep, goat and poultry pig production in the UK to total (organic and non-organic) production is low (i.e. <5% share), whereas the contribution of organic pigs to total (organic and non-organic) pig production is high (i.e. >5% share). The growth of organic livestock numbers in recent years has been high (i.e. >5%/year) for all species.

The UK government plans to develop the organic livestock sector through a variety of measures, such as setting targets as part of the Organic Agricultural Plan. One of the main targets under this plan is to reduce the contribution of imports in total organic food supply to 30% by 2010. According to the UK organic certification body, the Soil Association, 66% of organic primary produce sold in UK supermarkets is domestically produced (up 13% on 2004) whereas one-third is imported (Eurofood, 2006(i)).

Currently, consumer demand for organic produce in the UK is rising more rapidly than

Table 2.34: Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	97
Beef (incl. Veal)	60
Sheep and goat meat	94
Pork	76
Poultry	67
Eggs	90

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

the domestic supply. Milk is now the largest and fastest growing sector of the UK organic dairy market, making up around two thirds of total organic dairy production (Eurofood, 2006(j)). Furthermore, the UK organic milk marketing co-operative (OMSCo) believes that there is still enormous potential, because important distribution channels such as the foodservice and public sectors currently sell or use tiny amounts of organic liquid milk, despite the wider consumer demand (Eurofood, 2006(j)).

The UK government also offers direct support for organic production through the Organic Entry Level Stewardship replaced the Organic Farming Scheme payments in March 2005, and subsidies will be double what non-organic farmers receive at £60/ha (€88/ha) (Defra, 2005). This is intended to stop the decline of land area in-conversion, which decreased by 70% in 2004 (Soil Association, 2004).

Measures introduced to support and promote the organic aquaculture sector in the UK include a new partnership agreement between the Soil Association (organic certification body), the Marine Stewardship Council (MSC), Waitrose (UK supermarket chain) and Aquascot (a sustainable seafood business) to develop certified sustainable sources of fish meal and oil for organic farmed fish diets. This is seen as a necessary step to increase consumer confidence and demand for organic fish produce (Eurofood, 2006(k)).

The organic food and drink market is forecast to grow at a slowing rate in the future, although still at an annual growth rate exceeding that for non-organic foods for most of the period to 2009. However, there is unlikely to be any substantial increase in the numbers of heavy consumers of organic produce, with the majority of consumers purchasing relatively small proportions of organic food and drink within their total grocery purchases (Research and Markets, 2005).

Given the high rate of growth (i.e. >5%/year) seen in organic livestock numbers of all species in recent years, but the relatively low contribution of organic livestock to total livestock numbers and the strong consumer demand for organic products, the prospects for growth in organic livestock numbers appears positive.

2.19 Cyprus

2.19.1 Current state of organically reared livestock

2.19.1.1 Organic land area

Organic agriculture was introduced into Cyprus in 1988, when 3 hectares were cultivated (Theophanous, 2004). During the 1990s, the area of land under organic management as well as the number of farms is reported to have increased, although at slow a rate. By 1999, there were 166 hectares of certified, policy supported and in-conversion organic land, which had increased to 867 hectares by 2004. According to statistics from the Agricultural Research Institute (2006) in Cyprus, this area relates to the production of crops (primarily grapes (for wine and dessert) and olives) and not grass or fodder crops for livestock production.

2.19.1.2 Structure of the organic livestock sector

According to the Agricultural Research Institute (2006) in Cyprus, prior to 2000, there were no certified or in-conversion organic livestock farms in Cyprus, with the organic area used for specialist crop production only. No data on organic livestock numbers in Cyprus after 2000 were available and therefore no calculation of the share of total production was possible (see Table A. 18). Furthermore, there is no data available on organic aquaculture production in Cyprus.

2.19.1.3 Self-sufficiency

There is no data for self-sufficiency in organic livestock products for Cyprus.

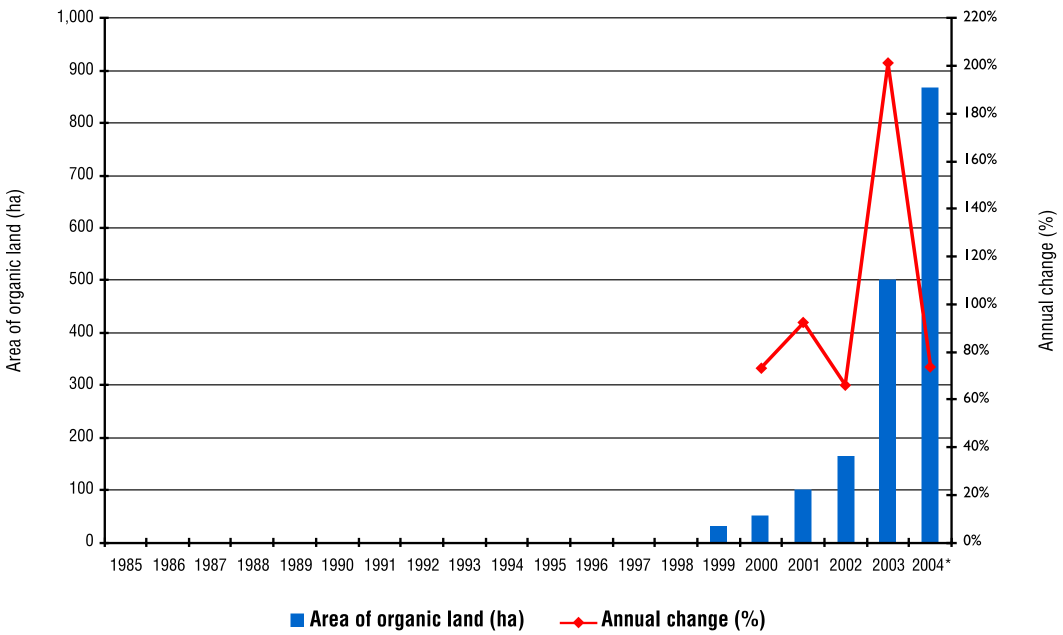
2.19.2 Prospects for the development of organic livestock

The government of Cyprus places a high priority on organic farming (Theopholous, 2000) and since 2002 has implemented an organic farming law in compliance with Council Regulation 2092/91. Given the importance of organic crop products such as olives, aromatic herbs, vegetables and citrus fruit to the agricultural sector in Cyprus, it is likely that the majority of the development in organic production will be for crop products.

However, as part of its Accession negotiations, Cyprus confirmed that it would implement the provisions of Council Regulation 1804/99 on organic animal production.

Given that much livestock production in Cyprus is already extensive in nature (particularly sheep and goat production), the prospects for the expansion of organic livestock production and therefore for the

*Figure 2.23 Cyprus: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

organic share of total livestock production to increase in the short-term are encouraging.

2.20 Czech Republic

2.20.1 Current state of organically reared livestock

2.20.1.1 Organic land area

The Czech Republic had 263,799 hectares of certified policy supported and in-conversion organic land in 2004, an increase from 15,818 hectares recorded a decade previously (see Figure 2.24). This increase is due to the introduction of government subsidies for organic farming in 1988 (Directive 505/2001), which increased from €1.5 million (CZK48 million) to €6.9 million (CZK210 million) in 2002 (USDA, 2003). Consequently, organic land area increased from 20,239 hectares to 71,620 hectares between 1997 and 1998, with subsequent substantial year-on-year increases.

These subsidy payments were made based on area and therefore in the livestock sector, as organic land area is a pre-requisite for organic livestock production, this favoured the conversion of land based enterprises with the greatest land area, i.e. sheep and goat production (see next section).

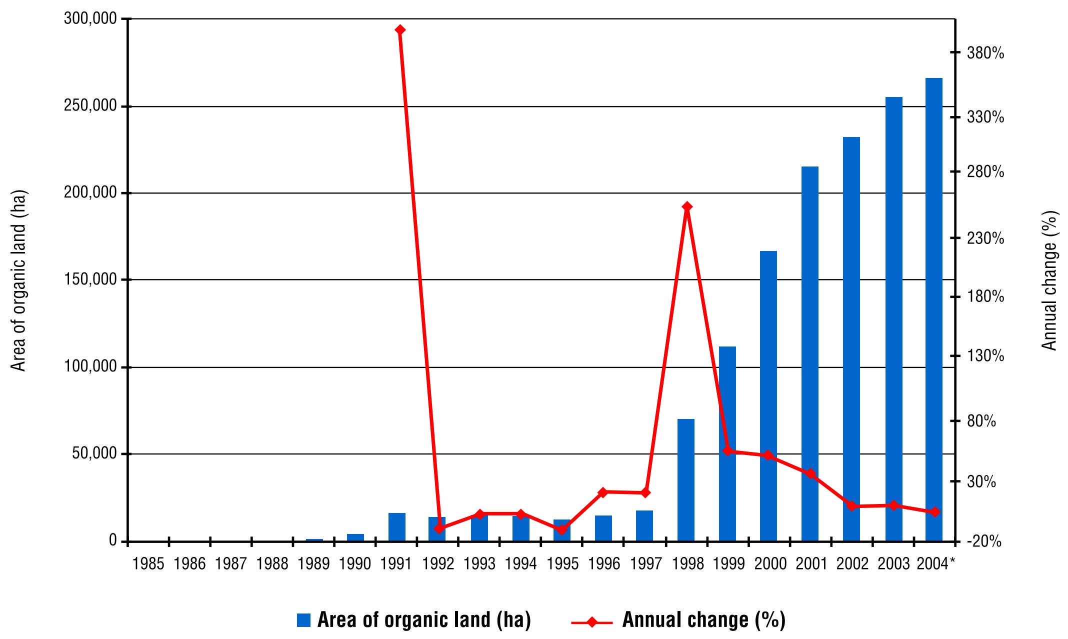
2.20.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in the Czech Republic has been collected for the main livestock species for the period 2001 to 2004 using data from Eurostat (2006) and the Research Institute of Agricultural Economics (2005(b)) (see Table A. 19).

During this period, the number of organic equines, bovines, sheep and goats increased, but decreased for pigs and poultry. Organic equines had the fastest compound annual growth rate (CAGR) of 104.5%/year (CAGR), followed by sheep and goats which increased by 18.5%/year (CAGR) and 14.3%/year (CAGR) respectively. By contrast, organic pig and poultry numbers decreased by 19.4%/year (CAGR) each.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data

*Figure 2.24 Czech Republic: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

from Eurostat (2006) and the FAO (2006) and is summarised in Table 2.35 below. The organic shares of sheep (20.4%), goats (18.7%), equines (8.4%) and bovines (7.2%) were all substantially above the EU-25 average in 2004 (2002 for equines), while the organic shares of poultry (<0.1%) and pigs (<0.1%) were below the EU-25 average.

Based on the data presented in Table A. 19, the following observations can be made regarding the current state and recent development of organically reared livestock in the Czech Republic:

- ***Equines:*** Total organic equine numbers increased by 4.5%/year (CAGR) between 2001 and 2002, from 1,684 to 1,760 head. Organic equines accounted for a share of 8.4% of total equine production in 2002.
- ***Bovines:*** Total organic bovine numbers increased by 8.1%/year (CAGR) between 2001 and 2004, from 79,364 to 100,304 head. Of this total, other bovine animals decreased by 31.5%/year (CAGR), while there was insufficient data available to calculate the change in dairy and beef cow numbers over the period. Organic bovines accounted for a share of 7.2% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 18.5%/year (CAGR) between 2001 and 2004, from 19,029 to 31,631 head. Of this total, breeding ewe numbers increased by 17.7%/year (CAGR), while other sheep numbers increased by 20.2%/year (CAGR). Organic sheep accounted for a share of 20.4% of total sheep production in 2004.

  Total organic goat numbers increased by 14.3%/year (CAGR) between 2001 and 2004, from 1,753 to 2,620 head. Of this total, breeding nanny numbers increased by 16.3%/year (CAGR), while other goat numbers increased by 11.0%/year (CAGR). Organic goats accounted for a share of 18.7% of total goat production in 2004.
- ***Pigs:*** Total organic pig numbers decreased by 19.4%/year (CAGR) between 2001 and 2004, from 2,597 to 1,359 head. Of this total, organic breeding sow, fattening and other pig numbers decreased by 19.2%/year (CAGR), 19.7%/year (CAGR) and 19.1%/year (CAGR) respectively. Organic pigs accounted for a share of <0.1% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers decreased by 19.4%/year (CAGR) between 2001 and 2004, from 3,274 to 1,715 head. Of this total, broiler numbers decreased by 100.0%/year (CAGR), while laying hen and other poultry numbers decreased by 17.3%/year (CAGR) and 22.4%/year (CAGR) respectively. Organic poultry accounted for a share of <0.1% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in the Czech Republic.

2.20.1.3 Self-sufficiency

The Czech Republic was self-sufficient in organic poultrymeat in 2001 (Hamm, *et al.* 2004). However there is no data available for self-sufficiency in organic milk, beef, sheep and goat meat, pork or eggs (see Table 2.36).

Table 2.35: Share of organic livestock in total livestock population, 2004 (head)

	Equines[1]	Bovines	Sheep	Goats	Pigs	Poultry
Organic	1,760	100,304	31,631	2,620	1,359	1,715
Total	21,000	1,399,600	155,000	14,000	3,031,333	36,503,000
Share	8.4%	7.2%	20.4%	18.7%	<0.1%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: 1 data for 2002.
Source: Organic data from sources shown in Table A. 19; total livestock numbers from Eurostat (2006) and FAO (2006).

2.20.2 Prospects for the development of organic livestock

The contribution of organic bovine, sheep and goat production in the Czech Republic to total (organic and non-organic) production is high (i.e. >5% share), whereas the contribution of organic pigs and poultry to total (organic and non-organic) pig and poultry production is low (i.e. <5% share). Similarly, the growth of organic bovine, sheep and goat numbers in recent years has been high (i.e. >5%/year), whereas the growth of organic pig and poultry numbers in recent years has been low (i.e. <5%/year).

As previously stated, the growth in organic agriculture in recent years was driven by the increase in government subsidies. Since EU accession in May 2004, EU funds have been available for the further development of Czech organic agriculture under the Horizontal Plan for Rural Development prepared by the Ministry of Agriculture in line with Council Regulation 1257/99. Furthermore, one of the draft support programmes prepared as part of the Czech organic Action Plan for 2010 (Czech Republic Ministry of Agriculture, 2004) concerns organic animal breeding.

Organic food consumption in the Czech Republic is low, with a share of just 0.18% of total food consumption, which is around 3-4% of the average organic food consumption in the EU-15 (Eurofood, May 31st 2006). Many consumers are reportedly discouraged by the higher price of organic food. Nevertheless, according to the Institute of Agricultural and Food Information (IAFA), consumer spending on organic produce is expected to increase by 189% over the next five years from CZK450 million (€15.8 million) in 2006 to CZK1.3 billion (€45.7 million) by 2011 (Eurofood, 2006(l)). However, given the low volume of organic production in the Czech Republic, a significant proportion of organic food is likely to be imported.

Given the wider structural reforms taking place in Czech agriculture and the rising demand for organic produce in the Czech Republic, it is likely that organic livestock numbers will continue to increase in the short-term. This view is strengthened by the fact that there are large numbers of small farms operating extensive production systems that would require little or no capital investment in order to convert to organic systems.

2.21 Estonia

2.21.1 Current state of organically reared livestock

2.21.1.1 Organic land area

Certified, policy supported and in-conversion organic land reached 46,016 hectares in 2004, a substantial increase over the 1,600 hectares recorded a decade previously (see Figure 2.25).

Table 2.36: Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	n.a.
Beef (incl. Veal)	n.a.
Sheep and goat meat	n.a.
Pork	n.a.
Poultry	100
Eggs	n.a.

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\text{sales of each organic product (as organic) for human consumption}}{\text{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

The organised organic farming movement in Estonia started in 1989 with the establishment of Estonian Biodynamic Association (EBA) and the implementation of the Organic Farming Act in 1997. However, it was not until 1999 that the area of organic land started to increase substantially after extensive promotional work by organic producer associations (Ministry of Agriculture (Estonia), 2000).

Most organic and in-conversion farms are concentrated into the traditionally extensive agriculture regions, namely south-east Estonia (Võru, Põlva and Valga counties), Saaremaa island (Saare county) and western Estonia (Lääne county), where the conversion into organic farming has been relatively easy, however, more recently there have been a number of larger farms and agricultural enterprises in the intensive agriculture regions that have shown interest as well (Ministry of Agriculture, 2000).

As would be expected a priori, because organic land area is a pre-requisite for organic livestock production, the more extensive land based livestock sectors have seen the greatest increase in organic livestock numbers.

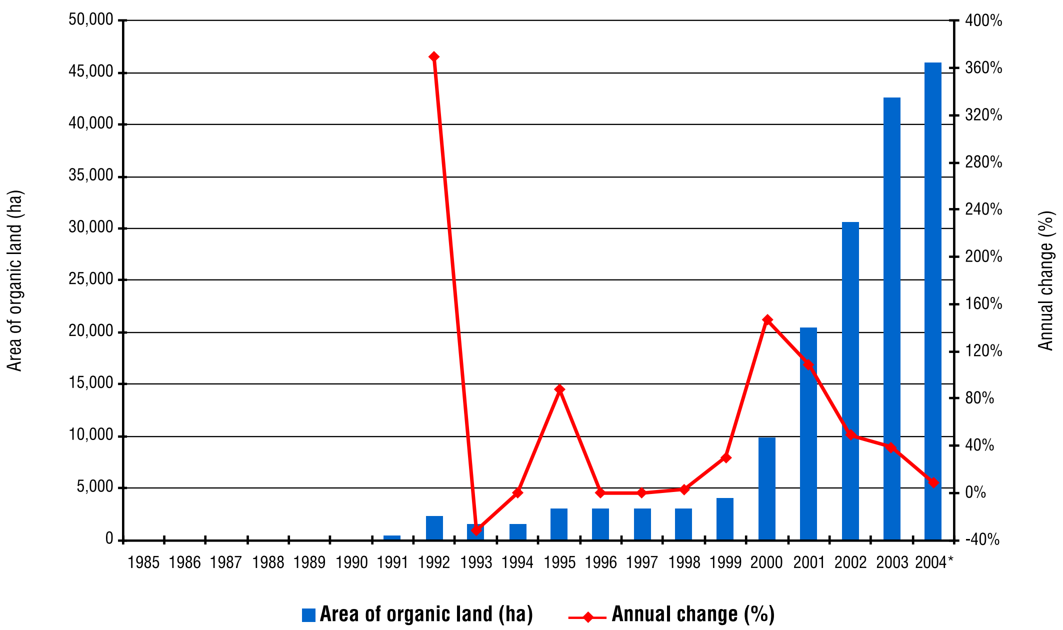
2.21.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Estonia has been collected for the main livestock species for the period 1999 to 2002 using data from the Research Institute of Agricultural Economics (2005(b)) (see Table A. 20).

During this period, the number of organic livestock increased for all species, with organic sheep increasing by 109.2%/year, followed by organic bovines at 74.5%/year (CAGR), organic equines at 47.3%/year (CAGR), organic pigs at 39.8%/year (CAGR), organic goats at 35.0%/year (CAGR) and organic poultry at 32.9%/year (CAGR).

The shares of organic livestock in total livestock numbers for 2002 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006). The organic shares of sheep (6.0%), goats (5.6%) and equines (4.8%) were all significantly above

*Figure 2.25 Estonia: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

the EU-25 average in 2004, while the shares of organic bovines (1.6%), pigs (0.1%) and poultry (<0.1%) were below the EU-25 average.

Based on the data presented in Table A. 20, the following observations can be made regarding the current state and recent development of organically reared livestock in Estonia:

- ***Equines:*** Total organic equine numbers increased by 47.3%/year (CAGR) between 1999 and 2002, from 83 to 265 head. Organic equines accounted for a share of 4.8% of total equine production in 2002.
- ***Bovines:*** Total organic bovine numbers increased by 74.5%/year (CAGR) between 1999 and 2002, from 815 to 4,327 head. There was no data available to separate dairy and beef cow numbers from this total, although other bovine animal numbers decreased by 11.1% between 2001 and 2002. Organic bovines accounted for a share of 1.6% of total bovine production in 2002.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 109.2%/year (CAGR) between 1999 and 2002, from 196 to 1,795 head. There was insufficient data to calculate the change in breeding ewe and other sheep numbers over the period. Organic sheep accounted for a share of 6.0% of total sheep production in 2002.

  Total organic goat numbers increased by 35.0%/year (CAGR) between 1999 and 2002, from 89 to 219 head. There was insufficient data to calculate the change in breeding nanny and other goat numbers over the period. Organic goats accounted for a share of 5.6% of total goat production in 2002.
- ***Pigs:*** Total organic pig numbers increased by 39.8%/year (CAGR) between 1999 and 2002, from 79 to 216 head. There was insufficient data to calculate the change in breeding sow, fattening and other pig numbers over the period. Organic pigs accounted for a share of 0.1% of total pig production in 2002.
- ***Poultry:*** Total organic poultry numbers increased by 32.9%/year (CAGR) between 1999 and 2002, from 586 to 1,376 head. There was insufficient data to calculate the change in broiler, laying hen and other poultry numbers over the period. Organic poultry accounted for a share of <0.1% of total poultry production in 2002.
- ***Aquaculture:*** There is no information available on organic aquaculture in Estonia.

2.21.1.3 Self-sufficiency

There is no data available for self-sufficiency in organic livestock products for Estonia.

2.21.2 Prospects for the development of organic livestock

The contribution of organic sheep and goat production in Estonia to total (organic and non-organic) sheep and goat production is high (i.e. >5% share), whereas the contribution of organic bovines, pigs and poultry to total (organic and non-organic) bovine, pig and poultry production is low (i.e. <5% share). Nevertheless, the growth of organic livestock numbers in recent years has been high (i.e. >5%/year) for all species.

Table 2.37: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic[1]	265	4,327	1,795	219	216	1,376
Total[1]	5,500	263,550	29,900	3,900	349,467	20,554,000
Share[1]	4.8%	1.6%	6.0%	5.6%	0.1%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Note: 1 data for 2002.
Source: Organic data from sources shown in Table A. 20; total livestock numbers from Eurostat (2006) and FAO (2006).

Taking into account the present agricultural situation, the expansion of the organic sector in 2000 and 2001 and the high level of consumer interest, there is great potential for the rapid development of the sector in the short to medium-term (Mikk, 2001). It is estimated that there will be an increase of between 50% to 100% in organic production per year over the next few years. (Ministry of Agriculture (Estonia), 2000).

There is considerable scope for the expansion of organic livestock production, in particular in the more extensive agricultural regions previously mentioned, particularly considering that there are approximately 298,700 hectares (Mikk, 2001) of extensive natural grasslands in Estonia, compared to a total organic land area in 2002 of 30,623 hectares (Lampkin, 2004). It is therefore likely that there will be a substantial increase in organic sheep, goat and bovine numbers in the short-term, due to the relatively low costs of converting already extensive production systems and the financial support available from the EU for converting to organic farming systems. There is also growing interest in organic dairy production and the Institute of Animal Husbandry began research into organic dairy farming and the development of organic milk products in 2000.

2.22 Hungary

2.22.1 Current state of organically reared livestock

2.22.1.1 Organic land area

Certified, policy supported and in-conversion organic land area in Hungary increased substantially in the latter half of the 1990s from 8,630 hectares in 1994 to 133,009 hectares in 2004 (see Figure 2.26). Since 1995, this increase has largely been due to improved export potential, and the accreditation of the Hungarian organic agriculture association Biokultúra through the IFOAM-Accreditation programme, resulting in an increase in activity by western inspection bodies and the inclusion of Hungary on the third country list under EU-regulation 2092/91. Since 1998 direct State financial support has been available to organic farmers for inspection and certification fees and investment in specialist machinery and seeds, etc. (Frühwald, 2002). As a result of this investment, organic area increased further in the early 2000s, reaching 103,671 hectares in 2002.

The Hungarian State supported organic agriculture because of its export potential and this support included Hungary's efforts to establish an inspection system in accordance with EU regulation 2092/91. In addition, there was substantial marketing support; however, the development of the domestic market was not supported by the state. This state support was largely focussed on crop products, which were seen to have greater export potential on EU markets compared to livestock products, according to Biokultúra (Frühwald, 2002). As a result, the increase in organic area over the period has not resulted in the corresponding increase in organic livestock numbers seen in other Member States, with the notable exception of bovine animals (see next section).

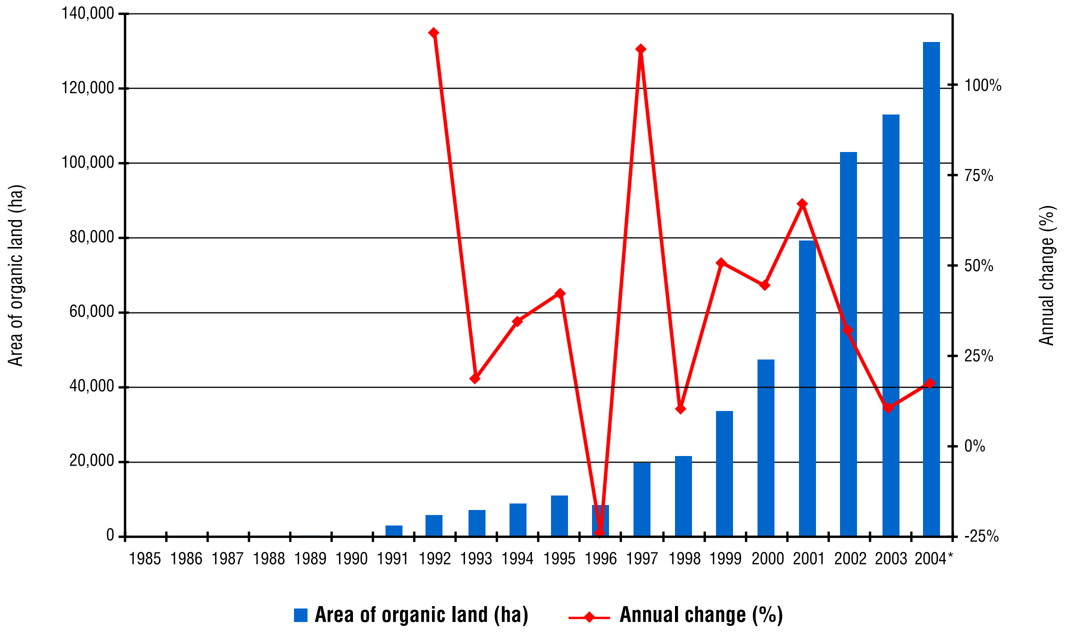
2.22.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Hungary has been collected for the main livestock species for the period 1998 to 2004 using data from Eurostat (2006) and the Research Institute of Agricultural Economics (2005(b)) (see Table A. 21).

During this period, the number of organic livestock increased for equines (49.8%CAGR), poultry (%25.8CAGR), bovines (20.2%CAGR) and sheep (5.9%CAGR), but decreased for pigs (4.2%CAGR) and goats (3.3%CAGR).

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006). The organic shares of all livestock species were below the EU-25 average in 2004.

*Figure 2.26 Hungary: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Based on the data presented in Table A. 21, the following observations can be made regarding the current state and recent development of organically reared livestock in Hungary:

- ***Equines:*** Total organic equine numbers increased by 49.8% between 1998 and 2004, from 25 to 282 head. Organic equines accounted for a share of 0.4% of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 20.2% between 1998 and 2004, from 2,900 to 8,747 head. There was no data available to separate dairy and beef cow numbers from this total. Organic bovines accounted for a share of 1.2% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased over the period by 5.9% between 1998 and 20042, from 1,517 to 2,137 head. There was insufficient data to calculate the change in breeding ewe and other sheep numbers over the period. Organic sheep accounted for a share of 0.2% of total sheep production in 2004.
  Total organic goat numbers decreased over the period by 3.3% between 1998 and 2004, from 361 to 296 head. There was insufficient data to calculate the change in breeding nanny and other goat numbers over the

Table 2.38: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	282	8,747	2,137	296	769	613
Total	70,680	729,000	1,397,000	74,000	4,242,667	8,067,000
Share	0.4%	1.2%	0.2%	0.4%	<0.1%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 21; total livestock numbers from Eurostat (2006) and FAO (2006).

period. Organic goats accounted for a share of 0.4% of total goat production in 2004.

- ***Pigs:*** Total organic pig numbers decreased over the period by 4.2% between 1998 and 2004, from 992 to 769 head. There was insufficient data to calculate the change in breeding sow, fattening and other pig numbers over the period. Organic pigs accounted for a share of <0.1% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased over the period by 25.8% between 1998 and 2004, from 155 to 613 head. There was insufficient data to calculate the change in broiler, laying hen and other poultry numbers over the period. Organic poultry accounted for a share of <0.1% of total poultry production in 2004.
- ***Aquaculture:*** Hungarian carp production covered an area of 4,600 ha in 2004 (Franz, 2004). There is no information available on organic aquaculture production volume in Hungary.

2.22.1.3 Self-sufficiency

There is no data available for self-sufficiency in organic livestock products for Hungary.

2.22.2 Prospects for the development of organic livestock

The contribution of organic livestock production in Hungary to total (organic and non-organic) livestock production is low (i.e. <5% share) for all species. Nevertheless, the rate of growth in livestock numbers has been high in recent years for organic bovines, sheep and poultry (i.e. >5%/year), whereas growth in organic goat and pig numbers has been low (i.e. <5%/year).

As previously stated, in the past, the Hungarian Government supported organic agriculture because of its export potential, but did not support the development of the domestic organic market. Since Accession to the EU, this position has changed and current support for the development of organic livestock production (under Regulation 2092/91 (as amended)) includes direct payments for organic livestock. These direct payments are provided under 2 schemes (see Table 2.39):

- the Organic Farming Scheme, to compensate for income forgone and provide assistance with the additional conversion costs incurred; and
- the Entry Level Agri-environment scheme, to support livestock producers (conventional and organic) for keeping and preserving endangered breeds, e.g. the woolly-haired breed of grazing pigs traditionally bred in Hungary to produce the speciality Mangalitza pork.

Thus the prospects for the development of the organic livestock production in Hungary are good, not least because according to Frühwald (2002) the current Utilised Agricultural Area is approximately two-thirds of the potential agricultural area. Much of this additional land area would not be suitable for the production of arable crops, i.e. being more marginal land best suited to extensive livestock production systems.

2.23 Latvia

2.23.1 Current state of organically reared livestock

2.23.1.1 Organic land area

Certified, policy supported and in-conversion organic land area in Latvia reached 43,982 hectares in 2004, having increased year on year from the 1,250 hectares recorded a decade previously (with the exception of a slight drop in 1995 and 1998 (see Figure 2.27). The organic agriculture movement in Latvia started in 1989, but did not really take off until the establishment of the Association of Organisations of Organic Farming in 1995. State subsidies for organic production became available from around 1999 onwards, which started a rapid expansion in the area of organic

Table 2.39: Direct payment for organic livestock and endangered breeds, €/head

Species	Organic Farming Scheme (€/head)	Endangered breeds Scheme (€/head)
Cattle	74.62	113.67
Pigs	58.82	78.43
Sheep	18.82	20.59
Laying hens	0.49	0.69
Broilers and Guinea fowl	0.25	0.33
Geese and Ducks	0.78	1.10
Turkeys	1.04	1.53
Equines		119.80

Source: Ministry of Agriculture, 2004.

and in-conversion land. In 2003, direct payments were introduced for organic farming under the Government's Action Plan for Organic Farming, resulting in a further substantial increase in area between 2003 and 2004.

As would be expected a priori, because organic land area is a pre-requisite for organic livestock production, organic livestock numbers have seen a substantial increase since 2000 (the first year for which data was available).

2.23.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Latvia has been collected for the main livestock species for the period 2000 to 2004 using data from Eurostat (2006) and the Research Institute of Agricultural Economics (2005(b)) (see Table A. 22).

During this period, the number of organic livestock increased for all species, with organic bovines increasing by 182.3%, organic poultry at 159.5%/year (CAGR), organic sheep at 114.5%/year (CAGR), organic goats at 82.3%/year (CAGR) and organic pigs at 62.8%/year (CAGR).

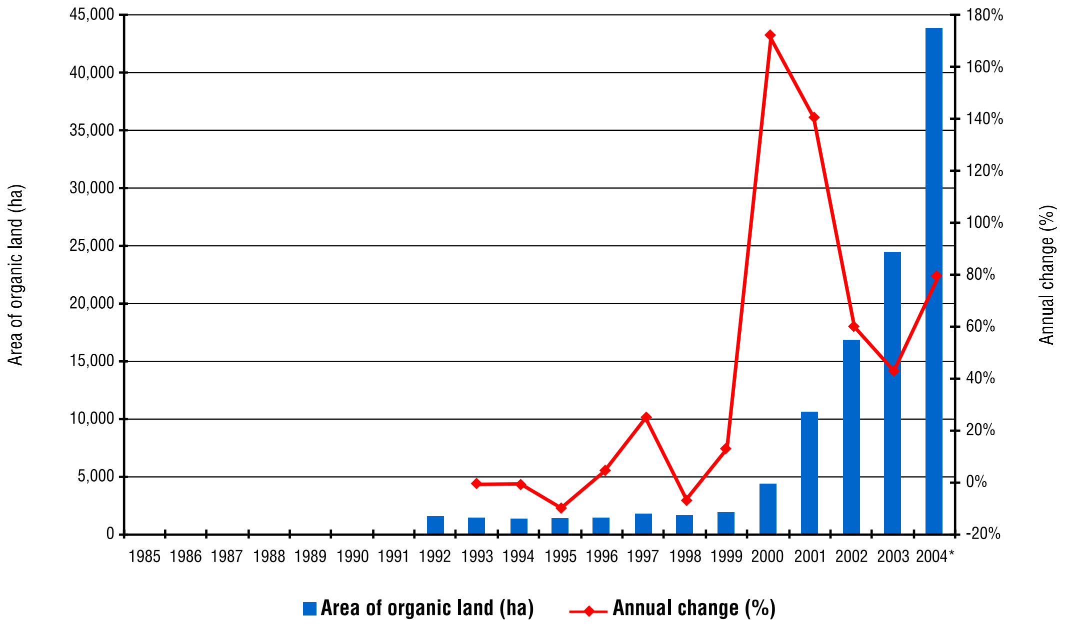
The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006). The organic shares of all livestock species apart from poultry were above the EU-25 average in 2004.

Based on the data presented in Table A. 22, the following observations can be made regarding the current state and recent development of organically reared livestock in Latvia:

- ***Equines:*** There were 352 organic equines in 2004, accounting for a 2.3% share of total equine production. Insufficient data was available to calculate the change in number over the period.
- ***Bovines:*** Total organic bovine numbers increased by 182.3%/year (CAGR) between 2000 and 2004, from 158 to 10,037 head. There was insufficient data available to calculate the change in dairy and beef cow numbers over the period. Organic bovines accounted for a share of 2.7% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 114.5%/year (CAGR) between 2000 and 2004, from 93 to 1,970 head. There was insufficient data to calculate the change in breeding ewe and other sheep numbers over the period. Organic sheep accounted for a share of 5.1% of total sheep production in 2004.

  Total organic goat numbers increased by 82.3%/year (CAGR) between 2000 and 2004, from 60 to 662 head. There was insufficient

*Figure 2.27 Latvia: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table 2.40: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	352	10,037	1,970	662	2,078	6,034
Total	15,400	375,200	38,950	14,700	438,400	14,695,000
Share	2.3%	2.7%	5.1%	4.5%	0.5%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 22; total livestock numbers from Eurostat (2006) and FAO (2006).

data to calculate the change in breeding nanny and other goat numbers over the period. Organic goats accounted for a share of 4.5% of total goat production in 2004.

- ***Pigs:*** Total organic pig numbers increased by 62.8%/year (CAGR) between 2000 and 2004, from 296 to 2,078 head. There was insufficient data to calculate the change in breeding sow, fattening and other pig numbers over the period. Organic pigs accounted for a share of 0.5% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers increased by 159.5%/year (CAGR) between 2000 and 2004, from 133 to 6,034 head. There was insufficient data to calculate the change in broiler, laying hen and other poultry numbers over the period. Organic poultry accounted for a share of <0.1% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Latvia.

2.22.1.3 Self-sufficiency

There is no data available for self-sufficiency in organic livestock products for Latvia.

2.23.2 Prospects for the development of organic livestock

The contribution of organic livestock production in Latvia to total (organic and non-organic) livestock production is low (i.e. <5% share), with the exception of organic sheep production, which has a high share of total sheep production (i.e. >5% share). Nevertheless, the rate of growth in organic livestock numbers has been high (i.e. >5%/year) for all species.

The Latvian government has supported and promoted organic farming through the Action Plan on Organic Farming and the introduction of direct payments for organic production under the agri-environmental programme. Latvia plans to spend a total of €150,000 over two years to promote organic food. The funding under Regulation EC1071/2005 will be co-financed by the EU and the aim is to stimulate awareness and demand for organic products, thereby potentially stimulating an increase in domestic organic production, including the production of organic livestock.

The prospects for the development and growth of the organic livestock sector would appear to be good, not least because according to Selegovska and Degola (2003) the area of organic and in-conversion land in 2003 accounted for just 1% of total agricultural area, whereas the potential share of organic land in total agricultural area could be as high as 21%. This is because in addition to those farms that have already converted to organic farming, many non-certified farms already operate extensive production systems that do not use inorganic fertilisers and agrochemical inputs to save costs. Furthermore, according to the Latvian Rural Development Plan (Ministry of Agriculture (Latvia), 2001) further development of the organic farming sector is expected, provided that domestic, Scandinavian and other EU market demand growth continues.

2.24 Lithuania

2.24.1 Current state of organically reared livestock

2.24.1.1 Organic land area

The first 9 organic farms in Lithuania totalling 148 hectares were certified in 1993. Substantial growth took place from the mid-1990s onwards and in 1998, land area classified as organic had increased to 4,006 hectares. In 2000, the Lithuanian Government introduced direct payments for organic farming from the Rural Support Fund (Ministry of Agriculture, 2000) and in 2004, area had increased further to 36,864 hectares (see Figure 2.28). The main reason for the recent interest in organic farming in Lithuania is mainly due to efforts (by Government, certification bodies and producers) to conserve farming traditions, produce agricultural products without inorganic fertilisers and agrochemicals, conserve the environment, reduce production costs and sell more products on foreign markets (Boguzas, *et al*. 2004)

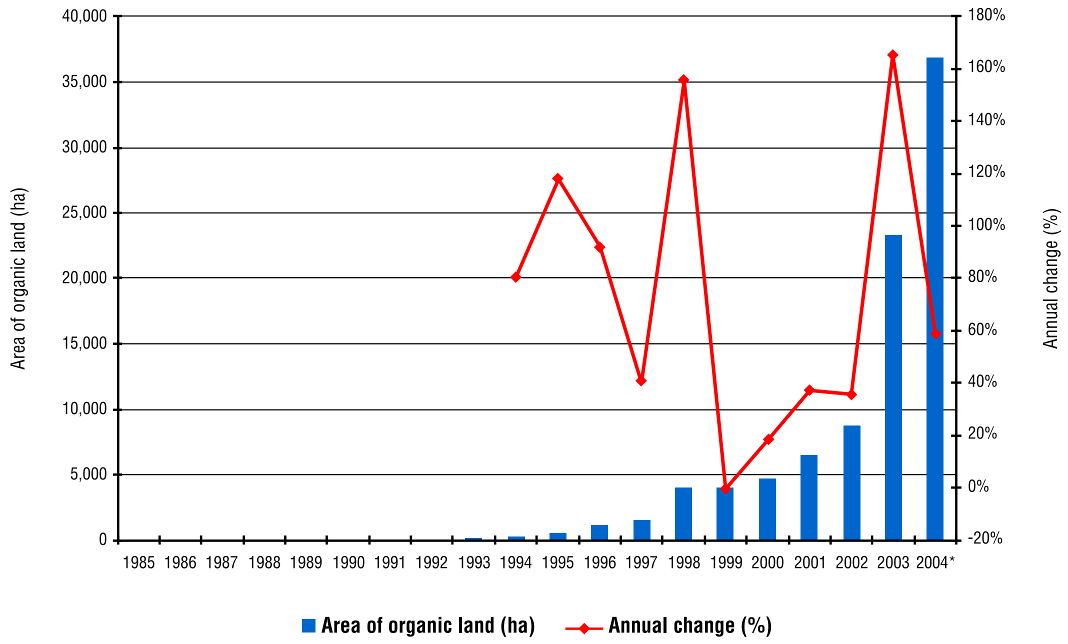
According to V. Rutkoviene, Chairman of the Executive Board of the certification body Ekoagros, half of the organic area comprises grassland and fodder crops for livestock production (BioFach, 2003). As would be expected a priori, because organic land area is a pre-requisite for organic livestock production, organic livestock numbers would be expected to have experienced a similar growth trend over the period (see next section).

Table 2.41: Funding for organic programmes under Regulation EC 1071/2005 (€)

Organisation	Total budget				EC contribution			
	Year 1	Year 2	Year 3	Total	Year 1	Year 2	Year 3	Total
Association of Latvian Organic Agriculture	71,000	79,000	0	**150,000**	35,500	39,500	0	**75,000**

Source: Regulation EC1071/2005.

*Figure 2.28 Lithuania: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

2.24.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Lithuania has been collected for the main livestock species between 2002 and 2004 using data from Eurostat (2006) and the Research Institute of Agricultural Economics (2005(b)) (see Table A. 23).

During this period, the number of organic livestock increased for bovines and sheep by 351.2% and 88.2% respectively, while the numbers of organic equines, pigs and poultry decreased by 34.8%/year (CAGR), 37.3%/year (CAGR) and 4.0%/year (CAGR) respectively.

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006). The share of organic sheep (17.1%) was substantially higher than the EU-25 average in 2004, while the shares of other organic livestock were all below the EU-25 average.

Based on the data presented in Table A. 23, the following observations can be made regarding the current state and recent development of organically reared livestock in Lithuania:

- ***Equines:*** Total organic equine numbers decreased by 34.8%/year (CAGR) between 2002 and 2004, from 447 to 190 head and accounted for a 0.3% share of total equine production in 2004.
- ***Bovines:*** Total organic bovine numbers increased by 351.2%/year (CAGR) between 2002 and 2004, from 325 to 6,616 head. There was insufficient data available to calculate the change in dairy and beef cow numbers over the period. Organic bovines accounted for a share of 0.8% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 88.2%/year (CAGR) between 2002 and 2004, from 1,070 to 3,789 head. There was insufficient data to calculate the change in breeding ewe

Table 2.42: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	190	6,616	3,789	321	83	890
Total	63,600	792,000	22,100	26,900	1,073,300	125,000,000
Share	0.3%	0.8%	17.1%	1.2%	<0.1%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 23; total livestock numbers from Eurostat (2006) and FAO (2006).

and other sheep numbers over the period. Organic sheep accounted for a share of 17.1% of total sheep production in 2004. Organic goat numbers totalled 321 in 2004, accounting for a 1.2% share of total goat production. There was insufficient data to calculate the change in total goat, breeding nanny and other goat numbers over the period.

- ***Pigs:*** Total organic pig numbers decreased by 37.3%/year (CAGR) between 2002 and 2004, from 211 to 83 head. There was insufficient data to calculate the change in breeding sow, fattening and other pig numbers over the period. Organic pigs accounted for a share of <0.1% of total pig production in 2004.

Poultry: Total organic poultry numbers decreased by 4.0%/year (CAGR) between 2002 and 2004, from 965 to 890 head. There was insufficient data to calculate the change in broiler and laying hen numbers over the period, although other poultry decreased by 21.4%/year (CAGR) over the period. Organic poultry accounted for a share of <0.1% of total poultry production in 2004.

Aquaculture: In 2003, certification was awarded to the first 13 organic aquaculture farms which breed organic fish. The total area covers approximately 3,000 hectares (Paurytė, 2003).

2.24.1.3 Self-sufficiency

There is no data available for self-sufficiency in organic livestock products for Lithuania.

2.24.2 Prospects for the development of organic livestock

The contribution of organic livestock production in Lithuania to total (organic and non-organic) livestock production is low (i.e. <5% share) for all species, with the exception of organic sheep production, which has a high share of total sheep production (i.e. >5% share). Nevertheless, the rate of growth in organic bovine and sheep numbers has been high (i.e. >5%/year) in recent years, while the rate of growth in organic pig and poultry numbers has been low (i.e. <5%/year).

The Lithuanian government's strategy for the development of the organic livestock sector is based on increasing the share of organic land and supporting organic production through direct payments. Under the Lithuanian Organic Action Plan, the target share of organic land in total Utilisable Agricultural Area (UAA) is 5% by the end of 2006 (BioFach, 2003).

Given that 50% of the organic area converted up until 2003 is reported to have been grassland and fodder crops for livestock production (BioFach, 2003), it is therefore likely that the number of organic livestock will increase along with the expected rise in organic land area in the short-term, particularly as direct payments for organic farming under the Agriculture and Rural Development Plan will continue until 2006 (Lithuanian Ministry of Agriculture (Lithuania), 2000).

2.25 Malta

2.25.1 Current state of organically reared livestock

2.25.1.1 Organic land area

Up until October 2003, there was no certification of organic farms and no national legislation covering organic production methods. There was no institutional framework that enabled the backing of the sector and most producers did not know the details and methods of production laid down in the EC Regulation 2092/91. In October 2003, an Organic Farming Unit was set up within the Agricultural Services and Rural Development Division. Since then, the unit has written and published the national legislation for organic farming, which transposed to EU Regulation 2092/91 upon Malta's entry into the EU (CIHEAM, 2004). In 2003, there was just 3 hectares of certified organic and in-conversion land, which increased to 39.72 ha in 2004, of which 16% was classed as fallow/grassland (Ministry for Rural Affairs and the Environment, 2006).

2.25.1.2 Structure of the organic livestock sector

There was no organic livestock production in Malta in 2004 and therefore the shares of organic livestock are zero. Furthermore, there is no information available on organic aquaculture production in Malta.

2.25.1.3 Self-sufficiency

As there was no organic livestock production in Malta, the self-sufficiency in organic livestock products is zero.

2.25.2 Prospects for the development of organic livestock

Malta introduced plans to promote and support organic farming under the Maltese Rural Development Plan. Furthermore, the entire territory of Malta has been designated as a "less-favoured area" (LFA), which will qualify all farmers for additional EU support

Given the rise in organic fallow/grassland area, the Less Favoured Area support and the organic support provided under the Maltese Rural Development Plan, the prospects for growth in organic livestock numbers appear good, provided that demand for Maltese organic livestock production also increases on both domestic and EU markets.

2.26 Poland

2.26.1 Current state of organically reared livestock

2.26.1.1 Organic land area

Certified organic and in-conversion land in Poland reached 82,730 hectares in 2004, a steady increase over the 5,000 hectares recorded a decade previously (see Figure 2.29). The most substantial annual increase occurred between 1999 and 2000, linked to the introduction of subsidies towards the cost of the audit system in 1998 and crucially, the introduction of subsidies per hectare of organic crop in 1999. In 2001, the Act on Organic Farming was passed, which also had

Table 2.43: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	0	0	0	0	0	0
Total	1,800	19,408	14,130	5,635	76,853	79,066,000
Share	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Total livestock numbers from Eurostat (2006) and FAO (2006) .

a favourable influence on the sector (Ministry Of Agriculture (Poland), 2005). EU accession in 2004 also resulted in a further substantial increase in the organic land area.

In 2003, the organic grassland area was reported to be 15,683 hectares (MIMQAPF, 2003), accounting for 31.4% of the organic land area in that year. As would be expected a priori, because organic land area is a pre-requisite for organic livestock production, organic livestock numbers are therefore likely to have experienced a similar growth trend over the period, however, there is no data available of organic livestock numbers in Poland.

2.26.1.2 Structure of the organic livestock sector

There is no data available on the numbers of organic livestock in Poland (confirmed by Metera (2005)). There is also no information available on organic aquaculture in Poland.

2.26.1.3 Self-sufficiency

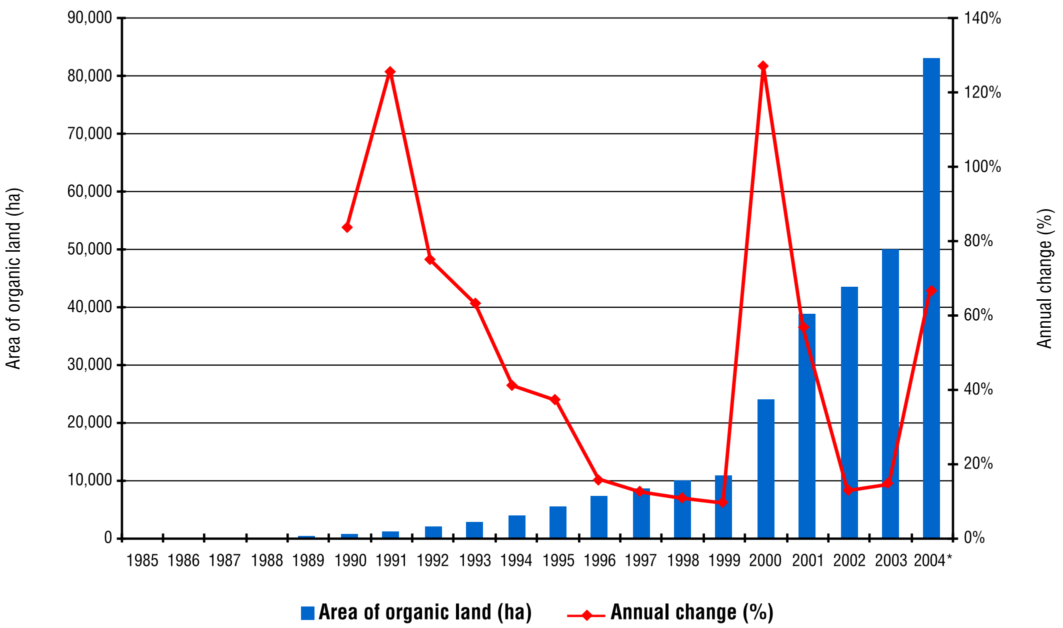
There is no data available for self-sufficiency in organic livestock products for Poland.

2.26.2 Prospects for the development of organic livestock

According to the Polish Ministry of Agriculture (2005), the reasons for the uneven growth of organic farming in Poland and the hitherto low number of farmers interested in such activities can be attributed to the late introduction of legal regulations or financial incentives, as well as lack of appropriate market creation for organic products. Furthermore, the USDA (2005) considers that demand for organic products in Poland is very low compared with non-organic products, mostly due to a lack of information and higher prices.

The Polish government introduced plans to increase the share of organic production in

*Figure 2.29 Poland: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table 2.44: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	-	-	-	-	-	-
Total	335,000	5,276,797	310,762	175,760	17,193,673	93,569,000
Share	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Total livestock numbers from Eurostat (2006) and FAO (2006).

Poland to between 3 and 5% of total farms within next few years under the Action Plan for Organic Farming. To achieve this aim, organic farming has been supported under Measure 4 of the Polish RDP since Poland's accession to the EU, as well as through direct payments paid through the Agency of Modernisation and Restructuring of Agriculture. These subsidies are only paid for farms less than 300 hectares, although the payment is increased by 20% for organic livestock production.

In order to stimulate demand, Poland plans to spend a total of €3.15 million over three years to promote organic food. The funding under Regulation EC1071/2005 will be co-financed by the EU and the aim is to stimulate awareness and demand for organic products, thereby potentially stimulating an increase in domestic organic production, including the production of organic livestock.

Therefore, given the incentives to convert and produce organic food, measures introduced to increase domestic demand for organic products, the development of organic land area that has taken place in recent years and the current share of organic land accounted for by organic grassland for livestock production, the prospects for the development of the Polish organic livestock sector and for an increase in the number of organic livestock appear positive.

2.27 Slovakia

2.27.1 Current state of organically reared livestock

2.27.1.1 Organic land area

The development of organic agriculture in Slovakia commenced in 1990/91 by the Ministry of Agriculture, following the experience and developing trend in Western Europe. At this time, there were 15,140 hectares of certified and in-conversion organic land. Subsidies were paid to producers over a 3-year conversion period. The first products were allowed to be sold with an organic label from 1994 onwards. In 1995 a plan for organic farming to 2010 was adopted and in 1998/99 the Act on ecological agriculture and biofood production was adopted, which substantially changed the system of subsidy payments, which had a dramatic effect on the area of policy supported and in-conversion organic land. Since 1998, organic area has fluctuated, increasing to a high of 58,706 hectares in 2001, before dropping back to 49,999 hectares in 2002. In 2004, there were 53,091 hectares of certified and in-conversion organic land (see Figure 2.30).

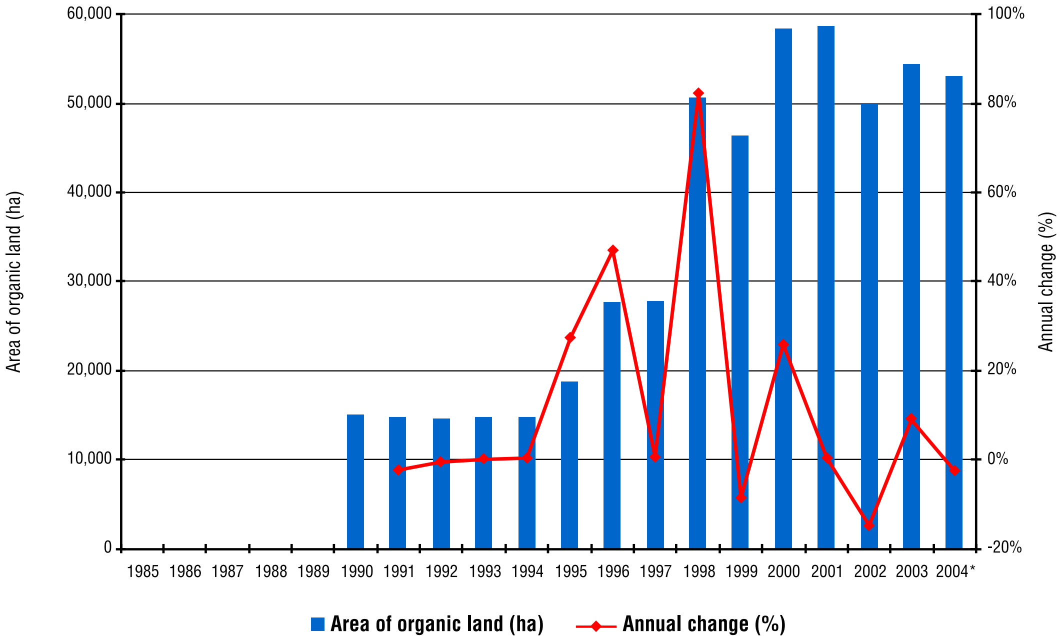
Of the 49,999 hectares of organic land in 2002, 32,781 hectares were permanent grassland

Table 2.45: Funding for organic programmes under Regulation EC 1071/2005 (€)

Organisation	Total budget				EC contribution			
	Year 1	Year 2	Year 3	**Total**	Year 1	Year 2	Year 3	**Total**
ARR	1,366,186	931,587	851,420	**3,149,193**	683,093	465,794	425,710	**1,574,597**

Source: Regulation EC1071/2005.

*Figure 2.30 Slovakia: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

accounting for a share of 66% of total organic area. In spite of a generally decreasing trend in livestock production during the 1990s (DG Agriculture, 2002), the increase in organic land area and the share of permanent grassland (for livestock production) would suggest that the development in the number of organic livestock is likely to have followed a similar upward trend over the period. However, as data is only available for 2001 and 2002, coinciding with a decrease in organic area, the data indicates a drop in livestock numbers that should not be considered representative of the overall trend.

2.27.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Slovakia has been collected for the main livestock species for the period 2001 and 2004 using data from Eurostat (2006) and the Research Institute of Agricultural Economics (2005(b)) (see Table A. 24).

During this period, the number of organic livestock increased for all species except poultry, which decreased by 78.3%. Organic pigs have shown the fastest rate of growth at 110.4%/year (CAGR), followed by organic bovines (26.1%/year (CAGR)), equines (22.2%/year (CAGR)), sheep (15.9%/year (CAGR)) and goats (3.0%/year (CAGR)).

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006). The shares of organic sheep (8.4%) and goats (1.7%) were above the EU-25 average in 2004, while the organic bovine share equalled the EU-25 average (2.3%). By contrast, the organic shares of equines (0.7%), pigs (<0.1%) and poultry (<0.1%) were below the EU-25 average.

Based on the data presented in Table A. 24, the following observations can be made regarding the current state and recent development of organically reared livestock in Slovakia:

- ***Equines:*** Total organic equine numbers increased by 22.2%/year (CAGR) between 2001 and 2004, from 34 to 62 head. Organic

Table 2.46: Share of organic livestock in total livestock population, 2004 (head)

	Equines	Bovines	Sheep	Goats	Pigs	Poultry
Organic	62	12,761	27,082	660	31	49
Total	9,000	555,307	321,227	39,012	1,277,827	5,134,000
Share	0.7%	2.3%	8.4%	1.7%	<0.1%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Source: Organic data from sources shown in Table A. 24; total livestock numbers from Eurostat (2006) and FAO (2006).

equines accounted for a share of 0.7% of total equine production in 2004.

- ***Bovines:*** Total organic bovine numbers increased by 26.1%/year (CAGR) between 2001 and 2004, from 6,366 to 12,761 head, of which dairy cow numbers increased by 22.1%/year (CAGR) between 2003 and 2004 and beef cow numbers increased by 49.1%/year (CAGR) over the same period, with suckler cows increasing by 264.4%/year (CAGR). Organic bovines accounted for a share of 2.3% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 15.9%/year (CAGR) between 2001 and 2004, from 17,401 to 27,082 head. Breeding ewe and other sheep numbers increased by 10.7%/year (CAGR) and 29.6%/year (CAGR) respectively over the same period. Organic sheep accounted for a share of 8.4% of total sheep production in 2004.
  Total organic goat numbers increased by 3.0%/year (CAGR) between 2001 and 2004, from 604 to 660 head. Breeding female and 1.8%/year (CAGR) and 48.9%/year (CAGR) respectively over the same period. Organic goats accounted for a share of 1.7% of total goat production in 2004.
- ***Pigs:*** Total organic pig numbers increased by 110.4%/year (CAGR) from 7 to 31 head between 2002 and 2004. Organic pigs accounted for a share of <0.1% of total pig production in 2004.
- ***Poultry:*** Total organic poultry numbers decreased by 78.3%/year (CAGR) between 2001 and 2004 from 4,776 to 49 head. The data collected suggests that there are no organic broilers and therefore this total represents the number of laying hens (with the exception of 4 other poultry in 2004). Organic poultry accounted for a share of <0.1% of total poultry production in 2004.
- ***Aquaculture:*** There is no information available on organic aquaculture in Slovakia.

2.27.1.3 Self-sufficiency

There is no data available for self-sufficiency in organic livestock products for Slovakia.

2.27.2 Prospects for the development of organic livestock

The contribution of organic livestock production in Slovakia to total (organic and non-organic) livestock production is low (i.e. <5% share) for all species, with the exception of organic sheep production, which has a high share of total sheep production (i.e. >5% share). Nevertheless, the rate of growth in organic bovine, pig and sheep numbers has been high (i.e. >5%/year) in recent years, while the rate of growth in organic goat and poultry numbers has been low (i.e. <5%/year).

The Slovenian government's current strategy to support organic conversion and provide production subsidy runs through 2006 under the Rural Development Plan (Slovakia Ministry of Agriculture (Slovakia), 2000). Support for organic farming is also available through the agri-environmental measures of the sectoral operational programme (Ministry of Agriculture (Slovakia), 2004).

Given the substantial share of organic land accounted for by organic grassland for livestock production, any increase in the area of organic land is likely to have a positive impact on the prospects for the development of the organic livestock sector.

2.28 Slovenia

2.28.1 Current state of organically reared livestock

2.28.1.1 Organic land area

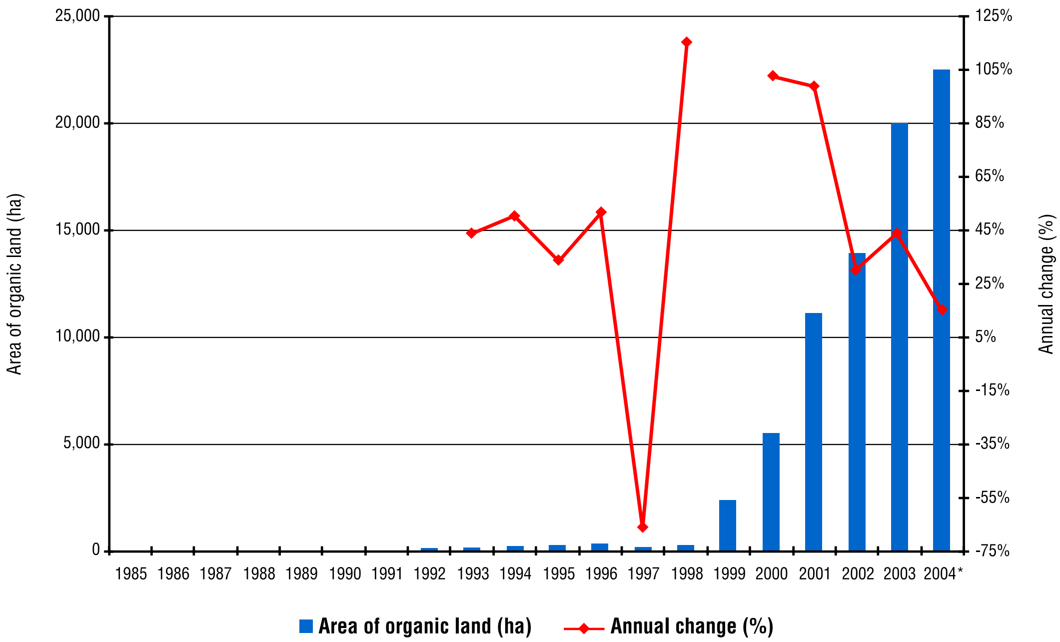
In 2004, there were 22,606 hectares of certified and in-conversion organic land in Slovenia, a substantial increase on the 150 hectares recorded in 1994 (see Figure 2.31). The origins of the Slovenian organic movement began with the formation of the AJDA Bio-dynamic Association in 1991, although very few farmers were part of this initiative. In 1997, the Slovenian Organic Farmers' Association (S.O.F.A.) was founded and introduced a market oriented certification system. By 1998, there were three certification programmes in Slovenia and in 1999, a joint certification programme was introduced. Farmers whose farms were certified as organic in 1999 or as in conversion in 1998 could apply for direct subsidies per hectare of agricultural land, which amounted to €200/ha for grassland (Slabe, 2002). As a result, since 1998 certified, policy supported and in-conversion organic land area has increased dramatically.

Over 70% of the farmland in Slovenia is classified as less favoured area and most of it is grassland for livestock production. The proportion of arable land in Slovenia is relatively low (Slabe, 2002). As would be expected a priori, because organic land area is a pre-requisite for organic livestock production, organic livestock numbers have increased over the period.

2.28.1.2 Structure of the organic livestock sector

Information on the number of organic livestock in Slovenia has been collected for the main livestock species for the period 1998 to

*Figure 2.31 Slovenia: evolution of certified and policy-supported organic and in-conversion land area, 1985-2004**



*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

2004 using data from Eurostat (2006) and the Research Institute of Agricultural Economics (2005(b)) (see Table A. 25).

During this period, the number of organic livestock increased for all species. Organic pigs have shown the fastest compound annual growth rate (CAGR) at 177.7%/year (CAGR), followed by organic goats (150.6%/year (CAGR)), equines (135.7%/year (CAGR)), bovines (122.8%/year (CAGR)), sheep (99.1%/year (CAGR)) and poultry (20.4%/year (CAGR)).

The shares of organic livestock in total livestock numbers for 2004 were calculated using total livestock (i.e. organic and non-organic) data from Eurostat (2006) and the FAO (2006). The organic shares of all livestock species except poultry (<0.1%) were above the EU-25 average in 2004, particularly for sheep and goats at 15.0% each (2.3%).

Based on the data presented in Table A. 25, the following observations can be made regarding the current state and recent development of organically reared livestock in Slovenia:

- ***Equines:*** Total organic equine numbers increased by 135.7%/year (CAGR) between 1998 and 2002, from 31 to 956 head and accounted for a 5.6% share of total equine production in 2002.
- ***Bovines:*** Total organic bovine numbers increased by 122.8%/year (CAGR) between 1998 and 2004, from 325 to 13,098 head. There was insufficient data available to calculate the change in dairy and beef cow numbers over the period. Organic bovines accounted for a share of 2.9% of total bovine production in 2004.
- ***Sheep and Goats:*** Total organic sheep numbers increased by 99.1%/year (CAGR) between 1998 and 2004, from 288 to 17,946 head. There was insufficient data to calculate the change in breeding ewe and other sheep numbers over the period. Organic sheep accounted for a share of 15.0% of total sheep production in 2004. Total organic goat numbers increased by 150.6%/year (CAGR) between 1998 and 2004, from 14 to 3,465 head. There was insufficient data to calculate the change in breeding nanny and other goat numbers over the period. Organic goats accounted for a share of 15.0% of total goat production in 2004.
- ***Pigs.*** Total organic pig numbers increased over the period by 177.7%/year (CAGR) between 1998 and 2004, from 31 to 14,218 head. Organic pigs accounted for a share of 2.7% of total pig production in 2004.
- ***Poultry.*** Total organic poultry numbers increased by 20.4%/year (CAGR) between 1998 and 2004, from 405 to 1,235 head. Of this total, broiler and other poultry numbers increased by 39.1%/year (CAGR) and 15.7%/year (CAGR) respectively, while laying hen numbers decreased by 14.0%/ year (CAGR) over the same period. Organic poultry accounted for a share of <0.1% of total poultry production in 2004.
- ***Aquaculture.*** There is no information available on organic aquaculture in Slovenia.

Table 2.47: Share of organic livestock in total livestock population, 2004 (head)

	Equines[1]	Bovines	Sheep	Goats	Pigs	Poultry
Organic	956	13,098	17,946	3,465	14,218	1,235
Total	16,952	451,136	119,264	23,031	533,998	13,930,000
Share	5.6%	2.9%	15.0%	15.0%	2.7%	<0.1%
EU-25 average	1.3%	2.3%	2.5%	1.5%	0.3%	1.3%

Notes: 1 data for 2002.
Source: Organic data from sources shown in Table A. 25; total livestock numbers from Eurostat (2006) and FAO (2006).

2.28.1.3 Self-sufficiency

In 2001 Slovenia was reported to be self-sufficient in all organic livestock products (Hamm, *et al*. 2004) (see Table 2.48).

2.28.2 Prospects for the development of organic livestock

The contribution of organic livestock production in Slovenia to total (organic and non-organic) livestock production is high (i.e. >5% share), with the exception of organic bovine and poultry production, which have a low share of total production (i.e. <5% share). Nevertheless, the rate of growth in organic livestock numbers has been high (i.e. >5%/year) in recent years for all species.

Current support for organic farming in Slovenia is provided under the Slovene Rural Development Plan for the period 2004 through 2006 (Ministry of Agriculture (Slovenia), 2004). Under this plan, Slovenia is aiming to triple the number of farms under agri-environmental contracts (including increasing the number of organic farms (Rural Europe, 2004)).

According to Slabe (2002), it is likely that with state support and a new agricultural policy oriented towards multifunctional agriculture, the number of organic farms will grow fairly quickly. Given the substantial share of organic land accounted for by organic grassland for livestock production, the prospects for the development of the organic livestock sector are favourable.

2.29 EU-25

2.29.1 Current state of organically reared livestock

2.29.1.1 Bovines

Organic bovine numbers in 2004 have been collected for the 24 Member States for which data exists, i.e. with the exception of Poland (see Table 2.49). The sources of data used were a combination of Eurostat (2006) and other national and institutional secondary data sources that are given in Appendix A2.2. These 24 Member States together account for 94.0% of the total EU-25 bovine (organic and non-organic) population. **Based on the information collected, there are 1,999,958 organic bovines in these 24 Member States (i.e. excluding Poland), representing 2.4% of the total bovine population in these 24 Member States. This means that in the EU-25, the contribution of organic bovines to the total bovine population is** *greater than or equal to* **2.3%.**

Just over two-thirds of the organic bovine population in the 24 Member States for which data exists (i.e. excluding Poland) are located in five countries, namely Denmark (6.3%), Germany (26.4%), Italy (10.8%), Austria (16.6%) and the

Table 2.48: Self-sufficiency in organic livestock products, 2001

Product	Self-sufficiency (%)
Milk	100
Beef (incl. Veal)	100
Sheep and goat meat	100
Pork	100
Poultry	100
Eggs	100

Note: The degree of self-sufficiency for each product was calculated as follows:

$$\frac{\textit{sales of each organic product (as organic) for human consumption}}{\textit{total human organic consumption of the same product}} \times 100$$

Source: Hamm, et al. (2004).

UK (10.0%). In total, the number of organic bovines in these five countries represents 1.3% of the total (organic and non-organic) EU-25 bovine population. In the new Member States, the Czech Republic has the largest number of organic bovines, accounting for 5.0% of the total organic bovine population in the 24 Member States for which data exists (i.e. excluding Poland).

Lithuania has experienced the greatest rate of growth in recent years, followed by Latvia, Portugal and Slovenia. Italy and Austria are the only two EU member states to have recorded a reduction in organic bovine numbers over the period 1997 to 2004.

Table 2.49 also provides information on the number of organic dairy and beef cows and the number of organic beef cows is further broken down into organic suckler cows and organic cattle for meat production.

2.29.1.1.1 Dairy Cows

Information on the number of organic dairy cows was available for 21 Member States, i.e. with the exception of Portugal, Estonia, Hungary and Poland (see Table 2.49), which together account for 85.1% of the total (organic and non-organic) EU-25 dairy cow population. **Overall, based on the available data there are 499,838 organic dairy cows in these 21 Member States (i.e. excluding Portugal, Estonia, Hungary and Poland), representing 2.5% of the total (organic and non-organic) dairy cow population in these 21 Member States. This means that in the EU-25, the contribution of organic dairy cows to the total (organic and non-organic) dairy cow population is** *greater than or equal to* **2.1%.**

In relative terms, just over two-thirds of organic dairy cows in these 21 Member States (i.e. excluding Portugal, Estonia, Hungary and Poland) are located in Germany (21.9%), Austria (17.4%), the UK (16.7%) and France (12.5%). In total, the number of organic dairy cows in these four countries represents 1.7% of the total (organic and non-organic) dairy cow population in these 21 Member States.

While the number of organic dairy cows has increased significantly in the UK, Belgium, France and Slovakia between 1997 and 2004, organic dairy cow numbers have declined in Italy, Austria and the Netherlands. However, it should be noted that for a number of countries there was insufficient data available to calculate a change in number over the period.

2.29.1.1.2 Beef cows

Looking at the organic beef sector, data was available for 19 Member States, i.e. excluding Spain, France, Portugal, Estonia, Hungary and Poland (see Table 2.49), which together account for 49.6% of the total (organic and non-organic) EU-25 beef cow population. **Based on the available data there are 1,318,803 organic beef cows in these 21 Member States (i.e. excluding Spain, Portugal, Estonia, Hungary and Poland), representing 22.0% of the total (organic and non-organic) beef cow population in these 21 Member States. This means that in the EU-25, the contribution of organic beef cows to the total beef cow population is** *greater than or equal to* **10.9%.**

In relative terms, four-fifths of organic beef cows in these 21 Member States are located in Germany (31.7%), Austria (18.5%), Italy (13.4%), the UK (8.9%) and the Czech Republic (7.4%) and these countries together hold 17.6% of the total (organic and non-organic) beef cow population in these 21 Member States.

While the number of organic beef cows has increased significantly in Belgium, Germany, Greece, Finland, the Netherlands, Sweden and Slovakia between 1997 and 2004, organic beef cow numbers have declined in Italy and the UK. However, it should be noted that for a number of countries there was insufficient data available to calculate a change in number over the period.

2.29.1.1.3 Suckler cows

Looking at organic suckler cows, data was available for 18 Member States, i.e. excluding Germany, Spain, Portugal, Czech Republic, Estonia, Hungary and Poland (see Table 2.49), which together account for 72.4% of the total (organic and non-organic) EU-25 beef cow[22] population. In relative terms, just under four-fifths of organic suckler cows in these 18 Member States are located in Austria (22.5%), France (22.1%), the UK (17.5%) and Italy (17.1%).

Based on the available data there are 282,643 organic suckler cows in these 18 Member States (i.e. excluding Germany, Spain, Portugal, Czech Republic, Estonia, Hungary and Poland), representing 3.2% of the total (organic and non-organic) beef cow[22] population in these 18 Member States. This means that in the EU-25, the contribution of organic suckler cows to the total beef cow[22] population is *greater than or equal to* **2.3%.**

2.29.1.1.4 Bovines for meat production

Looking at organic bovines for meat production, data was available for 17 Member States, i.e. excluding Austria, Belgium, Germany, France, Portugal, Estonia, Hungary and Poland (see Table 2.49), which together account for 50.5% of the total (organic and non-organic) EU-25 beef cow22 population. In relative terms, just over two-thirds of all organic bovines for meat production in these 17 Member States are located in just three countries, namely Italy (25.6%), Spain (21.7%) and the Czech Republic (21.3%).

Based on the available data there are 236,519 organic bovines for meat production in these 17 Member States (i.e. excluding Austria, Belgium, Germany, France, Portugal, Estonia, Hungary and Poland), representing 3.9% of the total (organic and non-organic) beef cow[22] population in these 17 Member States. This means that in the EU-25, the contribution of organic suckler cows to the total beef cow[22] population is *greater than or equal to* **2.0%.**

2.29.1.1.5 Other bovines

Looking at other organic bovines, data was available for 16 Member States, i.e. excluding Austria, Belgium, Germany, Spain, France, Portugal, Estonia, Hungary and Poland (see Table 2.49), which together account for 69.3% of the total (organic and non-organic) EU-25 beef cow[22] population. In relative terms, 81% of other organic bovines in these 16 Member States are located in Italy.

Based on the available data there are 41,791 other organic bovines in these 16 Member States (i.e. excluding Austria, Belgium, Germany, Spain, France, Portugal, Estonia, Hungary and Poland), representing 0.5% of the total (organic and non-organic) beef cow[22] population in these 18 Member States. This means that in the EU-25, the contribution of other organic bovines to the total beef cow22 population is *greater than or equal to* **0.3%.**

2.29.1.2 Sheep

Numbers of organic sheep in 2004 have been collected for 24 Member States for which data exists, i.e. with the exception of Poland (see Table 2.50). The sources of data used were a combination of Eurostat (2006) and other national and institutional secondary data sources that are given in Appendix A2.2. These 24 Member States together represent over 99.7% of the total (organic and non-organic) EU-25 sheep flock. **Based on the information collected, there are 2,259,283 organic sheep in these 24 Member States (i.e. excluding Poland), representing 2.49% of the total sheep population in these 24 Member States. This means that in the EU-25, the contribution of organic sheep to the total (organic and non-organic) sheep population is *greater than or equal to* 2.48%.**

22 It should be noted that the beef cow category comprises suckler cows, bovine animals for beef production and other bovine animals. The contribution of organic suckler cows/ bovines for meat/ other bovines to the total (organic and non-organic) beef cow population is referred to as an indicator for consistency reasons because not all member states reporting organic suckler cows/ bovines for meat/ other bovine numbers also reported total (organic and non-organic) suckler cows/ bovines for meat/ other bovine numbers, whereas all member states reported total (organic and non-organic) beef cow numbers.

Table 2.49: EU-25 organic bovine numbers, by Member State (2004)

	Total organic bovines			Organic dairy cows			Organic beef cows				
	Number[1]	CAGR[2]	Organic share	Number[1]	CAGR[2]	Organic share	Number[1]	CAGR[2]	Organic suckler[1]	Organic bovines for meat[1]	Other organic bovines[1]
Austria	331,441	-0.1%	16.6%	86,896	-1.7%	17.4%	244,545	0.5%	63,455		
Belgium	32,190	33.4%	1.6%	7,993	23.4%	1.6%	24,197	38.7%	7,728		
Germany	528,266	16.9%	26.4%	109,611	9.4%	21.9%	418,655	19.6%			
Denmark	125,200	10.9%	6.3%	53,115	9.4%	10.6%	72,085	12.1%	7,582	7,827*	658
Spain	53,688[4]		26.8%	2,338		0.5%				51,350	
Greece	14,776	75.4%	0.7%	480	0.0%	0.1%	14,296	90.7%	9,308	33	1,009
France	125,031[4]	23.9%[4]	62.5%	62,489	22.5%	12.5%			62,542		
Finland	18,029	16.1%	0.9%	5,052	5.4%	1.0%	12,977	24.4%	2,692	2,449*	185
Italy	215,022	-10.5%	10.8%	38,284	-18.6%	7.7%	176,738	-8.1%	48,376	60,579	33,851
Ireland	17,807		0.9%	649		0.1%	17,158		6,366	10,522	270
Luxembourg	952	8.7%	0.0%	243	6.0%	0.0%	709	9.7%	150	177*	131
Netherlands	34,841	7.8%	1.7%	15,629	-0.5%	3.1%	19,212	21.3%	3,466	4,051*	106
Portugal	54,351	157.4%	2.7%			0.0%					
Sweden	91,515	17.8%	4.6%	21,892	10.0%	4.4%	69,623	21.4%	13,542	4,968*	663
UK	200,959	42.1%	10.0%	83,253	42.2%	16.7%	117,706	-7.1%	49,582	34,850	1,264
Czech Rep	100,304	8.1%	5.0%	2,865		0.6%	97,439			50,390	1,450
Cyprus	0		0.0%	0		0.0%	0		0	0	0
Estonia	4,327	74.5%	0.2%			0.0%					
Hungary	8,747	20.2%	0.4%			0.0%					
Latvia	10,037	182.3%	0.5%	3,447		0.7%	6,590		914	1,375	78
Lithuania	6,616	351.2%	0.3%	3,048		0.6%	3,568		623	22*	0
Malta	0		0.0%	0		0.0%	0		0	0	0
Poland	-	-		-	-		-	-	-	-	-
Slovakia	12,761	26.1%	0.6%	1,550	22.1%	0.3%	11,211	49.1%	1,658	4,276	1,000
Slovenia	13,098	122.8%	0.7%	1,004		0.2%	12,094		4,659	3,650	1,126
Total	1,999,958		100.0%	499,838		100.0%	1,318,803		282,643	236,519	41,791

*[1] Organic numbers stated for 2004 or the most recent year for which data was available (see Appendix A2.2); [2] Compound Annual Growth Rate calculated for the period 1997-2004, or the longest time period for which data was available (see Appendix A2.2); [4] Agra CEAS estimate based on the data shown in Appendix A2.2; * Erroneous result in source data.*

Source: see national data sources shown in Appendix A2.2.

In relative terms, just under two-thirds of all organic sheep in the in these 24 Member States (i.e. excluding Poland) are located in three countries, namely the UK (30.4%), Italy (22.1%), and Germany (14.4%). In total, the share of organic sheep in these three countries represents 1.6% of the total (organic and non-organic) EU-25 sheep population. In the new Member States, the Czech Republic and Slovakia have the largest number of organic sheep, accounting for 1.4% and 1.2% of the total organic sheep population in the 24 Member States for which data exists (i.e. excluding Poland).

For the years where data was available between 1997 and 2004 (see Appendix A2.2) Spain has experienced the greatest rate of growth in recent years, followed by Latvia, Estonia and Slovenia. Austria was the only EU member state to have recorded a reduction in organic sheep numbers over the period.

2.29.1.2.1 Breeding ewes

Information on the number of organic breeding ewes was available for 16 Member States, i.e. with the exception of Austria, Germany, Spain, Luxembourg, Portugal, Estonia, Hungary, Poland and Slovenia (see Appendix A2.2), which together account for 84.6% of the total (organic and non-organic) EU-24 breeding ewe population (i.e. excluding Poland). **Based on the available data there are 1,058,216 organic breeding ewes in these 16 Member States (i.e. excluding Austria, Germany, Spain, Luxembourg, Portugal, Estonia, Hungary, Poland and Slovenia), representing 1.9% of the total (organic and non-organic) breeding ewe population in these 16 Member States. This means that the contribution of organic breeding ewes to the total breeding ewe population in the 24 Member States for which total breeding ewe population data is available (i.e. excluding Poland) is** *greater than or equal to* **1.6%.**

In relative terms, just under 90% of organic breeding ewes are located in the UK (36.2%), Italy (29.5%), France (12.1%) and Greece (11.5%) and these countries together hold 56.8% of the total (organic and non-organic) EU-24 (i.e. excluding Poland) breeding ewe population.

2.29.1.2.2 Other sheep

Looking at other organic sheep, data was available for 16 Member States, i.e. with the exception of Austria, Germany, Spain, Luxembourg, Portugal, Estonia, Hungary, Poland and Slovenia (see Appendix A2.2), which together account for 62.7% of the total (organic and non-organic) EU-24 (i.e. excluding Poland) other sheep population. **Overall, based on the available data there are 558,713 other organic sheep in these 16 member states (i.e. excluding Austria, Germany, Spain, Luxembourg, Portugal, Estonia, Hungary, Poland and Slovenia), representing 3.8% of the total (organic and non-organic) other sheep population in these 16 member states. This means that the contribution of organic other sheep to the total other sheep population in the 24 Member States for which total other sheep population data is available (i.e. excluding Poland), is** *greater than or equal to* **2.4%.**

2.29.1.3 Goats

Numbers of organic goats in 2004 have been collected for 24 Member States for which data exists, i.e. with the exception of Poland (see Table 2.51). The sources of data used were a combination of Eurostat (2006) and other national and institutional secondary data sources that are given in Appendix A2.2. **Based on the information collected, there are 576,916 organic goats in these 24 Member States (i.e. excluding Poland).** As there is no total goat population for Belgium[23] (and no organic goat total for Poland), a meaningful contribution of organic goats to the total goat population in these member states could not be calculated. **However, based on the available data, the contribution of organic goats to the total (organic and non-organic) goat population in the 24 Member States for which total population data is available (i.e. excluding Poland) is** *greater than or equal to* **3.1%.**

In relative terms, over two-thirds of all organic goats in these 24 Member States (i.e. excluding Poland) are located in Greece (56.7%) and Italy (15.0%). In total, the share of organic goats in these two countries represents 2.2% of the total (organic and non-organic) EU-24 (i.e. excluding Poland) goat population. In the new Member States, Slovenia and the Czech Republic have the largest number of organic goats, accounting for 0.9% and 0.7% of the total organic goat population in the 24 Member States for which data was available (i.e. excluding Poland) respectively.

For the years where data was available between 1997 and 2004 (see Appendix A2.2) Slovenia and Greece have experienced the fastest rate of growth in recent years, followed by Latvia and Portugal. Hungary and Finland were the only

23 The Belgium total organic goat number has been assumed to be the sum of the total other organic goats (see Table 2.51).

Table 2.50: *EU-25 organic sheep numbers, by Member State (2004)*

	Total organic sheep			Organic breeding ewes	Other organic sheep
	Number[1]	CAGR[2]	Organic share		
Austria	79,194	-3.4%	3.5%		
Belgium	7,086	8.2%	0.3%	4,685	2,401
Germany	279,501	19.5%	12.4%		
Denmark	11,737	3.2%	0.5%	11,435	302
Spain	146,673	196.9%	6.5%		
Greece	133,619	92.0%	5.9%	121,537	12,082
France	127,974[4]	23.5%[4]	56.6%	127,974	
Finland	4,296	4.5%	0.2%	4,188	108
Italy	499,978	18.4%	22.1%	312,527	187,451
Ireland	31,596		1.4%	31,077	519
Luxembourg	444	36.4%	0.0%		
Netherlands	10,115	-9.2%	0.4%	3,218	6,897
Portugal	114,664	73.5%	5.1%		
Sweden	38,193	7.7%	1.7%	15,425	22,768
UK	687,863	7.4%	30.4%	382,646	305,217
Czech Rep	31,631	18.5%	1.4%	21,461	10,170
Cyprus	0		0.0%	0	0
Estonia	1,795	109.2%	0.1%		
Hungary	2,137	5.9%	0.1%		
Latvia	1,970	114.5%	0.1%	351	1,619
Lithuania	3,789	88.2%	0.2%	3,789	0
Malta	0		0.0%	0	0
Poland	-	-		-	-
Slovakia	27,082	15.9%	1.2%	17,903	9,179
Slovenia	17,946	99.1%	0.8%		
Total	2,259,283		100.0%	1,058,216	558,713

1 Organic numbers stated for 2004 or the most recent year for which data was available (see Appendix A2.2);

2 Compound Annual Growth Rate calculated for the period 1997-2004, or the longest time period for which data was available (see Appendix A2.2);

4 Agra CEAS estimate based on the data shown in Appendix A2.2;

** Erroneous result in source data (see Appendix A2.2).*

Source: see national data sources shown in Appendix A2.2.

EU member states to have recorded a reduction in organic goat numbers over the period.

2.29.1.3.1 Breeding nannies

Table 2.51 also provides information on the number of organic breeding nannies and other goats. Information on the number of organic breeding nannies was available for 16 Member States, i.e. with the exception of Austria, Germany, Spain, Luxembourg, Portugal, UK, Estonia, Hungary and Poland (see Appendix A2.2). **Overall, based on the available data there are 270,721 organic breeding nannies in these 16 Member States.** However, given the number of member states for which no data on the total breeding nanny population is available (i.e. Belgium, Germany, Denmark, Ireland, Luxembourg, Netherlands and Poland), a meaningful contribution of organic nannies to the total nanny goat population in these member states could not be calculated. **Nevertheless, the contribution of organic breeding nannies to the total breeding nanny population in**

the 18 Member States for which total population data is available (i.e. excluding Belgium, Germany, Denmark, Ireland, Luxembourg, Netherlands and Poland) is greater *than or equal to* **3.1%.**

In relative terms, just under 85% of organic breeding nannies are located in Greece (71.7%) and Italy (12.7%) and these countries together hold just over half of the total (organic and non-organic) breeding nanny population in the 18 Member States for which total population data is available (i.e. excluding Belgium, Germany, Denmark, Ireland, Luxembourg, Netherlands and Poland).

2.29.1.3 Other goats

Looking at other organic goats, data was available for 14 Member States, i.e. with the exception of Austria, Germany, Denmark, Spain, France, Luxembourg, Portugal, UK, Estonia, Hungary and Poland (see Appendix A2.2). **Overall, based on the available data there are at least 57,524 other organic goats in these 14 Member States.** However, given the number of member states for which no data on the total other goat population is available (i.e. Belgium, Germany, Denmark, Ireland, Luxembourg, Netherlands and Poland), a meaningful contribution of organic goats to the total other goat population in these member states could not be calculated. **Nevertheless, the contribution of other organic goats to the total other goat population in the 18 Member States for which total other goat population data is available** (i.e. excluding Belgium, Germany, Denmark, Ireland, Luxembourg, Netherlands and Poland)**, is** *greater than or equal to* **2.0%.**

2.29.1.4 Pigs

Numbers of organic pigs in 2004 have been collected for 24 Member States for which data exists, i.e. with the exception of Poland (see Table 2.52). The sources of data used were a combination of Eurostat (2006) and other national and institutional secondary data sources that are given in Appendix A2.2. Together, these 24 Member States account for 88.5% of the total (organic and non-organic) EU-25 pig population. **The results of the data collection reveal that there are 524,387 organic pigs in these 24 Member States (i.e. excluding Poland), representing 0.4% of the total (organic and non-organic) pig population in these 24 Member States. This means that in the EU-25, the contribution of organic pigs to the total (organic and non-organic) pig population is** *greater than or equal to* **0.3%.**

Just over 70% of all organic pigs in the 24 Member States for which data was available (i.e. excluding Poland) are located in Germany (27.6%), France (11.9%), Denmark (11.1%), UK (10.5%) and Austria (9.4%). In total, the share of organic pigs in these countries represents 0.2% of the total (organic and non-organic) EU-25 pig population. In the new Member States, Slovenia, Latvia and the Czech Republic have the largest number of organic pigs, accounting for 2.7%, 0.4% and 0.3% of the total organic pig population in the 24 Member States for which data was available (i.e. excluding Poland) respectively.

For the years where data was available between 1997 and 2004 (see Appendix A2.2) Greece, Slovenia, Spain and Slovakia experienced the fastest rate of growth, whereas Lithuania, the Czech Republic, Finland, Hungary and Denmark were the only EU member states to have recorded a reduction in organic pig numbers over the period.

2.29.1.4.1 Fattening pigs

Information on the number of organic fattening pigs was available for 19 Member States, i.e. with the exception of Austria, Spain, Portugal, Estonia, Hungary and Poland (see Appendix A2.2), which together account for 65.8% of the total (organic and non-organic) EU-25 fattening pig population in these 19 Member States. **The results of the data collection reveal that there are 264,076 organic fattening pigs in these 19 Member States, representing 0.7% of the total (organic and non-organic) fattening pig population in these 19 Member States. This means that in the EU-25, the contribution of**

Table 2.51: *EU-25 organic goat numbers, by Member State (2004)*

	Total organic goats			Organic breeding nannies	Other organic goats
	Number[1]	CAGR[2]	Organic share		
Austria	17,244	3.4%	4.5%		
Belgium	3,505	24.5%	0.9%	0*	3,505
Germany	10,811	10.2%	2.8%		
Denmark	2,147[4]	12.0%[4]	5.7%	2,147	
Spain	17,692		4.7%		
Greece	215,291	119.6%	56.7%	193,980	21,311
France	19,754[4]	16.3%[4]	52.0%	19,754	
Finland	37	-9.3%	0.0%	35	2
Italy	56,815	29.3%	15.0%	34,367	22,448
Ireland	831		0.2%	581	250
Luxembourg	10	58.5%	0.0%		
Netherlands	21,473	16.5%	5.7%	14,950	6,523
Portugal	4,769	82.0%	1.3%		
Sweden	664	5.1%	0.2%	474	190
UK	513	32.9%	0.1%		
Czech Rep	2,620	14.3%	0.7%	1,708	912
Cyprus	0		0.0%	0	0
Estonia	219	35.0%	0.1%		
Hungary	296	-3.3%	0.1%		
Latvia	662	82.3%	0.2%	650	12
Lithuania	321		0.1%	321	0
Malta	0		0.0%	0	0
Poland	-	-		-	-
Slovakia	660	3.0%	0.2%	627	33
Slovenia	3,465	150.6%	0.9%	1,127	2,338
Total	379,799		100.0%	270,721	57,524

1 Organic numbers stated for 2004 or the most recent year for which data was available (see Appendix A2.2);

2 Compound Annual Growth Rate calculated for the period 1997-2004, or the longest time period for which data was available (see Appendix A2.2);

4 Agra CEAS estimate based on the data shown in Appendix A2.2;

** Erroneous result in source data (see Appendix A2.2).*

Source: see national data sources shown in Appendix A2.2.

organic fattening pigs to the total (organic and non-organic) fattening pig population is *greater than or equal to* **0.5%.**

In relative terms, just under three-fifths of organic fattening pigs are located in just 3 member states, namely France (22.3%), Denmark (20.9%), the UK (15.2%). The share of organic fattening pigs in these countries represents 0.2% of the total (organic and non-organic) EU-25 fattening pig population.

2.29.1.4.2 Breeding sows

Information on the number of organic breeding sows was available for 18 Member States, i.e. with the exception of Austria, Spain, Portugal, Estonia, Hungary, Lithuania and Poland (see Appendix A2.2), which together account for 63.7% of the total (organic and non-organic) EU-25 breeding sow population. **Overall, based on the available data there are 175,008 organic breeding sows in these 18 Member States, representing 1.8% of the total (organic and non-organic) breeding sow**

population in these 18 Member States. This means that the contribution of organic breeding sows to the total breeding sow population in the EU-25 is *greater than or equal to* **1.2%.**

2.29.1.4.3 Other pigs

Looking at other organic pigs, data was available for 16 Member States, i.e. excluding Austria, Spain, France, Ireland, Portugal, Estonia, Hungary, Lithuania and Poland (see Appendix A2.2), which together account for 53.3% of the total (organic and non-organic) EU-25 other pig population. **Overall, based on the available data there are 17,084 other organic pigs in these 16 Member States, representing 0.04% of the total (organic and non-organic) other pig population in these 16 Member States. This means that the contribution of other organic pigs to the total (organic and non-organic) other pig population in the EU-25 is** *greater than or equal to* **0.02%.**

2.29.1.5 Poultry

Numbers of organic poultry in 2004 have been collected for 24 Member States for which data exists, i.e. with the exception of Poland (see Table 2.53). The sources of data used were a combination of Eurostat (2006) and other national and institutional secondary data sources that are given in Appendix A2.2. Together, these 24 countries account for 93.0% of the total (organic and non-organic) EU-25 poultry population. **The results of the data collection reveal that there are 17,895,840 organic poultry in the 24 Member States for which data exists (i.e. excluding Poland), representing 1.4% of the total (organic and non-organic) poultry population in these 24 Member States. This means that in the EU-25, the contribution of organic poultry to the total (organic and non-organic) poultry population is** *greater than or equal to* **1.3%.**

Just over two-thirds of all organic poultry in the 24 Member States for which data was available (i.e. excluding Poland) are located in France (39.8%), the UK (15.7%) and Italy (12.7%). In total, the share of organic poultry in these three countries represents 0.9% of the total (organic and non-organic) EU-25 poultry population.

For the years where data was available between 1997 and 2004 (see Appendix A2.2) Portugal, Latvia and Belgium have experienced the fastest rates of growth in recent years, whereas Slovakia, the Czech Republic and Lithuania were the only EU member states to have recorded a reduction in organic poultry numbers over the period.

2.29.1.5.1 Broilers

Information on the number of organic broilers was available for 20 Member States, i.e. with the exception of Austria, Spain, Portugal, Hungary and Poland (see Appendix A2.2). Together, these 20 countries account for 75.6% of the total (organic and non-organic) EU-25 poultry[24] population. **Overall, based on the available data there are 10,582,823 organic broilers in the 20 member states for which data was available, representing 1.0% of the total (organic and non-organic) poultry24 population in these 20 Member States. This means that in the EU-25, the contribution of organic broilers to the total (organic and non-organic) poultry24 population is** *greater than or equal to* **0.8%.**

In relative terms, three-quarters of organic broilers are located in France (48.8%), Germany (15.3%) and the UK (11.6%).

2.29.1.5.2 Laying hens

Information on the number of organic laying hens was available for 21 Member States, i.e. with the exception of Austria, Portugal, Hungary and Poland (see Appendix A2.2). Together, these 21 countries account for 85.4% of the total (organic and non-

24 It should be noted that the total poultry category comprises broilers, laying hens and other poultry. The contribution of organic broilers/ laying hens to the total (organic and non-organic) poultry population is referred to as an indicator for consistency reasons because not all the member states reporting organic broilers/ laying hen numbers also reported total (organic and non-organic) broilers/ laying hen numbers, whereas all member states reported total (organic and non-organic) poultry numbers.

Table 2.52: EU-25 organic pig numbers, by Member State (2004)

	Total organic pigs			Organic fattening pigs	Organic breeding sows	Other organic pigs
	Number[1]	CAGR[2]	Organic share			
Austria	49,084	3.2%	9.4%			
Belgium	8,359	26.9%	1.6%	7,203	461	695
Germany	144,882	22.9%	27.6%	13,999*	130,883*	0
Denmark	58,361	-0.8%	11.1%	55,083	3,195	83
Spain	8,455	150.8%	1.6%			
Greece	27,792	364.5%	5.3%	25,180	2,393	219
France	62,506[4]		119.2%	58,889	3,617	
Finland	2,554	-9.8%	0.5%	2,130	416	8
Italy	26,508	1.4%	5.1%	12,503	7,432	6,573
Ireland	329		0.1%	67*	262*	
Luxembourg	434	61.1%	0.1%	204	72	158
Netherlands	29,268	27.3%	5.6%	25,623	3,570	75
Portugal	9,695	77.1%	1.8%			
Sweden	22,207	19.0%	4.2%	18,902	964	2,341
UK	55,199	50.7%	10.5%	40,144	11,080	3,975
Czech Rep	1,359	-19.4%	0.3%	704	163	492
Cyprus	0		0.0%	0	0	0
Estonia	216	39.8%	0.0%			
Hungary	769	-4.2%	0.1%			
Latvia	2,078	62.8%	0.4%	1,207	326	545
Lithuania	83	-37.3%	0.0%	83		
Malta	0		0.0%	0	0	0
Poland	-	-		-	-	-
Slovakia	31	110.4%	0.0%	30	1	0
Slovenia	14,218	177.7%	2.7%	2,125*	10,173*	1,920
Total	524,387		100.0%	264,076	175,008	17,084

1 Organic numbers stated for 2004 or the most recent year for which data was available (see Appendix A2.2);

2 Compound Annual Growth Rate calculated for the period 1997-2004, or the longest time period for which data was available (see Appendix A2.2);

4 Agra CEAS estimate based on the data shown in Appendix A2.2;

** Erroneous result in source data (see Appendix A2.2).*

Source: see national data sources shown in Appendix A2.2.

organic) EU-25 poultry24 population. **Overall, based on the available data there are 5,962,245 organic laying hens in these 21 Member States, representing 0.5% of the total (organic and non-organic) poultry24 population in these 21 Member States. This means that in the EU-25, the contribution of organic laying hens to the total (organic and non-organic) poultry24 population is** *greater than or equal to* **0.4%.**

In relative terms, just under three-quarters of organic laying hens are located in the UK (22.4%), France (21.8%), Germany (16.4%) and Denmark (13.0%), which contribute 0.3% of the total EU-25 (organic and non-organic) poultry24 population.

2.29.1.5.3 Other poultry

Looking at other organic poultry, data was available for 19 Member States, i.e. excluding Austria, Germany, Spain, Portugal, Hungary and Poland (see Appendix A2.2), which together account for 74.5% of the total (organic and non-organic) EU-25 other poultry population. **Overall, based on the available data there are 511,212 other organic poultry in these 19 Member States, representing 0.5% of the total (organic and non-organic) other poultry population in these 19 Member States. This means that in the EU-25, the contribution of organic other poultry to the total (organic and non-organic) other poultry population is** *greater than or equal to* **0.3%.**

In relative terms, just over three-quarters of organic other poultry are located in France (56.9%) and the UK (20.1%). Together, the contribution of organic other poultry in these two countries in total EU-25 other poultry is 0.3%

2.29.1.6 Equine

Numbers of organic equines in 2004 have been collected for 17 Member States for which data exists, i.e. with the exception of Cyprus, France, Ireland, Malta, Poland, Spain, Sweden and the UK (see Table 2.54). The sources of data used were a combination of Eurostat and other national and institutional secondary data sources that are given in Appendix A2.2. Together, these countries account for 52.1% of the total (organic and non-organic) EU-25 equine population. **Based on this data, there are 43,708 organic equines in these 17 Member States, representing 2.6% of the total (organic and non-organic) equine population in these 17 countries. This means that in the EU-25, the contribution of organic equines to the total (organic and non-organic) equine population is** *greater than or equal to* **1.3%.**

Table 2.53: EU-25 organic poultry numbers, by Member State (2004)

	Total organic poultry			Organic broilers	Organic laying hens	Other organic poultry
	Number[1]	CAGR[2]	Organic share			
Austria	848,337	15.6%	4.7%			
Belgium	801,080	76.8%	4.5%	682,525	116,379	2,176
Germany	2,590,358		14.5%	1,610,606	979,752	
Denmark	980,797	12.9%	5.5%	183,265	777,037	20,495
Spain	94,941		0.5%	38,393	56,548	
Greece	74,160	26.2%	0.4%	39,693	34,422	45
France	6,738,022	14.3%	37.7%	5,144,386	1,302,750	290,886
Finland	74,485	30.7%	0.4%	0	74,468	17
Italy	2,152,295	49.1%	12.0%	1,607,714	503,639	40,942
Ireland	24,322		0.1%	1,935	18,793	3,594
Luxembourg	6,959	43.0%	0.0%	4,550	2,409	0
Netherlands	453,244	27.1%	2.5%	0	405,123	48,121
Portugal	47,158	159.1%	0.3%			
Sweden	391,971	27.0%	2.2%	45,915	345,998	58
UK	2,662,347	33.6%	14.9%	1,222,355	1,337,369	102,623
Czech Rep	1,715	-19.4%	0.01%	0	1,174	541
Cyprus	0		0.0%	0	0	0
Estonia	1,376	32.9%	0.01%	8	1,183	185
Hungary	613	25.8%	0.00%			
Latvia	6,034	159.5%	0.03%	340	4,222	1,472
Lithuania	890	-4.0%	0.005%	0	861	29
Malta	0		0.00%	0	0	0
Poland	-	-		-	-	-
Slovakia	49	-78.3%	0.0003%	0	45	4
Slovenia	1,235	20.4%	0.01%	1,138	73	24
EU-25	17,895,840		100.0%	10,582,823	5,962,245	511,212

1 Organic numbers stated for 2004 or the most recent year for which data was available (see Appendix A2.2);

2 Compound Annual Growth Rate calculated for the period 1997-2004, or the longest time period for which data was available (see Appendix A2.2);

4 Agra CEAS estimate based on the data shown in Appendix A2.2;

** Erroneous result in source data (see Appendix A2.2).*

Source: see national data sources shown in Appendix A2.2.

In relative terms, three-quarters of organic equines are located in Germany (52.8%) and Austria (22.6%), which together account for 18.6% of the total (organic and non-organic) equine population in the 17 member states for which data is available.

For the years where data was available between 1997 and 2004 (see Appendix A2.2) Slovenia, Finland and Hungary have experienced the fastest rates of growth in recent years, whereas Denmark, Greece and Lithuania were the only EU member states to have recorded a reduction in organic equine numbers over the period.

2.29.1.7 Aquaculture

Information on organic aquaculture production was collected for the ten member states for which data is available. No information on production volumes was available for any member state. There is no information available on organic aquaculture in Belgium, Greece, Finland, Luxembourg, the Netherlands, Portugal, Sweden, Cyprus, the Czech Republic, Estonia, Latvia, Malta, Poland, Slovakia or Slovenia. Table 2.55 summarises the species of organically produced fish in the EU-25.

2.29.2 Prospects for the development of the EU organic livestock sector

Prospects for the development of the EU organic livestock sector at the national level have been discussed in Sections 2.4.2 to 2.28.2. As noted in these country assessments, the main drivers for the expansion of the sector over the last two decades have been, and appear likely to continue to be in the coming years, the:

Table 2.54: EU-25 organic equine numbers, by Member State (2004)

	Total organic equine[1]	CAGR[2]	Organic share
Austria	9,872		22.6%
Belgium	334	46.8%	0.8%
Germany	23,072	9.2%	52.8%
Denmark	735	-1.9%	1.7%
Greece	0	-100.0%	0.0%
Finland	13	86.6%	0.0%
Italy	4,773	29.4%	10.9%
Luxembourg	25		0.1%
Netherlands	836	0.7%	1.9%
Portugal	181	30.1%	0.4%
Czech Rep	1,760	4.5%	4.0%
Estonia	265	47.3%	0.6%
Hungary	282	49.8%	0.6%
Latvia	352		0.8%
Lithuania	190	-34.8%	0.4%
Slovakia	62	22.2%	0.1%
Slovenia	956	135.7%	2.2%
EU-25	43,708		100.0%

1 Organic numbers stated for 2004 or the most recent year for which data was available (see Appendix A2.2);

2 Compound Annual Growth Rate calculated for the period 1997-2004, or the longest time period for which data was available (see Appendix A2.2);

4 Agra CEAS estimate based on the data shown in Appendix A2.2;

** Erroneous result in source data.*

Source: see national data sources shown in Appendix A2.2.

- Demand, relative to supply, for organic products. This relativity is reflected in the premium paid for organic produce compared to non-organic production.
- The level of support provided to producers under the CAP's Rural Development Programmes. There is evidence that historic rates of organic growth in some Member States demonstrate the effect of the introduction of subsidies under the agri-environment regulation, see for example: Holt and Tranter (2002). In contrast, Gay and Offermann (2006) found no clear link between the level of support and the share of organic farming. However, this analysis only referred to a single point in time and not to the trend over a period of time.

Accordingly, differences in the policy environment between Member States and the market demand for different livestock products largely explain the observed differences in the development of the different organic livestock sectors between Member States, presented in Section 2.29. It is generally accepted that EU-25 organic area is and will continue to expand over the coming years, particularly in the new EU-N10 Member States, due to policy support and a growing market triggered by EU accession (Willer, 2005). Likewise, organic area is also expected to continue to expand in those EU-15 countries where the proportion of organic area is still relatively low, such as in Greece. Experts do not think, however, that organic sector growth in the EU-N10 Member States will have an immediate impact on the EU-15 Member States (Willer, 2005).

Following the launch of the *European Organic Action Plan* in June 2004 and the implementation of national Organic Action Plans in many Member States, these initiatives will provide further support to the sector. Specifically, the European Organic Action Plan concentrates on increasing consumer demand by providing information and research.

In addition, the latest reform to the CAP should impact favourably on the development of the sector. Although there were no specific recommendations on support to organic farming in the 2003 CAP Reform, many of the measures in the reform package have the potential to foster and stimulate organic production methods. The extent to which this will occur will however depend almost entirely on the extent to which, and the way in which, Member States choose to use the new instruments of the reform package.

Table 2.55: Organic aquaculture production

	Carp	Salmon	Trout			Mussels
			Rainbow	Brown	Unspecified	
Austria	√	√	√	√		
Germany	√		√	√		
Denmark					√	
Spain					√	
France		√			√	
Italy			√	√		
Ireland	√	√			√	√
UK	√		√	√		√
Hungary	√					
Lithuania	Fish (no species information available)					

Source: compiled from information in Franz, 2004; Soil Association, 2004.

The main benefit to organic livestock farmers is likely to come from the conversion from a (coupled) support system based on market support and production-linked subsidies to a largely 'decoupled' one based on the area farmed. This benefit is likely to arise because traditionally organic farms have received lower production support under the Common Market Organisations (CMOs) than non-organic farms (Offerman, 2003). This is because production-linked subsidies (i.e. coupled) tend to reward those producers that seek to maximise output. Since the choice to farm organically generally results in lower production levels, both in terms of the production system being more extensive (i.e. less animals being reared per unit of land) and in terms of the yield potential often being lower, then organic producers have in effect traditionally foregone part of their subsidies. That said, organic farmers tend to receive higher payments than comparable non-organic farms due to support from agri-environmental schemes (Offerman, 2003). However, a reduction of area based payments [over time] may slow down or invert growth in some parts of Europe (Willer, 2005), particularly in regions where there is a lack of demand for organic produce at a price premium that would enable the market to develop in the absence of a state subsidy (e.g. Italy) (Pinto and Zanolli, 2004).

As organic farms traditionally received lower production subsidies under the CMOs compared to non-organic farms, it follows that organic farms will be less affected by modulation than comparable non-organic farms in terms of the absolute level of cut to their subsidies. This is particularly so given that modulation is not applied to the first €5,000 of direct payments. At the same time, organic livestock producers may benefit more from the measures financed by modulation.

More generally, decoupling of payments from production is expected to favour more extensive farming systems, which are characteristic of the organic livestock sector (Section 2.3), especially where the Single Farm Payment is being paid on a regional basis. In addition, the exemption from the mandatory set-aside obligation for organic farmers will be a clear advantage for livestock producers that also have arable enterprises.

The introduction of cross-compliance provisions should be easier to follow for organic farmers. Whether or not cross-compliance might make it necessary to phase out some of the grassland support within agri-environmental programmes still remains to be seen. It is probable that organic grassland programmes will survive, particularly in countries like Austria where they form an important part of the organic farming sector.

Overall, the new rural development measures incorporated into the 2003 reform package and, potentially, the new financing in the proposed 2006 to 2013 rural development policy, should provide a number of options of potential benefit to organic producers. But as with other rural development measures, much depends on the willingness of national governments to match EU funding. Although there is contrasting evidence on whether a clear link exists between the level of support and the uptake of organic farming (see for example: Holt and Tranter (2002) and Gay and Offermann (2006)), if such a link does exist then without a uniformity of application by Member States, there will continue to be vast differences in the development stage of the organic sector between Member States.

Although these factors will provide the necessary political framework to facilitate further growth, the extent to which livestock producers will be able to take advantage of this will depend on the availability of organically reared breeding stock and the future of the derogation on the origin of animals.

More generally, we would expect the following factors to influence demand for organic livestock in the coming years (until 2008):

- **Consumer income evolution:** As incomes grow and the share of household income spent on food diminishes, consumers will become more able to concentrate on food characteristics other than price and will therefore be more able to pay the premium generally required for organic produce. This trend will tend be particularly marked in the new Member States.

- **Food quality and safety:** It is evident that consumer concern with the quality and safety of food and with the environmental impacts of food production affect the demand for organic products. To the extent these concerns are increased by further (unpredictable) food scares and increased public awareness of potential adverse environmental impacts of non-organic production systems this will tend to increase demand for organic products. For example, demand for organic food in the EU increased as result of the EU BSE crisis in 2001 (USDA FAS, 2001).
- **Marketing:** It is clear that in some Member States organic products are considered as a useful means of achieving higher incomes for producers than would otherwise be the case and concerted marketing efforts are therefore undertaken to stimulate consumer demand. These efforts may be further enhanced by other actors in the food chain e.g. retailers if they consider that the margins on such products are worth pursuing. However the supply and demand balance for individual organic products determines the extent of the organic price premium, and in periods where supply has exceeded demand for certain organic products, this production has been sold into the non-organic market without a price premium.

Looking in more detail at likely trends in the sector we can distinguish between four different stages of development of the sector based on two key factors. These are:

- the level of penetration of the overall livestock sector by the organic sector (i.e. percentage of animal numbers which are organic); and,
- the rate of growth in the number of organic animal numbers.

Taking this categorisation a step further we can distinguish between four types of Member State (Table 2.56):

- Category 1: Member States with a high rate of penetration (>5%) but low rates of production growth (<5%);
- Category 2: Member States with both a high rate of penetration (>5%) and a high rate of production growth (>5%);
- Category 3: Member States with a low rate of penetration (<5%) but high rates of production growth (>5%); and,
- Category 4: Member States with a low rate of penetration (<5%) and low rates of production growth (<5%).

In this context it should be noted that this classification has only been applied to bovines, sheep, goats and poultry since there is no country in the EU which has a significant (i.e.> 5%) share of its pig numbers in organic production and it is therefore not meaningful to include this species at this level in the classification. It should nevertheless be noted that with over 1% of the national herd in organic production Austria, Sweden, Greece, Slovenia and the United Kingdom have organic market shares well above the EU average of 0.3% of the pig herd and these countries have therefore been included in Categories 1 and 2 with a 1% threshold. Similarly countries with less than 1% organic penetration in the pig sector have been included in Categories 3 and 4.

While clearly it is difficult to generalise across a broad range of markets, the classification reveals that there are a significant number of Category 2 Member States which have a relatively high proportion of their national herd/flock in organic production and have experienced relatively strong production growth in recent years. While the classification does not reveal the actual numbers involved in each country and therefore may reflect relatively small numbers overall, it is reasonable to assume that the relatively strong growth rates seen within this category will be maintained until at least 2008, after which time these countries could begin to move from Category 2 to Category 1.

By contrast in Category 1 it can be argued that these would tend to be more mature markets where growth has tended to level out or may even be receding.

Category 3 will tend to include those markets where organic penetration is relatively low but growth is high from this base and we would expect the dynamism in these markets to be maintained. Thus for example, the organic poultry markets in the United Kingdom and France have been growing rapidly in recent years.

Finally for the group of countries in Category 4 it is clear that there is little market momentum and unless there are external factors which promote demand (e.g. food scares) or encourage production (e.g. increases in national funding) which change this position we would not expect a substantial dynamic to develop in these markets.

Overall, across the EU those countries with a relatively high proportion of EU organic livestock numbers have recently been growing strongly (Germany, UK, France for bovines; Germany, Italy, UK for sheep; France, Italy, UK for poultry; Germany, UK and the Netherlands for pigs; Greece and Italy for goats), despite a slowdown in the rate of growth in the overall area of organic production and the number of organic farms, in recent years (see Figure 2.1 and Figure 2.2). Thus, we would expect the overall growth of numbers of organic animals for the EU as a whole to continue to grow relatively strongly and certainly in excess of 5% per year.

Table 2.56 presents the aforementioned categorisation of Member States and provides an outlook for expected growth in EU organic livestock markets by Member State and species to 2008.

Table 2.56: Expected growth in EU organic livestock markets by Member State and species to 2008

	Bovines	Sheep	Goats	Pigs	Poultry	Forecast to 2008
Category 1: (***HIGH*** (>5%)* organic share of overall market and ***LOW*** (<5%) rate of growth of organic production)	Austria	Austria, Denmark, Finland	Austria,	Austria		Market more mature with limited growth expected
Category 2: (***HIGH*** (>5%)* organic share of overall market and ***HIGH*** (>5%) rate of growth of organic production)	Denmark, Sweden, Czech Republic	Germany, Italy, Luxembourg, Sweden, Czech Republic, Estonia, Latvia, Lithuania, Slovakia, Slovenia	Belgium, Germany, Italy, Netherlands, Sweden, Czech Republic, Estonia, Slovenia	Greece, Sweden, United Kingdom, Slovenia	Belgium, Denmark, Germany, Italy, Netherlands, Sweden,	Growth at over 5% per year expected to continue
Category 3: (***LOW*** (<5%)** organic share of overall market and ***HIGH*** (>5%) rate of growth of organic production)	Germany, Belgium, Greece, France, Finland, Luxembourg, Netherlands, Portugal, United Kingdom, Estonia, Hungary, Latvia, Lithuania, Slovakia, Slovenia	Belgium, Spain, Greece, France, Portugal, United Kingdom, Hungary	Denmark, Greece, France, Luxembourg, Portugal, United Kingdom, Latvia,	Belgium, France, Germany, Spain, Luxembourg, Netherlands, Portugal, Estonia, Latvia, Slovakia	Austria, Greece, France, Finland, Luxembourg, Portugal, United Kingdom, Estonia, Hungary, Latvia, Slovenia	Relatively high rates of growth forecast but from relatively low base
Category 4: (***LOW*** (<5%)** organic share of overall market and ***LOW*** (<5%) rate of growth of organic production)	Italy	Netherlands	Finland, Hungary, Slovakia	Hungary, Czech Republic, Lithuania, Italy, Finland, Denmark	Czech Republic, Lithuania, Slovakia	Low growth trend expected to be maintained

*Note: *>1% for pigs*
***<1% for pigs*
Source: Agra CEAS estimates.

3. Methodology

3.1 Introduction

As specified in the *Terms of Reference* (Appendix 3), this Study uses a case study method to assess the *economic sustainability* of an organic system which does not make use of the derogation on sourcing non-organic livestock (vis-à-vis organic production systems that make full use of the derogation) in selected Member States for selected livestock production systems, namely:

- organic egg production systems;
- organic broiler meat production systems; and,
- organic pig production systems.

3.2 Case study approach and its rationale as a method in this research

The *Technical Specifications* to this research stipulate that the economic assessment of the sustainability of a transition to an organic system which does not make use of the derogation on sourcing non-organic livestock should be undertaken using a case study method. Since the 1970s, there has been growing recognition that the use of case study methods can yield fruitful results, see for example: Diesing (1972), Yin (1981), Yin (1984) and Mohr (1985).

In general, case studies are the preferred approach when *how* and *why* questions are being posed. Yin (1981) states that as a research method, the distinguishing characteristic of the case study is that it attempts to examine a *contemporary phenomenon* in its *real-life context*, especially when the boundaries between the *phenomenon* and its *context* are not clearly evident. In the case of this study the *contemporary phenomenon* consists of not taking advantage of the derogation that permits non-organic livestock being brought onto an organic production unit, and thus the *real-life context* is the derogation that allows the use of non-organic livestock within the organic production system.

From a methodological perspective, the use of a case study method is therefore considered appropriate to this Study, since the Study objective is concerned about understanding *how* and *why* the economic sustainability of an organic production system which does not make use of the derogation might differ to an organic production system which uses the derogation. In this respect, the use of case studies provides an opportunity for interviews with industry stakeholders (including Government departments, organic certification bodies, organic research organisations, academic researchers, producers, etc.) to attain qualitative information and quantitative data for subsequent analysis.

The use of semi-structured questionnaires within the interview process further adds consistency thereby ensuring that the qualitative information and quantitative data collected allows generalisable conclusions to be made at the EU, national and sector levels. In so doing, an assessment of the need for adapting the current provisions laid down in Annex I, Part B.3 of Council Regulation (EC) 1804/99 can be made.

3.3 Concepts and definitions

Before discussing the methodological framework (Section 3.4) used in this Study to assess the *economic sustainability* of organic egg, broiler and pig production without using the derogation (*vis-à-vis* organic egg, broiler and pig production using the derogation), the concept of economic sustainability and the definitions of the different organic production systems based on the extent to which organic producers make use of the derogation on the use of non-organic livestock are discussed:

- *Economic sustainability*. *Economic sustainability* was defined in the *Terms of Reference to* this Study (Appendix 3) as '*the capacity to continue farming utilising the same production system in the medium to long-term*'.
- Organic production system A. The *Terms of Reference* to this Study (Appendix 3) defined organic production system A as the *"livestock farming system which does not take advantage of the derogations foreseen in Annex I, Part B 3 (origin of the animals) to Council Regulation (EEC) No 2092/91 on organic farming as amended by Council Regulation (EC) No 2277/03…"*.

During the course of this Study, it was considered necessary to refine this definition[25]. This was because this definition of organic production system A is not in line with that inferred in Annex 1 Part B 3.2 of Council Regulation (EC) No 1804/1999, which notes that replacement livestock must come from production units which comply with the rules on the various types of livestock production laid down in this Annex and in Article 6 and that throughout their life this system of production must be applied.

Consequently, in this Study **organic production system A is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of any of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) (origin of animals) which permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted.**

Thus, in organic production system A, livestock must come from production units in the organic production system and throughout their life, this system of production must be applied (Annex I, Part B, No. 3.2. of Council Regulation (EC) No 2092/91). Only livestock already present in a livestock production unit can be converted when the farm enters into organic farming for the first time (Annex I, Part B, No. 3.3. of Council Regulation (EC) No 2092/91)[26].

Based on this definition, this Study found that organic production system A was rare and only existed in a few cases. Specifically, the only case study country where such a system was found was Portugal, for a specific, local pig production system. The term organic production system A in this Study has therefore only been used to describe this particular example (Section 6.7).

Organic production system B. In the *Terms of Reference* to this Study (Appendix 3) there was no reference to the term organic production system B. However, during the course of this Study it was considered necessary to introduce this definition[27], particularly given the change in emphasis of the Study to concentrate on derogations 3.6, 3.7, 3.8, 3.9 and 3.10[28] in Annex I, Part B 3 (origin of animals) of Council Regulation (EC) No 1804/1999. In addition, it was necessary to provide more focused sub-definitions for the specific organic livestock production systems (i.e. organic production system B for eggs, broilers and pigs) being analysed.

Consequently, in this Study **organic production system B is defined as those livestock farming systems which do not take advantage**

25 In agreement with the Study's Steering Group (7 December 2005 and 23 February 2006).

26 The category of livestock that are converted and included as the organic livestock has to have an initial source, as is the case for the example of organic production system A pig production in Portugal.

27 In agreement with the Study's Steering Group (23 February 2006).

28 It was agreed with the Study's Steering Group (25 July 2005 and 7 December 2005) that the derogations 3.3, 3.4 and 3.11 would not form part of this study. The rationale for this was briefly noted in Section 1.2.

of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) for *production animals*[29]. But for reproduction (i.e. breeding) purposes these systems permit non-organic animals to be brought into an organic reproduction unit when a herd or flock is renewed, restocked or reconstituted, provided that this is restricted to breeding animals[30] as regards livestock and to certain production animals for poultry[31].

It should be noted that this definition is not in line with Annex 1 Part B 3.2, which states that livestock, whether for *breeding* or *production*, must come from production units which comply with the livestock rules laid down in Article 6 and in the aforementioned Annex. Specifically, it notes that throughout their life this system must be applied, whether it concerns production, parent or grandparent-stock, which is the definition of organic production system A.

With respect to the introduction of animals into organic production system B for laying hens, broilers and pigs (i.e. the specific organic livestock production systems being analysed in this Study), the following definitions for organic production system B for each of the livestock species have been used:

- *Laying hens*. Organic chicks/pullets reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age are brought into production flocks. Their grandparent flocks need not be managed organically.
- *Broilers*. Organic chicks reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age are brought into production flocks. Their grandparent flocks need not be managed organically.
- *Pigs*. Organic breeding gilts reared from parent (multiplier/reproduction) herds that are under permanent organic management are brought into production herds. The production piglets are born and reared in the organic production herd. The breeding gilts brought into the parent herds are reared from grandparent herds that need not be managed organically. For in-herd multiplication (nucleus herds), organic breeding gilts must have been brought in.

- *Organic production system C*. The *Terms of Reference* to this Study (Appendix 3) defined organic production system C as those "*livestock farming systems which take advantage of the aforementioned derogations…*". Similarly, during the course of this Study it was considered necessary to refine this definition[32], given the change in emphasis of the Study to concentrate on specific derogations and the need to provide more focused sub-definitions for the specific organic livestock production systems being analysed.

Consequently, in this Study **organic production system C is defined as those livestock farming systems which permit non-organic** *production* **and** *breeding* **livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted in line with the derogations foreseen in Annex I, Part B, No. 3.4, 3.6, 3.8, 3.9, 3.10 and 3.11.**

With respect to the introduction of animals into organic production system C for laying hens, broilers and pigs (i.e. the specific organic livestock production systems being analysed in this Study), the following definitions for organic

29 Production animal means an animal that is kept for the purpose of the production of meat, milk, eggs or wool.
30 Breeding animals or parent, multiplier or reproduction stock means, in general, animals that are not kept primarily for the purpose of the production of meat, milk, eggs or wool, but for the production of offspring used for producing these products.
31 As defined in Annex I, Part B, No. 3

32 In agreement with the Study's Steering Group (7 December 2005).

production system C for each of the livestock species have been used:

- *Laying hens*. Non-organic production pullets are brought into production flocks at a maximum 18 weeks of age and thereafter managed organically. Their parent flocks need not be managed organically. Or, where non-organic chicks are bought in at 1 or 3[33] days of age (depending on national/private standards) and thereafter managed organically.
- *Broilers*. Non-organic production chicks are brought into production flocks at 1 or 3[34] days of age (depending on national/private standards) and thereafter managed organically. Their parent flocks need not be managed organically.
- *Pigs*. Non-organic gilts are brought into production herds for breeding and thereafter managed organically. The production herds are under permanent organic management. Their parent herds need not be managed organically.

3.4 Methodological framework

To assess the economic sustainability of organic production system B, a hierarchical methodological framework was developed for the case studies. The hierarchy levels consist of an *Objective, Principles, Criteria, Indicators and Verifiers*.

Such a hierarchical methodological framework for assessing sustainability of agricultural systems has commonly been used in previous research, see for example: Namkoong, *et al. (*2002). The various levels of the hierarchy are conceptualised in Figure 3.1.

3.4.1 Objective of the case studies

As discussed in Section 3.3, the *objective* of the case studies is to assess the *economic sustainability* of organic production system B (*vis-à-vis* organic production system C) in selected Member States for selected livestock production systems.

3.4.2 Principles

It was noted in Section 3.1 that *economic sustainability* is defined as *'the capacity to continue farming utilising the same production system in the medium to long-term'*. From an economic perspective, the *sustainability* of organic production system B is dependent on two fundamental *economic principles*:

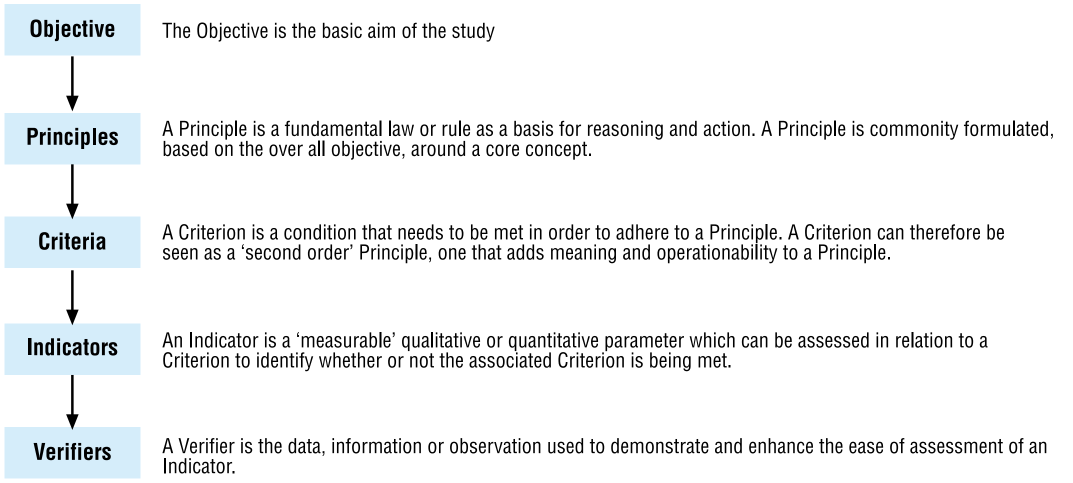
- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, there has to be *sufficient* availability of organic livestock in order to renew, restock or reconstitute a herd or flock under organic production system B. Therefore, without an *available* supply of organic livestock for use in for use in organic production system B (unless producers are able to breed their own organic replacement animals – namely organic production system A), producers will be unable to move from organic production system C to organic production system B in the *short-term* and sustain this system of production in the *medium* to *long-term*.

- Principle II: Viability[35] of organic production system B. From a *demand* perspective (i.e. a producer's demand for replacement animals for organic production system B, rather than using non organic replacement animals as part of an organic production system C), the *financial viability* of organic production system B *vis-à-vis* organic production system C (and non-organic production systems) is critical in determining *economic sustainability*. If these systems are not *financially viable*, then economically rational producers would seek alternative production systems that are more *financially viable*.

33 EU standard
34 EU standard

35 The term *viability* and *financial viability* are used interchangeably throughout this report.

Figure 3.1 Hierarchical framework as a methodological assessment tool



Therefore, if organic production system B is not *financially viable*, then organic production system B will not be sustainable in the *medium to long-term* for economically rational producers.

3.4.3 Criteria, indicators and verifiers

In order to provide a judgement on the *sustainability* of organic production system B, *criteria* on which *economic sustainability* could be judged, as well as quantitative and qualitative *indicators* to allow assessment of whether the *Criteria* are being met were established with respect to the two aforementioned *principles*:

- Principle I (and Criterion I): Availability of organic livestock for production system B. Without an *available* supply of organic livestock for use in organic production system B (unless producers are able to breed their own organic replacement animals), producers will be unable to move from organic production system C to organic production system B (or A) in the *short-term* and sustain this system of production in the *medium to long-term*.

  – *Criterion I: Extent to which organic livestock production systems already operate using organic production system B*. For organic production system B to be *sustainable* in the *medium* to *long-term*, it has to be able to source organic livestock which are suitable for use in organic production system B, or breed its own organic replacements.

  - *Organic production system B Indicator: Based on this criterion, where the uptake of organic production system B (or organic production system A) is greater than 1%, then this Study considers there to be a real potential, from a supply perspective, for producers to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.*

Indicator = Uptake of organic production system B (A) > 1%

  - *Organic production system B Verifier: Semi-structured interviews were carried out with industry stakeholders to identify the proportion of organic livestock production that is farmed under organic production system B.*

- *Principle II: Viability of organic production system B*. If the transition from organic production system C to organic production system B is considered *financially viable*, then according to Turner and Taylor (1998) three criteria should be met:

  – *Criterion II: Profitability*. For any business or production system to be *sustainable* in the *medium* to *long-term*, it has to make and retain *profits* on an annual basis (i.e. income must exceed expenditure).

    - *Profitability Indicator: Based on this criterion, where the gross margin (as a measure of profitability) of organic production system B (or organic production system A) is positive (i.e. profitable), then from a producer demand perspective this Study considers there to be a real potential for producers to move from organic production system C to organic production system B (A) in the short-term and sustain this system of production in the medium to long-term.*

Indicator = Gross margin of organic production system B (A) > 0

- *Profitability Verifier: Gross margins of organic production system B (i.e. profitability) were assessed by means of gross margin analysis. Gross margin analysis is the appropriate method for analysing the impact on profitability for single farm enterprises when moving from organic production system C to organic production system B (A), particularly where there is no change in the fixed cost structure of production, as in the case of this Study[36], see for example: Barnard and Nix (1994) and Buckett (1988). For each case study country and selected livestock production system (Section 3.6), this involved the collection of financial as well as technical and economic data at the farm enterprise level. (This process is explained in more detail in Section 3.5.)*

– *Criterion III: Worthwhileness*. In order to survive and grow, a business or production system must show an acceptable return on money (capital) invested if it is to, over the *medium* to *long-term*, be able to withstand inflationary costs and fund future expansion.

From an economic perspective, production of livestock under organic production system B (A) will only be worthwhile if it produces an acceptable return *vis-à-vis* organic production system C and non-organic production systems. It can therefore be hypothesised that an *economically rational* livestock producer would not move to organic production system B if the profitability of doing so is less than that of non-organic production systems (and organic production system C assuming the derogations 3.6, 3.8, 3.9 and 3.10 in Annex I, Part B 3 (origin of animals) of Council Regulation (EC) No 1804/1999 were maintained).

- *Worthwhileness Indicator: Based on this criterion, where the gross margin of organic production system B (A) is greater than the gross margin of non-organic production systems (particularly non-organic free-range*

36 This is because the transition from organic production system C to organic production system B, and the sourcing of suitable organic replacements does not entail any 'new' capital expenditure.

systems, assuming that there would be no conversion costs and that the fixed cost structure of production is similar) (i.e. it is worthwhile), then from a producer demand perspective this Study considers there to be a real potential for producers to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.

Indicator = Gross margin of organic production system B (A) ≥ non-organic production systems

- *Worthwhileness Verifier: Gross margins of organic production system B (i.e. profitability) vis-à-vis that of organic production system C and non-organic production systems were assessed by means of gross margin analysis. For each case study country and selected livestock production system (Section 3.6), this involved the collection of financial as well as technical and economic data at the farm enterprise level. (This process is explained in more detail in Section 3.5.)*

– *Criterion IV: Feasibility*. No business or production system can survive in the *short*, *medium* or *long-term* unless it has sufficient cash to fund its trading activities. In the short-term, cash may be more important than *Criterion II: Profitability* or *Criterion III: Worthwhileness* (Turner and Taylor, 1998)[37].

The feasibility of organic production system B was therefore assessed by identifying whether there are any initial capital expenditures associated with the transition from organic production system C (or non-organic production systems) to organic production system B (A). From a financial perspective, a large initial capital expenditure may prevent producers converting to organic production system B (A), despite favourable returns over the long-term, because of the associated cost and risk of borrowing such amounts.

- *Feasibility Indicator: Based on this Criterion, where the transition to organic production system B (A) incurs little or no initial capital expenditure (i.e. it is feasible), then from a demand perspective this Study considers there to be real potential for producers to move from organic production system C to organic production system B (A) in the short-term and sustain this system of production in the medium to long-term.*

Indicator = Initial capital expenditure = 0 (or marginal)

- *Feasibility Verifier: Semi-structured interviews with industry stakeholders were used to identify whether there is any initial capital expenditure associated with the transition from organic production system B to organic production system B (A). Where any initially capital expenditure was suggested, the magnitude was identified and a qualitative assessment made as to whether it would form a barrier to conversion.*

37 This is because if there is not enough cash to fund its initial trading activities, then the business or production system will not be able to continue production and hence will never be able to prove its profit potential or worthwhileness.

Figure 3.2 summarises the aforementioned hierarchical methodological framework (i.e. *Objective*, *Principles*, *Criteria*, *Indicators* and *Verifiers*) in the context of this Study (i.e. the methodological framework adopted in this Study to assess the *economic sustainability* of organic production system B). In summary, the *sustainability* of organic production system B is dependent on:

- Principle I: Availability of organic livestock for production system B - where the uptake of organic production system B > 1%. From a *supply* perspective, there has to be *sufficient* availability of organic livestock in order to renew, restock or reconstitute a herd or flock under organic production system B.

- Principle II: Viability of organic production system B - where the gross margin of organic production system B > 0 (i.e. profitable) and ≥ non-organic production systems (i.e. worthwhile), and the initial capital expenditure = 0 (i.e. feasible)). From a *demand* perspective (i.e. a producer's demand for replacement animals for organic production system B, rather than using non organic replacement animals as part of an organic production system C) the *financial viability* of organic production system B *vis-à-vis* organic production system C (and non-organic production systems) is critical in determining the *sustainability* in *the short, medium and long term*.

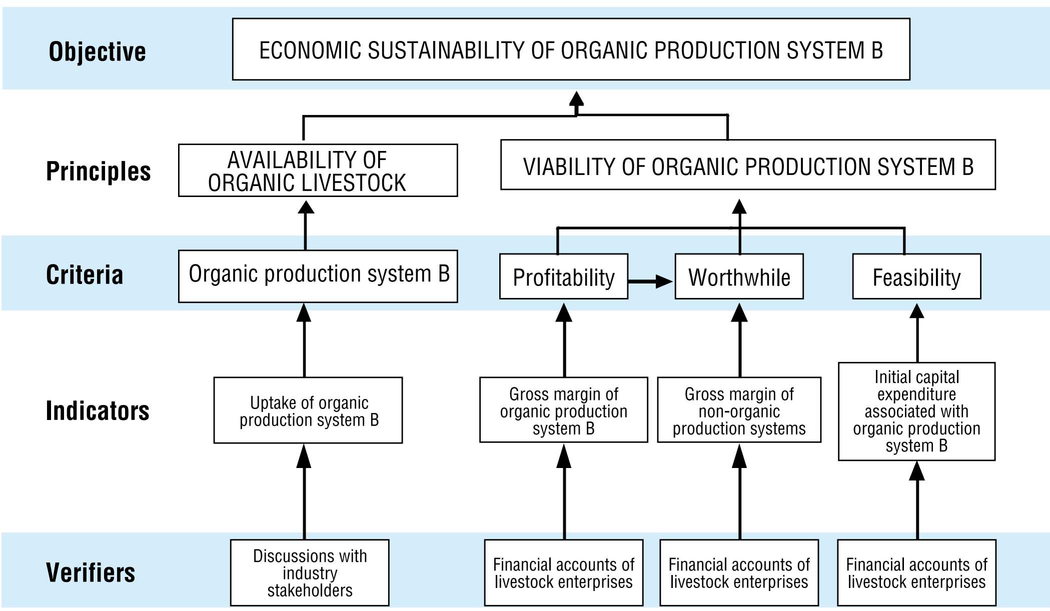
3.5 Use of gross margin analysis to assess *Profitability* and *Worthwhileness*

3.5.1 Rationale for use in this Study

In order to assess the technical, economic and financial performance of agricultural production systems, a variety of management techniques have been developed such as *gross margin analysis*. As noted above, the *Profitability Indicator* and the *Worthwhileness Indicator* were assessed by *gross margin analysis*.

Gross margin analysis is the appropriate method for analysing the change in (gross) profitability of a

Figure 3.2 Methodological framework used to assess the sustainability of organic production system B



single farm enterprise when that change does *not* impact the fixed cost structure of production, see for example: Barnard and Nix (1994) and Buckett (1988), as in the case of this Study[38].

Gross margin analysis as a methodology is well documented elsewhere (see for example: Barnard and Nix (1994) and Buckett (1988) and is commonly used for comparing the financial performance of agricultural enterprises and systems. **A gross margin for an enterprise is the difference between its financial output and the variable costs of production associated with that enterprise, and is expressed in a standardised format (as explained in Section 3.5.3) to allow such comparisons to be made**.

Enterprise *gross margin = gross output*[39] - *variable (production) costs*[40].

3.5.2 Comparing the performance of organic production systems

The central tenet of this Study was to assess the financial viability (as a measure of *economic sustainability*) of moving from organic production system C to organic production system B, relative to non-organic production systems. To achieve this, comparable data for both organic and non-organic production systems was collected from primary and secondary data sources.

When comparing the results of an organic farm with those of a non-organic farm, a number of issues need to be considered, see for example: Lampkin and Padel (1994) and Offermann and Nieberg (2000). In essence, a true comparison of the performance of organic production system B, organic production system C and non-organic production systems necessitates comparing one and the same farm, one time being managed organically and the other time being managed non-organically (Offermann and Nieberg, 2000). As in practice such a comparison is virtually impossible to perform, Offermann and Nieberg (2000) describe a number of alternatives:

- *Comparison of the performance of production systems before and after organic conversion*. A problem with this approach is that it does not include any developments in the production system had it not been converted to organic management. These developments would include, for example, changes in market prices and performance due to changes in climatic conditions.

- *Comparison of the performance of production systems with similar characteristics*. Production systems can be considered similar with respect to a number of factors, such as farm type, farm size, production potential, factor endowment and location (including region, soil type, climate, etc.). The more factors that are taken into account, the better the comparison.

Due to time and cost limitations, this Study employed the latter criteria, i.e. a comparison of the performance of production systems with similar characteristics. While every effort was made to ensure this was the case, it should be noted that the data will not necessarily be comparable between systems for the reasons set out above.

38 The transition from organic production system C to organic production system B was found (during the case study interviews with industry stakeholders and the analysis of financial data (where it exists)) not to affect the fixed cost structure of production as the main change in cost structure related to the purchase of suitable organic replacement animals for use in organic production system B rather than animals of non-organic origin. In gross margin analysis, it is generally the convention to show the cost of production animals as a depreciation charge as part of output/income (or the actual cost where they are fully utilised in one production cycle e.g. broiler production). This is explained in more detail in Section 3.5.3.

39 Gross output/income is defined as the total revenue received by an enterprise over a period of time, which is a function of the quantity of production from that enterprise and the price received for that production.

40 Variable costs are those which vary according to the size of the enterprise over a period of time (in this research these include feed costs, veterinary costs and miscellaneous costs).

3.5.3 The use of gross margin analysis in this study

For each case study country and selected livestock production system, the use of *gross margin analysis* involved the collection of *technical*, *economic* and *financial* data at the farm enterprise level. As discussed above, the *gross margin* of an enterprise is defined as *gross output/income* less the *variable (production) costs* associated with that enterprise.

In gross margin analysis, it is generally the convention to show the cost of production animals as a depreciation charge[41] as part of *output/income* (or the actual cost where they are fully utilised in one production cycle e.g. broiler production). Thus, income becomes a function of the quantity of production from that enterprise and the price received for that production, less the cost of production animals shown as a depreciation charge (or the actual live animal cost where appropriate). This is because unlike other costs, which are normally considered 'fixed', the cost of production animals (as a depreciation charge) can be readily apportioned marginally to output.

As national price and cost data are frequently categorised in different ways, the *financial* data was standardised so that comparisons could be made between production systems (i.e. organic production system B, organic production system C and non-organic) and Member States. In this Study, the gross margins were standardised in the following way[42]:

- for egg production - gross margin per kg eggs (and per dozen eggs) (and annualised to account for the differing length of laying cycles between systems);
- for broiler production - gross margin per bird (and per kg liveweight); and,
- for pig production - gross margin per kg deadweight (and per fattened pig).

Accordingly, a range of farm level *technical* and *economic* data was collected to standardise the financial data so that the efficiency and economics of organic production system B *vis-à-vis* organic production system C and non-organic production systems could be compared and contrasted. This allowed for the identification of those *technical* and *economic* factors that could cause any observed differences in the profitability of each production system.

The type of *technical* and *economic* data collected varied according to species. For example, the type of technical and economic data for the pig production case studies (Section 6) included: number of pigs produced per sow per year; number of litters produced per sow per year; number of pigs produced per litter; mortality rate; weight on weaning; daily liveweight gain; feed conversion ratios; carcass weight at purchase; and lean meat percentage. For the laying hen and broiler production case studies (Section 4 and 5), similar technical and economic data was collected such as annualised egg yield/ liveweight; deadweight at slaughter; feed use per bird; feed conversion ratios; mortality; and average growth rate per day.

However, official farm level *financial*, *economic* and *technical* data for organic production is seldom collected at the national level. Most available farm level *financial*, *economic* and *technical* data is for non-organic production systems. Where farm level *financial*, *economic* and *technical* data for organic production was available, this was almost always for organic production system C rather than organic production system B. Thus, in order to calculate the profitability of organic production

41 Animal depreciation charge represents the annual loss in value of an animal over its useful life. It is the difference between purchase cost and salvage value, allocated over the productive life of the animal.

42 However, from a methodological perspective it should be noted that the data presented is not necessarily comparable between systems for the reasons explained previously as the assumptions/data presented for each system are not based on homogenous samples of animals (e.g. there may be differences in scale of production, degrees of automation, etc. between the systems).

Figure 3.3 Iterative three-stage methodology used to estimate gross margins

Stage I: Estimation of gross margins for 'non-organic' production systems.

Farm level data for 'non-organic' production systems was collected from official national sources. Where such information was not available, experts were consulted to provide estimates. The results of this analysis served as a base for estimating the profitability of organic production systems C and B.

↓

Stage II: Estimation of gross margins for organic production system C.

Where farm level data for organic production system C was available, then this data was collected from official national sources. Where such data was not available, the results from Stage I served as a base for estimating the costs and revenue associated with organic production system C.

↓

Stage III: Estimation of gross margins for organic production system B.

Where farm level data did not exist for organic production system B, the results from Stage I and Stage II served as a base for estimating the costs and revenue associated with organic production system B.

system B, an iterative three-stage methodology was used, as detailed in Figure 3.3.

The advantage of using this iterative three-staged methodology to calculate the gross margin (gross profitability) of organic production system B is that it allows profitability comparisons to be made between the three production systems. This is necessary if the profitability of the organic production system B, *vis-à-vis* organic production system C (and non-organic production systems), is to be assessed.

It should be noted that any assessment of the costs and revenue associated with a production system that is not common in practice may be problematic, as the cost structure of such systems is *unknown* (e.g. the cost of sourcing organic livestock for use in organic production system B). We therefore built *sensitivity analysis* into our assessment to quantify the likely impact on profitability of changes in the cost/price of such *unknown* variables.

Sensitivity analysis is a procedure for assessing the *riskiness* of a decision by using several possible price and/or production outcomes to identify how sensitive, for example, the viability of organic production system B are to changes in costs (such as the cost of organic replacements) and revenues (such as changes in market prices or the organic price premium) which could render the system non-viable.

Where appropriate, *break-even analysis* was also undertaken to identify the absolute cost/price level of such *unknown* variables (e.g. the *unknown* cost of sourcing organic livestock suitable for use in organic production system B) at which it would no longer be profitable to produce organically under organic production system B. Accordingly, this would identify the point at which organic production system B would no longer be viable. **Break-even analysis is commonly used to determine the level at which costs equal the value of output.**

Detailed topic guides used as a basis to collect the necessary information (both published and unpublished) to assess the economic *sustainability* of organic production system B are contained in Appendix 4. These topic guides provided an outline to aid data collection during the semi-structured interview process from a range of non-randomly selected industry stakeholders (whose selection was based on expert-choice).

Table 3.1: *Breakdown of case study interviews/surveys by stakeholder type*

	Government departments	Certification bodies	Academic and research institutions	Industry consultants and advisors	Producers and producer organisations	Breeders, and 'other'
Laying hens						
Austria	1	6	2	1	4	
Denmark	1	3	2	2	3	1
France	1	5	1	1	1	
Germany	1	12	4	2	1	
Netherlands	1	1	1		1	
United Kingdom	1	8	2	1	4	
Broilers						
Austria	1	6	1	1		
France	1	5	1	1	1	
Germany	1	12	4	2	1	
Italy	1	6	1			
United Kingdom	1	8	2	1	1	
Pigs						
Czech Republic	1	1	1		3	
Denmark	1	3	2	1		
France	1	5	2	1		
Germany	1	12	4	1	1	
Netherlands	1	1	1			
Portugal	1	3	1	2	5	1
United Kingdom	1	8	2	1	1	

The type of stakeholders interviewed to supplement and contextualise the published data and information collected are listed as a footnote in each case study and detailed in Table 3.1. Unless otherwise referenced in the text, stakeholder comments have not been attributed to named stakeholders or their organisations. However, the type of stakeholder organisation to which they belong has been noted (e.g. producer, producer association, academia, etc.). It should be noted that different stakeholders were asked different questions, according to their area of expertise[43].

43 In this respect it should be noted that not all information on the topic guides was necessarily collected. For example, during the interview process it soon became apparent that the transition from organic production system C to organic production system B did not have any discernible impact on the fixed cost structure of production. The value of individual fixed costs were therefore not considered necessary to collect (given the gross margin analysis methodology employed), although in all of the egg case studies (with the exception of the Netherlands) fixed cost data was presented.

3.6 Case study selection

3.6.1 *Case study selection criteria*

The *Terms of Reference* stipulate that case studies should be undertaken in selected Member States for selected livestock production systems, namely organic egg production systems, organic broiler meat production systems and organic pig production systems. In order to select a representative cross-section of Member States and livestock sectors, the selection of case studies was based on a number of criteria, which were determined subjectively by the Study Steering Group[44]:

- Geographical balance: It was considered important to reflect the diversity of agricultural structures and circumstances which prevail across the EU, which means there needed to be a balance between

44 The Steering Group consisted of representatives from DG JRC (IPTS) and DG Agri (F5).

Northern and Southern Member States as well as between the EU-15 Member States and the new Member States. In this Study, Northern Member States were defined as those countries in the North west, Central and Nordic regions. Table 3.3 provides a breakdown of countries by geographical region, although in reality such a precise breakdown is subjective and not necessarily easily classifiable. For example, while some geographical regions within France can be considered representative of 'Southern' EU Member States, other geographical regions within France are more representative of 'North west' EU Member States.

- Species balance: It was considered important to select an adequate balance between the three organic livestock sectors, namely poultry (laying hens and broilers) and pigs.

- Relative importance of organic livestock sectors: It was considered important to select an adequate balance between countries according to the relative importance of organic livestock production both in terms of their weight within the EU-25 total and in terms of the share of national production.

- Importance of overall livestock sector: It was considered important to select an adequate balance between countries to reflect the differing importance of all livestock production (both non-organic and organic) in terms of their share of total animal numbers within the EU-25.

Beyond these core criteria there are other factors which were also taken into consideration when selecting the case study countries, such as any specific national experience of relevance to this Study. These include, for example, those countries, or livestock species sectors within a country, which no longer in law or in practice use the derogations which permit the use of non-organic animals and those countries with a long history of organic production (such as Austria).

3.6.2 Selected case studies

Based on the above criteria, a cross-section of case study countries and production systems were selected subjectively by the Study Steering Group. The selected case study countries by sector are presented in Table 3.2.

These case studies were chosen because it was considered that they provided the most representative cross-section of Member States for use in this Study given the aforementioned selection criteria[45]:

45 Note: the rankings given in these case study justifications are based on the available data for 2002.

Table 3.2: Case study selection by livestock production and Member State

	Laying hens	Broilers	Pigs
Austria	X	X	
Czech Republic			X
Denmark	X		X
France	X	X	X
Germany	X	X	X
Italy		X	
Netherlands	X		X
Portugal			X
United Kingdom	X	X	X
Total	6	5	7

- ***Austria*** was selected as a case study for broilers and laying hens. It is representative of a Northwest EU-15 Member State (see Table 3.3) and has the 3rd largest share of organic poultry in national production of the EU-25 Member States. In terms of total organic poultry numbers it ranks 7th in the EU-25, while in terms of total poultry numbers it ranks 16th in the EU-25. In addition, Austria has a long history of organic production, which on balance makes it a particularly good case study country.

- The ***Czech Republic*** was selected as a case study for pigs. It is representative of a Central EU-N10 Member State (see Table 3.3) and has the largest number of organic pigs in the EU-N10. While the share of organic pigs in national production is relatively low, the Czech Republic ranks 3rd in terms of EU-N10 total pig numbers and 11th in the EU-25.

- ***Denmark*** was selected as a case study for laying hens and pigs. It is representative of a Nordic EU-15 Member State (see Table 3.3). For all poultry (meat and egg production combined), Denmark has the highest national share of organic poultry and ranks 4th in terms of the number of organic poultry in the EU-25, although in terms of total poultry numbers it ranks 13th in the EU-25. For pigs, Denmark ranks 3rd in the number of organic pigs in the EU-25, 4th in terms of the national share of organic pigs and 5th in total pig numbers.

- ***France*** was selected as a case study for laying hens, broilers and pigs. It is representative of a Southern EU-15 Member State (see Table 3.3). France has the largest number of both organic and total poultry in the EU-25 and is ranked 4th in terms of the national share of organic poultry. For pigs, France has the 2nd highest number of organic pigs and the 4th largest number of total pigs in the EU-25. It is ranked 5th in the EU-25 in terms of the national share of organic pigs.

- ***Germany*** was selected as a case study for laying hens, broilers and pigs. It is representative of a Northwest EU-15 Member State (see Table 3.3). In the poultry sector, Germany has the 2nd largest number of organic poultry and the 4th highest number of total poultry in the EU-25. It is ranked 5th in terms of the national share of organic poultry production. In the pig sector, Germany has the highest number of both organic and total pigs, although it is ranked 7th in the EU-25 for the share of organic pigs in total national production.

- ***Italy*** was selected as a case study for broilers. It is representative of a Southern EU-15 Member State (see Table 3.3) and is ranked 5th in the EU-25 for organic poultry numbers and 6th for total poultry numbers, although ranking 9th in terms of the share of organic poultry in total production.

- The ***Netherlands*** was selected as a case study for laying hens and pigs. It is representative of a Northwest EU-15 Member State (see Table 3.3). In the poultry sector, the Netherlands has the 6th largest population of organic poultry and the 5th largest share of total poultry in the EU-25, with a share of organic poultry in total national production that ranks 10th.

- ***Portugal*** was selected as a case study for pigs. It is representative of a Southern EU-15 Member State (see Table 3.3) and operates an individual organic production system which is unique to the Mediterranean region[46]. Specifically, in Portugal some organic pig production takes place using the unique 'montado' extensive grazing system in the cork and holm oak forests of the Alentejo region. The uniqueness of this extensive Mediterranean production system therefore justifies closer examination. In purely

46 Similar organic pig production systems are found in Spain, for example.

production volume terms, Portugal ranks 11th in the EU-25 for organic pig numbers, 13th for total pig numbers and 13th for the share of organic pigs in total production.

- The ***UK*** was selected as a case study for laying hens, broilers and pigs. It is representative of a Northwest EU-15 Member State (see Table 3.3). In the poultry sector, the UK has the 3rd highest number of organic poultry and the 2nd highest number of total poultry in the EU-25, with an organic share of total national poultry production that ranks 6th. In the pig sector, the UK ranks 4th in terms of the number of organic pigs in the EU-25, has the 3rd highest share of organic pigs in total national pig production and ranks 9th in terms of total pig numbers in the EU-25.

The distribution of the selected of case studies by *selection criteria* are discussed below:

- Species balance: Table 3.2 above shows the balance of species within the selected case studies that were selected subjectively by the Study Steering Group. In total, there were 6 case studies covering the laying hen sector, 5 covering the broiler sector and 7 case studies in the pig sector.

- Geographical balance. Table 3.3 presents the selected case studies (depicted in ***bold italics***) by geographical region that were selected subjectively by the Study Steering Group. A good geographical balance between the regions was achieved.

- Relative importance of organic livestock sectors: Again, case study countries were selected subjectively by the Study Steering Group. The distribution of the selected case study countries, which reflect the importance of organic livestock production in terms of their weight within the EU-25 total, are presented in Figure 3.4 and Figure 3.5[47]. In terms of the share of national organic and non-organic output accounted for by organic livestock production systems, the distribution of the selected case studies are shown in Table 3.4 and Table 3.5[48].

- Importance of overall livestock sector: The distribution of the selected case study countries which reflect the importance of all (organic and non-organic) livestock production are presented in Figure 3.6 and Figure 3.7[49]. These were selected subjectively by the Study Steering Group.

47 Where the final case study selections, taking into account all the selection criteria are depicted in red.
48 Where the final case study selections, taking into account all the selection criteria are depicted in ***bold Italics***.
49 Where the final case study selections, taking into account all the selection criteria are depicted in red.

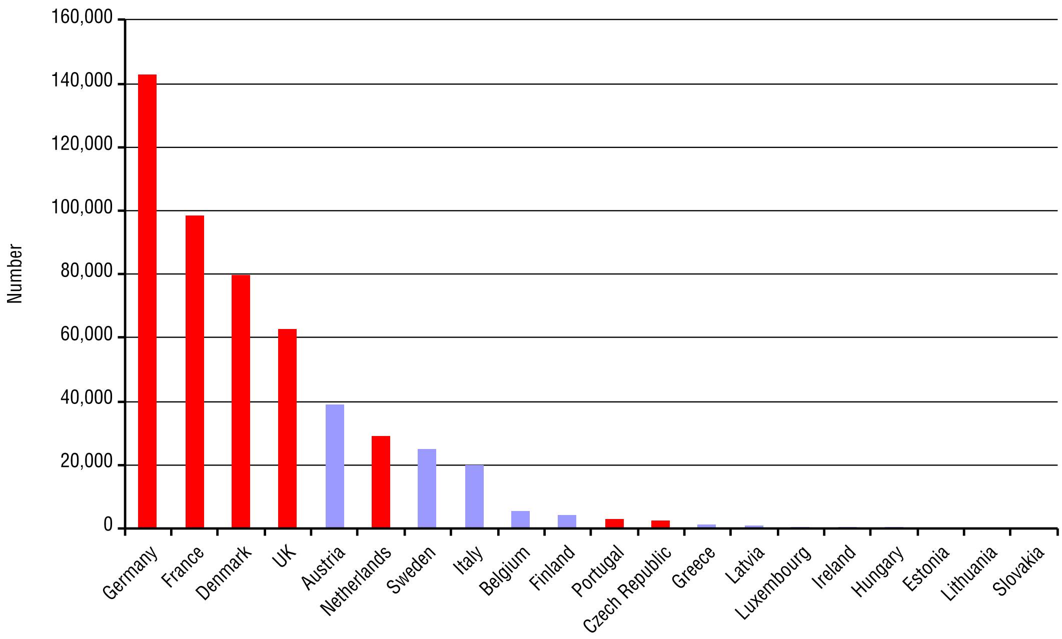
Table 3.3: *Geographical rationale for case study selection*

	EU-15	EU-N10
Northwest, Central and Nordic	Austria	Czech Republic
	Belgium	Estonia
	Denmark	Hungary
	Finland	Latvia
	Germany	Lithuania
	Ireland	Poland
	Luxembourg	Slovakia
	Netherlands	Slovenia
	Sweden	
	UK	
Southern	France	Cyprus
	Greece	Malta
	Italy	
	Portugal	
	Spain	

Note: Selected case study countries depicted in bold Italics.

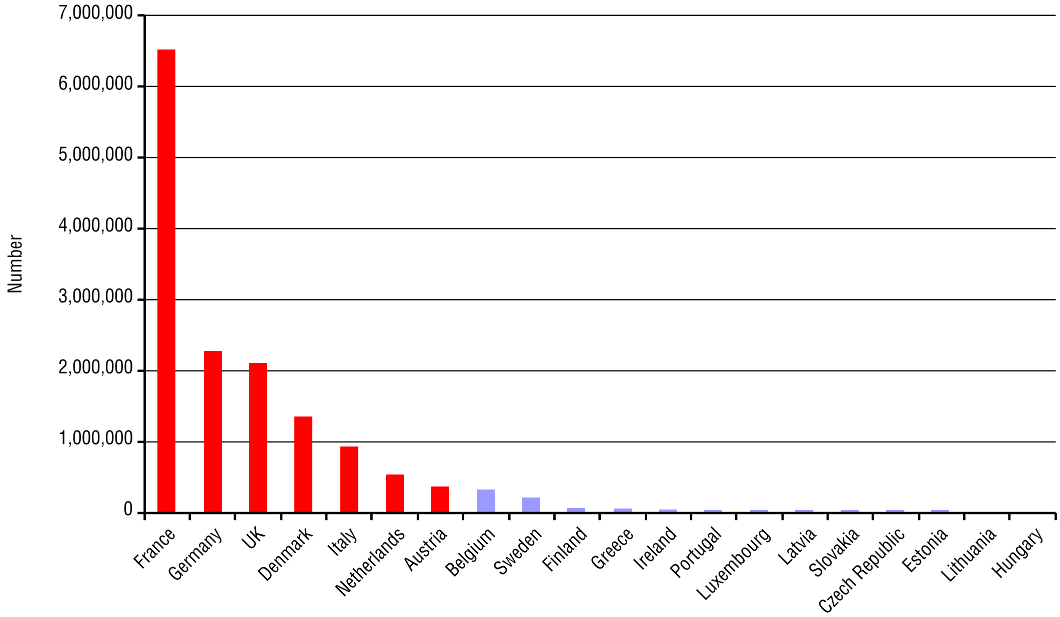
As discussed above, while these countries have been conveniently categorised into geographical regions, it is acknowledged that some countries do not necessary fit conveniently into one single geographical classification.

Figure 3.4 Number of organic pigs (breeding and fattening)



Note: Based on 2002 data. Selected case study countries depicted in red.
Source: Agra CEAS calculations based on the analysis presented in Section 2.

Figure 3.5 Number of organic poultry (meat and egg production)



Note: Based on 2002 data. Selected case study countries depicted in red.
Source: Agra CEAS calculations based on the analysis presented in Section 2.

Table 3.4: National shares of organic pigs (breeding and fattening), 2002

Country	Organic pigs
Sweden	1.3%
Austria	1.2%
UK	***1.2%***
Denmark	***0.6%***
France	***0.6%***
Luxembourg	0.6%
Germany	***0.5%***
Finland	0.3%
Netherlands	***0.3%***
Slovenia	0.3%
Italy	0.2%
Latvia	0.2%
Belgium	0.1%
Greece	0.1%
Estonia	0.1%
Portugal	***0.1%***
Czech Republic	***0.1%***
Ireland	<0.1%
Lithuania	<0.1%
Slovakia	<0.1%

Note: Selected case study countries depicted in bold Italics.

Source: Agra CEAS calculations based on the analysis presented in Section 2.

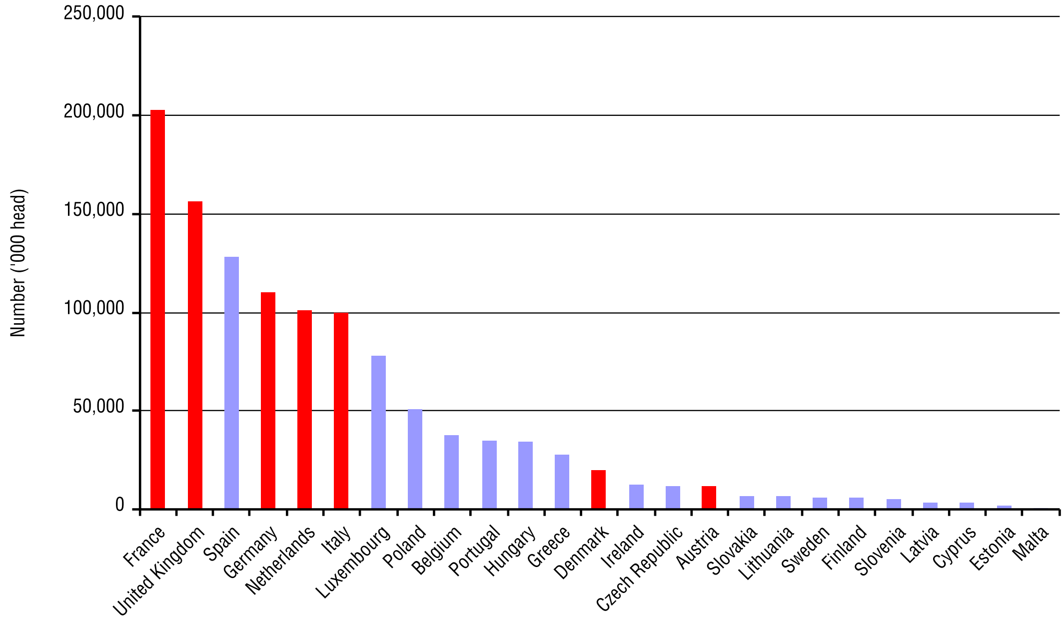
Table 3.5: National shares of organic poultry (meat and egg production), 2002

Country	Organic poultry
Denmark	***6.80%***
Sweden	4.40%
Austria	***3.90%***
France	***3.20%***
Germany	***2.10%***
UK	***1.40%***
Belgium	1.10%
Finland	1.00%
Italy	***0.90%***
Netherlands	***0.60%***
Ireland	0.20%
Greece	0.20%
Slovenia	0.20%
Slovakia	0.10%
Estonia	0.10%
Latvia	0.10%
Portugal	<0.1%
Czech Republic	<0.1%
Luxembourg	<0.1%

Note: Selected case study countries depicted in bold Italics.

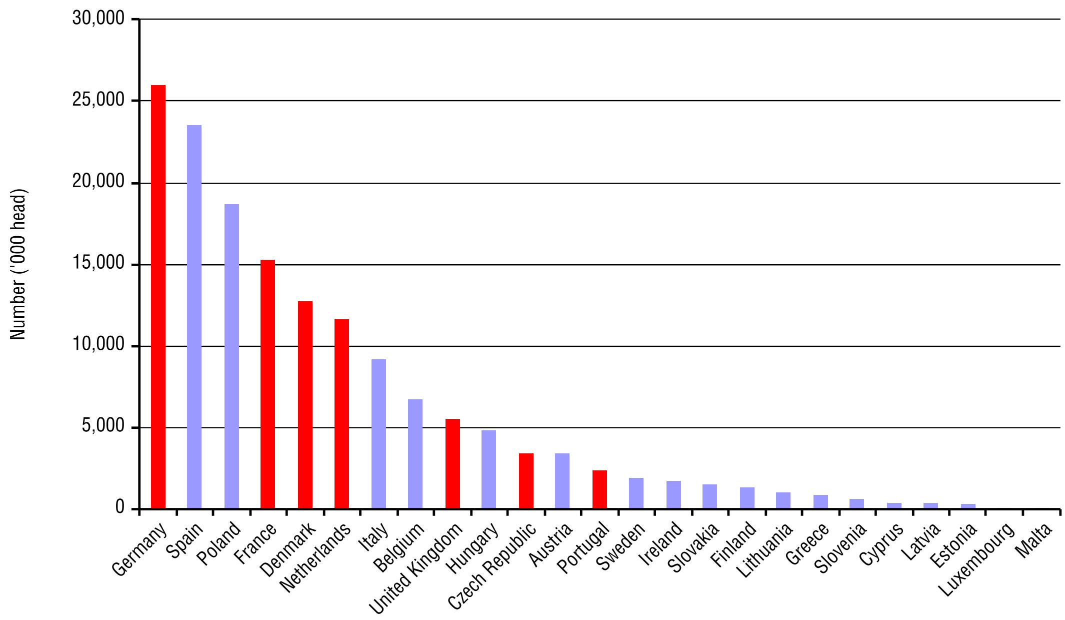
Source: Agra CEAS calculations based on the analysis presented in Section 2.

Figure 3.6 Total non-organic and organic poultry (meat and egg) numbers



Note: Based on 2002 data. Selected case study countries depicted in red.
Source: FAO (2006).

Figure 3.7 Total non-organic and organic pig numbers (breeding and fattening)



Note: Based on 2002 data. Selected case study countries depicted in red.
Source: FAO (2006).

4. Economic sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock

4.1 Introduction

This Section presents an economic analysis of the (likely) *economic sustainability* of organic egg production without the use of the derogation on sourcing non-organic livestock compared to organic production systems that use the derogation and non-organic systems (namely cage systems (both traditional and enriched), barn systems and free-range systems) in six Member States:

- Austria;
- Denmark;
- France;
- Germany;
- Netherlands; and,
- United Kingdom.

The specific definitions of each of the organic production systems, with respect to organic egg production, that have been used in this Study were defined in Sections 1.1.2 and 3.3 and are repeated in Box 4.1.

4.1.1 Brief overview of egg production systems in the EU

There are a number of production systems for laying hens in the EU. Organic systems are defined by Council Regulation (EEC) 2092/91 and non-organic systems are defined by Council Directive 1999/74/EC.

Box 4.1: Definition of the organic egg production systems

Organic egg production system A is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of any of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) (origin of animals) which permit non-organic livestock to be brought into an organic production unit when a flock is renewed, restocked or reconstituted.

Organic egg production system B is defined as those livestock farming systems which do not take advantage of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) for production animals. But for reproduction (i.e. breeding) purposes these systems permit non-organic animals to be brought into an organic reproduction unit when a flock is renewed, restocked or reconstituted, provided that this is restricted to breeding animals and certain production animals in the case of poultry. Thus, organic egg production system B uses:

- Organic chicks/pullets brought into production flocks having been reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age. Their grandparent flocks need not be managed organically.

Organic egg production system C is defined as those livestock farming systems which permit non-organic production and breeding livestock to be brought into an organic production unit when a flock is renewed, restocked or reconstituted in line with the derogations foreseen in Annex I, Part B, No. 3.4, 3.6, 3.8, 3.9, 3.10 and 3.11. Thus, organic egg production system C uses:

Non-organic production pullets brought into production flocks at a maximum 18 weeks of age and thereafter managed organically. Their parent flocks need not be managed organically. Or, where non-organic chicks are bought in at 1 or 3[50] days of age (depending on national/private standards) and thereafter managed organically.

50 EU standard.

The principal system used for egg production is the non-organic cage system[51]. However, over the last decade there has been a substantial increase in the proportion of the EU laying hen flock held in alternative non-cage systems. The share of the EU-15 laying hen flock held in alternative systems between 1993 and 2003 has risen from 3.6% to 11.9% (European Commission, 2005).

Within the alternative systems, non-organic free-range systems[52] are generally the most significant (outside the Scandinavian countries for climatic reasons) accounting for 48% of the alternative flock, followed by non-organic barn[53] (deep litter and perchery) with 42% and semi-intensive systems (now incorporated with the free-range category) with some 10% (European Commission, 2005).

Based on the available data presented in Section 2, organic production generally accounts for a low proportion (under 10%) of the overall total, but is important in some Member States, most notably Denmark.

4.1.2 *Brief overview of the egg supply chain in the EU*

A typical egg supply chain in the EU is presented in Figure 4.1. However, it should be noted that the general structure of the egg supply chain varies greatly between Member States; this is partially reflected by varying concentration levels at different points in the supply chain in different Member States

According to European Commission data[54], almost two-thirds of production takes place in flocks in excess of 30,000 birds, although the vast majority of production (98.0%) takes place on units with less than 100 hens. In fact, less than 0.5% of producers (just over 3,000 individuals) have flocks in excess of 30,000 birds. The largest proportion of flocks in excess of 30,000 birds is found in Spain, Italy, Portugal and Germany. In contrast the smallest proportions are located in Finland, Austria, Greece and Ireland.

In recent years, there has been a trend towards fewer and larger holdings with a greater number of laying hen places on larger units. Average flock size has increased over the last decade in most Member States, with the exception of Austria where average flock size has fallen. This reduction has been in part due to the continued trend towards organic production where flock sizes tend to be smaller. The largest increases have taken place in Portugal, Denmark and Finland, although in the latter two cases the average size still remained below the EU-15 average even after these large increases.

In some countries substantial portions of this chain are integrated meaning that pullet rearing, feed supply, production, processing and marketing to the retailer are all in the hands of a single company or co-operative. Prime examples of this would be Deutsche Frühstücksei in Germany, Eurovo in Italy, Deans Foods in the UK and Danæg A/S in Denmark, all of which own and pack a significant proportion of national production, packing and processing, as well as generally having their own pullet rearing and feed compounding capacity.

At the other end of the scale would be countries like Portugal and Greece, where a

51 Some of the principal characteristics of cage systems are that birds must have a minimum of 630cm2 in traditional cage systems rising to 750cm2 (the so-called enriched (or furnished) cage systems) from 1 January 2012 under Regulation 1999/74/EC, after which time birds must also have access to a number of facilities including a nest box, scratching area and dust bath.

52 Free range systems are similar to barn systems, but birds must have access to an outdoor area during day light hours at an outdoor stocking density of at most 2,500 birds per ha (although many quality marks require a more restrictive outdoor stocking rate such as the *Label Rouge* system in France).

53 Some of the principal characteristics of barn systems are that birds are free to roam within a barn at a stocking density of at most 7 birds/m2.

54 As cited by Agra CEAS Consulting (2005).

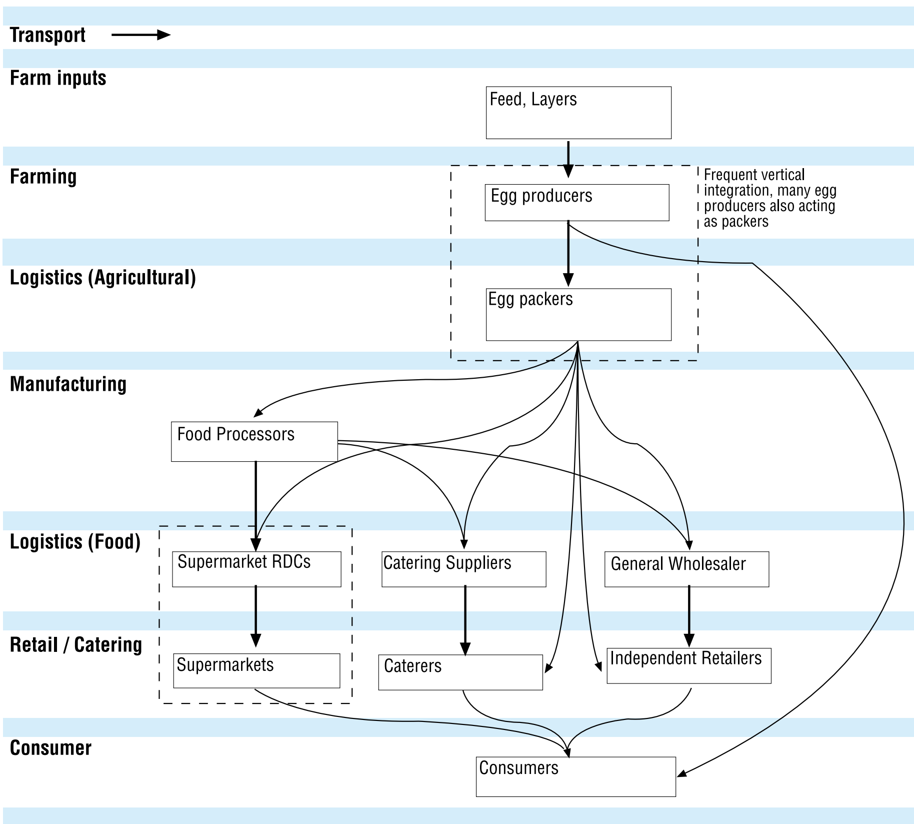
relatively fragmented production structure is accompanied by a marked lack of concentration at the packer level. In other countries such as Austria, producer groups play a significant role in the marketing of eggs. In most countries, however, packer concentration is relatively low and producers will either own their own packing station, or have arrangements to sell to independent packers who will bundle supplies on short-term supply or price contracts from a relatively limited number of producers.

The most concentrated packing sectors are in France and Denmark where the CR-4[55] in 2003 was 99.0% and 97.6% respectively. The sectors in Finland, Ireland, Sweden, the UK and Italy are all more concentrated than the EU-15 average, with least concentration evident in Greece, Spain and Portugal. In the vast majority of cases the packing sectors are more concentrated now than they were a decade ago, as larger companies have acquired smaller ones and mergers have taken place. Finland is an example where concentration has decreased, as some (now significant) players were established after accession.

The processing sector is much more concentrated than the packing sector with many Member States (Sweden, Finland, Denmark, Portugal, Greece, Austria, Belgium and Ireland) having fewer than four processors. All EU-15 Member States do, however, have at least one processing facility. Where processors are limited in number they tend to focus on breaking second

55 A concentration ratio (CR) is a measure of the market share accounted for by a particular number of enterprises in a sector or sub-sector. Thus the term CR-4 indicates the market share held by the largest four enterprises the term.

Figure 4.1 A typical egg supply chain in the EU



Source: Saltmarsh and Wakeman, 2004.

quality eggs, mainly for the domestic market, and usually liquid products only. Often these liquid products include blends and mixes in order to capture greater added value. The drying sector is becoming increasingly concentrated and many smaller scale processors have stopped this activity in the face of competition. For example, even in the UK, which has a reasonably large sector, there are no longer any drying facilities.

4.2 Austria

4.2.1 Introduction

This Section provides an economic analysis of the sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock in Austria.

Austria has a relatively well developed organic egg production sector. In terms of production, Table 3.5 (Section 1.1.2) shows that Austria had the third highest share of poultry production certified as organic in the EU-25, with 3.9% of all poultry[56] in Austria being organic.

4.2.2 Availability of organic pullets to allow production without derogation

Almost all pullets used for organic egg production in Austria are hatched from non-organically produced eggs. Accordingly, virtually all organic egg production systems make use of the derogation in Austria, using conventional breeds/strains of poultry[57].

Discussions with an Austrian producer association suggested that the main reason for the lack of organic pullets to allow production without the use of the derogation to take place was likely to be financial. It was suggested that if such production were to take place, the cost of sourcing the appropriate organic pullets would be too expensive and therefore economically non-viable; there is a general perception that the profitability of Austrian non-organic free-range systems would be more profitable. In addition, from a technical perspective it was suggested that in order to meet the demand for organic pullets in Austria if the derogation was removed, the economies of scale needed by breeding holdings would mean that the conversion to such an organic system would result in a loss of biodiversity. It is believed that the current size of the organic egg sector in Austria is too small to justify the investment in multiple breeding holdings that could breed different strains of pullets thereby maintaining the diversity of traditional and 'local' poultry strains. Accordingly, in order to gain the economies of scale necessary to produce organic pullets for use without the derogation, there is concern that breeders would concentrate their resources on breeding a single organic strain with a resultant loss in diversity.

However, national legislation concerning the sourcing of pullets for use with the derogation require higher standards than the Community standards set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91. Since April 2005, all pullets used in organic production systems have had to be reared organically from day 1 onwards, unless they have been able to demonstrate that no organically reared pullets were available at the time of purchasing. The Austrian organic control agencies were reported to adhere strictly to this principle. Moreover, it was reported during the industry interview with an organic certification body that there are currently some 190,000 places for rearing pullets organically from day 1, suggesting that supply is not a problem.

Accordingly, the derogation which allows pullets from non-organic parent-stock to be brought in at a maximum of 18 weeks of age and thereafter managed organically is rarely taken advantage of to its limit. Similarly, pullets from

56 i.e. total poultry
57 These include Lohmann Brown (brown eggs), Lohmann Silver (brown eggs), Lohmann Tradition (brown eggs), Hisex Brown (brown eggs), Isa Brown (brown eggs), Isa White (white eggs), Lohmann White (white eggs) and Hisex (white eggs).

non-organic parent-stock are rarely brought in at 2 and 3 days of age as chicks (and thereafter managed organically). Thus, although there are virtually no eggs produced in Austria without the use of the derogation, national legislation prevents Austrian egg producers from making full use of the derogation set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91.

4.2.3 Comparison of the performance of organic egg production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[58].

58 including the Austrian Ministry responsible for the implementation of organic regulations, an organic farmers' association in Austria, an Austrian University poultry specialist and the Austrian organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

4.2.3.1 Technical and economic performance

Data on the technical and economic performance of organic and non-organic egg production systems in Austria is presented in Table 4.1. Because virtually all organic egg production in Austria uses pullets from non-organic parent-stock reared from day 1 (organic production system C), actual data on the technical and economic performance of organic egg production without the use of the derogation (organic production system B (and A)) does not exist.

Compared to non-organic free-range systems, organic eggs produced under production system C were reported to show similar technical performance, with the exception of a slight decrease (3 eggs) in the number of eggs collected per laying cycle (235 eggs compared to 238 eggs).

Based on the findings of the industry interviews (see footnote 58), it was generally considered likely that there would be no discernible impact on the technical and economic performance of organic

Table 4.1: Technical and economic performance of egg production in Austria

	Non-organic			Organic	
	cage *traditional*	barn	free-range	system C	system B
Average size of poultry flock	15,000	10,000	5,000	2,100	2,100
Number of hens managed/labourer	10,000	5,000	3,000	3,000	3,000
Space allowance per hen per cm^2	550	1,429	1,429	1,323	1,323
Hens housed per m^2 house	18	7	7	6	6
Laying hen performance data					
Laying cycle (days)	406	413	413	413	413
Empty period (days)	14	28	28	28	28
Feed/bird/year (Kg)	40.58	41.02	44.44	44.44	44.44
Feed/bird/day (g)	115	120	130	130	130
Kg feed per kg eggs	2.41	2.67	2.99	3.02	3.02
Mortality (%)	6%	8%	10%	10%	10%
End of lay hen weight (Kg)	n/a	n/a	n/a	n/a	n/a
Egg production performance data					
Eggs/bird/laying cycle (collected)	269	246	238	235	235

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2). Technical and economic performance data for organic egg production system B has been estimated following discussions with the industry (see footnote 58), based on data for organic production system C.

Source: Agra CEAS calculations based on BioAustria (2005), Agra CEAS (2004) and interviews with industry stakeholders (see footnote 58).

egg production *per se* if organic egg production were to take place under organic production system B rather than organic production system C. A University poultry specialist raised the only exception to this. He noted that if the transition from organic production system C to organic production system B involved the use of different breeds/strains of poultry, then there could be some change in technical and economic performance. As discussed above, currently all organic egg production in Austria is carried out using conventional breeds/strains of poultry. As the transition to organic production system B would require breeding companies to set up dedicated hatching systems, the market may demand those breeds/strains of poultry that are more suited for organic production system B to be available.

However, on the assumption that the breeds/strains of poultry would remain the same, technical and economic performance data for organic egg production under organic production system B presented in Table 4.1 is in line with that of organic egg production under organic production system C.

4.2.3.2 Financial performance

Table 4.3 presents gross margin data (input costs, output prices and income) for a range of Austrian organic and non-organic egg production systems. The main difference in variable costs associated with organic systems, compared to non-organic systems, relates to feed. This is mainly due to the increased cost of feed used in organic systems, rather than the poorer feed conversion ratios associated with organic (and less intensive) production. Feed costs are almost double that of non-organic free-range systems. The main differences in the fixed costs associated with organic systems, compared to non-organic systems, relate to labour and land. Fixed costs are only slightly higher (€0.0256 per kg eggs (3.0%)) than those of non-organic free-range systems.

As virtually all organic egg production takes place under organic production system C in Austria, actual financial performance data for organic production system B is not available. However, discussions with the industry were unanimous in their assertion that the main difference between the two organic systems relates to the cost of pullets.

In Austria, the cost of pullets from non-organic parent-stock used in organic production system C amounts to €4.10 per pullet, the same as for non-organic free-range systems (Table 4.2). However, given that organic production systems produce a marginally lower number of eggs per laying cycle, when expressed on a per kg egg basis, the pullet cost for eggs produced under organic production system C is marginally higher.

Table 4.2: Pullet cost and end of lay hen price in Austria

	Non-organic			Organic	
	cage *traditional*	barn	free-range	system C	system B
Pullet cost (€/bird)	3.40	3.90	4.10	4.10	n/a
Pullet cost (€ cents per kg eggs)	17.55	21.01	22.86	23.10	n/a
Feed cost (€ cents per kg eggs)	45.77	52.05	58.95	104.33	n/a
End of lay hen price (€/bird)	0.10	0.10	0.10	0.10	n/a
End of lay hen price (€ cents per kg eggs)	1.55	1.62	1.67	1.69	n/a

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on BioAustria (2005), Agra CEAS (2004) and interviews with industry stakeholders (see footnote 58).

Table 4.3: Financial performance[1] of egg production in Austria

	Unit	Non-organic			Organic	
		cage *traditional*	barn	free-range	system C	system B
Output						
Egg returns	€ cents per kg eggs	80.95	96.12	108.98	165.70	165.70
Revenue from spent hens	€ cents per kg eggs	1.55	1.62	1.67	1.69	1.69
less cost of pullet	€ cents per kg eggs	17.55	21.01	22.86	23.10	33.62
Total output	€ cents per kg eggs	64.95	76.73	87.80	144.29	***133.77***
Variable costs						
Feed	€ cents per kg eggs	45.77	52.05	58.95	104.33	104.33
Veterinary and medicine	€ cents per kg eggs	0.77	3.23	3.34	3.94	3.94
Miscellaneous	€ cents per kg eggs					0.00
Total variable costs	€ cents per kg eggs	46.55	55.28	62.30	108.27	***108.27***
GROSS MARGIN	€ cents per kg eggs	18.40	21.45	25.50	36.02	***25.50***
	€ cents per dozen eggs	13.80	16.09	19.13	27.02	19.13
Operating margin	*%*	*28.3%*	*28.0%*	*29.0%*	*25.0%*	*19.1%*
Fixed costs						
Labour	€ cents per kg eggs	10.54	23.10	39.84	40.26	40.26
Buildings	€ cents per kg eggs	8.78	11.19	12.16	12.16	12.16
Equipment	€ cents per kg eggs	17.55	22.39	24.31	24.31	24.31
Land	€ cents per kg eggs			0.02	0.04	0.04
Insurance	€ cents per kg eggs	0.59	0.98	1.21	1.23	1.23
Utilities	€ cents per kg eggs	1.84	3.06	3.17	3.20	3.20
Cleaning	€ cents per kg eggs	0.24	0.26	0.27	0.27	0.27
Miscellaneous	€ cents per kg eggs	1.47	2.02	2.09	4.16	4.16
Total fixed	€ cents per kg eggs	41.01	63.00	83.06	85.62	***85.62***
NET PROFIT	€ cents per kg eggs	-22.61	-41.56	-57.56	-49.60	***-60.12***

Note: 1 Although the data has been standardised in annual terms in kg eggs to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Although this analysis has found that average production across all systems had a negative net profit in 2003, the results still provide an indication of the relative profitability between systems. It is likely that 2003 was a particularly poor year for egg production.

Source: Agra CEAS calculations based on BioAustria (2005), Agra CEAS (2004) and interviews with industry stakeholders (see footnote 58).

Thus, as there is currently no real source of organic pullets for use in organic production system B, and hence no cost data, Table 4.3 assumes a cost of €5.97 per pullet, equivalent to €0.3362 per kg eggs[59], which would allow its gross margin to breakeven with that of non-organic free-range systems. This is €1.87 per pullet (€0.1052 per kg eggs) (46%) more than the cost of non-organic free-range pullets. This cost represents the absolute maximum on a gross margin basis that an economically rational producer would pay for organic pullets for use in organic production system B (in the medium to long-term) before it becomes more financially viable to consider a move to non-organic free-range systems.

59 Calculated by dividing the cost of the pullet by the average number of eggs collected per bird per laying cycle (Table 4.1), and then multiplying this by 16 (assuming that 16 eggs equal 1 kg).

4.2.4 Viability of organic egg production systems

4.2.4.1 Profitability

Based on the financial performance data presented in Table 4.3, if organic pullets for use in organic production system B amount to more than €5.97 per pullet (€0.3362 per kg eggs) (i.e. 46% more than non-organic free-range pullets), then egg production under organic production system B would not be as profitable in terms of gross margin as non-organic free-range systems. Under this scenario, the transition from an organic production system C to an organic production system B would, *ceteris paribus*, result in a €0.1052 per kg eggs reduction (29.2%) in gross margin (i.e. a reduction from €0.3602 per kg eggs to €0.2550 per kg eggs). Accordingly, this would result in a reduction in operating margin from 25.0% to 19.1%.

However, this reduction in gross margin would be mitigated if the market price for eggs produced under organic production system B increased by 6.3% above that attainable for eggs produced in organic production system C (Table 4.4). As there is no production of eggs under organic production system B at present in Austria, an assessment as to whether the market would absorb an increased organic price premium compared to the price of eggs produced in non-organic systems is not clear.

If the cost of organic pullets for use under organic production system B increased by 156% to €10.5 per pullet then, *ceteris paribus*, organic egg production under organic production system B would only break-even, in terms of gross margin (Table 4.4). This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic production system B pullets (in the medium to long-term), above which it no longer becomes profitable to produce organic eggs under production system B. To put this into context, a cost increase of up to 156% does not seem unreasonable given that in the UK where there is a market for organic pullets[60], the relative cost differential between non-organic pullets and organic pullets for use in production system B was found to range from 91% to 204% higher (Section 4.7). This might suggest that, *ceteris paribus*, the profitability of egg production under organic production system B in Austria could be challenged.

When considering the fixed costs of production, i.e. net profitability, the impact of a transition from organic production system C to organic production system B would seem far greater. Given the technical, economic and financial assumptions presented above (and most notably a 156% increase in the cost of sourcing pullets), egg production under organic

60 As there is already an established market for organic pullets for use in organic production system B in the UK, the price premium for these organic pullets over the price for non-organic pullets in the UK provides a benchmark on which this unknown variable can be assessed in the case study countries where no such market exists. In other words, assuming the economic *law of one price* applies throughout the EU, it is likely that when a market for organic pullets for use in organic production system B develops in other EU Member States, a similar price premium can be expected.

Table 4.4: Breakeven analysis for eggs produced under organic production system B in Austria

	% increase and maximum cost of a pullet for use in organic production system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C, based on an organic production system B pullet cost of €5.97 per pullet.	6.3% to €1.76 per kg eggs
Allowable increase in the organic production system B pullet cost (compared to the organic production system C pullet cost) in order to produce a gross margin of zero	156% to €10.5 per pullet

Notes: assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

Table 4.5: Sensitivity analysis of the financial performance of eggs produced under organic production system B in Austria

	Change in value	Impact on gross margin: € cents per kg eggs	Impact on gross margin: %
Producer price for eggs	10%	16.57	46.0%
Organic producer price premium	10%	5.67	15.7%
Cost of pullets	10%	-2.31	-6.4%
Cost of feed	10%	-10.43	-29.0%

Notes: assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

Table 4.6: Impact of egg price and the organic premium on the gross margin of eggs produced under organic production system B in Austria (€ cents per kg eggs)

Non-organic egg price (€ cents per kg eggs)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
220	79.80	101.80	123.80	145.80	167.80	189.80	211.80	233.80	255.80	277.80	299.80	321.80	343.80	365.80	387.80	409.80
210	69.80	90.80	111.80	132.80	153.80	174.80	195.80	216.80	237.80	258.80	279.80	300.80	321.80	342.80	363.80	384.80
200	59.80	79.80	99.80	119.80	139.80	159.80	179.80	199.80	219.80	239.80	259.80	279.80	299.80	319.80	339.80	359.80
190	49.80	68.80	87.80	106.80	125.80	144.80	163.80	182.80	201.80	220.80	239.80	258.80	277.80	296.80	315.80	334.80
180	39.80	57.80	75.80	93.80	111.80	129.80	147.80	165.80	183.80	201.80	219.80	237.80	255.80	273.80	291.80	309.80
170	29.80	46.80	63.80	80.80	97.80	114.80	131.80	148.80	165.80	182.80	199.80	216.80	233.80	250.80	267.80	284.80
160	19.80	35.80	51.80	67.80	83.80	99.80	115.80	131.80	147.80	163.80	179.80	195.80	211.80	227.80	243.80	259.80
150	9.80	24.80	39.80	54.80	69.80	84.80	99.80	114.80	129.80	144.80	159.80	174.80	189.80	204.80	219.80	234.80
140	-0.20	13.80	27.80	41.80	55.80	69.80	83.80	97.80	111.80	125.80	139.80	153.80	167.80	181.80	195.80	209.80
130	-10.20	2.80	15.80	28.80	41.80	54.80	67.80	80.80	93.80	106.80	119.80	132.80	145.80	158.80	171.80	184.80
120	-20.20	-8.20	3.80	15.80	27.80	39.80	51.80	63.80	75.80	87.80	99.80	111.80	123.80	135.80	147.80	159.80
110	-30.20	-19.20	-8.20	2.80	13.80	24.80	35.80	46.80	57.80	68.80	79.80	90.80	101.80	112.80	123.80	134.80
100	-40.20	-30.20	-20.20	-10.20	-0.20	9.80	19.80	29.80	39.80	49.80	59.80	69.80	79.80	89.80	99.80	109.80
90	-50.20	-41.20	-32.20	-23.20	-14.20	-5.20	3.80	12.80	21.80	30.80	39.80	48.80	57.80	66.80	75.80	84.80

Source: Agra CEAS calculations.

production system B is likely to result in a loss of €60.12 cents per kg eggs.

However, as shown in the sensitivity analysis in Table 4.5, the profitability of egg production under organic production system B is least sensitive to changes in the cost of pullets. A 10% increase in the cost of pullets would, *ceteris paribus*, result vin a 6.4% decrease in gross margin. In contrast, the profitability of egg production under organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic eggs having, *ceteris paribus*, a 46.0% impact on profitability.

The extent to which the profitability of egg production under organic production system B is dependent on the producer price for eggs and the organic premium is shown in Table 4.6. At the reported egg price level of €109 cents per kg eggs, a premium of over 40% is required for egg production under for eggs produced under organic production system B, *ceteris paribus,* to remain profitable. Furthermore, it is evident from Table 4.6 that as the non-organic producer egg price falls, the importance of the organic price premium increases.

4.2.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 58) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

4.2.4.3 Worthwhileness

As presented in Table 4.3 and Table 4.2, if the cost of organic pullets for use in organic production system B amounts to more than €5.97 per pullet/€33.62 cents per kg eggs (46% more than equivalent non-organic free-range pullets), then non-organic free-range systems would, *ceteris paribus*, be more profitable in terms of gross margin. Accordingly, at this level of gross margin[61], it might be considered no longer worthwhile to continue an organic system of production.

As Table 4.3 suggests that fixed costs associated with organic systems are marginally higher than those associated with non-organic free-range systems, then (given the technical, economic and financial assumptions presented) non-organic free-range systems would also, *ceteris paribus*, be more profitable in terms of net profitability.

4.2.5 Sustainability of organic egg production system B in Austria

The central tenet of this Study is that the economic sustainability of organic egg production without derogation, i.e. producing eggs under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic pullets for use in production system B in Austria (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to production system B in the short-term and sustain this system of production in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented egg production under organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of egg production under organic system B in Austria in the medium to long-term was found to be highly sensitive to developments in the producer price for eggs.

  – Criterion III: Worthwhileness. Egg production under production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic pullets does not exceed 46% of the cost of pullets from non-organic parent-stock. However, in the medium to long-term the sustainability of egg production under organic production system B in Austria was found to be more sensitive to developments in the organic price premium for eggs. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

61 i.e. before fixed costs and any subsidies

- Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for eggs and the organic price premium, in particular.

In conclusion, the sustainability of egg production under organic production system B in Austria in the medium to long-term will likely be most affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the current lack of availability of organic pullets (Table 4.7).

4.3 Denmark

4.3.1 Introduction

This Section provides an economic analysis of the sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock in Denmark.

The Danish organic poultry[62] sector is relatively well developed. In terms of production, Table 3.5 (Section 1.1.2) shows that 6.8% of all poultry[63] in Denmark was organic. Moreover, Denmark was found to have the highest share of poultry production certified as organic than in any other Member State.

According to the *Danish Plant Directorate*, which certifies and controls all organic farms in Denmark, there were 3,594 certified organic farms in 2002[64]. Of these, 109 (2.8%) were organic poultry[65] farms, representing 28.3% of all poultry farms (Table 4.8).

62 i.e. total poultry
63 i.e. total poultry
64 With a total production area of 148,301 ha
65 i.e. total poultry

Table 4.7: Assessment of the sustainability of egg production system B in Austria

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B vis-à-vis organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented egg production under organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

Table 4.8: Danish organic farms classified according to type of production, 2002

	Organic farms	All farms	Organic farms	All farms	Organic farms as a % of all farms
	Number		%		
All poultry farms	109	384	2.8	0.8	28.3
Total farms	3,594	50,531	100.0	100.0	7.1

Source: Danish Plant Directorate (2006).

Discussion with a Danish agricultural organic advisory centre found that there are currently some 92 registered organic egg producers in Denmark, accounting for approximately 14% of Danish egg production, which would suggest that the sector is relatively well developed.

4.3.2 Availability of organic pullets to allow production without derogation

It was reported that Danish egg producers tend to make full use of the derogations set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91, with producers making full use of the derogation which allows chicks from non-organic parent-stock to be brought in at up to 3 days of age (and thereafter managed organically). That said, poultry breeders in Denmark are beginning to show some interest in the organic egg sector. However, supply of pullets for use in organic systems is small (there are only 92 organic registered egg producers in Denmark) and tends to be dominated by large international breeding companies. In total there are around ten significant breeders of laying hens and these breeders supply both organic and non-organic producers, mainly with conventional breeds/strains. The breeding stock available is genetically adapted to non-organic production systems and in particular to cage systems.

According to one breeder, there are no organic pullets available for use in organic production system B in Denmark. It is reported that in recent years there was a breeder who produced organic pullets for use in organic production system B, but this breeder no longer breeds such pullets. However, Danish sources suggest that any limited demand for organic pullets for organic production system B is currently being met by imports from other countries (e.g. Germany). Thus, based on the feedback from the interviews, it was considered likely that the proportion of Danish egg production taking place in organic production system B would be less than 3% of all organic laying hens.

4.3.3 Comparison of the performance of organic egg production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[66].

4.3.3.1 Technical and economic performance

Table 4.9 presents technical and economic performance data for organic and non-organic egg production systems in Denmark. As virtually all organic egg production in Denmark sources pullets from non-organic parent-stock for use in organic production system C, actual data on the technical and economic performance of egg production under organic production system B is not available.

Compared to non-organic free-range systems, eggs produced under organic production system C were reported to show similar technical performance, with the exception of a 37 egg decrease in the number of eggs collected per

66 including a Danish pullet hatchery, a Danish agricultural organic advisory centre, a Danish Poultry Association, Danish University organic and poultry specialists, Danish agricultural and policy consultants and the Danish organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 4.9: Technical and economic performance of egg production in Denmark

	Non-organic			Organic	
	cage e	barn	free-range	system C	system B
Average size of poultry flock	17,299	8,756	6,624	5,956	5,956
Number of hens managed/labourer	12,308	8,807	7,218	4,507	4,507
Space allowance per hen per cm^2	600	1,111	1,111	1,667	1,667
Hens housed per m^2 house	18	9	9	6	6
Laying hen performance data					
Laying cycle (days)	392	364	336	336	336
Empty period (days)	28	28	28	28	28
Feed/bird/year (Kg)	38.50	42.03	43.80	43.80	43.80
Feed/bird/day (g)	113	124	130	130	130
Kg feed per kg eggs	2.13	2.50	2.62	3.04	3.04
Mortality (%)	5.7%	9.7%	8.9%	14.8%	14.8%
End of lay hen weight (Kg)	n/a	n/a	n/a	n/a	n/a
Egg production performance data					
Eggs/bird/laying cycle (collected)	289	269	268	231	231

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2). Technical and economic performance data for organic egg production system B has been estimated following discussions with the industry (see footnote 66), based on data for organic production system C.

Source: Agra CEAS calculations based on Danish Poultry Council (2004), Agra CEAS (2004), Hjalager (2005) and interviews with industry stakeholders (see footnote 66).

laying cycle (268 eggs compared to 231 eggs) and significantly higher mortality levels. Although the level of mortality varies considerably between years, the observed relatively high mortality levels in the reported year are likely to be partly as a consequence of cannibalism and feather pecking. According to Sørensen (2001), this is mainly because the breeds/strains of poultry currently used for organic egg production in Denmark tend to be those that have been bred for cage systems. Consequently, over time these birds have lost their ability to behave in larger flocks and this has manifested itself in a high tendency for feather pecking and cannibalism. A further explanation of the relatively high mortality levels given during an interview with a Danish University organic and poultry specialist, was parasite infections in the reported year.

Based on discussions held with industry experts (see footnote 66) it was generally believed that there would be no change in the technical and economic performance of organic egg production if it were to take place under organic production system B rather than organic production system C, i.e. by sourcing organic pullets. The information presented in Table 4.9 for organic production system B reflects this. However, this would assume that in moving to organic production system B, similar breeds/strains of pullets would be used.

4.3.3.2 Financial performance

Table 4.11 presents gross margin data (input costs, output prices and income) for a number of organic and non-organic egg production systems in Denmark. Looking at the difference between the performance of organic and non-organic production, the main difference in variable costs is the feed. This is mainly due to the increased cost of feed used in organic systems, rather than the poorer feed conversion ratios associated with organic (and less intensive) production. The main differences in the fixed costs associated with organic systems, compared to non-organic systems, relate to labour, buildings and land.

Table 4.10: Pullet costs, feed costs and end of lay hen price in Denmark

	Non-organic			Organic	
	cage *enriched*	barn	free-range	system C	system B
Pullet cost (€/bird)	3.75	4.34	4.34	6.73	n/a
Pullet cost (€ cents per kg eggs)	18.07	24.03	26.01	46.82	n/a
Feed costs (€ cents per kg eggs)	40.00	49.33	52.00	89.33	n/a
End of lay hen price (€/bird)	0.04	0.13	0.13	0.18	n/a
End of lay hen price (€ cents per kg eggs)	0.18	0.71	0.71	1.25	n/a

Notes: Based on a €:DKK exchange rate of 0.134. Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on Danish Poultry Council (2004), Agra CEAS (2004), Hjalager (2005) and interviews with industry stakeholders (see footnote 66).

Fixed costs are considerably higher (€0.1389 per kg eggs (35.3%)) than those of non-organic free-range systems.

Since virtually all organic egg production in Denmark uses pullets from non-organic parent-stock, financial data for organic production system B is not available. However, the views of the industry based on discussions with industry stakeholders (see footnote 66) were that the only change to the cost of egg production under organic production system B would be an increase in the cost of organic pullets. This was in line with the findings of the other case studies.

In Denmark, the average cost of pullets from non-organic parent-stock used in organic production system C is typically €6.73 per pullet, 55% higher than those used in non-organic free-range and barn systems (i.e. €4.34 per pullet).

Since there is currently no significant source of organic pullets for use in organic production system B, and hence no cost data, Table 4.11 assumes an organic pullet cost which would allow its gross margin to breakeven with that of non-organic free-range systems. This cost is €7.78 per pullet, equivalent to €0.5411 per kg eggs[67]. This is €3.44 per pullet (79%) more than the cost of non-organic free-range pullets. This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets for use in for use in organic production system B (in the medium to long-term) before it becomes more financially viable to consider a move to non-organic free-range systems.

4.3.4 Viability of organic egg production systems

4.3.4.1. Profitability

Looking at the financial performance data presented in Table 4.11, if the cost of organic pullets for use in organic production system B amounts to more than €7.78 per pullet (€0.5411 per kg eggs) (79% more than equivalent non-organic free-range pullets), then egg production under organic production system B would not be as profitable in terms of gross margin as non-organic free-range systems. Under this scenario, the transition from organic production system C to organic production system B would, *ceteris paribus*, result in a €0.0730 per kg eggs reduction (12.0%) in gross margin (i.e. reduction from €0.6090 per kg eggs to €0.5360 per kg eggs). Accordingly, this would result in a reduction in operating margin from 39.1% to 36.2%.

67 Calculated by dividing the cost of the pullet by the average number of eggs collected per bird per laying cycle (Table 4.9), and then multiplying this by 16 (assuming that 16 eggs equal 1 kg).

Table 4.11: Financial performance[1] of egg production in Denmark

	Unit	Non-organic			Organic	
		cage *enriched*	barn	free-range	system C	system B
Output						
Egg returns	€ cents per kg eggs	80.20	125.06	135.93	201.13	201.13
Revenue from spent hens	€ cents per kg eggs	0.18	0.71	0.71	1.25	1.25
less cost of pullet	€ cents per kg eggs	18.07	24.03	26.01	46.82	54.11
Total output	€ cents per kg eggs	62.31	101.75	110.64	155.56	***148.26***
Variable costs						
Feed	€ cents per kg eggs	40.00	49.33	52.00	89.33	89.33
Veterinary and medicine	€ cents per kg eggs	0.85	2.55	2.77	2.81	2.81
Miscellaneous	€ cents per kg eggs	2.48	2.24	2.26	2.52	2.52
Total variable costs	€ cents per kg eggs	43.33	54.12	57.04	94.66	***94.66***
GROSS MARGIN	€ cents per kg eggs	18.97	47.63	53.60	60.90	***53.60***
	€ cents per dozen eggs	14.23	35.73	40.21	45.69	***40.21***
Operating margin	%	30.4%	46.8%	48.4%	39.1%	36.2%
Fixed costs						
Labour	€ cents per kg eggs	4.62	8.75	12.69	19.25	19.25
Buildings	€ cents per kg eggs	4.69	6.25	6.36	12.55	12.55
Equipment	€ cents per kg eggs	6.92	6.96	7.00	7.89	7.89
Land	€ cents per kg eggs			0.88	1.02	1.02
Insurance	€ cents per kg eggs	1.03	1.82	1.98	2.01	2.01
Utilities	€ cents per kg eggs	0.96	2.00	2.18	2.21	2.21
Cleaning	€ cents per kg eggs	1.71	5.47	5.95	6.02	6.02
Miscellaneous	€ cents per kg eggs	2.01	2.17	2.27	2.27	2.27
Total fixed	€ cents per kg eggs	21.94	33.42	39.31	53.20	***53.20***
NET PROFIT	€ cents per kg eggs	-2.97	14.21	14.29	7.70	***0.40***

Note: 1 All data has been standardised in annual terms in kg eggs. Based on a €:DKK exchange rate of 0.134.

Source: Agra CEAS calculations based on Danish Poultry Council (2004), Agra CEAS (2004), Hjalager (2005) and interviews with industry stakeholders (see footnote 66).

This fall in profitability would be eliminated if the market price for eggs produced under organic production system B increased by 3.6% above that achieved for eggs produced in organic production system C (Table 4.12). As there is no production of organic eggs produced under organic production system B at present in Denmark, an assessment as to whether the market would absorb an increased organic price premium compared to the price of non-organic eggs is unclear. In this respect, discussions with industry stakeholders found that Danish consumers are largely unaware of the details of the organic regulations and status of the products.

If the cost of organic pullets for use under organic production system B increased by 257% to €15.5 per pullet then, *ceteris paribus*, egg production under organic production system B would break-even, in terms of gross margin (Table 4.12). This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets (in the medium to long-term), above which it no longer becomes profitable to produce eggs under organic production system B. To put this into context, a cost increase of up to 257% does not seem unreasonable given that in the UK where there is a market for organic pullets (see footnote 60), the

Table 4.12: Breakeven analysis for eggs produced under organic production system B in Denmark

	% increase and maximum cost of a pullet for use in organic production system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C, based on an organic production system B pullet cost of €7.78 per pullet.	3.6% to €2.08 per kg eggs
Allowable increase in the organic production system B pullet cost (compared to the organic production system C pullet cost) in order to produce a gross margin of zero	257% to €15.5 per pullet

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.13: Sensitivity analysis of the financial performance of eggs produced under organic production system B in Denmark

	Change in value	Impact on gross margin	
		€ cents per kg eggs	%
Producer price for eggs	10%	20.11	33.0%
Organic producer price premium	10%	6.52	10.7%
Cost of pullets	10%	-4.68	-7.7%
Cost of feed	10%	-8.93	-14.7%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

relative cost differential between non-organic and organic pullets for use in production system B was found to range from 91% to 204% higher (Section 4.7). This would suggest that, *ceteris paribus*, even in an extreme scenario egg production under organic production system B in Denmark would remain profitable based on gross margin.

When considering the fixed costs of production, the impact of a transition from organic production system C to organic production system B would seem far greater in terms of its impact on net profitability. Based on the aforementioned technical, economic and financial assumptions, egg production under organic production system B is likely to result in a profit of €0.40 cents per kg eggs after fixed costs.

However, as shown in the sensitivity analysis in Table 4.13, the profitability of egg production under organic production system B is least sensitive to changes in the cost of organic pullets. A 10% increase in the cost of organic pullets would, *ceteris paribus*, result in a 7.7% decrease in gross margin. In contrast, the profitability of egg production under organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic eggs having, *ceteris paribus*, a 33.0% impact on profitability.

The extent to which the profitability of egg production under organic production system B is dependent on the producer price for eggs and the organic premium is shown in Table 4.14. At the reported egg price level of €136 cents per kg eggs, a premium of around 10% is required for organic production system B, *ceteris paribus,* to remain profitable. Furthermore, it is evident from Table 4.14 that as the non-organic producer egg price falls, the importance of the organic price premium increases.

4.3.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 66) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

Table 4.14: Impact of egg price and the organic premium on the gross margin of eggs produced under organic production system B in Denmark (€cents per kg eggs)

Non-organic egg price (€ cents per kg eggs)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
220	72.47	94.47	116.47	138.47	160.47	182.47	204.47	226.47	248.47	270.47	292.47	314.47	336.47	358.47	380.47	402.47
210	62.47	83.47	104.47	125.47	146.47	167.47	188.47	209.47	230.47	251.47	272.47	293.47	314.47	335.47	356.47	377.47
200	52.47	72.47	92.47	112.47	132.47	152.47	172.47	192.47	212.47	232.47	252.47	272.47	292.47	312.47	332.47	352.47
190	42.47	61.47	80.47	99.47	118.47	137.47	156.47	175.47	194.47	213.47	232.47	251.47	270.47	289.47	308.47	327.47
180	32.47	50.47	68.47	86.47	104.47	122.47	140.47	158.47	176.47	194.47	212.47	230.47	248.47	266.47	284.47	302.47
170	22.47	39.47	56.47	73.47	90.47	107.47	124.47	141.47	158.47	175.47	192.47	209.47	226.47	243.47	260.47	277.47
160	12.47	28.47	44.47	60.47	76.47	92.47	108.47	124.47	140.47	156.47	172.47	188.47	204.47	220.47	236.47	252.47
150	2.47	17.47	32.47	47.47	62.47	77.47	92.47	107.47	122.47	137.47	152.47	167.47	182.47	197.47	212.47	227.47
140	-7.53	6.47	20.47	34.47	48.47	62.47	76.47	90.47	104.47	118.47	132.47	146.47	160.47	174.47	188.47	202.47
130	-17.53	-4.53	8.47	21.47	34.47	47.47	60.47	73.47	86.47	99.47	112.47	125.47	138.47	151.47	164.47	177.47
120	-27.53	-15.53	-3.53	8.47	20.47	32.47	44.47	56.47	68.47	80.47	92.47	104.47	116.47	128.47	140.47	152.47
110	-37.53	-26.53	-15.53	-4.53	6.47	17.47	28.47	39.47	50.47	61.47	72.47	83.47	94.47	105.47	116.47	127.47
100	-47.53	-37.53	-27.53	-17.53	-7.53	2.47	12.47	22.47	32.47	42.47	52.47	62.47	72.47	82.47	92.47	102.47
90	-57.53	-48.53	-39.53	-30.53	-21.53	-12.53	-3.53	5.47	14.47	23.47	32.47	41.47	50.47	59.47	68.47	77.47

Source: Agra CEAS calculations.

4.3.4.3 Worthwhileness

As presented in Table 4.11 and Table 4.10, if the cost of organic pullets for use in organic production system B 'amounts to more than €7.78 per pullet/€54.11 cents per kg eggs (79% more than equivalent non-organic free-range pullets), then non-organic free-range systems would, *ceteris paribus*, be more profitable in terms of gross margin. Accordingly, at this level of gross margin[68], it might be considered no longer worthwhile to continue an organic system of production.

However, as the fixed costs associated with organic egg production are considerably higher than non-organic free-range systems in Denmark, then (based on the technical, economic and financial assumptions presented) non-organic free-range systems would, *ceteris paribus*, seem more profitable in terms of net profitability.

4.3.5 Sustainability of organic egg production system B in Denmark

The central tenet of this Study is that the economic sustainability of organic egg production without derogation, i.e. producing eggs under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is limited availability of organic pullets for use in production system B in Denmark. Consequently, it is likely that producers will be unable to move from organic production system C to production system B in the short-term and sustain this system of production in the medium to long-term. However, there is evidence that current demand for organic pullets for use in organic production system B is being met from imports (*<3% of production was found to take place under organic production system B*).

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Although the transition from organic production system C to production system B would likely result in a relatively large impact on profitability, under the assumptions presented egg production under organic

68 i.e. before fixed costs and any subsidies

production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of egg production under organic production system B in Denmark in the medium to long-term was found to be highly sensitive to developments in the producer price for eggs.

- Criterion III: Worthwhileness. Egg production under production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic pullets does not exceed 79% of the cost of pullets from non-organic parent-stock. However, in the medium to long-term the sustainability of egg production under organic production system B in Denmark was found to be more sensitive to developments in the organic price premium for eggs. That said, given the impact on profitability from a transition organic production system B, free-range non-organic systems become relatively more attractive.

- Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for eggs and the organic price premium, in particular.

In conclusion, the sustainability of egg production under organic production system B in Denmark in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the availability of organic pullets, although there is some evidence that organic pullets for use in organic production system B be imported at present (Table 4.15).

Table 4.15: Assessment of the sustainability of egg production system B in Denmark

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<3% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented egg production egg production under organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

4.4 France

4.4.1 Introduction

This Section provides an economic analysis of the sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock in France.

France has a relatively large organic poultry sector. In terms of production, Table 3.5 (Section 1.1.2) shows that France had the fourth highest share of poultry production certified as organic in the EU-25, with 3.2% of all poultry[69] in France being organic.

4.4.2 Availability of organic pullets to allow production without derogation

Despite national legislation for organic egg production in France requiring a higher standard[70] than that required under the EU Regulation for rearing pullets, virtually all organic egg production takes place utilising the derogations concerning the origin of animals with pullets from non-organic parent-stock being used. The findings of an interview with a French organic certification body revealed that it is probably impossible to source organic pullets for use in organic production system B in France.

Despite the fact that there is currently no recognised production of organic pullets for use in organic production system B in France, it was reported that the organic poultry industry has been working on proposals to define rules for the production of organically reared pullets (ITAVI, 2005). There is concern, however, that technical, sanitary and economic issues will limit the development of a gene pool for organically reared poultry breeds/strains for egg production. This would potentially reduce the extent to which local organically reared strains, which are adapted to their environment to limit disease outbreaks, could be used in organic production system B, as set out in Section 3 of Part B of Technical Annex I.

Currently, the same poultry breeds/strains are used for organic egg production as for *Label Rouge*[71] production in France. These breeds/strains are typically slow-growing non-organic birds.

4.4.3 Comparison of the performance of organic egg production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[72].

4.4.3.1. Technical and economic performance

Table 4.16 presents information on the technical and economic performance of organic and non-organic egg production systems in France. In comparison to non-organic free-range systems, organic production system C has a longer laying cycle, increased feed conversion ratios and produce on average 8 eggs less per laying cycle (254 eggs compared to 262 eggs). However, mortality levels are similar.

As virtually all organic egg production systems in France are produced under organic production system C using pullets from non-organic parent-stock, actual data on the technical and economic performance of eggs produced under organic production system B does not exist. Accordingly, technical and economic performance data for eggs produced under organic production system

69 i.e. total poultry

70 For example, non-organically reared poultry can be brought into an organic poultry unit for egg production but must be fed with at least 90% organic feed from the age of 12 weeks. Since 31 December 2005, however, such rules concerning the use of organic feed for non-organic pullets intended to enter organic production systems have applied to all Member States.

71 Non-organic free range systems

72 including a farmers' association and the French organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 4.16: Technical and economic performance of egg production in France

	Non-organic			Organic	
	cage	barn	free-range	system C	system B
Average size of poultry flock	30,000	10,000	8,000	3,000	3,000
Number of hens managed/labourer	30,000	8,000	8,000	4,500	4,500
Space allowance per hen per cm^2	550	1,429	1,429	1,429	1,429
Hens housed per m^2 house	73	7	7	6	6
Laying hen performance data					
Laying cycle (days)	352	327	332	338	338
Empty period (days)	19	26	26	25	25
Feed/bird/year (Kg)	37.58	39.81	39.35	41.63	41.63
Feed/bird/day (g)	109	118	116	122	122
Kg feed per kg eggs	2.13	2.44	2.40	2.62	2.62
Mortality (%)	5%	12%	14%	14%	14%
End of lay hen weight (Kg)	1.96	1.91	1.82	1.9	1.9
Egg production performance data					
Eggs/bird/laying cycle (collected)	282	261	262	254	254

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2). Technical and economic performance data for organic egg production system B has been estimated following discussions with the industry (see footnote 72), based on data for organic production system C.

Source: Agra CEAS calculations based on ITAVI (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 72).

B has been estimated by Agra CEAS (Table 4.16) based on discussions with industry stakeholders (see footnote 72). It is generally the view that moving from organic production system C to organic production system B would have no effect on the technical and economic performance of egg production *per se*.

4.4.3.2 Financial performance

Gross margin data (input costs, output prices and income) for a number of organic and non-organic egg production systems in France is presented in Table 4.18.

As the vast majority of all organic egg production in France uses pullets from non-organic parent-stock, actual financial data for organic production system B does not exist. Discussions with industry stakeholders (see footnote 72) confirmed the findings of the other case studies in that the only change to the cost of egg production when moving from organic production system C to organic production system B would likely be the increased pullet cost.

In France, the cost of pullets from non-organic parent-stock used in organic production system C is typically €4.20 per pullet, 27.3% higher than those used in non-organic free-range systems (€3.30 per pullet) (Table 4.17).

As there is currently no real source of *organic* pullets for use in organic production system B in France (hence no cost data) Table 4.18 assumes a cost for organic pullets of €8.12 per pullet, equivalent to €0.5047 per kg eggs[73], which would allow its gross margin to breakeven with that of non-organic free-range systems. This cost is €4.82 per pullet (i.e. €0.3014 per kg eggs) (146%) more than the cost of non-organic free-

73 Calculated by dividing the cost of the pullet by the average number of eggs collected per bird per laying cycle (Table 4.16), and then multiplying this by 16 (assuming that 16 eggs equal 1 kg).

Table 4.17: Pullet cost and end of lay hen price in France

	Non-organic			Organic	
	cage	barn	free-range	system C	system B
Pullet cost (€/bird)	3.10	3.10	3.30	4.20	n/a
Pullet cost (€ cents per kg eggs)	16.80	19.05	20.33	26.12	n/a
Feed costs (€ cents per kg eggs)	38.59	46.03	48.80	99.64	n/a
End of lay hen price (€/bird)	0.17	0.17	0.19	0.25	n/a
End of lay hen price (€ cents per kg eggs)	0.94	1.07	1.15	1.58	n/a

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on ITAVI (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 72).

Table 4.18: Financial performance of egg production in France[1]

	Unit	Non-organic			Organic	
		cage	barn	free-range	system C	system B
Output						
Egg returns	€ cents per kg eggs	79.18	96.36	108.02	189.83	189.83
Revenue from spent hens	€ cents per kg eggs	0.94	1.07	1.15	1.58	1.58
less cost of pullet	€ cents per kg eggs	16.80	19.05	20.33	26.12	50.47
Total output	€ cents per kg eggs	63.32	78.38	88.84	165.29	***140.94***
Variable costs						
Feed	€ cents per kg eggs	38.59	46.03	48.80	99.64	99.64
Veterinary and medicine	€ cents per kg eggs	0.76	0.86	1.60	2.55	2.55
Miscellaneous	€ cents per kg eggs	3.58	4.06	3.36	3.67	3.67
Total variable costs	€ cents per kg eggs	42.93	50.95	53.76	105.86	***105.86***
GROSS MARGIN	€ cents per kg eggs	20.39	27.43	35.08	59.43	***35.08***
Operating margin	%	32.2%	35.0%	39.5%	36.0%	24.9%
Fixed costs						
Labour	€ cents per kg eggs	5.12	15.89	21.27	38.39	38.39
Buildings	€ cents per kg eggs	2.88	3.73	4.16	5.64	5.64
Equipment	€ cents per kg eggs	5.76	7.46	8.32	11.29	11.29
Land	€ cents per kg eggs			0.74	0.77	0.77
Insurance	€ cents per kg eggs	4.54	3.68	4.88	5.04	5.04
Utilities	€ cents per kg eggs	1.14	1.11	1.10	1.13	1.13
Cleaning	€ cents per kg eggs	0.80	1.20	1.59	2.58	2.58
Miscellaneous	€ cents per kg eggs	2.40	2.40	2.40	2.40	2.40
Total fixed	€ cents per kg eggs	22.63	35.47	44.45	67.24	***67.24***
NET PROFIT	€ cents per kg eggs	-2.24	-8.04	-9.37	-7.81	***-32.16***

Note: 1 Although the data has been standardised in annual terms in kg eggs to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Although this analysis has found that average production across all systems had a negative net profit in 2003, the results still provide an indication of the relative profitability between systems. It is likely that 2003 was a particularly poor year for egg production.

Source: Agra CEAS calculations based on ITAVI (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 72).

range pullets. This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for *organic* pullets for use in organic production system B (in the medium to long-term) before it becomes more financially viable to consider a move to non-organic free-range systems.

4.4.4. Viability of organic egg production systems

4.4.4.1 Profitability

Based on the financial performance data presented in Table 4.18, if the cost of organic pullets for use in organic production system B rose above €8.12 per pullet (€0.5047 per kg eggs) (i.e. 146% more than non-organic free-range pullets), then egg production under organic production system B would no longer be as profitable in terms of gross margin as non-organic free-range systems. Under this scenario, the transition from organic production system C to organic production system B would, *ceteris paribus*, result in a €0.2435 per kg eggs reduction (41.0%) in gross margin (i.e. reduction from €0.5943 per kg eggs to €0.3508 per kg eggs). Accordingly, this would result in a reduction in operating margin from 36.0% to 24.9%.

However, this reduction in profitability would be mitigated if the market price for eggs produced under organic production system B increased by 31.3% above that attainable for eggs produced in organic production system C (Table 4.19). As there is no current market for eggs produced in organic production system B at present in France, an assessment as to whether the market would absorb an increased price premium compared to the price of non-organic is not clear.

Looking at the break-even cost of production, if the cost of organic pullets for use under organic production system B increased by 317% to €13.76 per pullet then, *ceteris paribus*, egg production under organic production system B would break-even, in terms of gross margin (Table 4.19). This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets (in the medium to long-term), above which it no longer becomes profitable to produce eggs under organic production system B. To put this into context, a cost increase of up to 317% does not seem unreasonable given that in the UK where there is a market for organic pullets (see footnote 60), the relative cost differential between non-organic pullets and organic pullets for use in production system B was found to range from 91% to 204% higher (Section 4.7). This would suggest that, *ceteris paribus*, even in an extreme scenario egg production under organic production system B in France would remain profitable based on gross margin.

Given the significantly greater fixed cost structure of organic systems compared to non-organic free-range systems, the transition from organic production system C to organic production system B would result (given the technical, economic and financial assumptions presented) in a loss of €32.16 cents per kg eggs

Table 4.19: Breakeven analysis for eggs produced under organic production system B in France

	% increase and maximum cost of a pullet for use in organic production system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C, based on an organic production system B pullet cost of €8.12 per pullet.	31.3% to €2.49 per kg eggs
Allowable increase in the organic production system B pullet cost (compared to the organic production system C pullet cost) in order to produce a gross margin of zero	317% to €13.76 per pullet

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.20: Sensitivity analysis of the financial performance of eggs produced under organic production system B in France

	Change in value	Impact on gross margin	
		€ cents per kg eggs	%
Producer price for eggs	10%	18.98	31.9%
Organic producer price premium	10%	8.18	13.8%
Cost of pullets	10%	-2.61	-4.4%
Cost of feed	10%	-9.96	-16.8%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.21: Impact of egg price and the organic premium on the gross margin of eggs produced under organic production system B in France (€cents per kg eggs)

Non-organic egg price (€ cents per kg eggs)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
220	65.25	87.25	109.25	131.25	153.25	175.25	197.25	219.25	241.25	263.25	285.25	307.25	329.25	351.25	373.25	395.25
210	55.25	76.25	97.25	118.25	139.25	160.25	181.25	202.25	223.25	244.25	265.25	286.25	307.25	328.25	349.25	370.25
200	45.25	65.25	85.25	105.25	125.25	145.25	165.25	185.25	205.25	225.25	245.25	265.25	285.25	305.25	325.25	345.25
190	35.25	54.25	73.25	92.25	111.25	130.25	149.25	168.25	187.25	206.25	225.25	244.25	263.25	282.25	301.25	320.25
180	25.25	43.25	61.25	79.25	97.25	115.25	133.25	151.25	169.25	187.25	205.25	223.25	241.25	259.25	277.25	295.25
170	15.25	32.25	49.25	66.25	83.25	100.25	117.25	134.25	151.25	168.25	185.25	202.25	219.25	236.25	253.25	270.25
160	5.25	21.25	37.25	53.25	69.25	85.25	101.25	117.25	133.25	149.25	165.25	181.25	197.25	213.25	229.25	245.25
150	-4.75	10.25	25.25	40.25	55.25	70.25	85.25	100.25	115.25	130.25	145.25	160.25	175.25	190.25	205.25	220.25
140	-14.75	-0.75	13.25	27.25	41.25	55.25	69.25	83.25	97.25	111.25	125.25	139.25	153.25	167.25	181.25	195.25
130	-24.75	-11.75	1.25	14.25	27.25	40.25	53.25	66.25	79.25	92.25	105.25	118.25	131.25	144.25	157.25	170.25
120	-34.75	-22.75	-10.75	1.25	13.25	25.25	37.25	49.25	61.25	73.25	85.25	97.25	109.25	121.25	133.25	145.25
110	-44.75	-33.75	-22.75	-11.75	-0.75	10.25	21.25	32.25	43.25	54.25	65.25	76.25	87.25	98.25	109.25	120.25
100	-54.75	-44.75	-34.75	-24.75	-14.75	-4.75	5.25	15.25	25.25	35.25	45.25	55.25	65.25	75.25	85.25	95.25
90	-64.75	-55.75	-46.75	-37.75	-28.75	-19.75	-10.75	-1.75	7.25	16.25	25.25	34.25	43.25	52.25	61.25	70.25

Source: Agra CEAS calculations.

(compared to a loss of €9.37 cents per kg eggs under non-organic free-range system).

However, as shown in the sensitivity analysis in Table 4.20, the profitability of eggs produced under organic production system B is least sensitive to changes in the cost of pullets. A 10% increase in the cost of pullets would, *ceteris paribus*, result in a 4.4% decrease in gross margin. In contrast, the profitability of egg production under organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic eggs having, *ceteris paribus*, a 31.9% impact on profitability.

The extent to which the profitability of egg production under organic production system B is dependent on the producer price for eggs and the organic premium is shown in Table 4.21. At the reported egg price level of €108 cents per kg eggs, an organic premium of over 40% is required for egg production under organic production system B to break-even. Furthermore, it is evident from Table 4.21 that as the non-organic producer egg price falls, the importance of the organic price premium increases.

4.4.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 72) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

4.4.4.3 Worthwhileness

As presented in Table 4.18 and Table 4.17, if the cost of organic pullets for use in organic production system B is more than €8.12 per pullet/€50.47 cents per kg eggs (146% more than equivalent non-organic free-range pullets), then non-organic free-range systems would, *ceteris paribus*, be more profitable in terms of gross margin. Accordingly, at this level of gross margin[74], it might be considered no longer worthwhile to continue an organic system of production.

This situation is compounded when considering fixed costs, given that the fixed costs associated with organic systems are significantly higher than those associated with non-organic free-range systems. As noted above, (based on the technical, economic and financial assumptions presented) the transition from organic production system C to organic production system B would result in a loss of €32.16 cents per kg eggs compared to a loss of €9.37 cents per kg eggs under non-organic free-range system (Table 4.18).

4.4.5 Sustainability of organic egg production system B in France

The central tenet of this Study is that the economic sustainability of organic egg production without derogation, i.e. producing eggs under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic pullets for use in production system B in France (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to production system B in the short-term and sustain this system of production in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented egg production under organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of egg production under organic system B in France in the medium to long-term was found to be highly sensitive to developments in the producer price for eggs.

  - Criterion III: Worthwhileness. Egg production under production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic pullets does not exceed 146% of the cost of pullets from non-organic parent-stock. However, in the medium to long-term the sustainability of egg production under organic production system B in France was found to be more sensitive to developments in the organic price premium for eggs. That said, given the impact on profitability from a transition to organic production system B, free-

74 i.e. before fixed costs and any subsidies

Table 4.22: Assessment of the sustainability of egg production system B in France

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented egg production under organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

range non-organic systems become relatively more attractive.

- Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for eggs and the organic price premium, in particular.

In conclusion, the sustainability of egg production under organic production system B in France in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the availability of organic pullets (Table 4.22).

4.5 Germany

4.5.1 Introduction

This Section provides an economic analysis of the sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock in Germany.

Germany has a relatively large organic poultry sector, with 2.1% of all poultry[75] in Germany being organic. According to Table 3.5 (Section 1.1.2), Germany has the fifth highest share of its national poultry flock certified as organic in the EU-25.

4.5.2 Availability of organic pullets to allow production without derogation

In Germany, the majority of organic egg production takes advantage of the derogation on the origin of animals and uses pullets from non-organic parent-stock. The majority of pullets are sourced from 4 main breeders. The breeds/strains used for organic egg production are typically those used in free-range systems, which are more compatible with organic production systems (such as Tetra, Silver, Lohmann and ISA).

75 i.e. total poultry

Although the majority of German egg production takes place under organic production system C, there were at least two relatively large-scale poultry units which used organic pullets under organic production system B. In total, a leading German University organic poultry specialist estimated that approximately 5% of all organic laying hens in Germany are kept under organic production system B.

The remaining 95% of egg production is carried out under organic production system C. In Germany national legislation for organic egg production requires a higher standard than that of the EU Regulation. In line with this legislation, almost all eggs produced under organic production system C use pullets from non-organic parent-stock that are reared organically from hatching. The German university organic poultry specialist interviewed estimated that since January 2005, 90% of these pullets from non-organic parent-stock have been raised organically from hatching.

Accordingly, the derogation which allows pullets from non-organic parent-stock to be brought in at a maximum of 18 weeks of age and thereafter managed organically is rarely taken advantage of to its limits. In contrast, most German egg producers make full use of the derogation allowing pullets from non-organic parent-stock to be brought in at 3 days of age (and thereafter managed organically). It was the view of a German organic poultry consultant that the sector was generally against the extension of the derogation which allows pullets from non-organic parent-stock to be brought in at a maximum of 18 weeks of age, although not necessarily against the derogation allowing pullets from non-organic parent-stock to be brought in as chicks at 3 days of age.

4.5.3 Comparison of the performance of organic egg production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[76].

4.5.3.1 Technical and economic performance

Technical and economic performance data for a range of organic and non-organic egg production systems in Germany is presented in Table 4.23. In comparison to non-organic free-range systems, eggs produced under organic production system C show similar technical performance, with the exception of a slight decrease of 3 eggs per laying cycle (235 eggs compared to 238 eggs).

In recent years there has been a growing number of organic eggs produced under organic production system B using organic pullets in Germany. During the interviews with the industry, a University organic poultry specialist and an organic consultant reported that on the two main units that produce organic eggs under organic production system B, there had been no obvious impact on the technical and economic performance. Thus, the technical and economic performance data for egg production under organic production system B presented in Table 4.23 is in line with that of egg production under organic production system C. However, it was noted that technical and economic performance would differ if the choice of poultry breeds/strains used were to be changed.

4.5.3.2 Financial performance

Table 4.25 presents gross margin data (input costs, output prices and income) for a range of organic and non-organic egg production systems in Germany. Looking at the difference in variable costs between organic systems and non-organic systems, the cost of feed in organic systems is almost twice as much. This is mainly due to the increased cost of (organic) feed used in organic

76 including, an organic producers' association in Germany, University poultry and organic specialists, organic livestock consultants and the German organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 4.23: *Technical and economic performance of egg production in Germany*

	Non-organic			Organic	
	cage	barn	free-range	system C	system B
Average size of poultry flock	n/a	n/a	n/a	n/a	n/a
Number of hens managed/labourer	20,000	20,000	5,000	5,000	5,000
Space allowance per hen per cm^2	550	1,429	1,429	1,323	1,323
Hens housed per m^2 house	18	7	7	6	6
Laying hen performance data					
Laying cycle (days)	406	413	413	413	413
Empty period (days)	14	28	28	28	28
Feed/bird/year (Kg)	39.52	41.02	44.44	44.44	44.44
Feed/bird/day (g)	112	120	130	130	130
Kg feed per kg eggs	2.30	2.48	2.99	3.02	3.02
Mortality (%)	6%	8%	10%	10%	10%
End of lay hen weight (Kg)	n/a	n/a	n/a	n/a	n/a
Egg production performance data					
Eggs/bird/laying cycle (collected)	275	265	238	235	235

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2). Technical and economic performance data for organic egg production system B has been estimated following discussions with the industry (see footnote 76), based on data for organic production system C.

Source: Agra CEAS calculations based on Hörning (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 76).

Table 4.24: *Pullet cost and end of lay hen price in Germany*

	Non-organic			Organic	
	cage	barn	free-range	system C	system B
Pullet cost (€/bird)	3.32	3.58	4.10	4.10	n/a
Pullet cost (€ cents per kg eggs)	16.80	17.89	22.86	23.10	n/a
Feed cost (€ cents per kg eggs)	41.52	46.83	58.97	104.36	n/a
End of lay hen price (€/bird)	0.10	0.10	0.10	0.10	n/a
End of lay hen price (€ cents per kg eggs)	1.52	1.50	1.67	1.69	n/a

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on Hörning (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 76).

systems, rather than the poorer feed conversion ratios associated with organic (and less intensive) production. Fixed costs are slightly higher than those of non-organic free-range systems, with the main increases being for buildings and equipment.

As there is limited egg production under organic production system B in Germany, financial data for organic production system B is not readily available. However, views from the industry interviews (see footnote 76) were that the only change to the cost of egg production under organic production system B would be an increase in the cost of pullets, as found in the other case studies. In Germany, the cost of pullets from non-organic parent-stock used in egg production under organic production system C is typically €4.10 per pullet, the same cost as those used in non-organic free-range systems

(Table 4.24). However, given that egg production under organic production system C produces a marginally lower number of eggs per laying cycle, when expressed on a per kg egg basis, the pullet cost for organic egg production system C is marginally higher.

Due to limited information on the cost of organic pullets for use in organic production system B, Table 4.25 assumes an organic cost of €5.97 per pullet, equivalent to €0.3361 per kg eggs[77], that would allow its gross margin to breakeven with that of non-organic free-range systems. This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets for use in organic production

77 Calculated by dividing the cost of the pullet by the average number of eggs collected per bird per laying cycle (Table 4.23), and then multiplying this by 16 (assuming that 16 eggs equal 1 kg).

Table 4.25: Financial performance[1] of egg production in Germany

	Unit	Non-organic			Organic	
		cage	barn	free-range	system C	system B
Output						
Egg returns	€ cents per kg eggs	79.31	89.16	108.98	165.70	165.70
Revenue from spent hens	€ cents per kg eggs	1.52	1.50	1.67	1.69	1.69
less cost of pullet	€ cents per kg eggs	16.80	17.89	22.86	23.10	33.61
Total output	€ cents per kg eggs	64.02	72.78	87.80	144.29	***133.78***
Variable costs						
Feed	€ cents per kg eggs	41.52	46.83	58.97	104.36	104.36
Veterinary and medicine	€ cents per kg eggs	0.76	3.00	3.34	3.94	3.94
Miscellaneous	€ cents per kg eggs					
Total variable costs	€ cents per kg eggs	42.27	49.83	62.31	108.30	***108.30***
GROSS MARGIN	€ cents per kg eggs	21.74	22.95	25.49	35.99	***25.49***
	€ cents per dozen eggs	16.31	17.22	19.12	27.00	***19.12***
Operating margin	%	34.0%	31.5%	29.0%	24.9%	19.1%
Fixed costs						
Labour	€ cents per kg eggs	4.00	9.33	23.90	24.16	24.16
Buildings	€ cents per kg eggs	3.47	5.07	12.16	16.20	16.20
Equipment	€ cents per kg eggs	6.93	10.13	24.31	32.41	32.41
Land	€ cents per kg eggs			0.02	0.04	0.04
Insurance	€ cents per kg eggs	0.58	0.91	1.21	1.23	1.23
Utilities	€ cents per kg eggs	1.80	2.84	3.17	3.20	3.20
Cleaning	€ cents per kg eggs	1.71	5.47	0.27	0.27	0.27
Miscellaneous	€ cents per kg eggs	1.44	1.88	2.09	4.16	4.16
Total fixed	€ cents per kg eggs	19.94	35.61	67.13	81.66	***81.66***
NET PROFIT	€ cents per kg eggs	1.81	-12.66	-41.64	-45.67	***-56.17***

Note: 1 Although the data has been standardised in annual terms in kg eggs to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Although this analysis has found that average production across most systems had a negative net profit in 2003, the results still provide an indication of the relative profitability between systems. It is likely that 2003 was a particularly poor year for egg production.

Source: Agra CEAS calculations based on Hörning (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 76).

system B (in the medium to long-term) before it becomes more financially viable to consider a move to non-organic free-range systems.

4.5.4 *Viability of organic egg production systems*

4.5.4.1 Profitability

Looking at the financial performance data presented in Table 4.25, if organic pullets for use in organic production system B were to amount to more than €5.97 per pullet (€0.3361 per kg eggs) (45% more than equivalent non-organic free-range pullets), then, *ceteris paribus*, egg production under organic production system B would not be as profitable in terms of gross margin as non-organic free-range systems. Under this scenario, the transition from organic production system C to organic production system B would, *ceteris paribus*, result in a €0.1050 per kg egg (29.2%) reduction in profitability to €0.2549 per kg egg. Accordingly, operating margin would fall from 24.9% to 19.1%.

To maintain profitability, market prices for eggs produced under organic production system B would have to increase by 6.3% above the market price for eggs produced under organic production system C (Table 4.26).

Similarly, if the cost of *organic* pullets for use in organic production system B increased by 156% to €10.5 per pullet then, *ceteris paribus*, egg production under organic production system B would break-even, in terms of gross margin (Table 4.26). This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets (in the medium to long-term), above which it no longer becomes profitable to produce eggs under organic production system B. To put this into context, a cost increase of up to 156% does not seem unreasonable given that in the UK where there is a market for *organic* pullets for use in organic production system B (see footnote 60), the relative cost differential between non-organic pullets and organic pullets used in organic production system B was found to range from 91% to 204% higher (Section 4.7). This might suggest that, *ceteris paribus*, the profitability of egg production under organic production system B in Germany could be challenged.

When accounting for fixed costs, the impact of a transition from organic production system C to organic production system B on net profitability would seem far greater. Given the technical, economic and financial assumptions presented, only cage systems make a slight profit. Net profitability of egg production under organic production system B is likely to result in a loss of €56.17 cents per kg eggs.

However, the profitability of egg production under organic production system B is least sensitive to changes in the cost of pullets. As shown in the sensitivity analysis in Table 4.27, a 10% increase in the cost of pullets would, *ceteris paribus*, result in a 6.4% decrease in gross margin. In comparison, the profitability of egg production under organic production system B is

Table 4.26: Breakeven analysis for eggs produced under organic production system B in Germany

	% increase and maximum cost of a pullet for use in organic production system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C, based on an organic production system B pullet cost of €5.97 per pullet.	6.3% to €1.76 per kg eggs
Allowable increase in the organic production system B pullet cost (compared to the organic production system C pullet cost) in order to produce a gross margin of zero	156% to €10.5 per pullet

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.27: Sensitivity analysis of the financial performance of eggs produced under organic production system B in Germany

	Change in value	Impact on gross margin: € cents per kg eggs	Impact on gross margin: %
Producer price for eggs	10%	16.57	46.0%
Organic producer price premium	10%	5.67	15.8%
Cost of pullets	10%	-2.31	-6.4%
Cost of feed	10%	-10.44	-29.0%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.28: Impact of egg price and the organic premium on the gross margin of eggs produced under organic production system B in Germany (€ cents per kg eggs)

Non-organic egg price (€ cents per kg eggs)	Organic price premium (%): 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
220	79.79	101.79	123.79	145.79	167.79	189.79	211.79	233.79	255.79	277.79	299.79	321.79	343.79	365.79	387.79	409.79
210	69.79	90.79	111.79	132.79	153.79	174.79	195.79	216.79	237.79	258.79	279.79	300.79	321.79	342.79	363.79	384.79
200	59.79	79.79	99.79	119.79	139.79	159.79	179.79	199.79	219.79	239.79	259.79	279.79	299.79	319.79	339.79	359.79
190	49.79	68.79	87.79	106.79	125.79	144.79	163.79	182.79	201.79	220.79	239.79	258.79	277.79	296.79	315.79	334.79
180	39.79	57.79	75.79	93.79	111.79	129.79	147.79	165.79	183.79	201.79	219.79	237.79	255.79	273.79	291.79	309.79
170	29.79	46.79	63.79	80.79	97.79	114.79	131.79	148.79	165.79	182.79	199.79	216.79	233.79	250.79	267.79	284.79
160	19.79	35.79	51.79	67.79	83.79	99.79	115.79	131.79	147.79	163.79	179.79	195.79	211.79	227.79	243.79	259.79
150	9.79	24.79	39.79	54.79	69.79	84.79	99.79	114.79	129.79	144.79	159.79	174.79	189.79	204.79	219.79	234.79
140	-0.21	13.79	27.79	41.79	55.79	69.79	83.79	97.79	111.79	125.79	139.79	153.79	167.79	181.79	195.79	209.79
130	-10.21	2.79	15.79	28.79	41.79	54.79	67.79	80.79	93.79	106.79	119.79	132.79	145.79	158.79	171.79	184.79
120	-20.21	-8.21	3.79	15.79	27.79	39.79	51.79	63.79	75.79	87.79	99.79	111.79	123.79	135.79	147.79	159.79
110	-30.21	-19.21	-8.21	2.79	13.79	24.79	35.79	46.79	57.79	68.79	79.79	90.79	101.79	112.79	123.79	134.79
100	-40.21	-30.21	-20.21	-10.21	-0.21	9.79	19.79	29.79	39.79	49.79	59.79	69.79	79.79	89.79	99.79	109.79
90	-50.21	-41.21	-32.21	-23.21	-14.21	-5.21	3.79	12.79	21.79	30.79	39.79	48.79	57.79	66.79	75.79	84.79

Source: Agra CEAS calculations.

more sensitive to changes in market prices, with a 10% change in the price for organic eggs having, *ceteris paribus*, a 46.0% impact on profitability.

The extent to which the profitability of egg production under organic production system B is dependent on the producer price for eggs and the organic premium is shown in Table 4.28. At the reported egg price level of €109 cents per kg eggs, a premium of around 30% is required for egg production under organic production system B, *ceteris paribus,* to remain profitable. Furthermore, it is evident from Table 4.28 that as the non-organic producer egg price falls, the importance of the organic price premium increases.

4.5.4.2 Feasibility

The findings of the interviews with stakeholders (see footnote 76) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

4.5.4.3 Worthwhileness

As presented in Table 4.25 and Table 4.24, if the cost of pullets produced under organic production system B is more than €5.97 per pullet/€0.3361 per kg eggs (45.0% more than equivalent non-organic free-range pullets), then non-organic free-range systems would, *ceteris paribus*, be more profitable in terms of gross margin. Accordingly, at this level of gross margin[78], it might be considered no longer worthwhile to continue an organic system of production.

Given that Table 4.25 shows that the fixed costs associated with organic systems are marginally higher than those associated with non-organic free-range systems, non-organic free-range systems would also, *ceteris paribus*, be more profitable in terms of net profitability based on these technical, economic and financial assumptions.

4.5.5 Sustainability of organic egg production system B in Germany

The central tenet of this Study is that the economic sustainability of organic egg production without derogation, i.e. producing eggs under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is limited availability of organic pullets for use in organic production system B in Germany (*5% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term unless there is a greater availability of organic pullets for use in organic production system B.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented egg production under organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of egg production under organic system B in Germany in the medium to long-term was found to be highly sensitive to developments in the producer price for eggs.

  - Criterion III: Worthwhileness. Egg production under production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic pullets does not exceed 45% of the cost of pullets from non-organic parent-stock. However, in the medium to long-term the sustainability of egg production under organic production system B in Germany was found to be more sensitive to developments in the organic price premium for eggs. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  - Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

78 i.e. before fixed costs and any subsidies

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for eggs and the organic price premium, in particular.

In conclusion, the sustainability of egg production under organic production system B in Germany in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the potential for the current supply of organic pullets for use in organic production system B to increase further (Table 4.29).

4.6 The Netherlands

4.6.1 Introduction

This Section provides an economic analysis of the sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock in the Netherlands.

In the Netherlands, there is a single public inspection authority (Skal) responsible for *all* inspection and certification of organic production. By the end of 2004 there was 48,155 hectares of land under inspection[79]. Although the Netherlands has a relatively small organic poultry sector, with only 0.6% of all poultry[80] in the Netherlands being organic (Table 3.5, Section 1.1.2), there were 405,123 certified organic laying hen places in 2004 (Skal, 2005).

4.6.2 Availability of organic pullets to allow production without derogation

National legislation for organic egg production in the Netherlands is implemented in line with that required under the EU Regulation.

Breeding companies in the Netherlands do not have a distinct organic breeding programme for the production of pullets for use in organic production system B as they consider the market to be too small at present. Consequently, organic egg production takes place under production system C using pullets from non-organic parent-stock.

79 of which 2,015 hectares were in their second year of conversion.
80 i.e. total poultry

Table 4.29: Assessment of the sustainability of egg production system B in Germany

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	5% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented egg production under organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

Table 4.30: Technical and economic performance of egg production in the Netherlands

	Non-organic			Organic	
	cage	barn	free-range	system C	system B
Average size of poultry flock	n/a	n/a	n/a	n/a	n/a
Number of hens managed/labourer	50,000	25,000	25,000	10,000	10,000
Space allowance per hen per cm^2	550	1429	1429	1429	1429
Hens housed per m^2 house	109	7	7	6	6
Laying hen performance data					
Laying cycle (days)	400	385	375	350	350
Empty period (days)	16	21	21	21	21
Feed/bird/year (Kg)	38.52	41.89	43.04	45.45	45.45
Feed/bird/day (g)	110	121	125	132	132
Kg feed per kg eggs	2.10	2.36	2.47	2.80	2.80
Mortality (%)	7%	9%	11%	12%	12%
End of lay hen weight (Kg)	1.70	1.80	1.80	1.70	1.70
Egg production performance data					
Eggs/bird/laying cycle (collected)	293	284	279	260	260

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2). Technical and economic performance data for organic egg production system B has been estimated following discussions with the industry (see footnote 81), based on data for organic production system C.

Source: Agra CEAS calculations based on LEI (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 81).

Thus, Dutch egg producers tend to make full use of the derogations set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91. Accordingly, use is made of the derogation which allows pullets from non-organic parent-stock to be brought in at a maximum of 18 weeks of age (and thereafter managed organically) and chicks from non-organic parent-stock to be brought in at up to 3 days of age (and thereafter managed organically).

4.6.3 Comparison of the performance of organic egg production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[81].

4.6.3.1 Technical and economic performance

Data on the technical and economic performance of a range of organic and non-organic egg production systems in the Netherlands is presented in Table 4.30. The main differences between non-organic free-range systems and eggs produced under organic production system C is the decrease in the number of eggs collected per laying cycle (260 organic eggs compared to 279 non-organic eggs), a shorter laying period, increased feed conversion ratios and slightly higher mortality level.

Because virtually all organic egg production in the Netherlands uses pullets from non-organic parent-stock for use in organic production system C, actual data on the technical and economic performance of egg production under organic production system B does not exist. However, the findings of the industry interviews with an academic organic researcher suggested that there is likely to be no discernible impact on the technical and economic performance of organic

81 including University poultry and organic specialists, agricultural consultants and the Dutch organic certification body (for a complete list, see Table 3.1, Section 3.5).

egg production *per se* when moving from organic production system C to organic production system B. Accordingly, technical and economic performance data for egg production under organic production system B presented in Table 4.30 is in line with that of eggs produced under organic production system C.

4.6.3.2 Financial performance

Gross margin data (input costs, output prices and income) for a number of organic and non-organic egg production systems in the Netherlands is presented in Table 4.32. The main difference in variable costs between organic production systems and non-organic free-range systems are principally the increased cost of organic feed, which are almost twice as much.

Since virtually all organic egg production in the Netherlands uses pullets from non-organic parent-stock, financial data for organic production system B is not available. However, the industry interviews (see footnote 81) found that the only change to the cost of egg production under organic production system B would likely be an increase in the cost of pullets. This was in line with the findings of the other case studies.

In the Netherlands, the cost of pullets from non-organic parent-stock used in egg production under organic production system C is typically €5.96 per pullet, equivalent to €0.3615 per kg eggs[82]. This is 52.4% higher than those used in non-organic free-range systems (Table 4.31).

As there is currently no real source of organic pullets for use in organic production system B, and hence no cost data, Table 4.32 assumes a pullet cost which would allow its gross margin to breakeven with that of non-organic free-range systems. This cost is €8.10 per pullet, equivalent to €0.4906 per kg eggs, (i.e. 107% more than non-organic free-range pullets). This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets for use under organic production system B (in the medium to long-term) before it becomes more financially viable to consider a move to non-organic free-range systems.

4.6.4 Viability of organic egg production systems

4.6.4.1 Profitability

Given the financial performance information contained in Table 4.32, if the cost of organic pullets for use in organic production system B amounted to more than €8.10 per pullet (€0.4906 per kg eggs) (107% more than non-organic free-

82 Calculated by dividing the cost of the pullet by the average number of eggs collected per bird per laying cycle (Table 4.30), and then multiplying this by 16 (assuming that 16 eggs equal 1 kg).

Table 4.31: Pullet cost and end of lay hen price in the Netherlands

	Non-organic			Organic	
	cage	barn	free-range	system C	system B
Pullet cost (€/bird)	3.43	3.76	3.91	5.96	n/a
Pullet cost (€ cents per kg eggs)	16.45	19.02	20.63	36.15	n/a
Feed costs (€ cents per kg eggs)	41.53	46.84	48.93	95.52	n/a
End of lay hen price (€/bird)	0.31	0.36	0.36	0.58	n/a
End of lay hen price (€ cents per kg eggs)	1.49	1.82	1.90	3.50	n/a

Notes: Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on LEI (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 81).

Table 4.32: Financial performance[1] of egg production in the Netherlands

	Unit	Non-organic			Organic	
		cage	barn	free-range	system C	system B
Output						
Egg returns	€ cents per kg eggs	71.98	86.38	99.98	172.76	172.76
Revenue from spent hens	€ cents per kg eggs	1.49	1.82	1.90	3.50	3.50
less cost of pullet	€ cents per kg eggs	16.45	19.02	20.63	36.15	49.06
Total output	€ cents per kg eggs	57.02	69.18	81.25	140.11	***127.19***
Variable costs						
Feed	€ cents per kg eggs	41.53	46.84	48.93	95.52	95.52
Veterinary and medicine	€ cents per kg eggs	0.57	1.01	1.59	0.95	0.95
Miscellaneous	€ cents per kg eggs					0.00
Total variable costs	€ cents per kg eggs	42.10	47.85	50.52	96.47	***96.47***
GROSS MARGIN	€ cents per kg eggs	14.92	21.33	30.73	43.64	***30.73***
	€ cents per dozen eggs	11.19	16.00	23.05	32.74	***23.05***
Operating margin	%	26.2%	30.8%	37.8%	31.1%	24.2%

Note: 1 Although the data has been standardised in annual terms in kg eggs to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on LEI (2005), Agra CEAS Consulting (2004) and interviews with industry stakeholders (see footnote 81).

Table 4.33: Breakeven analysis for eggs produced under organic production system B in the Netherlands

	% increase and maximum cost of a pullet for use in organic production system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C, based on an organic production system B pullet cost of €8.10 per pullet.	25.2% to €2.16 per kg eggs
Allowable increase in the organic production system B pullet cost (compared to the organic production system C pullet cost) in order to produce a gross margin of zero	237% to €13.1 per pullet

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

range pullets), then egg production under organic production system B would no longer be as profitable in terms of gross margin as non-organic free-range systems. Under this scenario operating margin would fall from 31.1% to 24.2%.

However, this fall in profitability would be removed if the market price for eggs produced under organic production system B increased by 25.2% above that attainable for eggs produced under organic production system B (Table 4.33).

Looking at the break-even cost of production, if the cost of organic pullets for use in organic production system B increased by 237% to €13.1 per pullet then, *ceteris paribus*, egg production under organic production system B would break-even, in terms of gross margin (Table 4.33). This cost represents the absolute maximum cost on a gross margin basis that an economically rational producer would pay for organic pullets (in the medium to long-term), above which it no longer becomes profitable to produce eggs under organic production system B. Putting this into context, a cost increase of up to 237% does not seem unreasonable given that in the UK where there is a market for organic pullets, the relative cost differential between non-organic pullets and

Table 4.34: Sensitivity analysis of the financial performance of eggs produced under organic production system B in the Netherlands

	Change in value	Impact on gross margin	
		€ cents per kg eggs	%
Producer price for eggs	10%	17.28	39.6%
Organic producer price premium	10%	7.28	16.7%
Cost of pullets	10%	-3.61	-8.3%
Cost of feed	10%	-9.55	-21.9%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.35: Impact of egg price and the organic premium on the gross margin of eggs produced under organic production system B in the Netherlands (€ cents per kg eggs)

		Organic price premium (%)															
		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
Non-organic egg price (€ cents per kg eggs)	220	77.97	99.97	121.97	143.97	165.97	187.97	209.97	231.97	253.97	275.97	297.97	319.97	341.97	363.97	385.97	407.97
	210	67.97	88.97	109.97	130.97	151.97	172.97	193.97	214.97	235.97	256.97	277.97	298.97	319.97	340.97	361.97	382.97
	200	57.97	77.97	97.97	117.97	137.97	157.97	177.97	197.97	217.97	237.97	257.97	277.97	297.97	317.97	337.97	357.97
	190	47.97	66.97	85.97	104.97	123.97	142.97	161.97	180.97	199.97	218.97	237.97	256.97	275.97	294.97	313.97	332.97
	180	37.97	55.97	73.97	91.97	109.97	127.97	145.97	163.97	181.97	199.97	217.97	235.97	253.97	271.97	289.97	307.97
	170	27.97	44.97	61.97	78.97	95.97	112.97	129.97	146.97	163.97	180.97	197.97	214.97	231.97	248.97	265.97	282.97
	160	17.97	33.97	49.97	65.97	81.97	97.97	113.97	129.97	145.97	161.97	177.97	193.97	209.97	225.97	241.97	257.97
	150	7.97	22.97	37.97	52.97	67.97	82.97	97.97	112.97	127.97	142.97	157.97	172.97	187.97	202.97	217.97	232.97
	140	-2.03	11.97	25.97	39.97	53.97	67.97	81.97	95.97	109.97	123.97	137.97	151.97	165.97	179.97	193.97	207.97
	130	-12.03	0.97	13.97	26.97	39.97	52.97	65.97	78.97	91.97	104.97	117.97	130.97	143.97	156.97	169.97	182.97
	120	-22.03	-10.03	1.97	13.97	25.97	37.97	49.97	61.97	73.97	85.97	97.97	109.97	121.97	133.97	145.97	157.97
	110	-32.03	-21.03	-10.03	0.97	11.97	22.97	33.97	44.97	55.97	66.97	77.97	88.97	99.97	110.97	121.97	132.97
	100	-42.03	-32.03	-22.03	-12.03	-2.03	7.97	17.97	27.97	37.97	47.97	57.97	67.97	77.97	87.97	97.97	107.97
	90	-52.03	-43.03	-34.03	-25.03	-16.03	-7.03	1.97	10.97	19.97	28.97	37.97	46.97	55.97	64.97	73.97	82.97

Source: Agra CEAS calculations.

organic pullets for use in organic production system B (see footnote 60) was found to range from 91% to 204% higher (Section 4.7). This would suggest that, *ceteris paribus*, even in an extreme scenario eggs produced under organic production system B in the Netherlands would remain profitable based on gross margin.

However, as shown in Table 4.34 the profitability of egg production under organic production system B is least sensitive to changes in the cost of pullets. The sensitivity analysis shows that a 10% increase in the cost of pullets would, *ceteris paribus*, result in an 8.3% decrease in gross margin. In contrast, the profitability of eggs produced under organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic eggs having, *ceteris paribus*, a 39.6% impact on profitability.

The extent to which the profitability of egg production under organic production system B is dependent on the producer price for eggs and the organic premium is shown in Table 4.35. At the reported egg price level of €100 cents per kg eggs, an organic premium of 42% is required for egg production under organic production system B to break-even. It is also evident from Table 4.35 that as the non-organic producer egg price falls, the importance of the organic price premium increases.

4.6.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 81) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

4.6.4.3 Worthwhileness

As presented in Table 4.32 and Table 4.31, if the cost of organic pullets for use in organic production system B cost more than €8.10 per pullet/€0.4906 per kg eggs (107.0% more than equivalent non-organic free-range pullets), then non-organic free-range systems would, *ceteris paribus*, be more profitable in terms of gross margin. Accordingly, at this level of gross margin[83], it might be considered no longer worthwhile to continue an organic system of production.

4.6.5 Sustainability of organic egg production system B in the Netherlands

The central tenet of this Study is that the economic sustainability of organic egg production without derogation, i.e. producing eggs under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic pullets for use in organic production system B in the Netherlands (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.

83 i.e. before fixed costs and any subsidies

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented egg production under organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of egg production under organic production system B in the Netherlands in the medium to long-term was found to be highly sensitive to developments in the producer price for eggs.

  - Criterion III: Worthwhileness. 'Egg production under production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic pullets does not exceed 107% of the cost of pullets from non-organic parent-stock. However, in the medium to long-term the sustainability of egg production under organic production system B in the Netherlands was found to be more sensitive to developments in the organic price premium for eggs. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  - Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for eggs and the organic price premium, in particular.

In conclusion, the sustainability of egg production under organic production system B in the Netherlands in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the availability of organic pullets (Table 4.36).

4.7 UK

4.7.1 Introduction

This Section provides an economic analysis of the sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock in the UK.

The UK organic poultry[84] sector is relatively well developed. In terms of production, Table 3.5 (Section 1.1.2) shows that 1.4% of all poultry[85] in the UK was organic. Compared with other EU Member States, the UK ranked sixth in terms of its share of poultry production certified as organic. Specifically concerning laying hens, there were 1.3 million organic laying hens in the UK in 2004 (Defra, 2005).

4.7.2 Availability of organic pullets to allow production without derogation

In the UK, there are nine organic certification bodies, of which the Soil Association is by far the biggest representing over half (55.8%) of all producers of organic products (Table 4.37). However, the majority of laying hens in the UK are certified by the Organic Food Federation and the Organic Farmers and Growers certification bodies.

Nevertheless, the Soil Association is also a significant player, but in contrast to the Organic Food Federation and the Organic Farmers and Growers certification bodies, its standard on flock

84 i.e. total poultry
85 i.e. total poultry

Table 4.36: Assessment of the sustainability of egg production system B in the Netherlands

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented egg production under organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

sizes limits the proportion of UK organic egg production it certifies. According to Aucott (2004), the Organic Food Federation and the Organic Farmers and Growers average between 6 and 12,000 birds compared to the Soil Association which has a maximum flock size of 500 birds (although they will allow up to 2,000 birds providing specific housing conditions are met).

In total, the Organic Food Federation, the Organic Farmers and Growers and the Soil Association are the three largest organic bodies, certifying the vast majority of organic eggs.

The Organic Food Federation and the Organic Farmers and Growers work to the basic organic standards set out by the Advisory Committee on Organic Standards (ACOS), which stipulate that preference should be given to sourcing organic pullets for use in organic production system B, where they are available, with pullets from non-organic parent-stock being used only with written approval from the certification body. This is in line with the standards set out in Council Regulation (EEC) No 2092/91 concerning the origin of animals which allow the production of eggs from organic production system C (i.e. taking advantage of the derogation permitting the use of pullets from non-organic parent-stock).

However, the Soil Association goes one step further in that it stipulates that these pullets must not only be reared organically, but they should originate from organically managed parents. If such pullets are not available, then producers must have a plan in place for sourcing organic pullets which are reared from organically managed parents. Given these standards, the Soil Association has been working with its certified producers to develop systems for either managing pullets organically as chicks from one day old or sourcing them from organic breeding units that breed organic pullets. (In this respect, the Soil Association has developed its own draft organic pullet rearing standards ahead of EU legislation.)

Based on discussions with certification bodies, the majority of UK organic egg production still takes place under organic production system C (i.e. taking advantage of the derogation permitting the use of pullets from non-organic parent-stock). Based on the number of organic egg producers certified by the Soil Association and the proportion of these that are likely to use organic pullets in organic production system B, it was considered likely that 10-15% of UK organic egg production currently does not take advantage of the derogations permitting the use of pullets from non-organic parent-stock.

Table 4.37: Number of organic producers and certification bodies in the UK

	Farmers and growers	
	Number	**%**
Organic Farmers and Growers Ltd	951	23.7%
Scottish Organic Producers Association	443	11.0%
Organic Food Federation	112	2.8%
Soil Association Certification Ltd	2,237	55.8%
Bio-Dynamic Agricultural Association	158	3.9%
Irish Organic Farmers and Growers Association	13	0.3%
Organic Trust Limited	10	0.2%
CMi Certification	26	0.6%
Quality Welsh Food Certification Ltd	60	1.5%
Total	4,010	100.0%

Source: Defra (2005).

Thus, the supply of organic pullets for use in organic production system B in the UK has developed mainly in response to the higher standards imposed by the Soil Association on its certified producers. However, the certification bodies report that while there is an increasing availability of organic pullets for use in organic production system B available on the market, suppliers are not yet producing to capacity. Therefore, there is potential to increase supply further.

To facilitate trade in organic livestock for use in organic production system B, the Soil Association has set up a web-based organic marketplace[86], which it claims is the UK's biggest searchable directory of organic livestock. This service is free and available to all organic farmers, regardless of their organic certification body.

4.7.3 Comparison of the performance of organic egg production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[87]

4.7.3.1 Technical and economic performance

Technical and economic performance data for a range of organic and non-organic egg production systems in the UK is presented in Table 4.38. The main differences in the technical and economic performance of organic systems compared to non-organic systems relate to a lower number of eggs collected and poorer feed conversion ratios.

In recent years there has been a growing proportion of organic eggs produced under organic production system B using organic pullets. Accordingly, actual data on the technical and economic performance has been presented for egg production under both organic production systems B and C.

The results of the industry interviews with two organic certification bodies found that there is no discernible difference in the technical and economic performance between the two organic systems when using the same breeds/ strains of poultry in the short term. However, it is acknowledged that in the medium to long-term there may be some loss of genetic potential when using organic pullets in organic production system B compared to using pullets from non-organic parent-stock.

4.7.3.2 Financial performance

Table 4.40 presents the financial data (costs and revenue) for the same range of organic and non-organic egg production systems in the UK. The main difference in the variable costs associated with organic systems, compared to non-organic systems, relates to feed. This is due to the increased cost of organic feed as well we the aforementioned poorer feed conversion ratios associated with organic (and less intensive) production. Feed costs are almost double (96%) that of non-organic free-range systems and just over one and a half times higher (155%) than non-organic cage systems.

The main differences in the fixed costs associated with organic systems, compared to non-organic systems, relate to labour, buildings, equipment and land. Fixed costs are (26%) higher than those of non-organic free-range systems and just over one and a half times higher (152%) than non-organic traditional cage systems. Based on the findings of the industry interviews with two organic certification bodies, it is considered that there is no change in the fixed cost structure (i.e. no impact on the use of labour, buildings, equipment, land, etc.) following the transition from organic production system C to organic production system B.

86 http://www.soilassociation.org/organicmarketplace
87 including UK organic certification bodies, the main egg packers, an egg industry association and University researchers (for a complete list, see Table 3.1, Section 3.5).

Table 4.38: Technical and economic performance of egg production in the UK

	Non-organic				Organic	
	cage *traditional*	cage *enriched*	barn	free-range	system C	system B
Average size of poultry flock	n/a	n/a	n/a	n/a	n/a	n/a
Number of hens managed/labourer	55,000	72,500	14,333	9,230	5,250	5,250
Space allowance per hen per cm^2	550	630	855	855	1,111	1,111
Hens housed per m^2 house	72	95	12	12	6	6
Laying hen performance data						
Laying cycle (days)	406	424	392	392	396	396
Empty period (days)	18	18	21	19	21	21
Feed/bird/year (Kg)	40.98	40.91	44.86	47.84	48.04	48.04
Feed/bird/day (g)	115	115	125	133	135	135
Kg feed per kg eggs	2.33	2.39	2.75	2.89	3.14	3.14
Mortality (%)	4.3%	4.0%	7.3%	7.8%	10.8%	10.8%
End of lay hen weight Kg	1.89	1.90	1.87	2.10	1.85	1.85
Egg production performance data						
Eggs/bird/laying cycle (collected)	282	274	261	265	246	246

Notes: Based on a €:£ exchange rate of 0.6740. Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2). Technical and economic performance data for organic egg production system B has been estimated following discussions with the industry (see footnote 87) based on data for organic production system C.

Source: Agra CEAS calculations based on British Egg Council (2004), Agra CEAS Consulting (2004) and interviews with four of the main egg packing companies and other industry stakeholders (see footnote 87).

As there is evidence of egg production under organic production system B in the UK, Table 4.40 reflects the actual financial performance of eggs produced under both organic production systems B and C. Although there is no reported difference in the cost of feed between organic production systems B and C, the additional feed cost for rearing organic pullets for use in organic production system B systems is reflected in the higher cost of pullets. Most notably, the cost of pullets is the only observed significant difference between organic production systems B and C (Table 4.39). In the UK, the cost of organic pullets for use in organic production system B typically ranges between €7.40 and €11.80 per pullet (a straight average of €9.60 per pullet, equivalent to €62.28 cents per kg eggs[88]). This is 91% and 204% higher than the cost of pullets from non-organic parent-stock (€3.88 per pullet) used in non-organic free-range production systems.

The higher revenue associated with organic systems, compared to non-organic systems, relates to the premium price received for organically produced eggs (which is offset slightly by a higher disposal cost for spent hens and higher cost of pullets. Compared to non-organic free-range systems, total output for eggs produced under organic production systems C and B is 67% and 32% higher, respectively.

According to Aucott (2004), there is no difference in the price received by producers for organic eggs produced under organic production

88 Calculated by dividing the cost of the pullet by the average number of eggs collected per bird per laying cycle (Table 4.38), and then multiplying this by 16 (assuming that 16 eggs equal 1 kg).

Table 4.39: Cost of pullets in the UK (2003)

	Non-organic				Organic	
	cage *traditional*	cage *enriched*	barn	free-range	system C	system B
Pullet cost (€/bird)	3.51	3.41	3.75	3.88	3.93	9.60
Pullet cost (€ cents per kg eggs)	18.79	18.57	20.86	21.29	23.19	62.28
Feed costs (€ cents per kg eggs)	42.38	42.16	48.70	55.07	107.85	107.85
End of lay hen price (€/bird)	-0.10	-0.07	-0.11	-0.12	-0.10	-0.10
End of lay hen price (€ cents per kg eggs)	-0.54	-0.39	-0.57	-0.65	-0.60	-0.60

Notes: Based on a €:£ exchange rate of 0.6740. Although the data has been standardised to allow for comparisons between systems, the data presented is not necessarily comparable as the assumptions/data presented for each system are not based on homogenous samples of laying hens farmed under each system (Section 3.5.2).

Source: Agra CEAS calculations based on British Egg Council (2004), Agra CEAS Consulting (2004) and interviews with four of the main egg packing companies and other industry stakeholders (see footnote 87).

Table 4.40: Financial performance[1] of egg production in the UK[2]

		Non-organic				Organic	
	Unit	cage *traditional*	cage *enriched*	barn	free-range	system C	system B
Output							
Egg returns	€ cents per kg eggs	84.08	79.10	106.97	133.06	209.91	209.91
Revenue from spent hens	€ cents per kg eggs	-0.54	-0.39	-0.57	-0.65	-0.60	-0.60
less cost of pullet	€ cents per kg eggs	18.79	18.57	20.86	21.29	23.19	62.28
Total output	€ cents per kg eggs	64.75	60.14	85.54	111.12	186.12	147.02
Variable costs							
Feed	€ cents per kg eggs	42.38	42.16	48.70	55.07	107.85	107.85
Veterinary & medicine	€ cents per kg eggs	0.47	0.47	1.27	1.11	0.46	0.46
Miscellaneous	€ cents per kg eggs						
Total variable costs	€ cents per kg eggs	42.84	42.63	49.97	56.18	108.31	108.31
GROSS MARGIN	€ cents per kg eggs	21.91	17.51	35.56	54.94	77.81	38.72
GROSS MARGIN	€ cents per dozen eggs	16.44	13.14	26.68	41.22	58.37	***29.05***
Operating margin	%	33.8%	29.1%	41.6%	49.4%	41.8%	26.3%
Fixed costs							
Labour	€ cents per kg eggs	7.26	3.35	18.18	26.16	32.04	32.04
Buildings	€ cents per kg eggs	3.60	3.35	4.70	5.06	6.97	6.97
Equipment	€ cents per kg eggs	7.20	6.70	9.40	10.12	13.93	13.93
Land	€ cents per kg eggs				1.61	0.79	0.79
Insurance	€ cents per kg eggs	0.40	0.20	0.40	0.54	0.40	0.40
Utilities	€ cents per kg eggs	2.54	0.87	1.74	2.29	1.80	1.80
Cleaning	€ cents per kg eggs	1.71	1.71	5.47	5.95	5.95	5.95
Miscellaneous	€ cents per kg eggs	4.15	0.01	2.57	4.70	5.85	5.85
Total fixed	€ cents per kg eggs	26.86	16.19	42.45	56.44	67.74	67.74
NET PROFIT	€ cents per kg eggs	-4.95	0.60	-6.89	-1.50	10.40	-29.02

Notes: 1 All data has been standardised in annual terms in kg eggs; 2 Based on a €:£ exchange rate of 0.6740.

Although this analysis has found that average production across most systems had a negative net profit in 2003, the results still provide an indication of the relative profitability between systems. It is likely that 2003 was a particularly poor year for egg production.

Source: Agra CEAS calculations based on British Egg Council (2004), Agra CEAS Consulting (2004) and interviews with four of the main egg packing companies and other industry stakeholders (see footnote 87).

system B compared to those produced under organic production system C. However, there is a price premium for eggs produced to 'higher' Soil Association standards when marketed under the Soil Association label as these eggs tend to be sold through a single UK supermarket chain that is well known for its work with farmer suppliers and commitment to animal welfare.

4.7.4 Viability of organic egg production systems

4.7.4.1 Profitability

Observed differences in the cost of pullets between systems has a significant impact on the economics of egg production in terms of the relative importance of the pullet cost as a proportion of gross margin. As shown in Table 4.39, the average cost of organic pullets for use in organic production system B is typically €9.60 per pullet. In contrast, the cost of pullets used in organic production system B typically cost 59.0% less (€3.93 per pullet).

This increased cost associated with sourcing organic pullets has important implications for the profitability of egg production under organic production system B. Gross margin under organic production system B falls by 50.2% to €38.72 cents per kg eggs (from €77.81 cents per kg eggs under organic production system C). Accordingly, this would result in a reduction in operating margin from 41.8% to 26.3%.

Moreover, as a proportion of gross margin, the cost of pullets for use in organic production system B accounts for 160.9% of gross margin, compared to 29.8% for organic production system C.

When considering the fixed costs of production, i.e. net profitability, the impact of a transition from organic production system C to organic production system B would seem far greater. The profitability of organic production system B is severely at risk; given the technical, economic and financial assumptions presented, organic production system B is likely to result in a loss of €29.09 cents per kg eggs.

However, as shown in the sensitivity analysis in Table 4.41, the profitability of organic production system B is least sensitive to changes in the cost of pullets. A 10% increase in the cost of pullets would, *ceteris paribus*, result in a 3.0% decrease in gross margin.

In contrast, the profitability of organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic eggs having, *ceteris paribus*, a 27.0% impact on gross margin (Table 4.41). Thus, if a separate market did exist for eggs produced under organic production system B then, *ceteris paribus*, to maintain the same level of gross margin as organic production system C, the market price for eggs produced under the organic production system B would need to have a premium of 5.4% (to €2.21 per kg eggs) (Table 4.42).

The extent to which the profitability of egg production under organic production system B is dependent on the producer price for eggs and the organic premium is shown in Table 4.43. At the reported egg price level of €133 cents per kg eggs, a premium of over 30% is required for egg production under organic production system B, *ceteris paribus,* to remain profitable. Furthermore, it is evident from Table 4.43 that as the non-organic producer egg price falls, the importance of the organic price premium increases.

4.7.4.2 Feasibility

As shown in Table 4.40, the transition from organic production system C to organic production system B does not involve any discernible initial capital expenditure or increase in fixed costs that could form a barrier to the transition.

4.7.4.3 Worthwhileness

Based on the analysis presented in Table 4.40, the transition from organic production

Table 4.41: Sensitivity analysis of the financial performance of eggs produced under organic production system B in the UK

	Change in value	Impact on gross margin	
		€ per kg eggs	%
Producer price for eggs	10%	20.99	27.0%
Organic producer price premium	10%	7.69	9.9%
Cost of pullets	10%	-2.32	-3.0%
Cost of feed	10%	-10.79	-13.9%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 4.42: Breakeven analysis for eggs produced under organic production system B in the UK

	% increase and maximum cost of a pullet for use in organic production system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C, based on an organic production system B pullet cost of €9.60 per pullet.	5.4 % to €2.21 per kg eggs

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

system C to organic production system B would, *ceteris paribus*, have a 50.2% negative impact on gross margin (i.e. a reduction in gross margin from €77.81 cents per kg eggs to €38.72 cents per kg eggs). Significantly, this reduction in gross margin makes egg production under organic production system B less profitable than non-organic free-range systems. Accordingly, at this level of gross margin[89], it might be considered no longer worthwhile to continue an organic system of production.

Moreover, when considering the fixed costs of production it would no longer be worthwhile (given the technical, economic and financial assumptions presented) to produce eggs under organic production system B, given that net profitability would result in a loss of €29.09 cents per kg eggs (Table 4.40). However, it should be noted that the fixed cost structure of egg production varies considerably between producers. While it may not be profitable for an 'average' producer, it may be profitable for those producers with relatively low fixed costs.

4.7.5 *Sustainability of organic egg production system B in the UK*

The central tenet of this Study is that the economic sustainability of organic egg production without derogation, i.e. producing eggs under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is availability of organic pullets for use in organic production system B in the UK (i.e. *10-15% of production was found to take place in organic production system B*). Evidence suggests that availability is developing in line with demand to allow producers to move from organic production system C to organic production system B in the short-term. If this supply base continues to expand, then it is likely that organic production system B would remain sustainable in the medium to long-term.

89 i.e. before fixed costs and any subsidies

Table 4.43: Impact of egg price and the organic premium on the gross margin of eggs produced under organic production system B in the UK (€cents per kg eggs)

Non-organic egg price (€ cents per kg eggs)	Organic price premium (%) 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
220	48.81	70.81	92.81	114.81	136.81	158.81	180.81	202.81	224.81	246.81	268.81	290.81	312.81	334.81	356.81	378.81
210	38.81	59.81	80.81	101.81	122.81	143.81	164.81	185.81	206.81	227.81	248.81	269.81	290.81	311.81	332.81	353.81
200	28.81	48.81	68.81	88.81	108.81	128.81	148.81	168.81	188.81	208.81	228.81	248.81	268.81	288.81	308.81	328.81
190	18.81	37.81	56.81	75.81	94.81	113.81	132.81	151.81	170.81	189.81	208.81	227.81	246.81	265.81	284.81	303.81
180	8.81	26.81	44.81	62.81	80.81	98.81	116.81	134.81	152.81	170.81	188.81	206.81	224.81	242.81	260.81	278.81
170	-1.19	15.81	32.81	49.81	66.81	83.81	100.81	117.81	134.81	151.81	168.81	185.81	202.81	219.81	236.81	253.81
160	-11.19	4.81	20.81	36.81	52.81	68.81	84.81	100.81	116.81	132.81	148.81	164.81	180.81	196.81	212.81	228.81
150	-21.19	-6.19	8.81	23.81	38.81	53.81	68.81	83.81	98.81	113.81	128.81	143.81	158.81	173.81	188.81	203.81
140	-31.19	-17.19	-3.19	10.81	24.81	38.81	52.81	66.81	80.81	94.81	108.81	122.81	136.81	150.81	164.81	178.81
130	-41.19	-28.19	-15.19	-2.19	10.81	23.81	36.81	49.81	62.81	75.81	88.81	101.81	114.81	127.81	140.81	153.81
120	-51.19	-39.19	-27.19	-15.19	-3.19	8.81	20.81	32.81	44.81	56.81	68.81	80.81	92.81	104.81	116.81	128.81
110	-61.19	-50.19	-39.19	-28.19	-17.19	-6.19	4.81	15.81	26.81	37.81	48.81	59.81	70.81	81.81	92.81	103.81
100	-71.19	-61.19	-51.19	-41.19	-31.19	-21.19	-11.19	-1.19	8.81	18.81	28.81	38.81	48.81	58.81	68.81	78.81
90	-81.19	-72.19	-63.19	-54.19	-45.19	-36.19	-27.19	-18.19	-9.19	-0.19	8.81	17.81	26.81	35.81	44.81	53.81

Source: Agra CEAS calculations.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented egg production under organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of eggs produced under organic production system B in the UK in the medium to long-term was found to be highly sensitive to developments in the producer price for eggs.

  - Criterion III: Worthwhileness. Under the assumptions presented, the profitability of egg production under organic production system B falls below that of non-organic free-range systems, suggesting that it is no longer financially worthwhile to produce under organic conditions. However, in the medium to long-term the worthwhileness and hence sustainability of organic production system B in the UK was found to be highly sensitive to developments in the organic price premium for eggs. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  - Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Based on the financial assumptions presented, organic production system B would likely not be financially viable, at least in the short-term, given that non-organic free-range systems would seem to be more profitable. However, in the medium to long term the financial viability (hence sustainability) of organic production system B will likely be highly dependent on future developments in the producer price for eggs and the organic price premium, in particular.

In conclusion, given that 10-15% of producers currently produce eggs under organic production system B in the UK, there is real evidence that the organic production system B is viable and sustainable, at least in the short term, despite the relative financial attractiveness of non-organic free-range systems (Table 4.44).

4.8 Overall conclusions on the economic sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock

In recent years there have been a growing number of organic eggs produced without the use of the derogation on sourcing non-organic livestock (i.e. organic egg production system B). Based on the results of the availability of organically reared livestock and the *viability* of organic egg production without the use of the derogation in the selected case study countries, a number of generalised conclusions can be drawn as to the '*economic sustainability*' of organic egg production system B:

- Most countries make use of the derogation as set out in Annex I, Part B.3 of Council Regulation (EC) No 1804/1999 on sourcing pullets from non-organic parent-stock, although the extent to which the derogation is used to its limit varies considerably by Member State. In summary, organic egg production in Austria, France and the Netherlands makes almost full use of the derogation on sourcing pullets from non-organic parent-stock. In contrast, a significant amount of production does not make use of the derogation in the UK, with 10-15% of egg production likely to take place in organic production system B (using suitable organic pullets). In Denmark and Germany, while the majority of organic egg production still takes advantage of the derogation on the origin of animals, there is some, albeit limited, organic egg production that does not make use of the derogation (Table 4.45).

Table 4.44: Assessment of the sustainability of egg production system B in the UK

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	10-15% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented egg production under organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

Table 4.45: Estimated share of organic egg production under organic production system B as a % of total organic egg production1

	%
Austria	<1%
Denmark	<3%
France	<1%
Germany	5%
The Netherlands	<1%
United Kingdom	10-15%[2]

Notes: 1 i.e. production not taking advantage of the derogation on the origin of animals; 2 includes those units that will have the capacity to do so by 31 December 2005.

Source: Country case studies (Sections 4.2 to 4.7).

- In those countries where organic egg production takes place under organic production system B, this production has tended to evolve in response to specific national or certification body rules within those countries which prevent producers from taking full advantage of the derogation on the origin of animals.

  In contrast, in those countries where national law and certification bodies permit the use of the derogation, organic production using pullets from non-organic parent-stock has continued. In general, the industry interviews found that the main reasons put forward to explain why producers in the case study countries still take advantage of this derogation and use pullets from non-organic parent-stock were due to a limited supply of suitable organic pullets at an economic price.

- In terms of technical and economic performance, no evidence was found that the transition from organic production system C to organic production system B would have any impact on performance, unless there were major adjustments to the production system (such as an expansion/contraction of the enterprise, a change in the strains used, etc.). In such a case, any resulting change would be attributable to these adjustments rather than the transition *per se*. In the medium to long-term there may, however, be some loss in potential genetic gain, as closed flocks, in particular, are unlikely to be able to maintain the same level of genetic improvement in their breeding programmes over time relative to that achieved in non organic commercial breeding flocks. Thus, this would result in a widening of the technical and economic performance gap between non-organic and organic systems in the medium to long-term.

- As the transition from organic production system C to organic production system B did not entail a change in labour requirement (e.g. the number of hens managed, and hence the number of eggs collected, per person), the economic sustainability of the farming systems in terms of labour productivity would remain unchanged. Any change in labour productivity when expressed on a financial basis (i.e. in terms of added value per working unit) would therefore be directly attributable to the impact of any change in income (gross margin) following the transition to organic production system B.

- Looking at the impact of the transition from organic production system C to organic production system B on gross margin, the only resulting quantifiable impact concerned an increase in cost of suitable organic pullets and thus on profit (gross margin). Based on the gross margin analysis, this transition had a relatively large impact on profitability, with gross margins falling to similar levels as those achieved by free-range non-organic systems. However, there was real evidence that organic production system B was sustainable, at least in the short term, in some countries, particularly in the UK, where many producers do not take advantage of the derogations on the origin of animals.

- The profitability of organic production system B was more sensitive to changes in market prices for organic products than the cost of suitable organic pullets *per se*. The sustainability of organic production system B in the long-term will therefore be dependent on the evolution of the price premium for organic produce relative to non-organic produce and the associated price and demand elasticities.

5. Economic sustainability of organic broiler production without the use of the derogation on sourcing non-organic livestock

5.1 Introduction

This Section presents an economic analysis of the (likely) *economic sustainability* of organic broiler production without the use of the derogation on sourcing non-organic livestock compared to organic production systems that use the derogation and non-organic systems in five Member States:

- Austria;
- France;
- Germany;
- Italy; and,
- United Kingdom.

The specific definitions of each of the organic production systems, with respect to organic broiler production, that have been used in this Study were defined in Sections 1.1.2 and 3.3 and are repeated in Box 5.1.

Box 5.1: Definition of the organic broiler production systems

Organic broiler production system A is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of any of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) (origin of animals) which permit non-organic livestock to be brought into an organic production unit when a flock is renewed, restocked or reconstituted.

Organic broiler production system B is defined as those livestock farming systems which do not take advantage of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) for production animals. But for reproduction (i.e. breeding) purposes these systems permit non-organic animals to be brought into an organic reproduction unit when a flock is renewed, restocked or reconstituted, provided that this is restricted to breeding animals and certain production animals in the case of poultry. Thus, organic broiler production system B uses:

- Organic chicks brought into production flocks when reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age. Their grandparent flocks need not be managed organically.

Organic broiler production system C is defined as those livestock farming systems which permit non-organic production and breeding livestock to be brought into an organic production unit when a flock is renewed, restocked or reconstituted in line with the derogations foreseen in Annex I, Part B, No. 3.4, 3.6, 3.8, 3.9, 3.10 and 3.11. Thus, organic broiler production system C uses:

- Non-organic production chicks brought into production flocks at 1 or 3[90] days of age (depending on national/private standards) and thereafter managed organically. Their parent flocks need not be managed organically.

5.1.1 Brief overview of broiler production systems in the EU

EU broiler production systems vary significantly both within and between Member States. However, according to Regulation EC 1538/91 Annex IV[91] and **Regulation EC 2092/91[92]** production systems may be voluntarily labelled

90 EU Standard
91 introducing detailed rules for implementing Regulation EC 1906/90 on certain marketing standards for poultry
92 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs

under five categories of production system, namely 'extensive indoor' (Barn reared), 'free-range', 'traditional free-range', 'free-range – total freedom' and 'organic'.

The principal system used for broiler production is the non-organic extensive indoor system. However, in recent years there has been a substantial increase in the proportion of the EU broiler flocks using free-range systems.

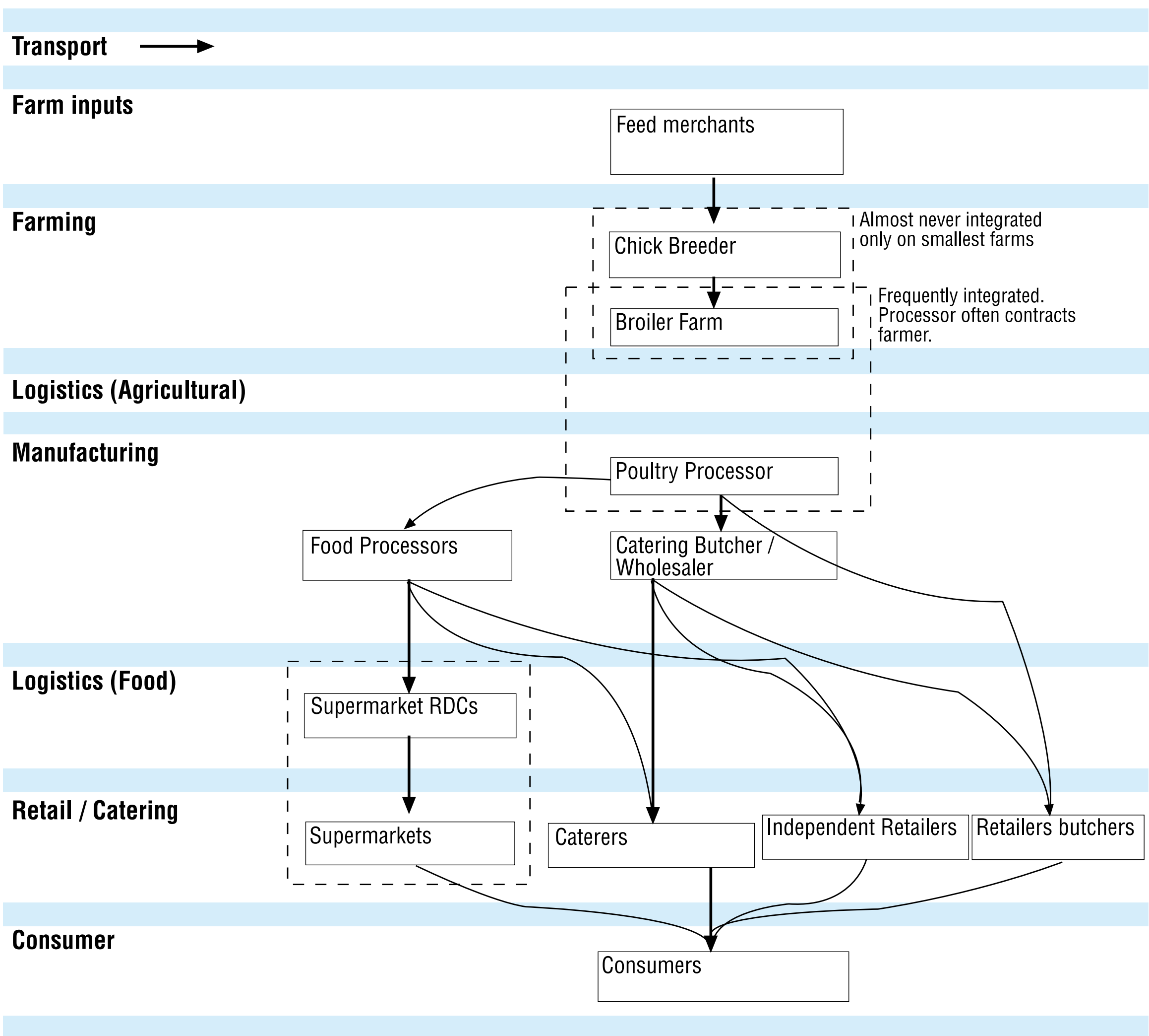
Based on the available data presented in Section 2, organic poultry production generally accounts for a low proportion (under 10%) of the overall total, although its importance was found to differ considerably between Member States.

5.1.2 Brief overview of the broiler meat supply chain in the EU

A typical broiler supply chain in the EU is presented in Figure 5.1. However, it should be noted that the general structure of the broiler supply chain varies greatly between Member States; this is partially reflected by varying concentration levels at different points in the supply chain in different Member States.

Broiler production is the most concentrated agricultural sector, dominated by a few very large integrated businesses. However, broiler production structures are rendered somewhat complex by the presence of a very large 'tail'

Figure 5.1 A typical broiler meat supply chain in the EU



Source: Saltmarsh and Wakeman, 2004.

of holdings that have less than 100 broilers. These account for 98% of holdings but can hardly be considered professional producers. Looking purely at those holdings with more than 100 broilers, enterprise structures vary greatly across the EU with some Member States such as Sweden, the UK, Denmark and the Netherlands having relatively large average size units of between 44,000 and 73,000 birds (European Commission, 2005). At the other end of the spectrum, where there are still many relatively small producers, lie Portugal, Austria, France and Greece with an average number of birds of below 13,000 (European Commission, 2005).

The sector has become dominated by integrated production and processing operations, with internal logistics. These large integrated production and processing operations have moved towards contract production over recent years. Under typical contracts, broiler producers are provided with all the inputs and paid a management fee for raising the birds.

The EU broiler meat-processing sector is highly concentrated and characterised by a strong degree of specialisation (driven by increased competition) and vertical integration, particularly between the animal feed industry, broiler producers, and the slaughtering and distribution sectors.

In recent years, this trend in vertical integration in the broiler supply chain has resulted in a growing proportion of broiler meat being sold through co-operatives and in advance on contract. According to European Commission (2005), more than half of domestic broiler meat production is sold through co-operatives in Austria and Finland and in seven EU-15 Member States 90-100% of domestic broiler meat production is sold in advance on contract. In France, Denmark and Germany the proportion is over 50%.

5.2 Austria

5.2.1 Introduction

This Section provides an economic analysis of the sustainability of organic broiler meat production without the use of the derogation on sourcing non-organic livestock in Austria.

Austria has a relatively well developed organic poultry sector. In terms of production, Table 3.5 (Section 1.1.2) shows that Austria had the third highest share of poultry production certified as organic in the EU-25, with 3.9% of all poultry[93] in Austria being organic.

5.2.2 Availability of organic chicks to allow production without derogation

In contrast to organic broiler production in the other case study countries, it is estimated that virtually all organic broiler production in Austria takes place under organic production system B. National rules concerning the origin of poultry for organic meat production are much stricter than that required under the EU Regulation. Since 2003 producers have had to use organic chicks unless they have been able to demonstrate that no organic chicks suitable for organic production system B were available at the time of purchasing.

It was reported that this has not been a problem as since 2003 Austria has had its own organic parent flock, producing sufficient numbers of organic chicks for fattening under organic production system B. As such, producers have rarely applied the derogations as they have to prove that there are organic chicks available. That said, the derogation has been applied temporarily by different producers on occasions, although not on a systematic basis.

One of the main drivers for the development of the organic parent flock in Austria is that under

93 i.e. total poultry

Regulation 1804/1999 (Annex 1B, paragraph 6.1.9) the stipulated minimum age at slaughter for chickens is 81 days. Where producers do not apply these minimum slaughter ages, the Regulation stipulates that slow-growing poultry strains must be used. However, after 81 days the broilers are considered to be too heavy and fat by Austrian consumers. Consequently, in order to produce this lighter and less fatty poultry meat, producers prefer to use slow-growing strains of organic chicks which can be slaughtered at less than 81 days, under the aforementioned Regulation. Organic broilers in Austria are usually slaughtered at 60-70 days.

From a technical perspective, it was reported that there are strict national rules on organic parent flock production in the organic broiler sector in Austria. In contrast to the EU regulation on organic farming, the Austrian rules do not oblige farmers to use free-range organic production systems. This is because of hygiene problems; free-range broilers have contact with rats and birds, which increases the risk of a salmonella infection. Keeping the organic parent broiler flock indoors limits this increased risk of salmonella infection.

The most important slow-growing strains used in organic production system B in Austria are JA457 and JA257 (both 'Isa' strains). These strains were traditionally both conventional slow-growing strains and are the results of the following crossings:

- JA 57 (hen) x Redbro (cock) = JA 457 ('Wildhendl') – 'white' birds
- JA 57 (hen) x I22 (cock) = JA 257 (Hungary, Slovenia) – 'brown' birds

The brown birds are mainly used on the Austrian market and the white birds are mainly exported. Based on discussions with industry stakeholders (see footnote 94), these 2 strains have turned out to be very adaptable to organic production as they have a good fattening performance under organic conditions. Small organic broiler producers doing direct marketing (i.e. not through the retail sector) often breed their own chicks using all kinds of breeds.

Table 5.1: Technical and economic performance of broiler production in Austria

	Non-organic	Organic system B
Average size of poultry flock	20,000	3,000
Housing rate (animals per m²)	30 kg per m²	21 kg per m²
Bought-in chick performance data		
Age of bought-in chicks (days)	1-2	1-2
Liveweight of bought-in chicks (g)	40	40
Broiler performance data		
Age at slaughter (days)	35	65
Liveweight at slaughter (kg)	1.6	1.9
Carcass (dead) weight (kg)	1.36	1.52
Killing out ratio (%)	85	80
Number of birds managed per worker	20,000	10,000
Rearing period (days)	35	65
Mortality rate over period (%)	2	3
Average growth rate per day (g)	40-42	29
Feed use per bird (kg)	3.5	5
Feed conversion ratio (:1)	2.1	2.78

Source: Agra CEAS calculations based on BioAustria (2005) and interviews with industry stakeholders (see footnote 94).

5.2.3 Comparison of the performance of organic broiler production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[94].

5.2.3.1 Technical and economic performance

Data on the technical and economic performance of organic broiler production system B and non-organic broiler production in Austria is presented in Table 5.1.

The results of the industry interviews (see footnote 94) suggest that the transition from organic production system C to organic production system B since 2003 has had little impact on the technical and economic performance of organic broiler production *per se*. However, the use of organic chicks in organic production system B means that broilers can be slaughtered at a younger age and at lower weights to meet market requirements.

5.2.3.2 Financial performance

Gross margin data (input costs, output prices and income) for organic and non-organic broiler production systems in Austria is presented in Table 5.2. The only difference in costs between organic broiler production system C (i.e. before 2003) and organic broiler production system B relates to the cost of day old chicks. In Austria, the cost of organic chicks for use in organic broiler production system B (€0.72 per chick) is 148% higher than the cost of non-organic chicks (€0.29 per chick).

5.2.4 Viability of organic broiler production systems

5.2.4.1 Profitability

Based on the data presented in Table 5.2, there is real evidence that organic broiler production system B is profitable in terms of

94 including the Austrian Ministry responsible for the implementation of organic regulations, an organic farmers' association in Austria, an Austrian University poultry specialist and the Austrian organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 5.2: Financial performance of broiler production in Austria

	Unit	Non-organic	Organic system C	Organic system B
Revenue (€ per bird)				
Value of broiler	€/kg live weight	0.76	N/a	2.61
Value of broiler	€/bird	1.22	3.06	4.96
(Less cost of bought-in chicks)	€/bird	-0.29	-0.29	-0.72
Total output	€/bird	0.93	***2.77***	4.24
Variable costs				
Feed	€/bird	0.61	2.01	2.01
Veterinary and medicine	€/bird	0.18	0.27	0.27
Heat and electricity	€/bird	0.06	0.06	0.06
Miscellaneous	€/bird			
Total variable costs	€/bird	0.85	***2.34***	2.34
GROSS MARGIN	€/bird	0.08	***2.33***	1.90
	€/kg live weight	0.05	n/a	1.00
Operating margin	%	8.6%	84.1%	44.8%
Cost of chick as a % of gross margin	%	381.6%	12.5%	37.9%
Cost of chick as a % of variable costs	%	25.4%	11.0%	23.5%

Source: Agra CEAS calculations based on BioAustria (2005) and interviews with industry stakeholders (see footnote 94).

Table 5.3: Sensitivity analysis of the financial performance of organic broiler production system B in Austria

	Change in value	Impact on gross margin	
		€ per bird	%
Producer price	10%	0.50	26.1%
Organic producer price premium	10%	0.37	19.7%
Cost of chicks	10%	-0.07	-3.8%
Cost of feed	10%	-0.20	-10.6%

gross margin. The gross margin of organic broiler production system B is estimated at €1.90 per bird with an operating margin of 44.8%.

This additional cost of day old chicks for use in organic broiler production system B has a significant impact on the economics of broiler production in terms of the relative importance of the chick cost as a proportion of gross margin. Under organic broiler production system B, the cost of day old chicks accounts for 38% of gross margin. This compares to 13% for organic broiler production system C (i.e. prior to 2003) (Table 5.2).

This would therefore suggest that the profitability of broiler production under organic broiler production system B is more sensitive to changes in the price of day old chicks than under organic broiler production system C. Every 10% increase in the price of day old chicks would, *ceteris paribus*, result in a 3.8% decrease in gross margin per bird (Table 5.3).

However, as shown in Table 5.3, the profitability of organic broiler production system B is least sensitive to changes in the cost of chicks. Profitability is most sensitive to changes in market prices, with a 10% change in the price for broilers having, *ceteris paribus*, a 26.1% impact on profitability.

The extent to which the profitability of organic broiler production system B is dependent on the producer price for broiler meat and the organic premium is shown in Table 5.4. At the reported broiler meat price level of €0.76 per

Table 5.4: Impact of broiler meat price and the organic premium on the gross margin of organic broiler production system B in Austria (€ per kg liveweight)

Non-organic broiler meat price (€ per kg liveweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
3.0	2.64	3.21	3.78	4.35	4.92	5.49	6.06	6.63	7.20	7.77	8.34	8.91	9.48	10.05	10.62	11.19
2.8	2.26	2.79	3.32	3.86	4.39	4.92	5.45	5.98	6.52	7.05	7.58	8.11	8.64	9.18	9.71	10.24
2.6	1.88	2.37	2.87	3.36	3.86	4.35	4.84	5.34	5.83	6.33	6.82	7.31	7.81	8.30	8.80	9.29
2.4	1.50	1.96	2.41	2.87	3.32	3.78	4.24	4.69	5.15	5.60	6.06	6.52	6.97	7.43	7.88	8.34
2.2	1.12	1.54	1.96	2.37	2.79	3.21	3.63	4.05	4.46	4.88	5.30	5.72	6.14	6.55	6.97	7.39
2.0	0.74	1.12	1.50	1.88	2.26	2.64	3.02	3.40	3.78	4.16	4.54	4.92	5.30	5.68	6.06	6.44
1.8	0.36	0.70	1.04	1.39	1.73	2.07	2.41	2.75	3.10	3.44	3.78	4.12	4.46	4.81	5.15	5.49
1.6	-0.02	0.28	0.59	0.89	1.20	1.50	1.80	2.11	2.41	2.72	3.02	3.32	3.63	3.93	4.24	4.54
1.4	-0.40	-0.13	0.13	0.40	0.66	0.93	1.20	1.46	1.73	1.99	2.26	2.53	2.79	3.06	3.32	3.59
1.2	-0.78	-0.55	-0.32	-0.10	0.13	0.36	0.59	0.82	1.04	1.27	1.50	1.73	1.96	2.18	2.41	2.64
1.0	-1.16	-0.97	-0.78	-0.59	-0.40	-0.21	-0.02	0.17	0.36	0.55	0.74	0.93	1.12	1.31	1.50	1.69
0.8	-1.54	-1.39	-1.24	-1.08	-0.93	-0.78	-0.63	-0.48	-0.32	-0.17	-0.02	0.13	0.28	0.44	0.59	0.74
0.6	-1.92	-1.81	-1.69	-1.58	-1.46	-1.35	-1.24	-1.12	-1.01	-0.89	-0.78	-0.67	-0.55	-0.44	-0.32	-0.21
0.4	-2.30	-2.22	-2.15	-2.07	-2.00	-1.92	-1.84	-1.77	-1.69	-1.62	-1.54	-1.46	-1.39	-1.31	-1.24	-1.16

Source: Agra CEAS calculations.

kg liveweight, a premium of around 100% is required for organic broiler production system B, *ceteris paribus,* to remain profitable. Furthermore, it is evident from Table 5.4 that as the non-organic producer broiler meat price falls, the importance of the organic price premium increases.

5.2.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 94) suggested that the transition from organic broiler production system C to organic broiler production system B has not involved any initial capital expenditure that could have formed a barrier to the transition.

5.2.4.3 Worthwhileness

As a result of the increased cost associated with sourcing organic chicks for use in organic broiler production system B, income (gross margin per bird) falls to €1.90 per bird compared to €2.33 per bird under organic broiler production system C. (Although gross margin per bird is still significantly higher than in non-organic systems, these systems typically have lower overhead costs.)

There is no perceived difference in any of the other input costs or the value of output (market price for organic broiler) between organic broiler production systems C and B. The results of the country case study found that Austrian consumers were generally unaware that non-organic chicks could be used in organic systems in the EU and as such no separate market exists for broilers produced under the two organic systems. In any case, the proportion of organic broilers produced in Austria using chicks from non-organic parent-stock is minimal.

5.2.5 Sustainability of organic broiler production system B in Austria

The central tenet of this Study is that the economic sustainability of organic broiler production without derogation, i.e. producing broilers under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is ample availability of organic chicks for use in organic production system B in Austria (i.e. *>90% of production was found to take place in organic broiler production system B*). The evidence therefore suggests that from a *supply* perspective, assuming that there is no contraction in the supply base, organic broiler production system B is likely to be sustainable in the short, medium and long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B has had a relatively large impact on profitability in Austria, broiler production under organic system B remains profitable (in terms of gross margin). Based on this Criterion, there is real evidence that the transition from organic production system C to organic production system B has been sustainable in the short to medium term. In the longer-term, it is likely that sustainability will be influenced by developments in the producer price for broiler meat.

  – Criterion III: Worthwhileness. Under the assumptions presented, the profitability of organic broiler production system B remained higher than that of non-organic systems. This provides real evidence that organic broiler production system B remains worthwhile in the short to medium term. In the longer-term, it is likely that viability and sustainability will be influenced by developments in the organic price premium for broiler meat. That said, given the impact on profitability from a transition to organic broiler production system B, free-range non-organic systems become relatively more attractive.

- Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic broiler production system C to organic broiler production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic broiler production system B in the short, medium and long-term.

Overall there is real evidence that broiler production under organic system B is financially viable and sustainable, at least in the short and medium-term. In the long term, however, the financial viability (hence sustainability) of organic broiler production system B will continue to be dependent on, in particular, future developments in the producer price for broiler meat and the organic price premium.

In conclusion, given that over 90% of producers currently produce broilers under organic broiler production system B in Austria, there is real evidence that organic production without the use of the derogation is viable and sustainable, at least in the short and medium term (Table 5.5).

5.3 France

5.3.1 Introduction

This Section provides an economic analysis of the sustainability of organic broiler meat production without the use of the derogation on sourcing non-organic livestock in France.

France has a relatively large organic poultry sector. In terms of production, Table 3.5 (Section 1.1.2) shows that France had the fourth highest share of poultry production certified as organic in the EU-25, with 3.2% of all poultry[95] in France being organic.

5.3.2 Availability of organic chicks to allow production without derogation

It is considered that (virtually, if not) all organic broiler production takes place utilising the derogation concerning the origin of animals with non-organic poultry being used. The general findings of the interviews with the French organic

95 i.e. total poultry

Table 5.5: Assessment of the sustainability of organic broiler production system B in Austria

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic broiler production system B.	
Criterion I: Organic production system B	>90% of production takes place in organic broiler production system B
Principle II: Viability of organic broiler production system B. From a producer demand perspective, organic broiler production system B *vis-à-vis* organic broiler production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic broiler production system C to organic broiler production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Although the transition to organic broiler production system B resulted in free-range non-organic systems becoming relatively more attractive, the profitability of organic broiler production system B has remained higher than that of non-organic systems.
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, there have been no barriers to transition.

Source: Agra CEAS.

poultry industry (see footnote 98) revealed that it is virtually impossible to source organic chicks for use in organic production system B in France.

That said, there are some aspects of the national legislation for organic broiler production in France that require higher standards in terms of the origin of chicks than that required under the EU Regulation. For example, non-organic chicks can only be brought into an organic poultry unit for meat production at one day old, unlike the EU Regulation that allows chicks to be brought in at up to three days old.

Despite the fact that there is currently no recognised production of organic day old chicks in France for use in organic production system B, the organic poultry industry has made some proposals to define rules for the production of organically reared day old chicks[96]. There is concern, however, that technical, sanitary and economic issues will limit the development of such organically reared poultry breeds/strains for meat production (ITAVI, 2005). The same concerns would be applied to any development in the availability of organic chicks.

Currently, the same poultry breeds are used for organic broiler production as for *Label Rouge*[97] production in France. These breeds are typically slow-growing non-organic strains. There are around twenty hatcheries involved in the production of such non-organic slow-growing strains of chicks, and only a few of these supply organically reared day old chicks for use in organic production system C.

96 The SYNALAF, which is the Union for all organic and label rouge producers, and the SNA (hatcheries Union) have made some proposals in order to define some rules for the production of organic day old chicks:
eggs are produced by parents which shouldn't have undergone any antibiotic treatments;
hatching eggs and day old chicks shouldn't have undergone any antibiotic treatments;
the complete rules of organic farming are implemented from the first day of life of the chick; and,
specific procedures for organic chicks should be implemented and checked by an audit made by the producer or the production organisation by the hatchery supplier.

97 Non-organic free range systems

Thus, although there are virtually no, if any, broiler meat produced under organic production system B in France, national legislation prevents French broiler producers from making full use of the derogation set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91, which permit non-organic chicks being brought in at 2 and 3 days of age (and thereafter managed organically).

5.3.3 Comparison of the performance of organic broiler production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[98].

5.3.3.1 Technical and economic performance

Data on the technical and economic performance of organic and non-organic broiler production in France is presented in Table 5.6. Given the importance of non-organic free-range broiler production in France under the Label Rouge system, technical and economic performance data for this system is also presented. Label Rouge broiler production systems are more comparable to organic systems, than the standard non-organic intensive production systems, as they tend to use the same breeds and slaughter birds at the same age.

Actual data on the technical and economic performance of organic broiler production system B does not exist in France given that virtually all organic broiler production uses chicks from non-organic parent-stock under organic broiler production system C. Accordingly, technical and economic performance data for organic broiler production system B has been estimated by Agra CEAS (Table 5.6) based on discussions held with industry stakeholders (see footnote 98). It is generally the view that moving from organic broiler production system C to organic broiler

98 including a farmers' association and the French organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 5.6: Technical and economic performance of broiler production in France

	Non-organic		Organic	
	'Standard'	Label Rouge	system C	system B
Average size of poultry flock[1]	33,000	4,400	4,000	4,000
Housing rate (animals per m²)	22	11	10	10
Bought-in chick performance data				
Age of bought-in chicks (days)	1	1	1	1
Liveweight of bought-in chicks (g)[2]	36-38	36-38	36-38	36-38
Broiler performance data				
Age at slaughter (days)	39.8	88.2	88.1	88.1
Liveweight at slaughter (kg)	1.91	2.23	2.15	2.15
Carcass (dead) weight (kg)	1.28	1.52	1.46	1.46
Killing out ratio (%)[3]	67%	68%	68%	68%
Number of birds managed per worker[4]	66,000	17,600	16,000	16,000
Rearing period (days)	40.2	88.2	88.1	88.1
Mortality rate over period (%)	4.3	3.2	3.5	3.5
Average growth rate per day (g)	48	25	24	24
Feed use per bird (kg)	3.55	7.04	7.00	7.00
Feed conversion ratio (:1)	1.86	3.16	3.25	3.25

Notes: 1 Based on the average size of the poultry houses - 1,500 m² for non-organic standard, 400 m² for the Label Rouge and 200 m² for organic poultry houses. A holding can have several poultry houses; 2 Day old chick weight depends on the egg weight; 3 Ready to cook (without giblets); 4 3,000 m² per worker for standard production, 1,600 m² for Label Rouge and organic production.

Source: Agra CEAS calculations based on ITAVI (2005) and interviews with industry stakeholders (see footnote 98).

production system B would have no effect on the technical and economic performance of broiler production *per se*.

5.3.3.2 Financial performance

Table 5.7 presents gross margin data (input costs, output prices and income) for a number of French organic and non-organic broiler production systems. As the vast majority of organic broiler production in France uses chicks from non-organic parent-stock, financial data for organic broiler production system B is not available. Based on discussions with the industry (see footnote 98), the only change to the cost

Table 5.7: Financial performance of broiler production in France

	Unit	Non-organic		Organic	
		'Standard'	Label Rouge	system C	system B
Revenue (€ per bird)					
Value of broiler	€/kg live weight	0.70	1.30	2.15	2.15
Value of broiler	€/bird	1.33	2.91	4.61	4.61
(Less cost of bought-in chicks)	€/bird	-0.23	-0.29	-0.29	-0.44
Total output	€/bird	1.10	2.62	4.32	***4.17***
Variable costs					
Feed	€/bird	0.80	1.46	2.91	3.84
Veterinary and medicine	€/bird	0.03	0.03	0.05	0.06
Heat and electricity	€/bird	0.05	0.10	0.10	0.14
Miscellaneous	€/bird	0.04	0.09	0.10	0.14
Total variable costs	€/bird	0.91	1.68	3.16	***4.17***
GROSS MARGIN	€/bird	0.19	0.94	1.16	***0.00***
	€/kg liveweight	0.10	0.42	0.54	***0.00***
Operating margin	%	17.3%	35.9%	26.9%	0.0%

Source: Agra CEAS calculations based on ITAVI (2005) and interviews with industry stakeholders (see footnote 98).

of broiler production under organic production system B would be an increase in the cost of bought-in chicks, which is in line with the findings of the other case studies.

5.3.4 *Viability of organic broiler production systems*

5.3.4.1 Profitability

As practically all organic broiler production in France currently uses chicks from non-organic parent-stock, there is no market or pricing information on the likely domestic cost of sourcing organic chicks for use in organic broiler production system B. Based on the financial performance data presented in Table 5.7, if the cost of chicks for use in organic broiler production system B amounts to more than €0.44 per chick, then broiler production under this organic system would not be profitable in terms of gross margin. This price represents the absolute maximum price on a gross margin basis that an economically rational producer would pay for organic chicks (in the medium to long-term), after which it no longer becomes profitable to produce organic broiler meat under organic production system B.

Table 5.8 quantifies the degree to which the profitability of organic broiler production under organic broiler production system B is sensitive to changes in the cost of chicks. A 10% change in the cost of chicks would, *ceteris paribus*, result

Table 5.8: Sensitivity analysis of the financial performance of organic broiler production system B in France

	Change in value	Impact on gross margin	
		€ per bird	%
Producer price	10%	0.29	30.8%
Organic producer price premium	10%	0.16	16.7%
Cost of chicks	10%	-0.03	-3.0%
Cost of feed	10%	-0.15	-15.4%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 5.9: Impact of broiler meat price and the organic premium on the gross margin of organic broiler production system B in France (€per kg liveweight)

Non-organic broiler meat price (€ per kg liveweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
3.0	1.84	2.49	3.13	3.78	4.42	5.07	5.71	6.36	7.00	7.65	8.29	8.94	9.58	10.23	10.87	11.52
2.8	1.41	2.01	2.62	3.22	3.82	4.42	5.02	5.63	6.23	6.83	7.43	8.03	8.64	9.24	9.84	10.44
2.6	0.98	1.54	2.10	2.66	3.22	3.78	4.34	4.89	5.45	6.01	6.57	7.13	7.69	8.25	8.81	9.37
2.4	0.55	1.07	1.58	2.10	2.62	3.13	3.65	4.16	4.68	5.20	5.71	6.23	6.74	7.26	7.78	8.29
2.2	0.12	0.59	1.07	1.54	2.01	2.49	2.96	3.43	3.91	4.38	4.85	5.32	5.80	6.27	6.74	7.22
2.0	-0.31	0.12	0.55	0.98	1.41	1.84	2.27	2.70	3.13	3.56	3.99	4.42	4.85	5.28	5.71	6.14
1.8	-0.74	-0.35	0.04	0.42	0.81	1.20	1.58	1.97	2.36	2.74	3.13	3.52	3.91	4.29	4.68	5.07
1.6	-1.17	-0.82	-0.48	-0.14	0.21	0.55	0.90	1.24	1.58	1.93	2.27	2.62	2.96	3.30	3.65	3.99
1.4	-1.60	-1.30	-1.00	-0.70	-0.39	-0.09	0.21	0.51	0.81	1.11	1.41	1.71	2.01	2.31	2.62	2.92
1.2	-2.03	-1.77	-1.51	-1.25	-1.00	-0.74	-0.48	-0.22	0.04	0.29	0.55	0.81	1.07	1.33	1.58	1.84
1.0	-2.46	-2.24	-2.03	-1.81	-1.60	-1.38	-1.17	-0.95	-0.74	-0.52	-0.31	-0.09	0.12	0.34	0.55	0.77
0.8	-2.89	-2.72	-2.54	-2.37	-2.20	-2.03	-1.86	-1.68	-1.51	-1.34	-1.17	-1.00	-0.82	-0.65	-0.48	-0.31
0.6	-3.32	-3.19	-3.06	-2.93	-2.80	-2.67	-2.54	-2.42	-2.29	-2.16	-2.03	-1.90	-1.77	-1.64	-1.51	-1.38
0.4	-3.75	-3.66	-3.58	-3.49	-3.40	-3.32	-3.23	-3.15	-3.06	-2.97	-2.89	-2.80	-2.72	-2.63	-2.54	-2.46

Source: Agra CEAS calculations.

in a 3.0% decrease in gross margin per bird. However, the profitability of broiler production is more sensitive to changes in market prices, with a 10% change in the price for broilers having, *ceteris paribus*, a 30.8% impact on profitability.

The extent to which the profitability of organic broiler production system B is dependent on the producer price for broiler meat and the organic premium is shown in Table 5.9. Under the financial assumptions presented and at the reported Label Rouge broiler meat price level of €1.30 per kg liveweight and with an organic price premium of 65%, organic broiler production system B breaks-even. Furthermore, it is evident from Table 5.9 that as the non-organic producer broiler meat price falls, the importance of the organic price premium to maintain profitability increases.

5.3.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 98) suggested that the transition from organic broiler production system C to organic broiler production system B would not involve any initial capital expenditure that would form a barrier to the transition.

5.3.4.3 Worthwhileness

Based on the information presented in Table 5.7, the break-even level of €0.44 per chick is 91% higher than the cost of non-organic chicks used in standard non-organic intensive systems (i.e. €0.23 per chick) and just 52% higher than the cost of non-organic chicks used in Label Rouge free-range systems (i.e. €0.29 per chick). In comparison, where markets do exist for organic chicks for use in organic broiler production system B (i.e. Austria and the UK) the relative price differential between non-organic and these organic chicks ranges from 139% in the UK to 148% in Austria. This might suggest that, *ceteris paribus*, the profitability of organic broiler production system B in France could be challenged.

Although the findings of the industry interviews suggest that consumers are unaware that chicks from non-organic parent-stock are used in organic systems (ITAVI, 2005), based on these costings the market for broiler meat produced under organic broiler production system B would, *ceteris paribus*, need to have a premium of 25.2% over organic broiler production system C to maintain the same level of profitability (gross margin). At the very least a premium of 20.4% would be required to maintain the same level of income as the Label Rouge free-range system, all other things being equal, and prevent producers converting back to this extensive system of non-organic farming (Table 5.10).

5.3.5 Sustainability of organic broiler production system B in France

The central tenet of this Study is that the economic sustainability of organic broiler production without derogation, i.e. producing broilers under organic production system B in the medium to long-term is dependent on two fundamental economic principles

Table 5.10: Breakeven analysis of organic broiler production system B in France

	% increase and breakeven value of broiler meat produced under organic system B
Increase in market price (premium) needed to produce a gross margin under organic broiler production system B identical to that produced under organic broiler production system C, based on an organic broiler production system B chick cost of €0.44 per chick.	25.2% to €5.77 per bird
Increase in market price (premium) needed to produce a gross margin under organic broiler production system B identical to that produced under the Label Rouge system.	20.4% to €5.55 per bird

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic chicks for use in organic production system B in France (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Under the assumptions presented, the transition from organic production system C to organic production system B would likely have a relatively large impact on profitability (in terms of gross margin). As long as the cost of organic chicks for use in organic production system B does not increase by more than 152% of the cost of non-organic Label Rouge chicks, then under this Criterion the transition from organic production system C to organic production system B would likely be sustainable, at least in the short-term. In the medium to long-term, sustainability of organic production system B in France was found to be highly sensitive to developments in the producer price for broiler meat.

  - Criterion III: Worthwhileness. Given that the profitability of non-organic Label Rouge systems was found to be relatively comparable with that of organic production system C, the transition from organic production system C to organic production system B in France is likely to reduce the financial attractiveness of organic broiler meat production under production system B. In the medium to long-term, the sustainability of organic production system B in France will likely be highly sensitive to developments in the organic price premium for broiler meat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  - Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B may not be financially viable (hence sustainable) because of the relative financial attractiveness of non-organic Label Rouge systems, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B will likely be highly dependent on future developments in the producer price for broiler meat and, in particular, the organic price premium.

In conclusion, the sustainability of organic production system B in France in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the availability of organic chicks for use in organic production system B at an economically viable price (Table 5.11).

Table 5.11: Assessment of the sustainability of organic production system B in France

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic broiler production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic broiler production system B
Principle II: Viability of organic broiler production system B. From a producer demand perspective, organic broiler production system B *vis-à-vis* organic broiler production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic broiler production system C to organic broiler production system B had a relatively large impact on profitability. Under the assumptions presented organic broiler production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Free-range non-organic systems were found to be more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

5.4 Germany

5.4.1 Introduction

This Section provides an economic analysis of the sustainability of organic broiler meat production without the use of the derogation on sourcing non-organic livestock in Germany.

Germany has a relatively large organic poultry sector, with 2.1% of all poultry[99] in Germany being organic. According to Table 3.5 (Section 1.1.2), Germany has the fifth highest share of its national poultry flock certified as organic in the EU-25.

5.4.2 Availability of organic chicks to allow production without derogation

In Germany, the majority of organic broiler production takes full advantage of the derogation on the origin of animals. However, the share of organic broiler production that doesn't make full use of the derogation on sourcing chicks from non-organic parent-stock is reported to vary significantly by Länder and by certification body. In total, a leading German University organic poultry specialist estimated that approximately 5% of all organic broilers in Germany are produced under organic production system B.

In practice, it is almost exclusively slow-growing hybrids which are used for organic broiler production. In general, these are imported from France as German producers tend to use intensive hybrids in their non-organic systems and therefore the gene pool[100] for such poultry strains in Germany is limited. In contrast, France has well established breeding companies[101] producing slow-growing hybrids for the French *Label Rouge* (non-organic) free-range production system.

5.4.3 Comparison of the performance of organic broiler production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[102].

5.4.3.1 Technical and economic performance

Data on the technical and economic performance of organic and non-organic broiler

99 i.e. total poultry

100 The issue of gene pool was discussed in Section 1.1.1.
101 Such as ISA, RedBro and Sasso.
102 including, an organic producers' association in Germany, University poultry and organic specialists, organic livestock consultants and the German organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 5.12: Technical and economic performance of broiler production in Germany

	Non-organic	Organic system C	Organic system B
Average size of poultry flock	42,062	n/a	n/a
Housing rate (animals per m^2)	21.46	7.9	7.9
Bought-in chick performance data			
Age of bought-in chicks (days)	1	1	1
Liveweight of bought-in chicks (g)	n/a	n/a	n/a
Broiler performance data			
Age at slaughter (days)	37.6	87.8	87.8
Liveweight at slaughter (kg)	1.947	n/a	n/a
Carcass (dead) weight (kg)	n/a	1.87	1.87
Killing out ratio (%)	n/a	n/a	n/a
Number of birds managed per worker	n/a	n/a	n/a
Rearing period (days)	n/a	n/a	n/a
Mortality rate over period (%)	3.58	2.9	2.9
Average growth rate per day (g)	51.6	n/a	n/a
Feed use per bird (kg)	3.44	n/a	n/a
Feed conversion ratio (:1)	1.77	n/a	n/a

Source: Agra CEAS calculations based on Schierhold and Pieper (2004), Hörning and Knierim (2004a and 2004b), Damme (2002), Hörning (2005) and interviews with industry stakeholders (see footnote 102).

production in Germany is presented in Table 5.12. Technical and economic performance data for these production systems has been estimated by Agra CEAS based on expert opinion from the industry interviews (see footnote 102). It is generally the view that moving from organic production system C to organic production system B would have no effect on the technical and economic performance of broiler production *per se*.

5.4.3.2 Financial performance

Table 5.13 presents gross margin data (input costs, output prices and income) for non-organic and organic broiler production systems in Germany. Based on the results of the industry interviews (see footnote 102), the only change to the cost of broiler production under organic production system B was considered to be an increase in the cost of bought-in chicks, which is in line with the findings of the other case studies.

As the majority of organic broiler production in Germany currently uses chicks from non-organic parent-stock, there is no market or pricing information on the likely domestic cost of sourcing organic chicks for use in organic production system B. If the premium for organic chicks for use under organic production system B in Germany is assumed to be in line with the price premiums reported in other countries where a defined market for such poultry exists (such as in the UK (139%) (Section 5.6) and in Austria (148%) (Section 5.2))[103], then the likely cost of organic chicks would be approximately €0.71/chick. This represents a premium of €0.42/chick (145%) on the cost of €0.29 for chicks used in organic production system C.

103 As there is already an established market for organic chicks for use in organic production system B in the UK, the price premium for these organic chicks over the price for non-organic chicks in the UK provides a benchmark on which this unknown variable can be assessed in the case study countries where no such market exists. In other words, assuming the economic law of one price applies throughout the EU, it is likely that when a market for organic chicks for use in organic production system B develops in other EU Member States, a similar price premium can be expected.

Table 5.13: Financial performance of broiler production in Germany

	Unit	Non-organic	Organic system C	Organic system B
Revenue (€ per bird)				
Value of broiler	€/kg live weight	0.76	2.15	2.15
Value of broiler	€/bird	1.47	4.61	4.61
(Less cost of bought-in chicks)	€/bird	-0.25	-0.29	-0.71
Total output	€/bird	1.22	4.32	***3.90***
Variable costs				
Feed	€/bird	0.76	2.84	2.84
Veterinary and medicine	€/bird	0.03	0.05	0.05
Heat and electricity	€/bird	0.02	0.10	0.10
Miscellaneous	€/bird	0.36		
Total variable costs	€/bird	1.19	2.99	***2.99***
GROSS MARGIN	€/bird	0.05	1.33	***0.91***
	€/kg live weight	0.03	0.62	***0.42***
Operating margin	%	4.1%	30.8%	23.3%

Source: Agra CEAS calculations based on Schierhold and Pieper (2004), Damme (2002), Redelberger (2004), Oekolandbau (2005), Hörning (2005) and interviews with industry stakeholders (see footnote 102).

5.4.4 Viability of organic broiler production systems

5.4.4.1 Profitability

As shown in Table 5.13, with an increase in the cost of chicks under organic production system B, broiler production remains profitable based on gross margins. However, the transition from organic production system C to organic production system B is shown to have a 31.6% impact on gross margin as a result of the higher chick cost, falling to €0.91 per bird. Accordingly, the operating margin falls from 30.8% to 23.3%.

Table 5.14 quantifies the degree to which profitability of organic broiler production under organic system B is sensitive to changes in the cost of organic chicks. A 10% change in the cost of chicks would, *ceteris paribus*, result in a 2.2% decrease in gross margin per bird. However, the profitability of broiler production is more sensitive to changes in market prices, with a 10% change in the price for broilers having, *ceteris paribus*, a 34.7% impact on profitability.

The extent to which the profitability of organic broiler production system B is dependent on the producer price for broiler meat and the organic premium is shown in Table 5.15. At the reported broiler meat price level of €0.76 per kg liveweight, a premium of around 120% is required for organic broiler production system B, *ceteris*

Table 5.14: Sensitivity analysis of the financial performance of organic broiler production system B in Germany

	Change in value	Impact on gross margin	
		€ per bird	%
Producer price	10%	0.46	34.7%
Organic producer price premium	10%	0.31	23.6%
Cost of chicks	10%	-0.03	-2.2%
Cost of feed	10%	-0.28	-21.4%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 5.15: Impact of broiler meat price and the organic premium on the gross margin of organic broiler production system B in Germany (€ per kg liveweight)

Non-organic broiler meat price (€ per kg liveweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
3.0	2.73	3.38	4.02	4.66	5.31	5.95	6.59	7.23	7.88	8.52	9.16	9.81	10.45	11.09	11.74	12.38
2.8	2.30	2.90	3.50	4.10	4.70	5.31	5.91	6.51	7.11	7.71	8.31	8.91	9.51	10.11	10.71	11.31
2.6	1.87	2.43	2.99	3.55	4.10	4.66	5.22	5.78	6.33	6.89	7.45	8.01	8.56	9.12	9.68	10.24
2.4	1.45	1.96	2.47	2.99	3.50	4.02	4.53	5.05	5.56	6.08	6.59	7.11	7.62	8.14	8.65	9.16
2.2	1.02	1.49	1.96	2.43	2.90	3.38	3.85	4.32	4.79	5.26	5.73	6.21	6.68	7.15	7.62	8.09
2.0	0.59	1.02	1.45	1.87	2.30	2.73	3.16	3.59	4.02	4.45	4.88	5.31	5.73	6.16	6.59	7.02
1.8	0.16	0.54	0.93	1.32	1.70	2.09	2.47	2.86	3.25	3.63	4.02	4.40	4.79	5.18	5.56	5.95
1.6	-0.27	0.07	0.42	0.76	1.10	1.45	1.79	2.13	2.47	2.82	3.16	3.50	3.85	4.19	4.53	4.88
1.4	-0.70	-0.40	-0.10	0.20	0.50	0.80	1.10	1.40	1.70	2.00	2.30	2.60	2.90	3.20	3.50	3.80
1.2	-1.13	-0.87	-0.61	-0.36	-0.10	0.16	0.42	0.67	0.93	1.19	1.45	1.70	1.96	2.22	2.47	2.73
1.0	-1.56	-1.34	-1.13	-0.91	-0.70	-0.48	-0.27	-0.06	0.16	0.37	0.59	0.80	1.02	1.23	1.45	1.66
0.8	-1.99	-1.81	-1.64	-1.47	-1.30	-1.13	-0.96	-0.78	-0.61	-0.44	-0.27	-0.10	0.07	0.24	0.42	0.59
0.6	-2.41	-2.29	-2.16	-2.03	-1.90	-1.77	-1.64	-1.51	-1.38	-1.26	-1.13	-1.00	-0.87	-0.74	-0.61	-0.48
0.4	-2.84	-2.76	-2.67	-2.59	-2.50	-2.41	-2.33	-2.24	-2.16	-2.07	-1.99	-1.90	-1.81	-1.73	-1.64	-1.56

Source: Agra CEAS calculations.

paribus, to remain profitable. Furthermore, it is evident from Table 5.15 that as the non-organic producer broiler meat price falls, the importance of the organic price premium increases.

5.4.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 102) suggested that the transition from organic broiler production system C to organic broiler production system B has not involved any initial capital expenditure that could have formed a barrier to the transition.

5.4.4.3 Worthwhileness

In an extreme scenario, based on the information presented in Table 5.13, the cost of organic chicks for use in organic broiler production system B would have to increase to €1.62 per chick, before *this* organic production system would become unprofitable (gross margin). At this break-even level, the cost of organic chicks for use in organic broiler production system B would be €1.37 (548%) higher than the cost of non-organic chicks used in standard non-organic intensive systems (€0.25 per chick) and €1.33 (457%) higher than the cost of chicks from non-organic parent-stock used in organic broiler production system C (€0.29 per chick). Putting this into context, in Austria, where organic broiler production system B already takes place, the cost of organic chicks used in this system is only 148% higher than the cost of non-organic chicks, at €0.72 per chick (Section 5.2). This would suggest that, *ceteris paribus*, even in an extreme scenario organic broiler production system B in Germany would remain profitable based on gross margin.

Table 5.16: Breakeven analysis of organic broiler production system B in Germany

	% increase and breakeven value of broiler meat produced under organic system B
Increase in market price (premium) needed to produce a gross margin under organic broiler production system B identical to that produced under organic broiler production system C.	9.1% to €5.03 per bird

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Although the findings of the industry interviews (see footnote 102) suggest that consumers are unaware that chicks from non-organic parent-stock are used in organic systems, based on these costs the market for broiler meat produced under organic broiler production system B would, *ceteris paribus*, need to have a premium of 9.1% over organic broiler production system C to maintain the same level of profitability (gross margin).

5.4.5 Sustainability of organic broiler production system B in Germany

The central tenet of this Study is that the economic sustainability of organic broiler production without derogation, i.e. producing broilers under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is limited availability of organic chicks for use in organic production system B in Germany (*5% of production was found to take place in organic broiler production system B*). Consequently, it is likely that producers will be unable to move from organic broiler production system C to organic broiler production system B in the short-term and sustain this system of production in the medium to long-term unless there is a greater availability of organic chicks for use in organic broiler production system B.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in Germany in the medium to long-term was found to be highly sensitive to developments in the producer price for broiler meat.

  – Criterion III: Worthwhileness. Organic production system B remained worthwhile under the assumption that the (*unknown*) cost of organic chicks for use in organic production system B is in line with those in countries where there is a developed market for such organic chicks. However, in the medium to long-term the sustainability of organic production system B in Germany was found to be highly sensitive to developments in the organic price premium for broiler meat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at

Table 5.17: Assessment of the sustainability of organic broiler production system B in Germany

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic broiler production system B	
Criterion I: Organic production system B	<5% of production takes place in organic broiler production system B
Principle II: Viability of organic broiler production system B. From a producer demand perspective, organic broiler production system B *vis-à-vis* organic broiler production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic broiler production system C to organic broiler production system B had a relatively large impact on profitability. Under the assumptions presented organic broiler production system B remained profitable (gross margin)
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic broiler production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition

Source: Agra CEAS.

least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for broiler meat and the organic price premium, in particular.

In conclusion, the sustainability of organic production system B in Germany in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the potential for the supply of organic chicks for use in organic production system B to increase (Table 5.17)

5.5 Italy

5.5.1 Introduction

This Section provides an economic analysis of the sustainability of organic broiler meat production without the use of the derogation on sourcing non-organic livestock in Italy.

The Italian organic poultry[104] sector is relatively small. In terms of production, Table 3.5 (Section 1.1.2) shows that 0.9% of all poultry[105] in Italy was organic, amounting to around 706,786 broilers in 2003. Compared with other EU Member States, Italy ranked ninth in terms of its share of poultry production certified as organic.

5.5.2 Availability of organic chicks to allow production without derogation

National legislation for organic broiler meat production in Italy is implemented in line with that required under the EU Regulation. It is the opinion of one organic certification body that all Italian poultry farmers make full use of the derogation and source three day old non-organic chicks. Accordingly, virtually all (if not all) organic broiler production in Italy takes place under organic production system B.

It is considered likely that some small-scale farms may be rearing their own organic chicks to use as replacements in organic production system B. However, according to an Italian organic University poultry specialist any such production would likely account for less than 1% of organic broiler production.

104 i.e. total poultry
105 i.e. total poultry

The findings of the discussion with the Italian organic University poultry specialist revealed that it is virtually impossible to source organic chicks for use in organic production system B in Italy. Of the 118 organic commercial poultry breeding units, none of the chicks sold for broiler production are currently suitable for use in organic production system B. Should the derogation on the use of non-organic chicks be removed, then it was noted during the industry interviews (see footnote 106) that in the short-term the industry would have to look to other EU markets to source its requirements.

Thus, Italian broiler producers tend to make full use of the derogation set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91. Accordingly, use is made of the derogation which allows non-organic chicks to be brought in at up to 3 days of age (and thereafter managed organically).

5.5.3 Comparison of the performance of organic broiler production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[106]

5.5.3.1 Technical and economic performance

Table 5.18 presents technical and economic performance data for organic and non-organic broiler production in Italy. As virtually all organic broiler production in Italy uses chicks from non-organic parent-stock in organic production system C, actual data on the technical and economic performance of organic production system B does not exist. Therefore, technical and economic performance data for organic

106 including organic certification bodies, an agricultural producers' association and University organic and poultry researchers (for a complete list, see Table 3.1, Section 3.5).

Table 5.18: Technical and economic performance of broiler production in Italy

	Non-organic	Organic	
		system C	system B
Average size of poultry flock	44,000[1]	2,866-4,800[1]	2,866-4,800[1]
Housing rate (animals per m²)	13.5	10 indoor and 0.25 in rotation outdoor	10 indoor and 0.25 in rotation outdoor
Bought-in chick performance data			
Age of bought-in chicks (days)	Few days	1	1
Liveweight of bought-in chicks (g)	40	40	40
Broiler performance data			
Age at slaughter (days)	60-70	81-90	81-90
Liveweight at slaughter (kg)	2.480	2.370[2]	2.370[2]
Carcass (dead) weight (kg)	n.a.	n.a.	n.a.
Killing out ratio (%)	n.a.	n.a.	n.a.
Number of birds managed per worker	187,000	50,000-100,000	50,000-100,000
Rearing period (days)	60	80	80
Mortality rate over period (%)	5.7	8.84	8.84
Average growth rate per day (g)	40.66	29,62	29,62
Feed use per bird (kg)	5.20	7.58	7.58
Feed conversion ratio (:1)	2.10	3.2	3.2

Notes: 1 Number of head per barn per cycle; there are 4.7 cycles in non-organic systems and 3.5 in organic production system C; 2 It is also common for organic poultry to be slaughtered at 3.5 kg live weight.

Source: Agra CEAS calculations based on CRPA (2005) and interviews with industry stakeholders (see footnote 106).

production system B has been estimated based on the opinion of the aforementioned industry stakeholders (see footnote 106). As shown in Table 5.18, it is unlikely that the technical and economic performance of organic production system B would differ from that of organic production system C.

5.5.3.2 Financial performance

Table 5.19 presents gross margin data (input costs, output prices and income) for organic and non-organic broiler production systems in Italy. Since virtually all organic broiler production in Italy uses chicks from non-organic parent-stock, financial data for organic production system B is not available. However, the views from the industry interviews (see footnote 106) were unanimous in that the only change to the cost of broiler production under organic production system B would likely be an increase in the cost of bought-in chicks. This was in line with the findings of the other case studies.

As there is no *real* supply of, or demand for, organic chicks for use in organic production system B in Italy at present, Table 5.19 assumes a range of scenarios to quantify the likely financial performance of broiler meat production under organic production system B. In Austria and the UK the relative price differentials between non-organic chicks and organic chicks used in organic production system B are 148% and 139%, respectively (see Sections 5.2 and 5.6). On the assumption that the markets for organic chicks for use in organic production system B in these two countries are relatively well developed, from an economic perspective this price differential should reflect the true cost difference for breeding such organic chicks (see footnote 103). The fact that these percentage increases are so close would tend to qualify this assumption. Thus, in Table 5.19 the cost of organic chicks for use in organic production system B is assumed to be (€0.91 per chick) 145% higher than the cost of chicks from non-organic parent-stock (€0.38 per chick), with a range of ± 20% (€0.73 to €1.09).

Table 5.19: Financial performance of broiler production in Italy

	Unit	Non-organic	Organic system C	Organic system B
Revenue (€ per bird)				
Value of broiler	€/kg live weight	0.82	1.82	1.82
Value of broiler	€/bird	2.03	4.31	4.31
(*Less cost of bought-in chicks*	€/bird	-0.38	-0.45	-0.91 (-0.73 to -1.09)
Total output	€/bird	1.65	3.86	***3.40 (3.22 to 3.58)***
Variable costs				
Feed	€/bird	1.18	2.54	2.54
Veterinary and medicine	€/bird	0.05	0.14	0.14
Heat and electricity	€/bird	0.08	0.12	0.12
Miscellaneous	€/bird	0.05	0.06	0.06
Total variable costs	€/bird	1.36	2.86	***2.86***
GROSS MARGIN	€/bird	0.29	1.00	***0.54 (0.36 to 0.72)***
	€/kg live weight	0.12	0.42	***0.23***
Operating margin	%	17.6%	25.9%	15.9%

Source: Agra CEAS calculations based on CRPA (2005) and interviews with industry stakeholders (see footnote 106).

5.5.4 *Viability of organic broiler production systems*

5.5.4.1 Profitability

Based on these assumptions, the price differential for bought-in chicks between systems has a significant impact on the economics of broiler production. The transition from organic production system C to organic production system B has a negative impact on profitability, with gross margins falling from €1.00 to €0.54 per bird. Accordingly, the operating margin falls from 25.9% to 15.9%.

As a result, the profitability of broiler production under organic production system B is more sensitive to changes in the cost of chicks than under organic production system C. Table 5.20 quantifies the degree to which profitability of organic broiler production under organic production system B is sensitive to changes in the cost of chicks. A 10% change in the cost of chicks would, *ceteris paribus*, result in a 4.5% decrease in gross margin per bird. However, the profitability of organic broiler production is more sensitive to changes in market prices, with a 10% change in the price for broilers having, *ceteris paribus*, a 43.1% impact on profitability.

The extent to which the profitability of broiler production under organic production system B is dependent on the producer price for broiler meat

Table 5.20: Sensitivity analysis of the financial performance of organic broiler production system B in Italy

	Change in value	Impact on gross margin	
		€ per bird	%
Producer price	10%	0.43	43.1%
Organic producer price premium	10%	0.23	22.8%
Cost of chicks	10%	-0.05	-4.5%
Cost of feed	10%	-0.25	-25.4%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 5.21: Impact of broiler meat price and the organic premium on the gross margin of organic broiler production system B in Italy (€ per kg liveweight)

		Organic price premium (%)															
		0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
Non-organic broiler meat price (€ per kg liveweight)	3.0	3.34	4.05	4.76	5.47	6.18	6.90	7.61	8.32	9.03	9.74	10.45	11.16	11.87	12.58	13.29	14.01
	2.8	2.87	3.53	4.19	4.86	5.52	6.18	6.85	7.51	8.17	8.84	9.50	10.17	10.83	11.49	12.16	12.82
	2.6	2.39	3.01	3.62	4.24	4.86	5.47	6.09	6.71	7.32	7.94	8.55	9.17	9.79	10.40	11.02	11.64
	2.4	1.92	2.49	3.06	3.62	4.19	4.76	5.33	5.90	6.47	7.04	7.61	8.17	8.74	9.31	9.88	10.45
	2.2	1.44	1.97	2.49	3.01	3.53	4.05	4.57	5.09	5.62	6.14	6.66	7.18	7.70	8.22	8.74	9.27
	2.0	0.97	1.44	1.92	2.39	2.87	3.34	3.81	4.29	4.76	5.24	5.71	6.18	6.66	7.13	7.61	8.08
	1.8	0.50	0.92	1.35	1.78	2.20	2.63	3.06	3.48	3.91	4.34	4.76	5.19	5.62	6.04	6.47	6.90
	1.6	0.02	0.40	0.78	1.16	1.54	1.92	2.30	2.68	3.06	3.43	3.81	4.19	4.57	4.95	5.33	5.71
	1.4	-0.45	-0.12	0.21	0.54	0.88	1.21	1.54	1.87	2.20	2.53	2.87	3.20	3.53	3.86	4.19	4.53
	1.2	-0.93	-0.64	-0.36	-0.07	0.21	0.50	0.78	1.06	1.35	1.63	1.92	2.20	2.49	2.77	3.06	3.34
	1.0	-1.40	-1.16	-0.93	-0.69	-0.45	-0.22	0.02	0.26	0.50	0.73	0.97	1.21	1.44	1.68	1.92	2.16
	0.8	-1.87	-1.68	-1.49	-1.31	-1.12	-0.93	-0.74	-0.55	-0.36	-0.17	0.02	0.21	0.40	0.59	0.78	0.97
	0.6	-2.35	-2.21	-2.06	-1.92	-1.78	-1.64	-1.49	-1.35	-1.21	-1.07	-0.93	-0.78	-0.64	-0.50	-0.36	-0.22
	0.4	-2.82	-2.73	-2.63	-2.54	-2.44	-2.35	-2.25	-2.16	-2.06	-1.97	-1.87	-1.78	-1.68	-1.59	-1.49	-1.40

Source: Agra CEAS calculations.

and the organic premium is shown in Table 5.21. At the reported broiler meat price level of €0.82 per kg liveweight, a premium of at least 100% is required for organic production system B, *ceteris paribus,* to remain profitable. Furthermore, it is evident from Table 5.21 that as the non-organic producer broiler meat price falls, the importance of the organic price premium increases.

5.5.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 106) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that would form a barrier to the transition.

5.5.4.3 Worthwhileness

Given the impact of changes in the price of day old chicks on income, it is not surprising that the cost of sourcing organic chicks for use in organic production system B has important implications for the profitability of adopting such an organic system of broiler production. Gross margin per bird falls to €0.54 per bird under organic production system B compared to €1.00 per bird under organic production system C. Although the gross margin per bird is still significantly higher than in non-organic systems (€0.29 per bird), these systems typically have lower overhead costs.

Based on discussions with industry interviews (see footnote 106), it is unlikely that there would be any other differences in the variable costs or market prices for organic broiler meat between the organic production systems C and B. Discussions with an Italian University poultry specialist suggested that Italian consumers were unaware that chicks from non-organic parent-stock were used in organic systems and therefore no separate market for broiler meat produced under organic production system B exists in Italy. If a separate market did exist then, *ceteris paribus*, to maintain the same level of profitability as organic production system C, the market price for broiler meat produced under organic production system B would need to have a premium of 10.7% over organic production system B (Table 5.22).

5.5.5 Sustainability of organic broiler production system B in Italy

The central tenet of this Study is that the economic sustainability of organic broiler production without derogation, i.e. producing broilers under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic chicks for use in organic production system B in Italy (i.e. *<1% of production was found to take place in organic broiler production system B*). Consequently, it is likely that producers will be unable to move from organic broiler production system C to organic broiler production system B in the short-term and sustain this system of production in the medium to long-term.

Table 5.22: Breakeven analysis of organic broiler production system B in Italy

	% increase and breakeven value of broiler meat produced under organic system B
Increase in market price (premium) needed to produce a gross margin under organic production system B identical to that produced under organic production system C.	10.7% to €4.77 per bird

Notes: assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic broiler production system C to organic broiler production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic broiler production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic broiler production system C to organic broiler production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic broiler production system B in Italy in the medium to long-term was found to be highly sensitive to developments in the producer price for broiler meat.

  – Criterion III: Worthwhileness. Organic broiler production system B remained worthwhile under the assumption that the (*unknown*) cost of organic chicks for use in organic broiler production system B is in line with those in countries where there is a developed market for such organic chicks. However, in the medium to long-term the sustainability of organic broiler production system B in Italy was found to be highly sensitive to developments in the organic price premium for broiler meat. That said, given the impact on profitability from a transition to organic broiler production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic broiler production system C to organic broiler production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic broiler production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic broiler production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence

Table 5.23: Assessment of the sustainability of organic broiler production system B in Italy

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic broiler production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic broiler production system B
Principle II: Viability of organic broiler production system B. From a producer demand perspective, organic broiler production system B *vis-à-vis* organic broiler production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic broiler production system C to organic broiler production system B had a relatively large impact on profitability. Under the assumptions presented organic broiler production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic broiler production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

sustainability) of organic broiler production system B was found to be highly dependent on future developments in the producer price for broiler meat and the organic price premium, in particular.

In conclusion, the sustainability of organic broiler production system B in Italy in the medium to long-term will be affected by the relative financial attractiveness of non-organic free-range systems (under the assumptions presented) as well as the availability of organic chicks for use under organic broiler production system B (Table 5.23)

5.6 United Kingdom

5.6.1 Introduction

This Section provides an economic analysis of the sustainability of organic broiler meat production without the use of the derogation on sourcing non-organic livestock in the UK.

The UK organic poultry[107] sector is relatively well developed. In terms of production, Table 3.5 (Section 1.1.2) shows that 1.4% of all poultry[108] in the UK was organic (Section 2). Compared with other EU Member States, the UK ranked sixth in terms of its share of broiler production certified as organic. Specifically concerning broilers, according to Defra (2005), there were around 1.1 million organic broilers in the UK in 2003.

5.6.2 Availability of chicks to allow production without derogation

The majority of UK production of organic broilers also takes place under organic production system B with chicks from non-organic parent-stock being used. However, organic broilers produced by producers who are certified by the *Soil Association* do not necessarily make full use of the derogation. The Soil Association production standards require their certified producers to source organic chicks suitable for organic production system B, unless they are not available and they have permission from the Soil Association in which case they must have a plan in place for sourcing such organic chicks in the future.

Thus, Soil Association certified producers either have the system in place for rearing their own organic chicks or source them from organic breeding units that rearing organic chicks suitable for organic production system B. It is therefore believed that 10-15% of organic broiler production in the UK currently does not take advantage of the derogation permitting the use of non-organic chicks.

While the supply of chicks for organic production system B in the UK has developed in response to the higher standards imposed by the Soil Association on its certified producers, it is reported that suppliers of such organic chicks are not yet producing to capacity. Therefore, there is the potential to increase supply further should demand exist.

To facilitate trade in organic livestock, the Soil Association has set up a web-based organic marketplace[109], which it claims is the UK's biggest searchable directory of organic livestock for use in organic production system B. This service is free and available to all organic farmers, regardless of their organic certification body.

5.6.3 Comparison of the performance of organic broiler production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[110]

107 i.e. total poultry
108 i.e. total poultry

109 http://www.soilassociation.org/organicmarketplace
110 including UK organic certification bodies and University researchers (for a complete list, see Table 3.1, Section 3.5).

Table 5.24: Technical and economic performance of broiler production in the UK

	Non-organic		Organic	
	'standard'	free-range	system C	system B
Average size of poultry flock	116,544	21,633		
Housing rate (animals per m²)				
Bought-in chick performance data				
Age of bought-in chicks (days)	1	1	1	1
Liveweight of bought-in chicks (g)	40	40	40	40
Broiler performance data				
Age at slaughter (days)	48	56	81	81
Liveweight at slaughter (kg)	2.3	2.4	3.0	3.0
Carcass (dead) weight (kg)	1.61	1.68	1.4	1.4
Killing out ratio (%)	70	70	70	70
Number of birds managed per worker				
Rearing period (days)	48	56	81	81
Mortality rate over period (%)	3.8	6.3	10.0	10.0
Average growth rate per day (g)	49	43	37	37
Feed use per bird (kg)	4.37	5.28	8.5	8.5
Feed conversion ratio (:1)	1.9	2.2	2.8	2.8

Source: Agra CEAS calculations based on Nix (2004), Lampkin, et al. (2004), Sheppard (2004), Elliot, et al. (2003), Lampkin (1997) and interviews with industry stakeholders (see footnote 110).

5.6.3.1 Technical and economic performance

Table 5.24 presents technical and economic performance data for organic and non-organic broiler production in the UK. In recent years there has been a growing volume of poultry being produced under organic production system B using organic chicks. Accordingly, actual data on technical and economic performance has been recorded for both organic production systems C and B. According to discussions with an organic certification body, technical and economic performance of the two organic systems does not generally differ.

5.6.3.2 Financial performance

Gross margin data (input costs, output prices and income) for organic and non-organic broiler production systems in the UK is presented in Table 5.25. The only difference in costs between organic production systems C and B relate to the cost of bought in chicks. In the UK, the cost of organic chicks for use in organic production system B (€0.81 per chick) is 139% higher than the cost of chicks from non-organic parent-stock (€0.34 per chick).

5.6.4 Viability of organic broiler production systems

5.6.4.1 Profitability

The difference in the cost of chicks between systems has a significant impact on the economics of broiler production in terms of the relative importance of bought-in chicks as a proportion of total variable costs and gross margin. Under organic broiler production system B, the cost of day old chicks accounts for 16% of total variable costs and 15% of gross margin. This compares to 7% and 6% for organic broiler production system C.

This increased cost associated with sourcing organic chicks for use in organic broiler production system B has important implications for the profitability of organic broiler production under this system. Gross margin falls to €3.94 per bird under organic broiler production system B compared to €5.88 per bird under organic broiler production system C. Accordingly, the operating margin falls from 57.9% to 40.7%.

Table 5.25: Financial performance of broiler production in the UK1

	Unit	Non-organic	Organic	
			system C	system B
Revenue (€ per bird)				
Value of broiler	€/kg live weight	2.08	3.50	3.50
Value of broiler	€/bird	4.79	10.49	10.49
(*Less cost of bought-in chicks*	€/bird	-0.34	-0.34	-0.81
Total output	€/bird	4.46	10.15	***9.68***
Variable costs				
Feed	€/bird	1.21	4.19	4.19
Veterinary and medicine	€/bird	0.06	0.07	0.07
Heat and electricity	€/bird			
Miscellaneous	€/bird	1.21	0.00	0.00
Total variable costs	€/bird	2.47	4.26	***4.26***
GROSS MARGIN	€/bird	1.99	5.88	***5.41***
	€/kg live weight	0.86	1.96	***1.80***
Operating margin	%	44.6%	57.9%	55.9%
Cost of chicks as a % of gross margin	%	17.0%	5.8%	14.7%
Cost of chicks as a % of variable cost	%	12.0%	7.3%	15.9%

Note: 1 Based on a €:£ exchange rate of 0.6800.

Source: Agra CEAS calculations based on Nix (2004), Lampkin, et al (2004), Sheppard (2004), Elliot, et al (2003), Lampkin (1997) and interviews with industry stakeholders (see footnote 110).

Table 5.26: Sensitivity analysis of the financial performance of organic broiler production system B in the UK

	Change in value	Impact on gross margin	
		€ per bird	%
Producer price	10%	1.05	17.8%
Organic producer price premium	10%	0.57	9.7%
Cost of chicks	10%	-0.03	-0.6%
Cost of feed	10%	-0.42	-7.1%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

As a result, the profitability of broiler production under organic broiler production system B is more sensitive to changes in the cost of chicks than under organic production system C. Table 5.26 quantifies the degree to which profitability of broiler production is sensitive to changes in the cost of chicks. A 10% change in the cost of chicks would, *ceteris paribus*, result in a 0.6% decrease in gross margin per bird. However, the profitability of broiler production is most sensitive to changes in market prices, with a 10% change in the price for broilers having, *ceteris paribus*, a 17.8% impact on profitability.

The extent to which the profitability of organic broiler production system B is dependent on the producer price for broiler meat and the organic premium is shown in Table 5.27. At the reported broiler meat price level of €2.08 per kg liveweight, broiler meat production under organic production system B is profitable without an organic price premium. However, if the price was to fall to below €1.65 per kg liveweight, then the importance of the organic price premium increases.

5.6.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 110) suggested that the transition from organic broiler production system C to organic broiler production system B has not involved any initial capital expenditure that could have formed a barrier to the transition.

Table 5.27: Impact of broiler meat price and the organic premium on the gross margin of organic broiler production system B in the UK (€ per kg liveweight)

Non-organic broiler meat price (€ per kg liveweight)	Organic price premium (%) 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
4.4	8.31	9.63	10.96	12.28	13.60	14.93	16.25	17.57	18.90	20.22	21.54	22.87	24.19	25.51	26.84	28.16
4.1	7.43	8.66	9.90	11.13	12.37	13.60	14.84	16.07	17.31	18.54	19.78	21.01	22.25	23.49	24.72	25.96
3.8	6.54	7.69	8.84	9.99	11.13	12.28	13.43	14.57	15.72	16.87	18.01	19.16	20.31	21.46	22.60	23.75
3.5	5.66	6.72	7.78	8.84	9.90	10.96	12.01	13.07	14.13	15.19	16.25	17.31	18.37	19.43	20.49	21.54
3.2	4.78	5.75	6.72	7.69	8.66	9.63	10.60	11.57	12.54	13.51	14.49	15.46	16.43	17.40	18.37	19.34
2.9	3.90	4.78	5.66	6.54	7.43	8.31	9.19	10.07	10.96	11.84	12.72	13.60	14.49	15.37	16.25	17.13
2.6	3.01	3.81	4.60	5.40	6.19	6.99	7.78	8.57	9.37	10.16	10.96	11.75	12.54	13.34	14.13	14.93
2.4	2.13	2.84	3.54	4.25	4.96	5.66	6.37	7.07	7.78	8.49	9.19	9.90	10.60	11.31	12.01	12.72
2.1	1.25	1.87	2.49	3.10	3.72	4.34	4.96	5.57	6.19	6.81	7.43	8.04	8.66	9.28	9.90	10.51
1.8	0.37	0.90	1.43	1.96	2.49	3.01	3.54	4.07	4.60	5.13	5.66	6.19	6.72	7.25	7.78	8.31
1.5	-0.51	-0.07	0.37	0.81	1.25	1.69	2.13	2.57	3.01	3.46	3.90	4.34	4.78	5.22	5.66	6.10
1.2	-1.40	-1.04	-0.69	-0.34	0.01	0.37	0.72	1.07	1.43	1.78	2.13	2.49	2.84	3.19	3.54	3.90
0.9	-2.28	-2.01	-1.75	-1.49	-1.22	-0.96	-0.69	-0.43	-0.16	0.10	0.37	0.63	0.90	1.16	1.43	1.69
0.6	-3.16	-2.99	-2.81	-2.63	-2.46	-2.28	-2.10	-1.93	-1.75	-1.57	-1.40	-1.22	-1.04	-0.87	-0.69	-0.51

Source: Agra CEAS calculations.

5.6.4.3 Worthwhileness

As shown in Table 5.25, the increased cost associated with sourcing organic chicks for use in organic broiler production system B causes gross margin to fall to €3.94 per bird under such an organic production system. However, gross margin per bird is still significantly higher than in non-organic systems (€1.99 per bird), although these systems typically have lower overhead costs.

Discussions with an organic certification body revealed that the industry believed there to be no other differences in the cost structure or market price for organic broiler meat between organic broiler production systems C and B. Discussions with two organic certification bodies found no evidence that UK consumers were aware that chicks from non-organic parent-stock were used in organic systems. Consequently, there is no separate market in the UK for broiler meat produced under organic broiler production system B. If a separate market did exist then, *ceteris paribus*, to maintain the same level of income as organic broiler production system C, the market price for broiler meat produced under organic broiler production system B would need to have a premium of 4.5% over organic broiler production system C (Table 5.28).

5.6.5 Sustainability of organic broiler production system B in the UK

The central tenet of this Study is that the economic sustainability of organic broiler production without derogation, i.e. producing broilers under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

Table 5.28: Breakeven analysis of organic broiler production system B in the UK

	% increase and breakeven value of broiler meat produced under organic system B
Increase in market price (premium) needed to produce a gross margin under organic broiler production system B identical to that produced under organic broiler production system C.	4.5% to €10.96per bird

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is availability of organic chicks for use in organic production system B in the UK (i.e. *10-15% of production was found to take place in organic production system B*). Evidence suggests that availability is developing in line with demand to allow producers to move from organic production system C to organic production system B in the short-term. If this supply base continues to expand, then it is likely that organic production system B would remain sustainable in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although evidence suggests that the transition from organic production system C to organic production system B has had a relatively large impact on profitability in the UK, organic broiler production system B remains profitable (in terms of gross margin). Based on this Criterion, there is real evidence that the transition from organic production system C to organic production system B is sustainable in the short to medium term. In the longer-term, it is likely that sustainability will be influenced by developments in the producer price for broiler meat.

  – Criterion III: Worthwhileness. Under the assumptions presented, the profitability of organic production system B remained higher than that of non-organic systems. This provides real evidence that organic production system B remains worthwhile in the short to medium term. In the longer-term, it is likely that viability and sustainability will be influenced by developments in the organic price premium for broiler meat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would

Table 5.29: Assessment of the sustainability of organic broiler production system B in the UK

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic broiler production system B.	
Criterion I: Organic production system B	10-15% of production takes place in organic broiler production system B
Principle II: Viability of organic broiler production system B. From a producer demand perspective, organic broiler production system B *vis-à-vis* organic broiler production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic broiler production system C to organic broiler production system B had a relatively large impact on profitability. Under the assumptions presented organic broiler production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic broiler production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

Table 5.30: Estimated share of organic broiler production under organic production system B as a % of total organic egg production[1]

	%
Austria	>90%
France	<1%
Germany	5%
Italy	<1%
United Kingdom	10-15%

Notes: 1 i.e. production not taking advantage of the derogation on the origin of animals.

Source: Country case studies (Section 5.2 to 5.6).

be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that there is real evidence that organic production system B is financially viable and sustainable, at least in the short and medium-term. In the long term, however, the financial viability (hence sustainability) of organic production system B will continue to be dependent on, in particular, future developments in the producer price for broiler meat and the organic price premium.

In conclusion, given that 10-15% of producers currently produce broilers under organic production system B in the UK, there is real evidence that this organic broiler production system is viable and sustainable, at least in the short term, despite the relative financial attractiveness of non-organic free-range systems (Table 5.29).

5.7 Overall conclusions on the economic sustainability of organic broiler production without the use of the derogation on sourcing non-organic livestock

In recent years there have been a growing number of organic broilers produced without the use of the derogation on sourcing non-organic livestock (i.e. organic broiler production system B). Based on the results of the availability of organically reared livestock and the *viability* of organic broiler production without the use of the derogation in the selected case study countries, a number of generalised conclusions can be drawn as to the '*economic sustainability*' of organic broiler production system B:

- Most countries make use of the derogation as set out in Annex I, Part B.3 of Council Regulation (EC) No 1804/1999 on sourcing non-organic chicks, although the extent to which the derogation is used to its limit varies considerably by Member State. In summary, organic broiler production in both France and Italy makes almost full use of the derogation on sourcing non-organic chicks. In contrast, almost all organic broiler production in Austria takes place without the use of the derogation (i.e. organic production system B) using suitable organic chicks. In the UK and Germany, while the majority of organic broiler production still takes advantage of the derogation on the origin of animals, there is a growing share of organic broiler production which now uses suitable organic chicks for use in organic production system B (Table 5.30).

- In those countries where organic broiler production takes place under organic production system B, this production has tended to evolve in response to specific national or certification body rules within those countries which prevent producers from taking full advantage of the derogation on the origin of animals.

In contrast, in those countries where national law and certification bodies permit the use of this derogation, organic production using non-organic livestock has continued. In general, the industry interviews found that the main reasons put forward to explain why producers in the case study countries still take advantage of this derogation and use non-organic animals were due to a low availability of suitable organic chicks and the expected impact on profitability from purchasing these chicks at a higher cost.

- In terms of technical and economic performance, no evidence was found that the transition from organic production system C to organic production system B would have any impact on performance, unless there were major adjustments to the production system (such as an expansion/contraction of the enterprise, a change in the strains used, etc.). In such a case, any resulting change would be attributable to these adjustments rather than the transition *per se*. In the medium to long-term there may, however, be some loss in potential genetic gain, as closed flocks, in particular, are unlikely to be able to maintain the same level of genetic improvement in their breeding programmes over time relative to that achieved in non organic commercial breeding flocks. Thus, this would result in a widening of the technical and economic performance gap between non-organic and organic systems in the medium to long-term.

- As the transition from organic production system C to organic production system B did not entail a change in labour requirement (e.g. the number of birds managed, and the average weight of birds at slaughter, per person), the economic sustainability of the farming systems in terms of labour productivity would remain unchanged. Any change in labour productivity when expressed on a financial basis (i.e. in terms of added value per working unit) would therefore be directly attributable to the impact of any change in income (gross margin) following the transition to organic production system B.

- Looking at the impact of the transition from organic production system C to organic production system B on gross margin, the only resulting quantifiable impact concerned an increase in cost of suitable organic chicks and thus on profit (gross margin). Based on the gross margin analysis, this transition had a relatively large impact on profitability, with gross margins in some countries falling to similar levels as those achieved by free-range non-organic systems. However, there was real evidence that organic production system B was sustainable, at least in the short term, in some countries, particularly in Austria and the UK, where many producers do not take advantage of the derogation on the origin of animals.

- The profitability of organic production system B was more sensitive to changes in market prices for organic products than the cost of suitable organic chicks *per se*. The sustainability of organic production system B in the long-term will therefore be dependent on the evolution of the price premium for organic produce relative to non-organic produce and the associated price and demand elasticities.

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6. Economic sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock

6.1 Introduction

This Section presents an economic analysis of the (likely) *economic sustainability* of organic pig production without the use of the derogation on sourcing non-organic livestock compared to organic production systems that use the derogation and non-organic systems in seven Member States:

- Czech Republic;
- Denmark;
- France;
- Germany;
- Netherlands;
- Portugal; and,
- United Kingdom

The specific definitions of each of the organic production systems, with respect to organic pig production, that have been used in this Study were defined in Sections 1.1.2 and 3.3 and are repeated in Box 6.1.

6.1.1 Brief overview of pig production systems in the EU

Pig production systems in the EU are normally classified according to the type of pig produced, which depends on the stage of production. In general, there are three common production systems, which vary significantly both within and between Member States:

Box 6.1: Definition of the organic pig production systems

Organic pig production system A is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of any of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) (origin of animals) which permit non-organic gilts to be brought into an organic production unit when a herd is renewed, restocked or reconstituted.

Organic pig production system B is defined as those pig production systems which do not take advantage of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) for production animals. But for reproduction (i.e. breeding) purposes these systems permit non-organic gilts to be brought into an organic reproduction unit when a herd is renewed, restocked or reconstituted, provided that this is restricted to breeding animals. Thus, organic pig production system B is defined as one where:

- organic breeding gilts reared from parent (multiplier/reproduction) herds that are under permanent organic management, are brought into production herds. The production piglets are born and reared in the organic production herd. The breeding gilts brought into the parent herds are reared from grandparent herds that need not be managed organically. For in-herd multiplication (nucleus herds), organic breeding gilts must have been brought in.

Organic pig production system C is defined as those livestock farming systems which permit non-organic production and breeding livestock to be brought into an organic production unit when a herd is renewed, restocked or reconstituted in line with the derogations foreseen in Annex I, Part B, No. 3.4, 3.6, 3.8, 3.9, 3.10 and 3.11. Thus, organic pig production system C is defined as one where:

- non-organic gilts are brought into production herds for breeding and thereafter managed organically. The production herds are under permanent organic management. Their parent herds need not be managed organically.

- **Sow herds or breeding herds**, which produce *piglets (or weaners)* for sale to other farms for fattening. Breeding herds generally sell the weaners at between 20kg and 35kg liveweight, approximately 9-12 weeks of age. However, this varies considerably between Member States. Although some piglet production herds breed their own replacement sow stock, it is usual to purchase these animals from specialist breeders. Young females (gilts) and boars are generally bought at between 5 and 6 months of age, although they can be purchased earlier and reared on-farm within the herd.

- **Fattening herds, finishing herds or feeding herds**, which produce *slaughter pigs* produced from purchased piglets from sow/breeding herds. Slaughter pigs in most Member States are usually sold onto the market at an average of 120 kg liveweight. In some Member States such as Denmark, Spain and the UK the average is lower partially because of the importance of bacon production that requires a lighter pig. Thus in the UK slaughter pigs are usually sold at around 97 kg liveweight. By contrast, in other Member States such as Italy where ham production is particularly important, pigs are sold at heavier weights of around 150kg liveweight.

- **Farrowing to finishing herds or breeding and feeding herds**, which produce and fatten *piglets (or weaners)* on the same farm for slaughter. Larger units will generally operate continually, i.e., farrowings, weanings and servicing will take place every week (smaller units will operate sequentially with the production cycles of all sows synchronised). An alternative, and increasingly popular method, involves separating sows into divisions farrowing at three week intervals. This method allows the stockman to concentrate on each stage of production in turn. Large units will keep each division completely separate and will thoroughly clean facilities between batches to reduce the risk of cross-infection. On some farms, each type of pig (sows, weaned piglets and finishing pigs) are kept on different sites to prevent disease transmission between pigs of different ages.

The above three types of pig production systems may be kept either outdoors or indoors. The majority of pigs in the EU are kept indoors in intensive units with high capital investment in specialist buildings and equipment. A small, but increasing, proportion of pigs are kept outdoors in low cost units where the selection of breed and stocking density is more important.

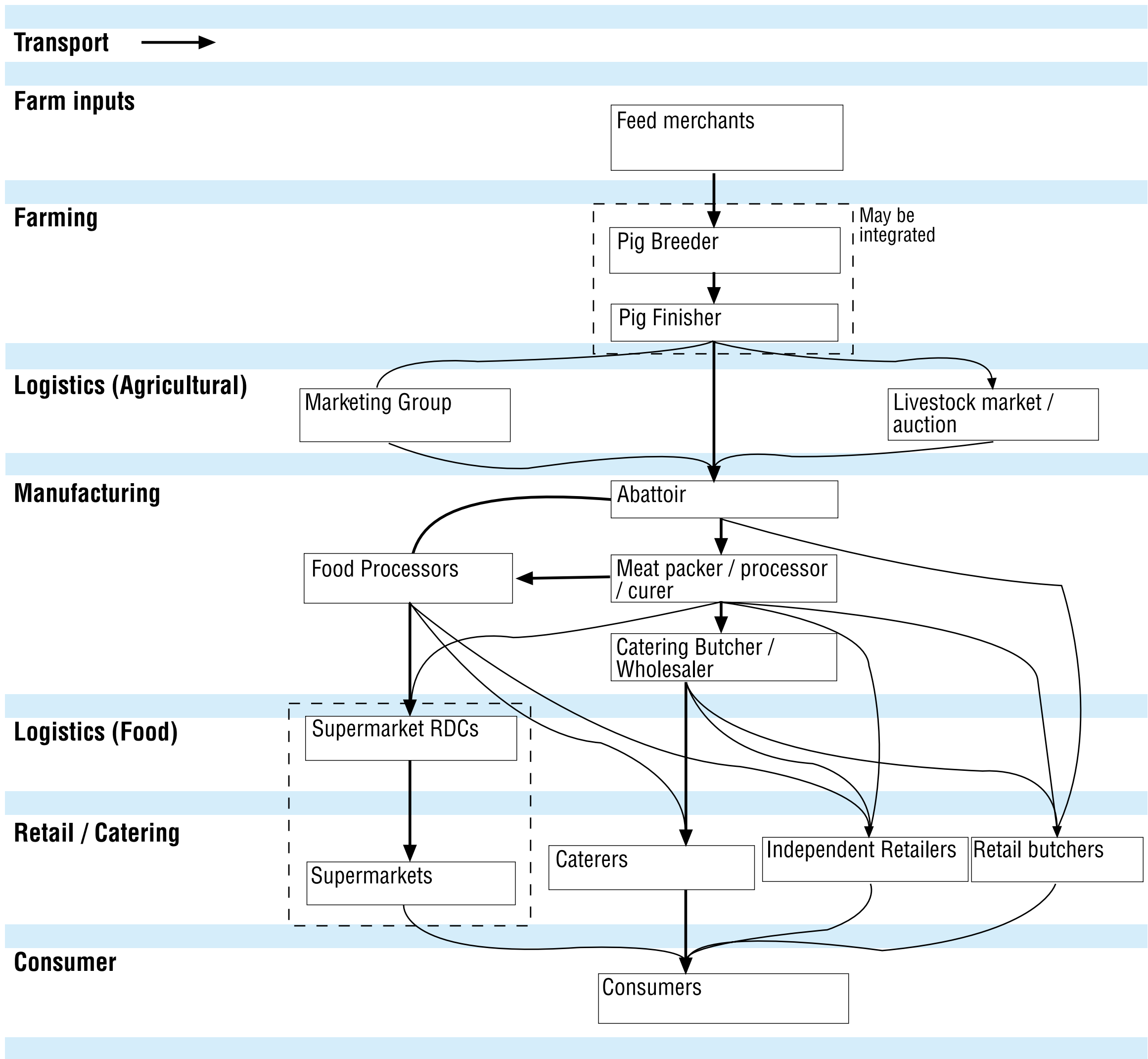
In recent years, an increasing number of pigs have been reared organically. However, based on the available data presented in Section 2, organic pig production still only accounts for a very small proportion of total EU pig production (less than 2%), although its importance was found to differ considerably between Member States.

6.1.2 Brief overview of the pig supply chain in the EU

A typical pigmeat supply chain in the EU is presented in Figure 6.1. However, it should be noted that the general structure of the pigmeat supply chain varies greatly between Member States; this is partially reflected by varying concentration levels at different points in the supply chain in different Member States.

The average size of pig herds in the EU has been increasing over time as a result of a reduction in the number of small and medium sized pig units with less than 100 pigs and a corresponding increase in the number of large units with more than 1,000 pigs. However, there is a wide difference in the average size of pig herds between Member States. The Netherlands, Belgium, Denmark and the UK tend to have larger herds than in other Member States. According to European Commission (2005) data for EU-15 countries, the size of the average pig herd in the

Figure 6.1 A typical pigmeat supply chain in the EU



Source: Saltmarsh and Wakeman, 2004.

Netherlands is 1,078 pigs, in Belgium is 712 pigs, in Denmark is 975 pigs and in the UK is 499 pigs. In contrast, herd size tends to be significantly smaller in Germany (223 pigs), France (277 pigs), Spain (344 pigs) and Italy (38 pigs). This is because pig farms in these countries still tend to be less specialised family owned units.

A major factor driving these structural changes has been technology. Improvements in production, breeding and management techniques have enabled considerable productivity gains to be made, particularly for larger operations, thus creating an incentive to increase scale. Technologies and economies of scale have also made it possible to move the industry toward off-farm feed preparation. A major factor encouraging the development and uptake of productivity enhancing technologies has been the intense competition in the meat market and the long-term decline in real prices received by farmers, which in turn is driven by productivity improvements.

However, in general, EU pig production is still relatively unspecialised, with pig production units typically being one of a number of farm enterprises. The latest European Commission data suggests that only 6% of EU pig holdings are specialist pig production units[111]. However, it is likely that these specialist units will account for a much greater proportion of production. Significant variation in the degree of specialisation exists between Member States. Of those Member States which have larger average herd sizes, pig production tends to be more specialised. Similarly, in those Member States that have lower average herd sizes, pig production tends to be less specialised. For example, in the Netherlands, Belgium, Denmark and the UK, a higher proportion of pig holdings is specialised whereas in Germany, France, Spain and Italy, a lower proportion of national pig holdings is specialised (European Commission, 2005).

The structure of the EU meat processing sector is diverse, consisting of a number of large companies, operating beside numerous small and medium sized enterprises. As such, the EU meat processing sector is relatively fragmented, although there has been marked consolidation in recent years. Furthermore, there are marked differences in the structure of companies processing pigmeat. For example, the level of concentration in ham production tends to be low, whereas there tends to be greater concentration of production in other types of pigmeat more suited to the application of large-scale industrial techniques.

The EU pigmeat processing sector is also characterised by a strong degree of specialisation (driven by increased competition) and vertical integration, particularly between the animal feed and breeding industry, pig producers, the slaughtering and distribution sectors. In this respect, there has been a growing trend in the proportion of pigmeat that is sold through co-operatives as well as the proportion of pigmeat sold in advance on contract. More than half of domestic pigmeat production is sold through co-operatives in Denmark, France, Sweden, Ireland and Finland and over half of domestic pigmeat production is sold in advance on contract in Sweden, Finland, UK and Belgium (European Commission, 2005).

6.2 Czech Republic

6.2.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in the Czech Republic.

The organic pig sector in the Czech Republic is still in its infancy. According to Table 3.4 (Section 1.1.2), less than 0.1% of national pig production is organic.

6.2.2 Availability of organic gilts to allow production without derogation

The number of certified organic pig herds in the Czech Republic is relatively small. According to the Research Institute of Agricultural Economics (2005b), few certified organic pig herds currently take advantage of the derogation allowing the use of non-organic gilts.

Consequently all organic pig production in the Czech Republic takes place in organic production system C. One of the main reasons cited for this was the relatively small scale of domestic organic pig production and consequent low demand for establishing breeding capacity for breeding gilt replacements for use in organic production system B.

6.2.3 Comparison of the performance of organic pig production systems

Technical, economic and financial performance data was based on primary and secondary data sources and supplemented and

111 Where 'specialist' is defined as a farm where breeding sows account for more than two-thirds of the economic size.

contextualised by discussions with a range of industry stakeholders[112].

6.2.3.1 Technical and economic performance

Technical and economic performance data for organic and non-organic pig production systems in the Czech Republic is presented in Table 6.1. The size of the organic pig sector in the Czech Republic is still very small and as such the organic data presented in Table 6.1 is based on a very small sample size of (possibly relatively high performing[113]) producers. Furthermore, as the organic pig sector is still in its infancy, there was no past history on which to validate the results of this limited producer survey. Accordingly, when comparing across systems the technical and economic performance data for organic systems should be read with caution.

Despite these limitations, it was considered that there would be no difference in the technical and economic performance of pig production following the transition from organic production system C to organic production system B (Research Institute of Agricultural Economics, 2005a and 2005b). However, in the medium to long-term it is likely that inbreeding under organic production system B would lead to a potential loss of genetic gain. This is because closed herds, in particular, are unlikely to be able to maintain the same level of genetic improvement in their breeding programmes over time relative to that achieved in non organic commercial breeding herds. Thus, this would result in a widening of the technical and economic performance gap between non-organic and organic systems in the medium to long-term.

112 including the University organic specialists and the organic certification body (for a complete list, see Table 3.1, Section 3.5).

113 with the exception of the reported high mortality levels

Table 6.1: Technical and economic performance of pig production in the Czech Republic

	Non-organic	Organic	
		system C	system B
Number of pigs weaned per sow per year	19	18	18
Number of pigs finished per sow per year	16	17	17
Number of litters per sow per year	2.15	2	2
Number of pigs born alive per litter	9.91	12	12
Pre weaning mortality rate (%)	15	25[1]	25[1]
Rearing mortality rate (%)	10		
Finishing mortality rate (%)	3	5	5
Pig transfer weight from breeding unit (kg)	7	33	33
Pig transfer weight from rearing to finishing unit (kg).	35		
Pig finishing daily live weight gain - at 30 kg slaughter weight (g/day)	0.575	0.620	0.620
Finishing Feed Conversion Ratio - at 30 kg slaughter weight (g/day)	3.1	4.5	4.5
Number of finishing pigs per 'pig place' per year			
Average live slaughter weight (kg)	108.7	130	130
Average carcass weight (kg)	92.3	105	105
Average killing out ratio (%)	85	81	81
Average carcass meat production per sow per year (kg)	1,476.8	1,785.0	1,785.0

Notes: 1 all piglets immediately after delivery (including non-viable animals).

The data presented is not necessarily comparable between systems as the assumptions/data presented for each system are not based on homogenous samples of pigs. In addition, the organic producer survey was based on a very small sample size.

Source: Agra CEAS calculations based on Research Institute of Agricultural Economics (2005a and 2005b) and discussions with industry stakeholders (see footnote 112).

6.2.3.2 Financial performance

Gross margin data (input costs, output prices and income) for organic and non-organic pig production systems in the Czech Republic is set out in Table 6.3. This financial data was based on data provided by the Research Institute of Agricultural Economics (2005a and 2005b).

The average price for pigmeat in the Czech Republic in 2004 is reported to be approximately €0.95 per kg deadweight. The producer price premium for organic pigmeat during this period was 18.8%. However, Hamm*, et al.* (2004) report that this premium was 229% in 2001, although in 1996 it was reported to have been much lower at 13%, see for example: Mada (1997) and Offerman and Nieberg (2000). The price data presented in Table 6.3 is based on the aforementioned average producer pigmeat price and organic price premium for 2004. However, the impact on gross margin for a range of producer pigmeat prices and organic price premiums is presented in Table 6.5.

Discussions with organic pig producers suggested that most organic farms in the Czech Republic are still using non-organic gilts to allow expansion as the sector is still in its infancy (Research Institute of Agricultural Economics, 2005a and 2005b). As a result, the difference in the cost of gilts used in organic production system C and those used in non-organic systems is relatively small. According to the Research Institute of Agricultural Economics (2005a and 2005b) the typical cost of gilts used in organic pig production systems in 2004 was approximately €215 per gilt (Table 6.2). This is 22.8% more than those used in non-organic systems, where the cost of non-organic in-pig gilts is reported to be €175 per gilt (Table 6.2). The cost of gilts for non-organic and organic systems is reflected in Table 6.3 in the cost of sow depreciation.

The only possible change to the cost structure of pig production under organic production system B would be an increased cost for bought-in gilts (Research Institute of Agricultural Economics, 2005a). Currently there is no market for organic gilts for use in organic production system B in the Czech Republic and as such no cost data is available. Therefore, Table 6.3 assumes that the transition from organic production system C to organic production system B would entail a 50% increase in the cost of replacement gilts, which is in line with the findings of the UK case study[114] (Section 6.8.3).

The data in Table 6.3 suggests that the cost of concentrate feed for organic production is around 5.3% higher than that for non-organic production. The relatively comparable prices probably reflect the different feeding strategies of organic pig producers as well as the possibility that the data is based on a small sample of relatively high performing producers. This theory

114 As there is already an established market for organic gilts for use in organic production system B in the UK, the price premium for these organic gilts over the price for non-organic gilts in the UK provides a benchmark on which this unknown variable can be assessed in the case study countries where no such market exists. In other words, assuming the economic *law of one price* applies throughout the EU, it is likely that when a market for organic gilts for use in organic production system B develops in other EU Member States, a similar price premium can be expected.

Table 6.2: Cost of gilts, feed costs and sow deprecation in the Czech Republic[1]

	Non-organic	Organic	
		system C	system B
Cost of gilts (€ per gilt)	175	215	n/a
Feed costs (€ per kg deadweight)	0.25	0.26	n/a
Sow depreciation cost (€ per kg deadweight)	0.03	0.03	n/a

Notes: 1 Based on a €:CZK exchange rate of 30.23.

Source: Agra CEAS calculations based on Research Institute of Agricultural Economics (2005a and 2005b).

Table 6.3: Financial performance of pig herds in the Czech Republic[2]

	Unit	Non-organic	Organic	
			system C	system B
Output				
Pigmeat price	€ per kg deadweight	0.95	1.13	1.13
Sow depreciation cost	€ per kg deadweight	0.03	0.03	0.06
Total output	€ per kg deadweight	0.90	1.10	1.07
Variable costs				
Feed	€ per kg deadweight	0.25	0.26	0.26
Other	€ per kg deadweight	0.10	0.06	0.06
Total variable costs	€ per kg deadweight	0.35	0.32	0.32
GROSS MARGIN	€ per kg deadweight	0.55	0.78	0.75
	€ per fattened pig	52.92	82.12	79.05
Operating margin	%	61.1%	70.9%	70.1%
Value of sow depreciation as a % of gross margin	%	4.6%	4.0%	7.5%
Value of sow depreciation as a % of variable costs	%	7.5%	9.9%	17.8%

Notes: 1 Based on a scenario of a 50% increase in bought-in gilt cost; 2 Based on a €:CZK exchange rate of 30.23.

Source: Agra CEAS calculations based on Research Institute of Agricultural Economics (2005a and 2005b), Hamm, et al. (2004), European Commission (2005).

is also reflected in the fact that other variable costs are 46.3% lower in organic systems.

6.2.4 Viability of organic pig production systems

6.2.4.1 Profitability

On the basis of the financial performance data presented in Table 6.3, the value of replacement gilts (sow depreciation cost) in organic production system C accounts for 4.0% of gross margin (compared to 4.6% of gross margin in non-organic pig production systems). Based on the results of the interviews with organic pig producers (Research Institute of Agricultural Economics, 2005a), the transition from organic production system C to organic production system B is not expected to have a significant impact on profitability, with gross margins falling by €0.03 to €0.75 per kg deadweight (with a fall in operating margin from 70.9% to 70.1%).

The only change in the cost structure is likely to result from a possible increase in the cost of gilts. Thus, under the scenario that this transition would result in a 50% increase in the cost of gilts, this would, *ceteris paribus*, have a 3.2% negative impact on profitability (gross margin). This would increase the importance of the replacement gilts cost (i.e. sow depreciation cost) as a proportion of gross margin to 7.5% (Table 6.3).

However, profitability is least sensitive to changes in the cost of gilts, as shown in the sensitivity analysis presented in Table 6.4. A 10% change in the cost of gilts would, *ceteris paribus*, have a 0.6% impact on gross margin. Although the gross margin becomes more sensitive to the cost of gilts at lower levels of income, i.e. with decreasing producer pigmeat prices (and organic price premiums).

On the contrary, the profitability of organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic pigmeat having, *ceteris paribus*, a 14.5% impact on profitability. Likewise, a 10% change in the producer price premium for organic pigmeat would, *ceteris paribus*, have a 5.5% impact on profitability (Table 6.4).

Table 6.5 quantifies the impact on profitability of organic production system B at

Table 6.4: Sensitivity analysis of the financial performance of organic production system B in the Czech Republic

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.113	14.5%
Organic producer price premium	10%	0.043	5.5%
Cost of gilts	10%	-0.005	-0.6%
Cost of feed	10%	-0.026	-3.3%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 6.5: Impact of pigmeat price and the organic premium on the gross margin of organic production system B in the Czech Republic (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	1.83	2.05	2.27	2.49	2.71	2.93	3.15	3.37	3.59	3.81	4.03	4.25	4.47	4.69	4.91	5.13
2.1	1.73	1.94	2.15	2.36	2.57	2.78	2.99	3.20	3.41	3.62	3.83	4.04	4.25	4.46	4.67	4.88
2.0	1.63	1.83	2.03	2.23	2.43	2.63	2.83	3.03	3.23	3.43	3.63	3.83	4.03	4.23	4.43	4.63
1.9	1.53	1.72	1.91	2.10	2.29	2.48	2.67	2.86	3.05	3.24	3.43	3.62	3.81	4.00	4.19	4.38
1.8	1.43	1.61	1.79	1.97	2.15	2.33	2.51	2.69	2.87	3.05	3.23	3.41	3.59	3.77	3.95	4.13
1.7	1.33	1.50	1.67	1.84	2.01	2.18	2.35	2.52	2.69	2.86	3.03	3.20	3.37	3.54	3.71	3.88
1.6	1.23	1.39	1.55	1.71	1.87	2.03	2.19	2.35	2.51	2.67	2.83	2.99	3.15	3.31	3.47	3.63
1.5	1.13	1.28	1.43	1.58	1.73	1.88	2.03	2.18	2.33	2.48	2.63	2.78	2.93	3.08	3.23	3.38
1.4	1.03	1.17	1.31	1.45	1.59	1.73	1.87	2.01	2.15	2.29	2.43	2.57	2.71	2.85	2.99	3.13
1.3	0.93	1.06	1.19	1.32	1.45	1.58	1.71	1.84	1.97	2.10	2.23	2.36	2.49	2.62	2.75	2.88
1.2	0.83	0.95	1.07	1.19	1.31	1.43	1.55	1.67	1.79	1.91	2.03	2.15	2.27	2.39	2.51	2.63
1.1	0.73	0.84	0.95	1.06	1.17	1.28	1.39	1.50	1.61	1.72	1.83	1.94	2.05	2.16	2.27	2.38
1.0	0.63	0.73	0.83	0.93	1.03	1.13	1.23	1.33	1.43	1.53	1.63	1.73	1.83	1.93	2.03	2.13
0.9	0.53	0.62	0.71	0.80	0.89	0.98	1.07	1.16	1.25	1.34	1.43	1.52	1.61	1.70	1.79	1.88

Source: Agra CEAS calculations.

varying producer price levels and organic price premiums. At all price and premium levels presented in Table 6.5, organic production system B remains profitable, in terms of gross margin.

6.2.4.2 Feasibility

The findings of the interviews with pig producers suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition (Research Institute of Agricultural Economics, 2005a).

6.2.4.3 Worthwhileness

Based on the analysis presented in Table 6.3, the transition from organic production system C to organic production system B would, *ceteris paribus*, have a 3.2% negative impact on profitability (i.e. gross margin would fall from €0.78 per kg deadweight to €0.75 per kg deadweight). However, the profitability of organic production system B would have to fall by 24.2% (i.e. from €0.75 per kg deadweight to €0.55 per kg deadweight) to achieve the same level of gross margin as in non-organic systems. At this level of gross margin[115], it may no longer be considered worthwhile to continue an organic system of production.

115 i.e. before fixed costs and any subsidies

Table 6.6: Breakeven analysis of organic pig production compared to non-organic production in the Czech Republic

	Level to breakeven with non-organic systems[1]	
	Organic system C	Organic system B
Cost of gilts (€)	1,102	1,102
Allowable increase in the cost of gilts (%)	413%	242%

Note: 1based on the level of non-organic financial performance set out in Table 6.3 and assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

As shown in Table 6.6, the cost of gilts would have to increase by 242% for the gross margin of organic production system B to fall, *ceteris paribus*, to the levels achieved in non-organic systems.

6.2.5 Sustainability of organic pig production system B in the Czech Republic

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic gilts for use in organic production system B in the Czech Republic (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in the Czech Republic in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

  – Criterion III: Worthwhileness. Organic production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic gilts for use in organic production system B does not increase by more than 242% of the cost of non-organic gilts. However, in the medium to long-term the sustainability of organic production system B in the Czech Republic was found to be more sensitive to developments in the organic price premium for pigmeat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system

C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

In conclusion, the sustainability of organic production system B in the Czech Republic in the medium to long-term will be affected by the relative financial attractiveness of non-organic systems (under the assumptions presented) as well as the availability of the necessary organic gilts (Table 6.7).

6.3 Denmark

6.3.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in Denmark.

The Danish organic pig sector is relatively well developed. According to the *Danish Plant Directorate*, which certifies and controls all organic farms in Denmark, there were 3,594 certified organic farms in 2002[116]. Of these organic farms, 103 (2.9%) were organic pig farms, representing 1.3% of all pig farms in Denmark (Table 6.8).

In terms of production, Table 3.4 (Section 1.1.2) shows that 0.6% of all pigs in Denmark were organic. However, compared to other EU Member States, the Danish organic pig sector is relatively well developed, having the fourth highest share of pig production certified as organic.

6.3.2 Availability of organic gilts to allow production without derogation

In Denmark, organic pig production tends to take place on farms with relatively small herds. Most organic pig farms have an integrated breeding and finishing system.

The relative size of organic pig production compared to non-organic pig production in Denmark is small. Discussions with industry

116 With a total production area of 148,301 ha

Table 6.7: Assessment of the sustainability of organic production system B in the Czech Republic

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become *relatively* more attractive.
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

Table 6.8: *Organic farms classified according to type of production*

	Organic farms	All farms	Organic farms	All farms	Organic farms as a % of all farms
	Number		%		
Pig farms	103	7,714	2.9	15.3	1.3
Total farms	3,594	50,531	100.0	100.0	7.1

Source: Danish Plant Directorate (2006).

stakeholders (see footnote 117) found that there was no evidence of organic pig production taking place in organic production system B. Thus, Danish producers seem to make full use of the derogations set out in Annex 1 Part B.3 of Council Regulation (EEC) 2092/91, which permit the use of non-organic gilts.

6.3.3 Comparison of the performance of organic pig production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[117].

6.3.3.1 Technical and economic performance

Technical and economic performance data for organic and non-organic pig production systems in Denmark is presented in Table 6.9. The performance data suggests that organic

117 including the University organic specialists and organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 6.9: *Technical and economic performance of pig production in Denmark*

	Non-organic	Organic	
		system C	system B
Number of pigs weaned per sow per year	23.80	17.59	17.59
Number of pigs finished per sow per year	22.01	16.40	16.40
Number of litters per sow per year	2.25	1.90	1.90
Number of pigs born alive per litter	12.20	11.65	11.65
Pre weaning mortality rate (%)	13.30	16.30	16.30
Rearing mortality rate (%)	3.70		
Finishing mortality rate (%)	3.80		
Pig transfer weight from breeding unit (kg)	7.0		
Pig transfer weight from rearing to finishing unit (kg).	30.0	28.2	28.2
Pig finishing daily live weight gain - at 30 kg slaughter weight (g/day)	827		
Finishing Feed Conversion Ratio - at 30 kg slaughter weight (g/day)	2.74		
Number of finishing pigs per ‘pig place’ per year	3.39		
Average live slaughter weight (kg)	101.0	107.68	107.68
Average carcass weight (kg)	77.0	81.8	81.8
Average killing out ratio (%)	76.2	76.0	76.0
Average carcass meat production per sow per year (kg)	1,695.0	1,341.52	1,341.52

Note: The data presented is not necessarily comparable between systems as the assumptions/data presented for each system are not based on homogenous samples of pigs.

Source: Agra CEAS calculations based on Knowles and Fowler (2004), Hjalager (2005) and interviews with industry stakeholders (see footnote 117).

production system C has a slightly lower level of performance than non-organic production, with a loss of over five finished pigs per sow per year (25.5%). Despite the slightly higher carcass weight of organic pigs, average carcass meat production per organic sow per year is 1,342 kg, 20.9% lower than non-organic production at 1,695 kg.

The discussions with industry stakeholders in Denmark (see footnote 117) found there to be no discernible difference in the technical and economic performance between the two organic systems when using the same breeds of pig. In the medium to long-term, however, it is likely that there would be some loss in genetic gain if organic systems were not able to capitalise on the breeding advances of bought-in gilts.

6.3.3.2 Financial performance

Table 6.11 presents gross margin data (input costs, output prices and income) for organic and non-organic pig production systems based on secondary data sources, supplemented where necessary with information from industry stakeholders (see footnote 117).

Between 1998 and 2004, the annual average price for pigmeat in Denmark ranged from €1.03 to €1.57 per kg deadweight, averaging at €1.23 per kg deadweight. Industry surveys carried out during this period identified that average producer price premiums for organic pigmeat in Denmark were 71% in 2000 (Hamm, *et al*. 2002) and 45% in 2001 (Hamm, *et al.* 2004). Prior to this period it is reported that this price premium showed similar levels and fluctuations between years, at 34% in 1994 and increasing to 75% in 1995 (Jensen, *et al.* 1998 and Offerman and Nieberg 2000).

Because of the large variability in producer pigmeat prices (and the organic price premium) over time, the financial data presented in Table 6.11 is based on the aforementioned average producer pigmeat price for the 1998 to 2004 period. For organic production, Table 6.11 is based on the average of the annual premiums for the 2000 and 2001 period (i.e. 58%). However, the impact on gross margin for a range of producer pigmeat prices and organic price premiums is presented in Table 6.13.

The typical cost of gilts used in organic pig production systems was found to be in the region of €195 per gilt. Since most organic pig producers make use of the derogation and purchase non-organic gilts, the cost of gilts for organic systems was found to be €225 per gilt, 15.4% more than those used in non-organic systems at €195 per gilt (Table 6.10).

Discussions with the industry (see footnote 117) found that the only change to the cost structure of pig production under organic production system B would likely be a higher cost for bought-in gilts. The cost of gilts for non-organic and organic systems is reflected in Table 6.11 in the cost of sow depreciation. As no reliable data is available on the cost of sourcing organic breeding stock for use in organic production system B, Table 6.11 assumes that the transition from organic production system C to organic production system

Table 6.10: Cost of gilts, feed costs and sow deprecation in Denmark

	Non-organic	Organic	
		system C	system B
Cost of gilts (€ per gilt)	195	225	n/a
Feed cost (€ per kg deadweight)	0.87	1.10	n/a
Sow depreciation cost (€ per kg deadweight)	0.03	0.04	n/a

Source: Agra CEAS calculations based Knowles and Fowler (2004), Hjalager (2005) and interviews with industry stakeholders (see footnote 117).

Table 6.11: Financial performance of pig herds in Denmark

	Unit	Non-organic	Organic	
			system C	system B
Output				
Pigmeat price	€ per kg deadweight	1.23	1.94	1.94
Sow depreciation cost	€ per kg deadweight	0.03	0.04	0.08
Total output	€ per kg deadweight	1.20	1.89	1.86
Variable costs				
Feed	€ per kg deadweight	0.87	1.10	1.10
Other	€ per kg deadweight	0.08	0.05	0.05
Total variable costs	€ per kg deadweight	0.95	1.15	1.15
GROSS MARGIN	€ per kg deadweight	0.25	0.74	0.71
	€ per fattened pig	19.19	60.61	57.73
Operating margin	%	20.8%	39.2%	38.2%
Value of sow depreciation as a % of gross margin	%	10.3%	5.6%	10.9%
Value of sow depreciation as a % of variable costs	%	2.7%	3.6%	6.7%

Note: 1 Based on a scenario of a 50% increase in bought-in gilt cost.

Source: Agra CEAS calculations based on European Commission (2005), Knowles and Fowler (2004), Hjalager (2005), Hamm, et al. (2002), Hamm, et al. (2004), Jensen, et al. (1998), Offerman and Nieberg (2000) and interviews with industry stakeholders (see footnote 117).

B would entail a 50% increase in the cost of sourcing gilts, which is in line with the findings of the UK case study[118] (Section 6.8.3).

The cost of concentrate feed for organic production is typically €0.23 per kg deadweight, 26.4% higher in organic systems than in non-organic production. However, other variable costs are €0.05 per kg deadweight, 34.0% lower than in non-organic systems.

6.3.4 Viability of organic pig production systems

6.3.4.1 Profitability

Based on the financial performance data presented in Table 6.11, the value of replacement organic gilts (i.e. sow depreciation cost) accounts for 5.6% of gross margin (compared to 10.3% of gross margin in non-organic pig production systems). The likely impact on profitability of a transition from organic production system C to organic production system B would result from a possible increase in the cost of gilts. All other costs and revenue are expected to remain unchanged. Thus, under the scenario that this transition would result in a 50% increase in the cost of gilts, this would, *ceteris paribus*, have a 4.8% negative impact on profitability (gross margin), with operating margins falling marginally from 39.2% to 38.2%. This would increase the importance of the replacement gilts cost (i.e. sow depreciation cost) as a proportion of gross margin to 10.9%, more or less in line with non-organic systems.

As in the other case studies, the profitability of organic production system B was found to be more sensitive to changes in market prices than the cost of bought-in gilts. As shown in Table 6.12, a 10% change in the price for organic pigmeat would, *ceteris paribus*, have a 26.1% impact on profitability (gross margin). A 10% change in the producer price premium for organic pigmeat

118 The UK case study was used as a benchmark in this respect as it was found to be the only case study country where a relatively significant market exists for organic gilts for use in organic production system B and where cost data was available to allow comparisons. On the assumption that the market for these organic gilts in the UK is relatively well developed, from an economic perspective this price differential should reflect the true cost difference for buying in organic gilts for use in organic production system B instead of non-organic gilt replacements.

Table 6.12: Sensitivity analysis of the financial performance of organic production system B in Denmark

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.194	26.1%
Organic producer price premium	10%	0.106	14.3%
Cost of gilts	10%	-0.007	-1.0%
Cost of feed	10%	-0.110	-14.8%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 6.13: Impact of pigmeat price and the organic premium on the gross margin of organic production system B in Denmark (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	0.97	1.19	1.41	1.63	1.85	2.07	2.29	2.51	2.73	2.95	3.17	3.39	3.61	3.83	4.05	4.27
2.1	0.87	1.08	1.29	1.50	1.71	1.92	2.13	2.34	2.55	2.76	2.97	3.18	3.39	3.60	3.81	4.02
2.0	0.77	0.97	1.17	1.37	1.57	1.77	1.97	2.17	2.37	2.57	2.77	2.97	3.17	3.37	3.57	3.77
1.9	0.67	0.86	1.05	1.24	1.43	1.62	1.81	2.00	2.19	2.38	2.57	2.76	2.95	3.14	3.33	3.52
1.8	0.57	0.75	0.93	1.11	1.29	1.47	1.65	1.83	2.01	2.19	2.37	2.55	2.73	2.91	3.09	3.27
1.7	0.47	0.64	0.81	0.98	1.15	1.32	1.49	1.66	1.83	2.00	2.17	2.34	2.51	2.68	2.85	3.02
1.6	0.37	0.53	0.69	0.85	1.01	1.17	1.33	1.49	1.65	1.81	1.97	2.13	2.29	2.45	2.61	2.77
1.5	0.27	0.42	0.57	0.72	0.87	1.02	1.17	1.32	1.47	1.62	1.77	1.92	2.07	2.22	2.37	2.52
1.4	0.17	0.31	0.45	0.59	0.73	0.87	1.01	1.15	1.29	1.43	1.57	1.71	1.85	1.99	2.13	2.27
1.3	0.07	0.20	0.33	0.46	0.59	0.72	0.85	0.98	1.11	1.24	1.37	1.50	1.63	1.76	1.89	2.02
1.2	-0.03	0.09	0.21	0.33	0.45	0.57	0.69	0.81	0.93	1.05	1.17	1.29	1.41	1.53	1.65	1.77
1.1	-0.13	-0.02	0.09	0.20	0.31	0.42	0.53	0.64	0.75	0.86	0.97	1.08	1.19	1.30	1.41	1.52
1.0	-0.23	-0.13	-0.03	0.07	0.17	0.27	0.37	0.47	0.57	0.67	0.77	0.87	0.97	1.07	1.17	1.27
0.9	-0.33	-0.24	-0.15	-0.06	0.03	0.12	0.21	0.30	0.39	0.48	0.57	0.66	0.75	0.84	0.93	1.02

Source: Agra CEAS calculations.

would, *ceteris paribus*, have a 14.3% impact on profitability (gross margin).

In contrast, a 10% change in the cost of gilts would, *ceteris paribus*, only have a 1.0% impact on gross margin, although gross margins would become more sensitive to the cost of gilts as profitability decreases (i.e. as the producer pigmeat price (and the organic price premium) falls).

As shown in Table 6.13, the profitability of organic production system B is dependent on the payment of a premium on the non-organic pigmeat price. Although, *ceteris paribus*, organic pig production still has a positive gross margin if the organic producer price premium is removed, if the pigmeat price falls to below €1.23 per kg deadweight then it would no longer be profitable.

6.3.4.2 Feasibility

As found in the other case studies, the findings of the interviews with industry stakeholders (see footnote 117) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

6.3.4.3 Worthwhileness

Based on the analysis presented in Table 6.11, the transition from organic production system C to organic production system B would, *ceteris paribus*,

Table 6.14: Breakeven analysis of organic pig production compared to non-organic production in Denmark

	Level to breakeven with non-organic systems[1]	
	Organic system C	Organic system B
Cost of gilts (€)	1,796	1,796
Allowable increase in the cost of gilts (%)	698%	432%

Note: 1based on the level of non-organic financial performance set out in Table 6.11.

have a 4.8% negative impact on profitability (i.e. gross margin would fall from €0.74 per kg deadweight to €0.71 per kg deadweight). However, the profitability of organic production system B would have to fall by 64.7% (i.e. from €0.71 per kg deadweight to €0.25 per kg deadweight) to achieve the same level of gross margin as in non-organic systems. At this level of gross margin[119], it might be considered no longer worthwhile to continue an organic system of production.

Alternatively, the cost of gilts would have to increase by 432% for the gross margin of organic production system B to fall to non-organic levels (Table 6.14).

6.3.5 Sustainability of organic production system B in Denmark

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of organic gilts for use in organic production system B in Denmark (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in Denmark in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

  – Criterion III: Worthwhileness. Organic production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of organic gilts for use in organic production system B does not increase by more than 432% of the cost of non-organic gilts. However, in the medium to long-term the sustainability of organic production system B in

119 i.e. before fixed costs and any subsidies

Denmark was found to be more sensitive to developments in the organic price premium for pigmeat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

– Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

In conclusion, the sustainability of organic production system B in Denmark in the medium to long-term will be affected by the relative financial attractiveness of non-organic systems (under the assumptions presented) as well as the availability of the necessary organic gilts (Table 6.15).

6.4 France

6.4.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in France.

France has a relatively small organic pig sector. Nevertheless, in terms of production Table 3.4 (Section 1.1.2) shows that France had the fifth highest share of pig production certified as organic in the EU-25, with 0.6% of all pigs in France being organic.

6.4.2 Availability of organic gilts to allow production without derogation

Virtually all organic pig production in France takes place utilising the derogation concerning the origin of animals with non-organic gilts being

Table 6.15: Assessment of the sustainability of organic production system B in Denmark

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

brought on to pig units or replacements being reared using artificial insemination with semen from non-organic boars. This is not because of a lack of demand for organic replacements. Discussions with the Ministry of Agriculture suggest that following the demise of the EU derogation in 2003 which allowed the use of non-organic piglets to be used for fattening in organic production system C, the demand for piglets for use in organic production system B has increased considerably. As a result, potential breeding females have been diverted for use in organic fattening units where demand for short term gains is considered to be higher than long-term investment in breeding stock.

It was noted during the industry interviews with the Ministry of Agriculture and organic advisors that the main factor inhibiting the development of organic production system B has therefore been the lack of available suitable organic gilts as a result of the ending of the aforementioned derogation.

6.4.3 Comparison of the performance of organic pig production systems

Financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[120].

120 including the Institute Technique du Porc, Ministry of Agriculture, a farmers' association and the French organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

6.4.3.1 Technical and economic performance

Technical and economic performance data for organic pig production systems was not available. However, discussions with organic certification bodies on the likely impact of moving from organic production system C to organic production system B confirmed the general findings across case studies that it is unlikely to have any significant impact, at least in the short term.

6.4.3.2 Financial performance

Gross margin data (input costs, output prices and income) for organic and non-organic pig production systems in France is set out in Table 6.17, based on secondary data sources and supplemented where necessary with information from industry stakeholders (see footnote 120).

The annual average price for pigmeat in France between 1998 and 2004 ranged from €1.14 to €1.65 per kg deadweight, with a period average of €1.32 per kg deadweight. During this period, industry surveys have identified that average producer price premiums for organic pigmeat in France were 91% in 2000 (Hamm, *et al*. 2002) and 62% in 2001 (Hamm, *et al*. 2004). Table 6.17 therefore presents typical producer prices for non-organic and organic pigmeat over the period. For non-organic pigmeat, Table 6.17 uses the aforementioned average producer price for the 1998 to 2004 period and the average of the annual premiums for the 2000 and 2001 period (i.e. 76.5%) for organic production. The impact of a range of producer pigmeat prices and organic price premiums on gross margin is presented in Table 6.19.

Table 6.16: Cost of gilts, feed costs and sow depreciation in France

	Non-organic	Organic	
		system C	system B
Cost of gilts (€ per gilt)	205	238	N/a
Feed cost (€ per kg deadweight)	N/a	N/a	N/a
Sow depreciation cost (€ per kg deadweight)	0.02	0.03	N/a

Source: Agra CEAS calculations based on Institute Technique du Porc (2005), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 120).

Table 6.17: *Financial performance of pig production in France*

	Unit	Non-organic	Organic system C	Organic system B
Output				
Pigmeat price	€ per kg deadweight	1.32	2.32	2.32
Sow depreciation cost	€ per kg deadweight	0.02	0.03	0.06
Total output	€ per kg deadweight	1.29	2.29	2.26
Variable costs				
Feed	€ per kg deadweight	0.80	0.96	0.96
Other	€ per kg deadweight	0.13	0.13	0.13
Total variable costs	€ per kg deadweight	0.93	1.09	1.09
GROSS MARGIN	€ per kg deadweight	0.36	1.20	1.17
	€ per fattened pig	31.62	106.84	104.31
Operating margin	%	27.9%	52.4%	51.8%
Value of sow depreciation as a % of gross margin	%	6.6%	2.8%	5.3%
Value of sow depreciation as a % of variable costs	%	2.6%	3.1%	5.7%

Note: 1 Based on a scenario of a 50% increase in bought-in gilt cost.

Source: Agra CEAS calculations based on European Commission (2005), Institute Technique du Porc (2005), Knowles and Fowler (2004), Hamm, et al. (2002), Hamm, et al. (2004) and interviews with industry stakeholders (see footnote 120).

As shown in Table 6.16, the cost of gilts used in organic pig production systems is typically €238 per gilt, 16.1% more than those used in non-organic systems (€205 per gilt). Although there is a lack of *official* national market and price data on the cost of sourcing organic breeding stock for use in organic production system B, the results of the industry interviews (see footnote 120) were unanimous in suggesting that a transition from organic production system C to organic production system B would result in increased sourcing costs. According to interviews with two organic certification bodies, this is believed to be the case given that there was already high demand for suitable organic gilts and the competing demand for suitable organic piglets for fattening was constraining supply and potentially rendering the cost of such replacements as non viable.

The cost of gilts for non-organic and organic systems is reflected in Table 6.17 in the cost of sow depreciation. As there is limited *official national* market and price data on the cost of sourcing suitable organic breeding stock, Table 6.17 assumes that the transition from organic production system C to organic production system B would entail a 50% increase in the cost of sourcing gilts, which is in line with the findings of the UK case study[121] (Section 6.8.3).

Based on the financial data presented in Table 6.17, the main difference in the cost structure of organic pig production *vis-à-vis* non-organic pig production relates to feed. The cost of concentrate feed for organic production when expressed on a per kg deadweight basis is €0.96 per kg deadweight, 20.0% higher than that used in non-organic systems.

6.4.4 Viability of organic pig production systems

6.4.4.1 Profitability

Based on the financial performance data presented in Table 6.17, the value of

121 The UK case study was used as a benchmark in this respect as it was found to be the only case study country where a relatively significant market exists for organic gilts for use in organic production system B and where cost data was available to allow comparisons. On the assumption that the market for these organic gilts in the UK is relatively well developed, from an economic perspective this price differential should reflect the true cost difference for buying in organic gilts for use in organic production system B instead of non-organic gilt replacements.

replacement organic gilts (sow depreciation cost) accounts for 2.8% of gross margin (compared to 6.6% of gross margin in non-organic pig production systems). Although revenue and most costs are expected to remain unchanged following a transition from organic production system C to organic production system B, as mentioned above it is likely that the cost of sourcing organic gilts for use in organic production system B would increase because of the competing demand for organic pigs for use in fattening systems. Under a scenario that this transition would result in a 50% increase in the cost of gilts, this would, *ceteris paribus*, have a 2.4% negative impact on profitability (gross margin), with operating margins falling marginally from 52.4% to 51.8%. This would increase the importance of the replacement gilts cost as a proportion of gross margin from 2.8% to 5.3%.

As presented in the sensitivity analysis in Table 6.18, profitability (gross margin) is least sensitive to changes in the cost of gilts. A 10% change in the cost of gilts would, *ceteris paribus*, have a 0.5% impact on gross margin (although profitability would become more sensitive to the cost of gilts at lower levels of income, i.e. as the producer pigmeat price (and organic price premium) falls).

Table 6.18 shows that the profitability of organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic pigmeat having, *ceteris paribus*, a 19.3% impact on gross margin. Likewise, a 10% change in the producer price premium for organic pigmeat would, *ceteris paribus*, have a 10.7% impact on income.

Table 6.19 quantifies the extent to which the profitability of organic production system B is dependent on the payment of a premium on the non-organic pigmeat price. Although, *ceteris paribus*, organic pig production still has a positive gross margin if the organic producer price premium is removed, if the pigmeat price falls to below €1.12 per kg deadweight then it would no longer be profitable.

6.4.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 120) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

6.4.4.3 Worthwhileness

Based on the analysis presented in Table 6.17, the transition from organic production system C to organic production system B would, *ceteris paribus*, have a 2.4% negative impact on profitability (i.e. gross margin would fall from €1.20 per kg deadweight to €1.17 per kg deadweight). However, the profitability of organic production system B would have to fall by 69.0% (i.e. from €1.17 per kg deadweight to €0.36 per kg deadweight) to achieve the same level of gross

Table 6.18: Sensitivity analysis of the financial performance of organic production system B in France

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.232	19.3%
Organic producer price premium	10%	0.129	10.7%
Cost of gilts	10%	-0.006	-0.5%
Cost of feed	10%	-0.096	-8.0%

Notes: assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

Table 6.19: Impact of pigmeat price and the organic premium on the gross margin of organic production system B in France (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%) 0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	1.05	1.27	1.49	1.71	1.93	2.15	2.37	2.59	2.81	3.03	3.25	3.47	3.69	3.91	4.13	4.35
2.1	0.95	1.16	1.37	1.58	1.79	2.00	2.21	2.42	2.63	2.84	3.05	3.26	3.47	3.68	3.89	4.10
2.0	0.85	1.05	1.25	1.45	1.65	1.85	2.05	2.25	2.45	2.65	2.85	3.05	3.25	3.45	3.65	3.85
1.9	0.75	0.94	1.13	1.32	1.51	1.70	1.89	2.08	2.27	2.46	2.65	2.84	3.03	3.22	3.41	3.60
1.8	0.65	0.83	1.01	1.19	1.37	1.55	1.73	1.91	2.09	2.27	2.45	2.63	2.81	2.99	3.17	3.35
1.7	0.55	0.72	0.89	1.06	1.23	1.40	1.57	1.74	1.91	2.08	2.25	2.42	2.59	2.76	2.93	3.10
1.6	0.45	0.61	0.77	0.93	1.09	1.25	1.41	1.57	1.73	1.89	2.05	2.21	2.37	2.53	2.69	2.85
1.5	0.35	0.50	0.65	0.80	0.95	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.45	2.60
1.4	0.25	0.39	0.53	0.67	0.81	0.95	1.09	1.23	1.37	1.51	1.65	1.79	1.93	2.07	2.21	2.35
1.3	0.15	0.28	0.41	0.54	0.67	0.80	0.93	1.06	1.19	1.32	1.45	1.58	1.71	1.84	1.97	2.10
1.2	0.05	0.17	0.29	0.41	0.53	0.65	0.77	0.89	1.01	1.13	1.25	1.37	1.49	1.61	1.73	1.85
1.1	-0.05	0.06	0.17	0.28	0.39	0.50	0.61	0.72	0.83	0.94	1.05	1.16	1.27	1.38	1.49	1.60
1.0	-0.15	-0.05	0.05	0.15	0.25	0.35	0.45	0.55	0.65	0.75	0.85	0.95	1.05	1.15	1.25	1.35
0.9	-0.25	-0.16	-0.07	0.02	0.11	0.20	0.29	0.38	0.47	0.56	0.65	0.74	0.83	0.92	1.01	1.10

Source: Agra CEAS calculations.

Table 6.20: Breakeven analysis of organic pig production compared to non-organic production in France

	Level to breakeven with non-organic systems[1] Organic system C	Organic system B
Cost of gilts (€)	3,748	3,748
Allowable increase in the cost of gilts (%)	1475%	950%

Note: 1based on the level of non-organic financial performance set out in Table 6.17.

margin as in non-organic systems. At this level of gross margin[122], it might be considered no longer worthwhile to continue an organic system of production.

To put this into context, the cost of gilts would have to increase by 950% for the gross margin of organic production system B to fall to the levels achieved in non-organic systems (Table 6.20).

6.4.5 Sustainability of organic production system B in France

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is not a sufficient availability of suitable organic gilts in France (i.e. *<1% of production was found to take place in organic production system B*). Consequently, it is likely that producers will be unable to move from organic production system C to organic production system B in the short-term and sustain this system of production in the medium to long-term.

122 i.e. before fixed costs and any subsidies

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in France in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

  – Criterion III: Worthwhileness. Organic production system B remained worthwhile under the assumptions presented as long as the additional (*unknown*) cost of suitable organic gilts does not increase by more than 950% of the cost of non-organic gilts. However, in the medium to long-term the sustainability of organic production system B in France was found to be more sensitive to developments in the organic price premium for pigmeat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

Table 6.21: Assessment of the sustainability of organic production system B in France

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	<1% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

In conclusion, the sustainability of organic production system B in France in the medium to long-term will be affected by the relative financial attractiveness of non-organic systems (under the assumptions presented) as well as the availability of suitable organic gilts (Table 6.21).

6.5 Germany

6.5.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in Germany.

Germany has a relatively small organic pig sector, with 0.5% of all pigs in Germany being organic. That said, Table 3.4 (Section 1.1.2) shows that Germany has the seventh highest share of national pig production certified as organic in the EU-25.

6.5.2 Availability of organic gilts to allow production without derogation

The main pig breeds used in organic production system C in Germany are more or less the same as those used on non-organic holdings, particularly on the larger units producing for the multiple retailers. Smaller organic production units, which sell their pigmeat direct to consumers/independent retailers, tend to use traditional breeds.

As in the case of France, there is a high demand for organic gilts for use in organic production system B for breeding purposes in Germany (Rainer, 2004), although it is reported that the cost differential between organic and non-organic animals has limited demand. Despite this, Rainer (2004) estimated that 700 organic gilts for use in organic production system B were sold in Germany in 2004.

The industry interviews (see footnote 123) found a huge variation by region and certification body in the proportion of gilts produced under organic production system B. One certification body estimates that 25-30% of its certified organic breeding pigs are reared in organic production system B. In addition, a recent industry survey (Rainer, 2005) calculated that on average 60% of all organic pig holdings breed their own replacements, ranging from 25% to 100% of replacements.

Rainer (2005) estimated that 70% of the organic sows used in organic pig holdings were of non-organic origin while the remaining 30% had originated from organic herds, and considered to be suitable for use in organic production system B.

6.5.3 Comparison of the performance of organic pig production systems

Financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[123].

6.5.3.1 Technical and economic performance

Technical and economic performance data for organic pig production systems was not available. However, discussions with two organic certification bodies on the likely impact of moving from organic production system C to organic production system B confirmed the general findings across case studies that it is unlikely to have any significant impact, at least in the short term.

6.5.3.2 Financial performance

Table 6.23 presents gross margin data (input costs, output prices and income) for organic and non-organic pig production systems in Germany, based on secondary data sources, supplemented

123 including, an organic producers' association in Germany, Zentral Der Deutschen Schweineproduktion, University pig and organic specialists, organic livestock consultants and the German organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 6.22: Cost of gilts, feed costs and sow depreciation in Germany

	Non-organic	Organic	
		system C	system B
Cost of gilts (€ per gilt)	200	235	n/a
Feed costs (€ per kg deadweight)	0.74	1.20	n/a
Sow depreciation cost (€ per kg deadweight)	0.02	0.03	n/a

Source: Agra CEAS calculations based on Zentral Der Deutschen Schweineproduktion (2005), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 123).

Table 6.23: Financial performance of pig herds in Germany

	Unit	Non-organic	Organic	
			system C	system B
Output				
Pigmeat price	€ per kg deadweight	1.37	2.17	2.17
Sow depreciation cost	€ per kg deadweight	0.02	0.03	0.06
Total output	€ per kg deadweight	1.35	2.14	2.11
Variable costs				
Feed	€ per kg deadweight	0.74	1.20	1.20
Other	€ per kg deadweight	0.13	0.10	0.10
Total variable costs	€ per kg deadweight	0.87	1.30	1.30
GROSS MARGIN	€ per kg deadweight	0.48	0.84	0.81
	€ per fattened pig	44.96	80.31	77.56
Operating margin	%	35.6%	39.3%	38.4%
Value of sow depreciation as a % of gross margin	%	5.0%	4.1%	7.8%
Value of sow depreciation as a % of variable costs	%	2.8%	2.7%	4.9%

Note: 1 Based on a scenario of a 50% increase in bought-in gilt cost.

Source: Agra CEAS calculations based on European Commission (2005), Zentral Der Deutschen Schweineproduktion (2005), Hamm, et al. (2002), Hamm, et al. (2004), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 123).

where necessary with information from industry stakeholders (see footnote 123).

There has been wide variation in the annual average price for pigmeat in Germany between 1998 and 2004, ranging from €1.14 to €1.71 per kg deadweight and averaging at €1.37 per kg deadweight. During this period, industry surveys have found that the average producer price premium for organic pigmeat was 71% in 2000 (Hamm, *et al.* 2002) and 45% in 2001 (Hamm, *et al.* 2004).

Given this variability in producer pigmeat prices (and the organic price premium) over time, the financial data presented in Table 6.23 is based on the aforementioned average producer pigmeat price for the 1998 to 2004 period of €1.37 per kg deadweight. For organic production, Table 6.23 is based on the average of the annual premiums for the 2001 and 2002 period (i.e. 58.0%). The impact on gross margin for a range of producer pigmeat prices and organic price premiums is presented in Table 6.25.

Secondary data sources, corroborated by interviews with industry stakeholders (see footnote 123), found the typical cost of gilts used in organic pig production systems to be €235 per gilt (Table 6.22). This is 17.5% more than those used in non-organic systems, where the cost of non-organic in-pig gilts is reported to be in the region of €200 per gilt. The cost of gilts for non-organic and organic systems is reflected in Table 6.23 in the cost of sow depreciation.

6.5.4 *Viability of organic pig production systems*

6.5.4.1 Profitability

Given the financial performance data presented in Table 6.23, the value of replacement gilts for organic production (sow depreciation cost) accounts for 4.1% of gross margin (compared to 5.0% of gross margin in non-organic pig production systems).

Although there is no *official* data on the cost of sourcing suitable organic breeding stock for use in organic production system B, Discussions with two organic certification bodies and an organic pig consultant suggested that a transition to organic production system B would result in an increase in the cost of gilts. Therefore, Table 6.24 assumes that the transition from organic production system C to organic production system B would entail a 50% increase in the cost of sourcing gilts, which is in line with the findings of the UK case study[124] (Section 6.8.3).

Thus, under the scenario that this transition would result in a 50% increase in the cost of gilts, this would, *ceteris paribus*, have a 3.4% negative impact on profitability (gross margin), with operating margins falling marginally from 39.3% to 38.4%. This would increase the importance of the replacement gilts cost as a proportion of gross margin to 7.8%.

Looking at the sensitivity of the profitability of organic pig production to changes in costs and revenue (Table 6.24), gross margin is least sensitive to changes in the cost of gilts. A 10% change in the cost of gilts would, *ceteris paribus*, have a 0.7% impact on gross margin. However, it should be noted that gross margin becomes more sensitive to the cost of gilts at lower levels of income, i.e. as the producer pigmeat price (and organic price premium) falls.

124 The UK case study was used as a benchmark in this respect as it was found to be the only case study country where a relatively significant market exists for organic gilts for use in organic production system B and where cost data was available to allow comparisons. On the assumption that the market for these organic gilts in the UK is relatively well developed, from an economic perspective this price differential should reflect the true cost difference for buying in organic gilts for use in organic production system B instead of non-organic gilt replacements.

Table 6.24: Sensitivity analysis of the financial performance of organic production system B in Germany

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.217	26.0%
Organic producer price premium	10%	0.108	13.0%
Cost of gilts	10%	-0.006	-0.7%
Cost of feed	10%	-0.120	-14.3%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 6.25: Impact of pigmeat price and the organic premium on the gross margin of organic production system B in Germany (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	0.84	1.06	1.28	1.50	1.72	1.94	2.16	2.38	2.60	2.82	3.04	3.26	3.48	3.70	3.92	4.14
2.1	0.74	0.95	1.16	1.37	1.58	1.79	2.00	2.21	2.42	2.63	2.84	3.05	3.26	3.47	3.68	3.89
2.0	0.64	0.84	1.04	1.24	1.44	1.64	1.84	2.04	2.24	2.44	2.64	2.84	3.04	3.24	3.44	3.64
1.9	0.54	0.73	0.92	1.11	1.30	1.49	1.68	1.87	2.06	2.25	2.44	2.63	2.82	3.01	3.20	3.39
1.8	0.44	0.62	0.80	0.98	1.16	1.34	1.52	1.70	1.88	2.06	2.24	2.42	2.60	2.78	2.96	3.14
1.7	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04	2.21	2.38	2.55	2.72	2.89
1.6	0.24	0.40	0.56	0.72	0.88	1.04	1.20	1.36	1.52	1.68	1.84	2.00	2.16	2.32	2.48	2.64
1.5	0.14	0.29	0.44	0.59	0.74	0.89	1.04	1.19	1.34	1.49	1.64	1.79	1.94	2.09	2.24	2.39
1.4	0.04	0.18	0.32	0.46	0.60	0.74	0.88	1.02	1.16	1.30	1.44	1.58	1.72	1.86	2.00	2.14
1.3	-0.06	0.07	0.20	0.33	0.46	0.59	0.72	0.85	0.98	1.11	1.24	1.37	1.50	1.63	1.76	1.89
1.2	-0.16	-0.04	0.08	0.20	0.32	0.44	0.56	0.68	0.80	0.92	1.04	1.16	1.28	1.40	1.52	1.64
1.1	-0.26	-0.15	-0.04	0.07	0.18	0.29	0.40	0.51	0.62	0.73	0.84	0.95	1.06	1.17	1.28	1.39
1.0	-0.36	-0.26	-0.16	-0.06	0.04	0.14	0.24	0.34	0.44	0.54	0.64	0.74	0.84	0.94	1.04	1.14
0.9	-0.46	-0.37	-0.28	-0.19	-0.10	-0.01	0.08	0.17	0.26	0.35	0.44	0.53	0.62	0.71	0.80	0.89

Source: Agra CEAS calculations.

In comparison, the profitability of organic production system B is more sensitive to changes in market prices, with a 10% change in the price of organic pigmeat having, *ceteris paribus*, a 26.0% impact on income. Similarly, a 10% change in the producer price premium for organic pigmeat would, *ceteris paribus*, have a 13.0% impact on income.

Table 6.25 quantifies the impact on profitability of organic production system B at varying price and organic premium levels. Although, *ceteris paribus*, organic pig production still has a positive gross margin if the organic producer price premium is removed, if the pigmeat price falls to below €1.36 per kg deadweight then it would no longer be profitable.

6.5.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 123) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

6.5.4.3 Worthwhileness

As reported above in Table 6.23, the transition from organic production system C to organic production system B would, *ceteris paribus*, have a 3.4% negative impact on profitability (i.e. gross margin would fall from €0.84 per kg deadweight to €0.81 per kg deadweight). However, the profitability of organic production system B would have to fall by 40.2% (i.e. from €0.81 per kg deadweight to €0.48 per kg deadweight) to achieve the same level of gross margin as in non-organic systems. At this level of gross margin[125], it might be considered no longer worthwhile to continue an organic system of production.

If the cost of gilts increased by 377%, the gross margin of organic production system B would fall to the levels achieved in non-organic systems (Table 6.26).

125 i.e. before fixed costs and any subsidies

Table 6.26: Breakeven analysis of organic pig production compared to non-organic production in Germany

	Level to breakeven with non-organic systems[1]	
	Organic system C	Organic system B
Cost of gilts (€)	1,680	1,680
Allowable increase in the cost of gilts (%)	615%	377%

Note: 1based on the level of non-organic financial performance set out in Table 6.23.

6.5.5 Sustainability of organic production system B in Germany

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is some availability of organic gilts for use in organic production system B in Germany (i.e. *30% of production was considered to take place in organic production system B*). Evidence suggests that availability has been developing in recent years thereby allowing producers to move from organic production system C to organic production system B in the short-term. If this supply base continues to expand, then it is likely that organic production system B would remain sustainable in the medium to long-term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in Germany in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

  – Criterion III: Worthwhileness. Organic production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of suitable organic gilts does not increase by more than 377% of the cost of non-organic gilts. However, in the medium to long-term the sustainability of organic production system B in Germany was found to be more sensitive to developments in the organic price premium for pigmeat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

In conclusion, given that 30% of producers currently produce pigs under organic production system B in Germany, there is real evidence that the organic production system B is viable and sustainable, at least in the short term, despite the relative financial attractiveness of non-organic systems (Table 6.27).

6.6 Netherlands

6.6.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in the Netherlands.

In the Netherlands, there is a single public inspection authority (Skal) responsible for *all* inspection and certification of organic production. By the end of 2004, Skal had 48,155 hectares of land under inspection[126] (Skal, 2005). Although the Netherlands has a relatively small organic pig sector, with only 0.3% of all pigs in the Netherlands being organic (Table 3.4, Section 1.1.2), according to Skal (2005) it certified 25,623 organic pig places in 2004.

6.6.2 Availability of organic gilts to allow production without derogation

Council Regulation (EC) No 1804/1999 has been implemented in the Netherlands by the Decree on the Agricultural Quality of Organic Production Methods. This decree refers directly to the EU-regulation without additional requirements. Accordingly, Dutch organic pig producers are able to take full advantage of the derogations set out in Annex I Part B. 3 (origin of animals) which permit non-organic gilts to be brought onto an organic production unit when a pig herd is renewed, restocked or reconstituted.

Discussions with the national organic certification body revealed that most organic pig producers use non-organic pigs as replacement

126 of which 2,015 hectares were in their second year of conversion.

Table 6.27: Assessment of the sustainability of organic production system B in Germany

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	30% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

stock, typically crosses between Dutch Landrace and Great Yorkshire or Large White or Duroc. On around half of all organic pig herds, sows are served naturally by boars, although artificial insemination is also used on most farms in combination with natural service.

According to the opinion of Skal (2006), the *majority* of its certified organic pig producers (i.e. all certified organic pig producers in the Netherlands) take advantage of the aforementioned derogations set out in Annex I Part B. 3 (origin of animals). It is, however, the general view that there are some closed systems in operation, whereby all replacements are bred on-farm and thus considered to operate under organic production system B. These organic production system B units were considered to account for no more than 20% of Dutch organic production.

From a technical perspective, the size of the Dutch organic pig population in the Netherlands is considered too small a genetic base for breeding purposes. As a result, there is concern by some that using this genetic base would result in a population of pigs that during the fattening process would produce a high percentage of fat. Furthermore, national animal health regulations restrict pig transportation between farms, with the exchange of gilts between regions not being allowed. This would further reduce the genetic base for breeding.

An industry organic consultant suggests that a minimum organic pig population of 100,000 slaughter pigs per year is required before a specialist organic pig breeding programme can be developed.

6.6.3 Comparison of the performance of organic pig production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised

Table 6.28: Technical and economic performance of pig production in the Netherlands

	Non-organic	Organic	
		system C	system B
Number of pigs weaned per sow per year	21.51	19.6	19.6
Number of pigs finished per sow per year	19.83		
Number of litters per sow per year	2.31	2.06	2.06
Number of pigs born alive per litter	11.50	11.9	11.9
Pre weaning mortality rate (%)	11.70	8%	8%
Rearing mortality rate (%)	2.20		
Finishing mortality rate (%)	3.50		
Pig transfer weight from breeding unit (kg)	8.0	24.4	24.4
Pig transfer weight from rearing to finishing unit (kg).	25.8		
Pig finishing daily live weight gain - at 30 kg slaughter weight (g/day)	762	752	752
Finishing Feed Conversion Ratio - at 30 kg slaughter weight (g/day)	2.67	2.86	2.86
Number of finishing pigs per 'pig place' per year	2.97		
Average live slaughter weight (kg)	114.0	114.2	114.2
Average carcass weight (kg)	87.2	88.9	88.9
Average killing out ratio (%)	76.5	77.8%	77.8%
Average carcass meat production per sow per year (kg)	1,926.0		

Note: The data presented is not necessarily comparable between systems as the assumptions/data presented for each system are not based on homogenous samples of pigs.

Source: Agra CEAS calculations based on LEI (2005), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 127).

by discussions with a range of industry stakeholders[127].

6.6.3.1 Technical and economic performance

Technical and economic performance data for organic and non-organic pig production systems in the Netherlands is presented in Table 6.28. In general, organic pig production has a lower level of performance than non-organic production, with a loss of almost two weaned per sow per year (8.9%).

Although it is considered that some pigs are produced in the Netherlands under organic production system B, no performance data is available. A Dutch University organic pig specialist thought it unlikely that there would be any real differences in the technical and economic performance between the two organic systems if the same breeds of pigs continued to be used. However, it is likely that with on-farm breeding there would be a loss of potential genetic gain in the long-term, thus widening the performance gap between non-organic and organic systems.

6.6.3.2 Financial performance

Table 6.30 presents gross margin data (input costs, output prices and income) for organic and non-organic pig production systems in the Netherlands. This information is based on secondary data sources, corroborated where necessary with information from industry stakeholders (see footnote 127).

Between 1998 and 2004, the annual average price for pigmeat in the Netherlands ranged from €0.93 to €1.43 per kg deadweight, averaging at €1.18 per kg deadweight. Industry surveys carried out during this period found that average producer price premiums for organic pigmeat were 50% in 2000 (Hamm, *et al*. 2002) and 132% in 2001 (Hamm, *et al.* 2004). Given the variability in producer pigmeat prices and the organic price premium over time, Table 6.30 presents financial data based on the aforementioned average producer pigmeat price for the 1998 to 2004 period. For organic production, the average of the annual premiums for the 2001 and 2002 period (i.e. 91.0%) has been used. The impact on gross margin for a range of producer pigmeat prices and organic price premiums is presented in Table 6.32.

Secondary data sources (collaborated by discussions with a Dutch University organic specialist) found that the typical cost of gilts used in organic pig production systems was €260 per gilt (Table 6.29). This is 37.6% more than those used in non-organic systems (€189 per gilt) (Table 6.29). As most organic pig production in the Netherlands takes place in organic production system C, actual financial data on organic production system B is not available. However, the findings of the industry interviews with a Dutch University organic pig specialist and organic consultant suggested that the cost of gilts as a result of a transition from organic production system C to organic production system B would increase.

127 including a University pig and organic specialist, an organic agricultural consultant and the Dutch organic certification body (for a complete list, see Table 3.1, Section 3.5).

Table 6.29: Cost of gilts, feed costs and sow depreciation in the Netherlands

	Non-organic	Organic	
		system C	system B
Cost of gilts (€ per gilt)	189	260	n/a
Feed costs (€ per kg deadweight)	0.70	1.19	n/a
Sow depreciation cost (€ per kg deadweight)	0.02	0.04	n/a

Source: Agra CEAS calculations based on LEI (2005), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 127).

Table 6.30: Financial performance of pig herds in the Netherlands

	Unit	Non-organic	Organic	
			system C	system B
Output				
Pigmeat price	€ per kg deadweight	1.18	2.26	2.26
Sow depreciation cost	€ per kg deadweight	0.02	0.04	0.07
Total output	€ per kg deadweight	1.16	2.22	2.19
Variable costs				
Feed	€ per kg deadweight	0.70	1.19	1.19
Other	€ per kg deadweight	0.10	0.09	0.09
Total variable costs	€ per kg deadweight	0.80	1.28	1.28
GROSS MARGIN	€ per kg deadweight	0.36	0.94	0.91
	€ per fattened pig	32.55	83.52	80.87
Operating margin	%	31.0%	42.3%	41.6%
Value of sow depreciation as a % of gross margin	%	5.9%	4.2%	7.6%
Value of sow depreciation as a % of variable costs	%	2.6%	3.1%	5.4%

Note: 1 Based on a scenario of a 50% increase in bought-in gilt cost.

Source: Agra CEAS calculations based on European Commission (2005), LEI (2005), Hamm, et al. (2002), Hamm, et al. (2004), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 127).

As there is no *official* data on the cost of sourcing suitable organic breeding stock for use in organic production system B, Table 6.30 assumes that the transition from organic production system C to organic production system B would entail a 50% increase in the cost of sourcing gilts, which is in line with the findings of the UK case study (Section 6.8.3). The UK case study was used as a benchmark in this respect as it was found to be the only case study country where a relatively significant market exists for organic gilts used in organic production system B and where cost data was available to allow comparisons. On the assumption that the UK market for organic gilts for use in organic production system B is relatively well developed, from an economic perspective this price differential should reflect the true cost difference for buying in gilts for use in organic production system B instead of organic production system C. The cost of gilts for non-organic and organic systems is reflected in Table 6.30 in the cost of sow depreciation.

Based on the cost data presented in Table 6.30, feed for organic pig production costs €1.19 per kg of deadweight, 70% more than non-organic production. In contrast, other variable costs tend to be slightly lower (10%) in organic production at €0.09 per kg of deadweight.

6.6.4 Viability of organic pig production systems

6.6.4.1 Profitability

Based on the financial performance data presented in Table 6.30, the value of replacement organic gilts (i.e. sow depreciation cost) accounts for 4.2% of gross margin. This compares to 5.9% of gross margin in non-organic pig production systems. As noted above, the transition from organic production system C to organic production system B is likely to result in an increase in the cost of gilts. Thus, under the scenario that this transition would result in a 50% increase in the cost of gilts, this would, *ceteris paribus*, have a 3.2% negative impact on profitability (gross margin), with operating margins falling marginally from 42.3% to 41.6%. This would increase the importance of the replacement gilts cost (i.e. sow depreciation cost) as a proportion of gross margin to 7.6%.

Table 6.31: Sensitivity analysis of the financial performance of organic production system B in the Netherlands

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.226	24.0%
Organic producer price premium	10%	0.137	14.6%
Cost of gilts	10%	-0.006	-0.6%
Cost of feed	10%	-0.119	-12.7%

Notes: assuming all other assumptions remain constant.

Source: Agra CEAS calculations.

Table 6.32: Impact of pigmeat price and the organic premium on the gross margin of organic production system B in the Netherlands (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	0.85	1.07	1.29	1.51	1.73	1.95	2.17	2.39	2.61	2.83	3.05	3.27	3.49	3.71	3.93	4.15
2.1	0.75	0.96	1.17	1.38	1.59	1.80	2.01	2.22	2.43	2.64	2.85	3.06	3.27	3.48	3.69	3.90
2.0	0.65	0.85	1.05	1.25	1.45	1.65	1.85	2.05	2.25	2.45	2.65	2.85	3.05	3.25	3.45	3.65
1.9	0.55	0.74	0.93	1.12	1.31	1.50	1.69	1.88	2.07	2.26	2.45	2.64	2.83	3.02	3.21	3.40
1.8	0.45	0.63	0.81	0.99	1.17	1.35	1.53	1.71	1.89	2.07	2.25	2.43	2.61	2.79	2.97	3.15
1.7	0.35	0.52	0.69	0.86	1.03	1.20	1.37	1.54	1.71	1.88	2.05	2.22	2.39	2.56	2.73	2.90
1.6	0.25	0.41	0.57	0.73	0.89	1.05	1.21	1.37	1.53	1.69	1.85	2.01	2.17	2.33	2.49	2.65
1.5	0.15	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40
1.4	0.05	0.19	0.33	0.47	0.61	0.75	0.89	1.03	1.17	1.31	1.45	1.59	1.73	1.87	2.01	2.15
1.3	-0.05	0.08	0.21	0.34	0.47	0.60	0.73	0.86	0.99	1.12	1.25	1.38	1.51	1.64	1.77	1.90
1.2	-0.15	-0.03	0.09	0.21	0.33	0.45	0.57	0.69	0.81	0.93	1.05	1.17	1.29	1.41	1.53	1.65
1.1	-0.25	-0.14	-0.03	0.08	0.19	0.30	0.41	0.52	0.63	0.74	0.85	0.96	1.07	1.18	1.29	1.40
1.0	-0.35	-0.25	-0.15	-0.05	0.05	0.15	0.25	0.35	0.45	0.55	0.65	0.75	0.85	0.95	1.05	1.15
0.9	-0.45	-0.36	-0.27	-0.18	-0.09	0.00	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90

Source: Agra CEAS calculations.

The sensitivity analysis presented in Table 6.31 shows that profitability is least sensitive to changes in the cost of gilts. A 10% change in the cost of gilts would, *ceteris paribus*, have a 0.6% impact on gross margin. However, it should be noted that gross margin becomes more sensitive to the cost of gilts at lower levels of income, i.e. as the producer pigmeat price (and organic price premium) falls.

On the contrary, the profitability of organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic pigmeat having, *ceteris paribus*, a 24.0% impact on gross margin. Similarly, a 10% change in the producer price premium for organic pigmeat would, *ceteris paribus*, have a 14.6% impact on gross margin.

Table 6.32 shows the extent to which the profitability of organic production system B is dependent on the payment of a premium on the non-organic pigmeat price. Without such a premium, organic production system B would, *ceteris paribus,* not be profitable. At the reported pigmeat price level of €1.18 per kg deadweight and with an organic premium of 14%, pig production under organic production system B fails to break-even. Furthermore, as the non-organic producer pigmeat price falls, the importance of the organic price premium in maintaining the profitability of organic production system B increases.

6.6.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 127) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

6.6.4.3 Worthwhileness

As reported above (Table 6.30), the transition from organic production system C to organic production system B would, *ceteris paribus*, have a 3.2% negative impact on profitability (i.e. gross margin would fall from €0.94 per kg deadweight to €0.91 per kg deadweight). However, the profitability of organic production system B would have to fall by 60.2% (i.e. from €0.91 per kg deadweight to €0.36 per kg deadweight) to achieve the same level of gross margin as in non-organic systems. At this level of gross margin[128], it might be considered no longer worthwhile to continue an organic system of production.

To put this into context, the cost of gilts would have to increase by 613% for the gross margin of organic production system B to fall to the levels achieved in non-organic systems (Table 6.33).

128 i.e. before fixed costs and any subsidies

6.6.5 Sustainability of organic production system B in the Netherlands

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is some availability of suitable organic gilts for use in organic production system B in the Netherlands (i.e. *20% of production was found to take place in organic production system B*). Evidence suggests that availability has been developing in recent years, partly in response to national movement restrictions on transporting gilts within the Netherlands. This has facilitated producers in moving from organic production system C to organic production system B, in the short to medium term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  - Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under

Table 6.33: Breakeven analysis of organic pig production compared to non-organic production in the Netherlands

	Level to breakeven with non-organic systems[1]	
	Organic system C	Organic system B
Cost of gilts (€)	2,780	2,780
Allowable increase in the cost of gilts (%)	969%	613%

Note: 1based on the level of non-organic financial performance set out in Table 6.30.

the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in the Netherlands in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

– Criterion III: Worthwhileness. Organic production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of suitable organic gilts does not increase by more than 613% of the cost of non-organic gilts. However, in the medium to long-term the sustainability of organic production system B in the Netherlands was found to be more sensitive to developments in the organic price premium for pigmeat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

– Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long-term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

In conclusion, given that 20% of producers currently produce pigs under organic production system B in the Netherlands, there is real evidence that organic production system B is viable and sustainable, at least in the short term, despite the relative financial attractiveness of non-organic production (Table 6.34).

Table 6.34: Assessment of the sustainability of organic production system B in the Netherlands

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	20% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

6.7 Portugal

6.7.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in Portugal.

The organic pig sector in Portugal is still in its infancy with the first certified pig herd established in 2001. There are currently 38 organic pig herds in Portugal. According to Table 3.4 (Section 1.1.2) shows, 0.1% of national pig production is organic.

6.7.2 Availability of organic gilts to allow production without derogation

The minimum requirements of Council Regulation (EC) No 1804/1999 with respect to the origin of animals have been implemented in Portugal. Accordingly, Portuguese organic pig producers are able to take full advantage of the derogations set out in Annex I Part B. 3 (origin of animals) which permit non-organic gilts to be brought onto an organic production unit when a pig herd is renewed, restocked or reconstituted.

Initially, all of the current 38 organic pig herds began production taking advantage of these derogations, with the conversion of existing non-organic herds. Evidence from the industry interviews suggests that no pig producer started organic production by buying-in non-organic gilts. Furthermore, since converting to organic production the vast majority of these 38 organic pig herds have bred their own organic replacement gilts, i.e. operating a closed herd. In line with the definitions presented in this report (Section 3.3), the majority of organic pig production in Portugal can be considered to take place under organic production system A[129]. Therefore, in this case study the term 'organic production system A' is used to describe this particular organic system of pig production.

The longest running organic pig herd in Portugal was certified in 2001 and is in its second generation of breeding animals; the Portuguese pig producer replaced his sows when they reached 4 years old and he replaces his boars every year. Therefore, based on the definitions presented in Sections 1.1.2 and 3.3 (see footnote 129), pigs are produced in this unit under of organic production system A.

According to the largest organic certification body of pigs in Portugal, responsible for the control of approximately 60% of domestic organic pig production, none of its certified producers buy-in gilts; instead they keep some of their progeny for breeding stock. Discussions with a large-scale pig producer in Portugal, who is under control of another certification body, reported that he also keeps his own progeny back for breeding stock, thereby maintaining a closed herd and operating under organic production system A.

Based on this evidence, it is the view that virtually all organic pig production in Portugal is carried out under of organic production system A. In line with the characteristics of organic production system A (i.e. livestock must come from production units in the organic production system and throughout their life, this system of production must be applied), it was noted that there is currently no market in Portugal for organic breeding animals.

129 In organic production system A, livestock must come from production units in the organic production system and throughout their life, this system of production must be applied (Annex I, Part B, No. 3.2. of Council Regulation (EC) No 2092/91). Only livestock already present in a livestock production unit can be converted when the farm enters into organic farming for the first time (Annex I, Part B, No. 3.3. of Council Regulation (EC) No 2092/91).

6.7.3 *Comparison of the performance of organic pig production systems*

Technical, economic and financial performance data was based on primary and secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[130].

6.7.3.1 Technical and economic performance

Table 6.35 presents technical and economic performance data for organic and non-organic pig production systems in Portugal. In general, organic pig production has a much lower level of performance than non-organic production, with a loss of just over 10 finished pigs per sow per year (50.0%).

6.7.3.2 Financial performance

The production characteristics of organic pig production in Portugal seem to favour the development of organic production system A. As such, there has been a growing number of pig units that have converted from non-organic to organic production system A and developed their own breeding stock and breed their own replacements. Table 6.37 presents gross margin data (input costs, output prices and income) for organic production system A and non-organic pig production systems.

Between 1998 and 2004, the annual average price for pigmeat in Portugal ranged within a price band of €1.20 to €1.84 per kg deadweight, averaging at €1.43 per kg deadweight. According to the results of the pig producer survey (AgroGes, 2005a), the average producer price premium for organic pigmeat is currently 64%.

The results of the producer survey (AgroGes, 2005a) found that the typical *value* of gilts used in organic production system A is considered to be approximately €300 per gilt (Table 6.36), although no market is reported to exist for them. This is 100% more than those used in non-

130 including the University organic specialists and the organic certification bodies (for a complete list, see Table 3.1, Section 3.5).

Table 6.35: Technical and economic performance of pig production in Portugal

	Non-organic	Organic system A
Number of pigs weaned per sow per year	24.7	11.5
Number of pigs finished per sow per year	20	10
Number of litters per sow per year	2.4	2
Number of pigs born alive per litter	11.2	6.5
Pre weaning mortality rate (%)	11	12
Rearing mortality rate (%)	4.5	5
Finishing mortality rate (%)		2
Pig transfer weight from breeding unit (kg)	17	6
Pig transfer weight from rearing to finishing unit (kg).	100	100
Pig finishing daily live weight gain - at 30 kg slaughter weight (g/day)	500	130
Finishing Feed Conversion Ratio - at 30 kg slaughter weight (g/day)	6.5	7.5
Number of finishing pigs per 'pig place' per year		
Average live slaughter weight (kg)	160	143
Average carcass weight (kg)	128	124
Average killing out ratio (%)	80	80
Average carcass meat production per sow per year (kg)		

Note: The data presented is not necessarily comparable between systems as the assumptions/data presented for each system are not based on homogenous samples of pigs.

Source: Agra CEAS calculations based on AgroGes (2005a and 2005b).

Table 6.36: Cost of gilts, feed costs and sow depreciation in Portugal

	Non-organic	Organic system A
Cost of gilts (€ per gilt)	150	300
Feed costs (€ per kg deadweight)	0.76	1.37
Sow depreciation cost (€ per kg deadweight)	0.02	0.04

Source: Agra CEAS calculations based on AgroGes (2005a and 2005b).

Table 6.37: Financial performance of pig herds in Portugal

	Unit	Non-organic	Organic system A
Output			
Pigmeat price	€ per kg deadweight	1.43	2.34
Sow depreciation cost	€ per kg deadweight	0.01	0.08
Total output	€ per kg deadweight	1.42	2.27
Variable costs			
Feed	€ per kg deadweight	0.76	1.37
Other	€ per kg deadweight	0.08	0.09
Total variable costs	€ per kg deadweight	0.84	1.46
GROSS MARGIN	€ per kg deadweight	0.58	0.81
	€ per fattened pig	71.35	103.50
Operating margin	%	40.8%	35.7%
Value of sow depreciation as a % of gross margin	%	2.0%	9.3%
Value of sow depreciation as a % of variable costs	%	1.4%	5.2%

Notes: 1 Based on a scenario of a 50% increase in the cost of gilts.
Source: Agra CEAS calculations based on AgroGes (2005a and 2005b).

organic systems, where the cost of non-organic in-pig gilts was reported to be in the region of €150 per gilt (Table 6.36).

The main difference in the cost structure of organic pig production relates to feed. The cost of concentrate feed for organic production is €1.37 per kg deadweight, 80.0% more than the cost of feed used for non-organic production.

6.7.4 Viability of organic pig production systems

6.7.4.1 Profitability

Based on the financial performance data presented in Table 6.37, there is real evidence that organic production system A is profitable in Portugal. The financial analysis suggests that organic production system A produce gross margins of €0.81 per kg deadweight with an operating margin of 35.7%.

The *value* of replacement organic gilts suitable for organic production system A (sow depreciation cost) was found to account for 9.3% of gross margin (compared to 2.0% of gross margin in non-organic pig production systems). However, the sensitivity analysis presented in Table 6.38 shows that profitability of organic production system A is least sensitive to changes in the *value* of gilts. A 10% change in the cost of gilts would, *ceteris paribus*, have a 1.2% impact on gross margin, although gross margins become more sensitive to the *value* of gilts at lower levels of profitability (i.e. as the producer pigmeat price (and organic price premium) falls).

In contrast, the profitability of organic production system A is more sensitive to changes in market prices, with a 10% change in the price for organic pigmeat having, *ceteris paribus*, a 29.0% impact on income. Similarly, a

Table 6.38: Sensitivity analysis of the financial performance of organic production system A in Portugal

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.234	29.0%
Organic producer price premium	10%	0.141	17.4%
Cost of gilts	10%	-0.010	-1.2%
Cost of feed	10%	-0.137	-17.0%

Notes: assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

Table 6.39: Impact of pigmeat price and the organic premium on the gross margin of organic production system A in Portugal (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	0.66	0.88	1.10	1.32	1.54	1.76	1.98	2.20	2.42	2.64	2.86	3.08	3.30	3.52	3.74	3.96
2.1	0.56	0.77	0.98	1.19	1.40	1.61	1.82	2.03	2.24	2.45	2.66	2.87	3.08	3.29	3.50	3.71
2.0	0.46	0.66	0.86	1.06	1.26	1.46	1.66	1.86	2.06	2.26	2.46	2.66	2.86	3.06	3.26	3.46
1.9	0.36	0.55	0.74	0.93	1.12	1.31	1.50	1.69	1.88	2.07	2.26	2.45	2.64	2.83	3.02	3.21
1.8	0.26	0.44	0.62	0.80	0.98	1.16	1.34	1.52	1.70	1.88	2.06	2.24	2.42	2.60	2.78	2.96
1.7	0.16	0.33	0.50	0.67	0.84	1.01	1.18	1.35	1.52	1.69	1.86	2.03	2.20	2.37	2.54	2.71
1.6	0.06	0.22	0.38	0.54	0.70	0.86	1.02	1.18	1.34	1.50	1.66	1.82	1.98	2.14	2.30	2.46
1.5	-0.04	0.11	0.26	0.41	0.56	0.71	0.86	1.01	1.16	1.31	1.46	1.61	1.76	1.91	2.06	2.21
1.4	-0.14	0.00	0.14	0.28	0.42	0.56	0.70	0.84	0.98	1.12	1.26	1.40	1.54	1.68	1.82	1.96
1.3	-0.24	-0.11	0.02	0.15	0.28	0.41	0.54	0.67	0.80	0.93	1.06	1.19	1.32	1.45	1.58	1.71
1.2	-0.34	-0.22	-0.10	0.02	0.14	0.26	0.38	0.50	0.62	0.74	0.86	0.98	1.10	1.22	1.34	1.46
1.1	-0.44	-0.33	-0.22	-0.11	0.00	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.10	1.21
1.0	-0.54	-0.44	-0.34	-0.24	-0.14	-0.04	0.06	0.16	0.26	0.36	0.46	0.56	0.66	0.76	0.86	0.96
0.9	-0.64	-0.55	-0.46	-0.37	-0.28	-0.19	-0.10	-0.01	0.08	0.17	0.26	0.35	0.44	0.53	0.62	0.71

Source: Agra CEAS calculations.

10% change in the producer price premium for organic pigmeat would, *ceteris paribus*, have a 17.4% impact on income.

The extent to which the profitability of organic production system A is dependent on price and the producer premium is shown in Table 6.39. At the reported pigmeat price level of €1.43 per kg deadweight, a premium of at least 7.5% is required for organic production system A, *ceteris paribus,* to remain profitable. In addition, as the non-organic producer pigmeat price falls, the importance of the organic price premium increases.

6.7.4.2 Feasibility

The findings of discussion with industry stakeholders AgroGes (2005a and 2005b) suggested that the transition to organic production system A did not involve any significant initial capital expenditure for producers that could form a barrier to the transition.

6.7.4.3 Worthwhileness

Based on the analysis presented in Table 6.37, there is real evidence that organic production system A is profitable. For these production systems to be considered no longer worthwhile, gross margin would have to fall by 24.2% (i.e. from €0.81 per kg deadweight to €0.58 per kg deadweight) to achieve the same level of gross margin as in non-organic systems.

To put this into context, the cost of rearing replacement organic gilts suitable for use in

Table 6.40: Breakeven analysis of organic pig production compared to non-organic production in Portugal

	Level to breakeven with non-organic systems[1]
	Organic production system A
Cost of gilts (€)	1,011
Allowable increase in the cost of gilts (%)	237%

Note: 1based on the level of non-organic financial performance set out in Table 6.37.

organic production system A would have to increase by 237% for the gross margin of organic production system A to fall to the levels achieved in non-organic systems (Table 6.40).

6.7.5 Sustainability of organic production system A in Portugal

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B (and A) in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is sufficient availability of suitable organic gilts in Portugal (i.e. >*90% of production was found to take place in organic production system A*) as the evidence suggests that producers keep their own organic progeny back for breeding stock thereby maintaining organic production system A.

- Principle II: Viability of organic production system B (and A). From a producer *demand* perspective, the evidence suggests that:

  - Criterion II: Profitability. Under the assumptions presented, organic production system A is profitable (in terms of gross margin). Based on this Criterion, the sustainability of organic production system A in Portugal in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

  - Criterion III: Worthwhileness. Organic production system A remains worthwhile under the assumptions presented. In the medium to long-term the sustainability of organic production system A in Portugal was found to be sensitive to developments in the organic price premium for pigmeat.

  - Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving to organic production system A. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system A in the short, medium and long-term.

Overall there is real evidence that organic production system A is financially viable and sustainable. In the medium to long term, however, the financial viability (hence sustainability) of organic production system A will continue to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

In conclusion, given that over 90% of producers currently produce pigs under organic production system A in Portugal, there is real evidence that organic production system A is viable and sustainable, at least in the short (and medium) term, despite the relative financial attractiveness of non-organic production (Table 6.41).

Table 6.41: Assessment of the sustainability of organic production system A in Portugal

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B (and A).	
Criterion I: Organic production system B (and A)	>90% of production takes place in organic production system A
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B (and A) *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, organic production system A was found to be profitable (gross margin).
Criterion III: Worthwhileness	That said, organic production system B and free-range non-organic systems offer an attractive alternative.
Criterion IV: Feasibility	No discernible barriers to the transition to organic production system A were found.

Source: Agra CEAS.

6.8 United Kingdom

6.8.1 Introduction

This Section provides an economic analysis of the sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock in the UK.

The UK organic pig sector is relatively well developed. In terms of production, Table 3.4 (Section 1.1.2) shows that 1.2% of all pigs in the UK were organic. Compared with other EU Member States, the UK ranked third in terms of its share of pig production certified as organic. According to Defra (2005), there were approximately 0.7 million organic pigs in the UK in 2003.

6.8.2 Availability of organic gilts to allow production without derogation

The organic pig sector in the UK is polarised with many small-scale producers which use traditional breeds and market their produce directly to consumers/small retail outlets and large-scale producers which use commercially produced hybrid (non-organic) breeds (e.g. English Landrace X Duroc) to produce pigmeat for the multiple retail sector.

In contrast, small-scale producers tend to breed their own organic replacements, particularly traditional and rare breeds, with any surplus organic gilts sold as replacements suitable for use in organic production system B. Such breeds include Berkshire and Gloucester Old Spot, of which the sector considered there to be a good supply of organic gilts for use in organic production system B. However, this is not the case for all breeds; it was reported that there are currently little or no supplies of some traditional/rare breeds for use in organic production system B, such as Tamworth gilts.

From a technical perspective, however, there is a logistical issue concerning the availability of organic gilts for use in organic production system B in that these organic gilts often do exist but they may be located some distance from the demand centre. Accordingly, this would necessitate transport over long distances, which may go against the principle of welfare friendly organic production. Discussions with the Soil Association suggest that around 20% of all organic pigs in the UK are produced in organic production system B.

To facilitate trade in livestock suitable for organic production system B, the Soil Association has set up a web-based organic marketplace[131], which it claims is the UK's biggest searchable directory of organic livestock. This service is free and available to all organic farmers, regardless of their organic certification body.

131 http://www.soilassociation.org/organicmarketplace

6.8.3 Comparison of the performance of organic pig production systems

Technical, economic and financial performance data was based on secondary data sources and supplemented and contextualised by discussions with a range of industry stakeholders[132]

6.8.3.1 Technical and economic performance

Technical and economic performance data for organic and non-organic pig production systems in the UK is presented in Table 6.42. In general, organic pig production has a slightly lower level of performance than non-organic production, with a loss of almost one finished pig per sow per year (4.0%). Given the slightly higher carcass weight of organic pigs, average carcass meat production per organic sow per year is €1,295 per kg deadweight, only 0.5% lower than non-organic production at €1,302 kg deadweight.

According to the results of interviews with two organic certification bodies, there is no discernible difference in the technical and economic performance between the two organic systems when using the same breeds of pig. However, over the medium to longer-term, it is likely that there would be some loss in genetic gain in organic production system B as a result of inbreeding.

6.8.3.2 Financial performance

Table 6.44 presents typical gross margins (input costs, output prices and income) for organic and non-organic pig production systems in the UK based on secondary data sources, supplemented where necessary with information from industry stakeholders (see footnote 132).

Between 1998 and 2004, the annual average price for pigmeat in the UK ranged from €1.20 to

132 including UK organic certification bodies and University researchers (for a complete list, see Table 3.1, Section 3.5).

Table 6.42: Technical and economic performance of pig production in the UK

	Non-organic (indoor)	Organic	
		system C	system B
Number of pigs weaned per sow per year	20.35	18.00	18.00
Number of pigs finished per sow per year	18.22	17.50	17.50
Number of litters per sow per year	2.10	2.00	2.00
Number of pigs born alive per litter	10.89	10.00	10.00
Pre weaning mortality rate (%)	10.80	10.00	10.00
Rearing mortality rate (%)	4.20	2.80	2.80
Finishing mortality rate (%)	6.30	2.00	2.00
Pig transfer weight from breeding unit (kg)	7.1		
Pig transfer weight from rearing to finishing unit (kg).	34.7	32.0	32.0
Pig finishing daily live weight gain - at 30 kg slaughter weight (g/day)	635	690	690
Finishing Feed Conversion Ratio - at 30 kg slaughter weight (g/day)	2.72	2.45	2.45
Number of finishing pigs per 'pig place' per year	3.47		
Average live slaughter weight (kg)	97.1	100.0	100.0
Average carcass weight (kg)	71.5	74.0	74.0
Average killing out ratio (%)	73.6	74.0	74.0
Average carcass meat production per sow per year (kg)	1,302.0	1,295.0	1,295.0

Note: The data presented is not necessarily comparable between systems as the assumptions/data presented for each system are not based on homogenous samples of pigs.

Source: Agra CEAS calculations based on Knowles and Fowler (2004), Lampkin, et al. (2004) and interviews with industry stakeholders (see footnote 132).

Table 6.43: Cost of gilts, feed costs and sow depreciation in the UK

	Non-organic	Organic	
		system C	system B
Cost of gilts (€ per gilt)	185	305	n/a
Feed costs (€ per kg deadweight)	0.88	1.20	n/a
Sow depreciation cost (€ per kg deadweight)	0.04	0.07	n/a

Source: Agra CEAS calculations based on Lampkin, et al. (2004) and Nix (2004), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 132).

€1.59 per kg deadweight, averaging at €1.44 per kg deadweight. Industry surveys carried out during this period identified that average producer price premiums for organic pigmeat in the UK were 112% in 2000 (Hamm, *et al*. 2002) and 120% in 2001 (Hamm, *et al*. 2004). However, prior to this period it is reported that this price premium was much lower, ranging from 0% to 40%, see for example: Lampkin (1997) and Offerman and Nieberg (2000). Because of the large variability in producer pigmeat prices (and the organic price premium) over time, the financial data presented in Table 6.44 is based on the aforementioned average producer pigmeat price for the 1998 to 2004 period. For organic production, Table 6.44 is based on the average of the annual premiums for the 2000 and 2001 period (i.e. 116%). However, the impact on gross margin for a range of producer pigmeat prices and organic price premiums is presented in Table 6.46.

A review of published literature, corroborated by interviews with industry stakeholders (see footnote 132), found that the typical cost of gilts used in organic pig production systems was approximately €305 per gilt (Lampkin, *et al*. 2004). This is 64.9% more than those used in non-organic systems, where the cost of non-organic in-pig gilts is reported to be in the region of €185 per gilt (Nix, 2004) (Table 6.43). However, it should be noted that there is considerable difference in the cost of organic gilts in the UK depending on the level of their organic status, regional supply and demand factors, the breed of gilts used, etc.

The findings of the industry interviews revealed different views on the likely impact on the price of organic gilts suitable for use in organic production system B as a result of a transition from organic production system C to organic production system B. While one organic certification body suggested that this transition would result in an increase in the cost of gilts, another suggested the cost structure would remain virtually unchanged, noting that there was not much difference in the current market price for breeding stock used in organic production system B.

The cost of gilts for non-organic and organic systems is reflected in Table 6.44 in the cost of sow depreciation. As there is limited *official* national market data on the cost of sourcing organic breeding stock, Table 6.44 assumes that the transition from organic production system C to organic production system B would entail a 50% increase (€0.049 per kg deadweight) in the cost of sourcing gilts from €0.065 per kg deadweight to €0.115 per kg deadweight. This was in line with the cost increase for organic gilts published on the Soil Association's organic marketplace (http://www.soilassociation.org/organicmarketplace), and was generally considered to be a reasonable estimate by those industry stakeholders interviewed (see footnote 132).

The only significant difference in the cost structure of organic pig production relates to feed. The cost of concentrate feed for organic production is typically €370 per tonne (Lampkin, *et al*. 2004), 60.8% more than that the cost of concentrate feed used in non-organic production (€230 per tonne) (Nix, 2004). When expressed on a per kg deadweight basis, the reported cost of organic feed is around 37.1% more than feed used for non-organic production, as many

Table 6.44: Financial performance of pig herds in the UK[2]

	Unit	Non-organic	Organic	
			system C	system B
Output				
Pigmeat price	€ per kg deadweight	1.44	3.11	3.11
Sow depreciation cost	€ per kg deadweight	0.04	0.07	0.11
Total output	€ per kg deadweight	1.40	3.05	3.00
Variable costs				
Feed	€ per kg deadweight	0.88	1.20	1.20
Other	€ per kg deadweight	0.12	0.12	0.12
Total variable costs	€ per kg deadweight	0.99	1.32	1.32
GROSS MARGIN	€ per kg deadweight	0.41	1.73	1.68
	€ per fattened pig	29.25	127.95	124.30
Operating margin	%	29.3%	56.7%	56.0%
Value of sow depreciation as a % of gross margin	%	9.3%	3.8%	6.8%
Value of sow depreciation as a % of variable costs	%	3.8%	5.0%	8.7%

Notes: 1 Based on a scenario of a 50% increase in the cost of gilts; 2 Based on a €:£ exchange rate of 0.6757.

Source: Agra CEAS calculations based on European Commission (2005), Nix (2004), Lampkin, et al. (2004), Hamm, et al. (2002), Hamm, et al. (2004), Knowles and Fowler (2004) and interviews with industry stakeholders (see footnote 132).

organic pig producers in the UK have different feeding strategies that reduce their reliance on the relatively higher priced feeds, including the increased use of forage.

6.8.4 Viability of organic pig production systems

6.8.4.1 Profitability

Based on the financial performance data presented in Table 6.44, the value of replacement organic gilts (i.e. sow depreciation cost) accounts for 3.8% of gross margin (compared to 9.3% of gross margin in non-organic pig production systems). The likely impact on profitability of a transition from organic production system C to organic production system B would result from a possible increase in the cost of gilts. All other costs and revenue are expected to remain unchanged. Thus, under the scenario that this transition would result in a 50% change in the cost of gilts, this would, *ceteris paribus*, have a 2.9% negative impact on profitability (gross margin), with operating margins falling marginally to 56.0%. This would increase the importance of the replacement gilts cost (i.e. sow depreciation cost) as a proportion of gross margin to 6.8%.

However, as shown in the sensitivity analysis presented in Table 6.45, profitability is least sensitive to changes in the cost of gilts. A 10% change in the cost of gilts would, *ceteris paribus*, have a 0.6% impact on gross margin. Nevertheless, it should be noted that gross margin becomes more sensitive to the cost of gilts at lower levels of income, i.e. as the producer pigmeat price (and organic price premium) falls.

In contrast, the profitability of organic production system B is more sensitive to changes in market prices, with a 10% change in the price for organic pigmeat having, *ceteris paribus*, an 18.0% impact on income. Similarly, a 10% change in the producer price premium for organic pigmeat would, *ceteris paribus*, have a 12.5% impact on income.

As shown in Table 6.46, the profitability of organic production system B is dependent on the payment of a premium on the non-organic pigmeat price. Although, *ceteris paribus*, organic

Table 6.45: Sensitivity analysis of the financial performance of organic production system B in the UK

	Change in value	Impact on gross margin	
		€	%
Producer price for pigmeat	10%	0.311	18.0%
Organic producer price premium	10%	0.217	12.5%
Cost of gilts	10%	-0.010	-0.6%
Cost of feed	10%	-0.120	-6.9%

Notes: assuming all other assumptions remain constant.
Source: Agra CEAS calculations.

Table 6.46: Impact of pigmeat price and the organic premium on the gross margin of organic production system B in the UK (€ per kg deadweight)

Non-organic pigmeat price (€ per kg deadweight)	Organic price premium (%)															
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	110%	120%	130%	140%	150%
2.2	0.77	0.99	1.21	1.43	1.65	1.87	2.09	2.31	2.53	2.75	2.97	3.19	3.41	3.63	3.85	4.07
2.1	0.67	0.88	1.09	1.30	1.51	1.72	1.93	2.14	2.35	2.56	2.77	2.98	3.19	3.40	3.61	3.82
2.0	0.57	0.77	0.97	1.17	1.37	1.57	1.77	1.97	2.17	2.37	2.57	2.77	2.97	3.17	3.37	3.57
1.9	0.47	0.66	0.85	1.04	1.23	1.42	1.61	1.80	1.99	2.18	2.37	2.56	2.75	2.94	3.13	3.32
1.8	0.37	0.55	0.73	0.91	1.09	1.27	1.45	1.63	1.81	1.99	2.17	2.35	2.53	2.71	2.89	3.07
1.7	0.27	0.44	0.61	0.78	0.95	1.12	1.29	1.46	1.63	1.80	1.97	2.14	2.31	2.48	2.65	2.82
1.6	0.17	0.33	0.49	0.65	0.81	0.97	1.13	1.29	1.45	1.61	1.77	1.93	2.09	2.25	2.41	2.57
1.5	0.07	0.22	0.37	0.52	0.67	0.82	0.97	1.12	1.27	1.42	1.57	1.72	1.87	2.02	2.17	2.32
1.4	-0.03	0.11	0.25	0.39	0.53	0.67	0.81	0.95	1.09	1.23	1.37	1.51	1.65	1.79	1.93	2.07
1.3	-0.13	-0.00	0.13	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.17	1.30	1.43	1.56	1.69	1.82
1.2	-0.23	-0.11	0.01	0.13	0.25	0.37	0.49	0.61	0.73	0.85	0.97	1.09	1.21	1.33	1.45	1.57
1.1	-0.33	-0.22	-0.11	-0.00	0.11	0.22	0.33	0.44	0.55	0.66	0.77	0.88	0.99	1.10	1.21	1.32
1.0	-0.43	-0.33	-0.23	-0.13	-0.03	0.07	0.17	0.27	0.37	0.47	0.57	0.67	0.77	0.87	0.97	1.07
0.9	-0.53	-0.44	-0.35	-0.26	-0.17	-0.08	0.01	0.10	0.19	0.28	0.37	0.46	0.55	0.64	0.73	0.82

Source: Agra CEAS calculations.

pig production still has a positive gross margin if the organic producer price premium is removed, if the pigmeat price falls to below €1.43 per kg deadweight then it would no longer be profitable. In addition, as the non-organic producer pigmeat price falls, the importance of the organic price premium increases.

6.8.4.2 Feasibility

The findings of the interviews with industry stakeholders (see footnote 132) suggested that the transition from organic production system C to organic production system B would not involve any initial capital expenditure that could form a barrier to the transition.

6.8.4.3 Worthwhileness

Based on the analysis presented in Table 6.44, the transition from organic production system C to organic production system B would, *ceteris paribus*, have a 2.9% negative impact on profitability (i.e. gross margin would fall from €1.73 per kg deadweight to €1.68 per kg deadweight). However, the profitability of organic production system B would have to fall by 75.6% (i.e. from €1.68 per kg deadweight to €0.41 per kg deadweight) to achieve the same level of gross margin as in non-organic systems. At this level of gross margin[133], it might be

133 i.e. before fixed costs and any subsidies

Table 6.47: Breakeven analysis of organic pig production compared to non-organic production in the UK

	Level to breakeven with non-organic systems[1]	
	Organic system C	Organic system B
Cost of gilts (€)	4,375	4,375
Allowable increase in the cost of gilts (%)	1,335%	857%

Note: 1 based on the level of non-organic financial performance set out in Table 6.44.

considered no longer worthwhile to continue an organic system of production.

To put this into context, the cost of gilts would have to increase by 857% for the gross margin of organic production system B to fall to the levels achieved in non-organic systems.

6.8.5 Sustainability of organic production system B in the UK

The central tenet of this Study is that the economic sustainability of organic pig production without derogation, i.e. producing pig meat under organic production system B in the medium to long-term is dependent on two fundamental economic principles:

- Principle I (and Criterion I): Availability of organic livestock for production system B. From a *supply* perspective, the evidence suggests that currently there is some availability of suitable organic gilts in the UK for use in organic production system B (i.e. *20% of production was found to take place in organic production system B*). Evidence suggests that availability has been developing in recent years, facilitated by the development of the Soil Association's web-based organic market place for sourcing gilts to be used in organic production system B. This has allowed producers to move from organic production system C to organic production system B, in the short to medium term.

- Principle II: Viability of organic production system B. From a producer demand perspective, the evidence suggests that:

  – Criterion II: Profitability. Although the transition from organic production system C to organic production system B would likely result in a relatively large impact on profitability, under the assumptions presented organic production system B remained profitable (in terms of gross margin). Based on this Criterion, the transition from organic production system C to organic production system B in the short-term would likely be sustainable given the assumptions presented. However, the sustainability of organic production system B in the UK in the medium to long-term was found to be highly sensitive to developments in the producer price for pigmeat.

  – Criterion III: Worthwhileness. Organic production system B remains worthwhile under the assumptions presented as long as the additional (*unknown*) cost of suitable organic gilts does not increase by more than 857% of the cost of non-organic gilts. However, in the medium to long-term the sustainability of organic production system B in the UK was found to be more sensitive to developments in the organic price premium for pigmeat. That said, given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive.

  – Criterion IV: Feasibility. The evidence suggests that there is no discernible impact on the fixed cost structure of moving from organic production system

Table 6.48: Assessment of the sustainability of organic production system B in the UK

Principle I: Availability of organic livestock for production system B. From a supply perspective, there has to be sufficient availability of organic livestock in order to renew, restock or reconstitute a herd or flock operating under organic production system B.	
Criterion I: Organic production system B	20% of production takes place in organic production system B
Principle II: Viability of organic production system B. From a producer demand perspective, organic production system B *vis-à-vis* organic production system C (and non-organic production systems) must be financially viable in terms of profitability, worthwhileness and feasibility:	
Criterion II: Profitability	Based on the gross margin analysis, the transition from organic production system C to organic production system B had a relatively large impact on profitability. Under the assumptions presented organic production system B remained profitable (gross margin).
Criterion III: Worthwhileness	Given the impact on profitability from a transition to organic production system B, free-range non-organic systems become relatively more attractive
Criterion IV: Feasibility	As there is no discernible impact on the fixed cost structure, it is likely that there would be no barriers to transition.

Source: Agra CEAS.

C to organic production system B. Accordingly, such a transition would be considered feasible and would have no adverse impact on the sustainability of organic production system B in the short, medium and long-term.

Overall the evidence suggests that under the financial assumptions presented, organic production system B would likely be financially viable and sustainable, at least in the short-term. In the medium to long term, however, the financial viability (hence sustainability) of organic production system B was found to be highly dependent on future developments in the producer price for pigmeat and the organic price premium, in particular.

In conclusion, given that 20% of producers currently produce pigs under organic production system B in the UK, there is real evidence that organic production system B is viable and sustainable, at least in the short term, despite the relative financial attractiveness of non-organic production (Table 6.48).

6.9 Overall conclusions on the economic sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock

In recent years there have been a growing number of organic pigs produced without the use of the derogation on sourcing non-organic livestock (i.e. organic pig production system B). Based on the results of the availability of organically reared livestock and the *viability* of organic pig production without the use of the derogation in the selected case study countries, a number of generalised conclusions can be drawn as to the '*economic sustainability*' of organic pig production system B:

- Most countries make use of the derogation as set out in Annex I, Part B.3 of Council Regulation (EC) No 1804/1999 on sourcing non-organic gilts, although the extent to which the derogation is used to its limit varies considerably by Member State. In summary, organic pig production in the Czech Republic, France and Denmark makes full use of the derogation on sourcing non-organic gilts. The UK, Germany and the Netherlands have a significant proportion of

Table 6.49: *Estimated share of organic pig production under organic production system B as a % of total organic pig production*[1]

	%
Czech Republic	<1%
Denmark	<1%
France	<1%
Germany	30%
The Netherlands	20%
Portugal	>90%[2]
United Kingdom	20%

Note: 1 i.e. production not taking advantage of the derogation on the origin of animals. 2 refers to organic pig production system A.
Source: Country case studies (Sections 6.2 to 6.8).

production that takes place under organic pig production system B using suitable organic gilts (Table 6.49).

In contrast, there was evidence that organic pig production system A exists in Portugal (for a specific, local production system), whereby replacement livestock come from units within the organic production system and throughout their life, this system of production is applied. Moreover, it is estimated that over 90% of organic pig production in Portugal takes place under this system.

- In those countries where there is evidence that a proportion of organic livestock production takes place under organic production system B, this production has tended to evolve in response to specific national or certification body rules within those countries which prevent producers from taking full advantage of the derogation on the origin of animals. In addition, in the Netherlands restrictions on movements of gilts between regions under national animal health regulations have facilitated the uptake of organic production system B.

  In contrast, in those countries where national law and certification bodies permit the use of this derogation, organic production using non-organic livestock has continued. In general, the industry interviews found that the main reasons put forward to explain why producers in the case study countries still take advantage of this derogation and use non-organic animals were due to a low availability of suitable organic gilts at an economic price.

- In terms of technical and economic performance, no evidence was found that the transition from organic production system C to organic production system B would have any impact on performance, unless there were major adjustments to the production system (such as an expansion/contraction of the enterprise, a change in the breeds used, etc.). In such a case, any resulting change would be attributable to these adjustments rather than the transition *per se*. In the medium to long-term there may, however, be some loss in potential genetic gain, as closed herds, in particular, are unlikely to be able to maintain the same level of genetic improvement in their breeding programmes over time relative to that achieved in non organic commercial breeding herds. Thus, this would result in a widening of the technical and economic performance gap between non-organic and organic systems in the medium to long-term.

- As the transition from organic production system C to organic production system B did not entail a change in labour requirement (e.g. the number of pigs managed, and the average weight of pigs at slaughter, per person), the economic sustainability of the farming systems in terms of labour productivity would remain unchanged. Any change in labour productivity when expressed on a financial basis (i.e. in terms of added value per working unit) would therefore be directly attributable to the impact of any change in income (gross margin) following the transition to organic production system B.

- Looking at the impact of the transition from organic production system C to organic production system B on gross margin, the only resulting quantifiable impact concerned an increase in the cost for suitable organic gilts and thus on profit (gross margin). Based on the gross margin analysis, the organic pig sector would, *ceteris paribus,* remain profitable following a transition to organic production system B (and A). Moreover, there was real evidence that organic production system B (and A) was sustainable, at least in the short term, in some countries. This was particularly the case for organic production system B in Germany, the Netherlands and the UK and organic production system A in Portugal.

- The profitability of organic production system B was more sensitive to changes in market prices for organic products than the cost of suitable organic livestock *per se*. The sustainability of organic production system B in the long-term will therefore be dependent on the evolution of the price premium for organic produce relative to non-organic produce and the associated price and demand elasticities.

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7. Examination of the need for adapting the current provisions

7.1 Overall conclusions

Based on the results of the country case study analysis of the availability of organically reared livestock and the *viability* of organic production system B, a number of generalised conclusions can be drawn as to the '*economic sustainability*' of organic production systems without the use of the derogation on sourcing non-organic livestock:

- Most countries make full use of the derogation on sourcing non-organic livestock. However, the extent to which this derogation is used was found to vary considerably by livestock species and Member State. In summary:

  – Organic egg production[134] in Austria, France and the Netherlands makes almost full use of the derogation on sourcing pullets from non-organic parent-stock. Consequently, there is little availability of suitable organic pullets for use in organic production system B in these countries. In contrast, in the UK 10-15% of production takes place in organic production system B using suitable organic pullets, in line with an increasing availability of organic pullets. In Denmark and Germany, while the majority of organic egg production still takes advantage of the derogation on the origin of animals, there is a limited amount of organic eggs produced under organic production system B. Similar to the UK, the increasing availability of suitable organic pullets in these countries has facilitated uptake.

  – Organic broiler production[135] in both France and Italy makes almost full use of the derogation on sourcing non-organic chicks. Consequently, there is little availability of suitable organic chicks for use in organic production system B in these countries. In contrast, almost all organic broiler production in Austria takes place under organic production system B using suitable organic chicks. The availability of suitable organic chicks in Austria is reported to have been sufficient in recent years in meeting demand. In the UK and Germany, while the majority of organic broiler production still takes advantage of the derogation on the origin of animals, there is a growing share of organic broiler production which now takes place under organic production system B, in line with an increasing availability of suitable organic chicks.

  – Organic pig production[136] in the Czech Republic makes full use of the derogation on sourcing non-organic gilts. Consequently, there is little availability of suitable organic gilts for use under organic production system B in the Czech Republic. In the UK, Germany and the Netherlands, a significant proportion of production that takes place in organic production system B using suitable organic gilts, in line with an increasing availability in recent years. In France and Denmark, while the majority of organic pig production still

134 Case studies were carried out in Austria, Denmark, France, Germany, the Netherlands and the UK.

135 Case studies were carried out in Austria, France, Germany, Italy and the UK.

136 Case studies were carried out in the Czech Republic, Denmark, France, Germany, the Netherlands, Portugal and the UK.

takes advantage of the derogation on the origin of animals, there is a limited amount of organic pig production taking place in organic production system B, with limited availability of suitable organic gilts reported. In contrast, pig production under organic production system A exists in Portugal (for a specific, local production system), where it is estimated that over 90% of organic pig production takes place under this production system. Pig herds within this system tend to operate closed systems, so the unit itself determines the availability of organic replacement gilts.

- In those countries where there is evidence that a proportion of organic livestock production takes place under organic production system B, this production has tended to evolve in response to specific factors within those countries which prevent producers from taking full advantage of the derogation on the origin of animals. For example, organic broiler production system B in Austria has evolved in response to national demand characteristics that prevent the use of the derogation. In the case of the UK, standards by the Soil Association prevent certified producers taking advantage of the derogation (thus operating organic production system B) for the production of organic broilers and eggs.

- In contrast, in those countries where national law and certification bodies permit the use of the derogation, organic production using non-organic livestock has continued. In general, the industry interviews found that the main reasons put forward to explain why producers in the case study countries still take advantage of this derogation and use non-organic animals were:

  – *Economic* in terms of the need for organic producers to maintain relative profitability and cost competitiveness *vis-à-vis* non-organic producers. The transition from organic production system C to organic production system B, given that no separate consumer market currently exists for meat and livestock products produced under such a system, prevents producers from taking advantage of the derogation to use 'cheaper' non-organic replacement livestock, thereby providing a disincentive to move to organic production system B.

  – *Availability of organically reared livestock* in terms of both the numbers and the diversity of appropriate breeds/strains. It was concluded from our industry interviews that in those countries where producers are unable to take advantage of the derogation on using non-organic livestock, the availability of organically reared animals has developed in line with demand. As a result, one might expect *a priori* that should a *real* demand for suitable organic livestock for use in organic production system B develop, then the market for these organic livestock would likewise evolve. However, while the availability of these organic livestock is reported to have developed more or less in line with demand in those countries where producers are unable to take advantage of the derogation, there is still a lack of availability in terms of specific breeds/strains.

- This Study found no discernible evidence that the transition from organic production system C to organic production system B would have a significant impact on technical and economic performance in the short to medium term, unless there were major adjustments to the production system (such as an expansion/contraction of the enterprise, a change in the breeds/strains used, etc.). In such a case, any resulting change would be attributable to these adjustments rather than the transition *per se*. In the medium to long-term there may, however, be some loss in potential genetic gain, thus widening the performance gap between non-organic and organic systems.

- As the transition from organic production system C to organic production system B did not entail a change in labour requirement, the economic sustainability of the farming systems in terms of labour productivity would remain unchanged. Any change in labour productivity (added value per working unit) is directly attributable to the impact of any change in profitability (gross margin) as a result of increases in the cost of sourcing appropriate organic replacements.

- Looking at the impact of the transition from organic production system C to organic production system B on profitability (gross margin), the only resulting quantifiable impact concerned an increase in the cost for suitable organic livestock for use in organic production system B and thus on profit (gross margin). Based on the gross margin analysis, the organic egg sector seemed to be less able to withstand the likely impact of this transition to organic production system B than the organic poultry and organic pig sectors[137]. However, there was real evidence that organic production system B was sustainable, at least in the short term, in some countries and sectors, particularly for organic broiler production in Austria and to a lesser extent the UK, organic egg production in the UK and organic pig production in Portugal[138], and to a lesser extent Germany, the Netherlands and the UK.

- The profitability (gross margin) of organic production system B was more sensitive to changes in market prices for organic products than the cost of suitable organic livestock replacements *per se*. The sustainability of organic production system B in the long-term will therefore be dependent on the evolution of the price premium for organic produce relative to non-organic produce and the associated price and demand elasticities.

7.2 Need to adapt the current harmonised rules for organically reared livestock

The evidence of the shift from organic production system C to organic production system B reviewed in this report suggests that the derogation provided for in Annex 1, Part B.3 to Council Regulation (EC) No 2092/91 are working as intended in that the setting of these Community standards has provided the basis for a number of Member States to start to introduce the higher requirements needed to operate under organic production system B.

As is evident from the analysis presented in this report, while most countries and most sectors continue to make (full) use of almost all the derogations provided for in the Annex 1, Part B.3 to Council Regulation (EC) No 2092/9, a limited number of Member States have started to shift to produce organic eggs, poultrymeat and pig production under organic production system B (i.e. without the use of the derogation on sourcing non-organic livestock. It is particularly worth noting that where such shifts towards producing without the use of the derogation have occurred, these are generally in Member States which have a relatively substantial market in place for organic products (e.g. Austria, Germany and the UK) and also where (national) legislation or certification body standards have mandated such a shift. This suggests strongly that organic producers tend to move towards organic production system B as and when the sector in a particular Member State considers the conditions for such a move are sustainable.

137 It should be noted that this Study assessed the impact on profitability based on a single year's financial data and therefore the findings are based on the relative performance between the species for that single year. A temporal assessment might have produced different results.

138 Organic production system A.

The further elaboration of rules concerning the origin of animals for organic production might therefore be seen as running against the need for 'subsidiarity' in Community decision making as well as potentially endangering the viability of those organic livestock sectors and countries where the sector is still at the infant stage of development. In other words a shift towards producing under organic production system B can take place when the demand response and size of the market are such as to allow producers to operate without requiring the full use of the derogations set out in Council Regulation (EC) No 2092/91[139]. A further point here is that it may be perceived as more important for the 'credibility' of organic market operators in relatively 'mature' organic markets to be seen to be moving in this direction.

From a producer demand perspective the *financial viability* of organic production system B *vis-à-vis* organic production system C and non-organic production systems will determine the *sustainability* of producing without making use of the derogation. Once financial viability is assured, the technical solutions will follow to allow, from a *supply* perspective, *sufficient* availability of organic replacement livestock in order to renew, restock or reconstitute livestock in organic production system B.

However, it is acknowledged that the sustainability of organic production system B is dependent on the size of the current organic gene pool for the different organically reared livestock breeds/strains and species (including both livestock species for production and livestock species for breeding). As set out in Section 3 of Part B of Technical Annex I, the first principle rule governing the origin of animals for use in organic systems concerns the choice of breeds and strains so that animals used for organic production are adapted to their environment, so that natural resistance to certain diseases can be built up. However, due to the cost of increased bio-security associated with organic production system B breeding stock (particularly poultry), it is likely that sanitary issues will limit any development in the current size of the organic gene pool. Thus, from a *supply* perspective there is concern that without further (temporary) extension of the aforementioned derogation, certain organic livestock enterprises may become unsustainable, both in terms of the low availability of, and relatively higher price for, organically reared livestock breeds/strains and species, and may disappear.

Furthermore, the risk of over-specification of the rules at EU level at the current point in time could potentially limit the scope for development of the organic sector in those Member States where both supply and demand are in the early stages of development by, for example:

- preventing the renewal or reconstitution of the flock (Annex 1, Part B 3.6 b and 3.7); and,
- limiting the ability to supplement natural growth and renewal of the herd or flock (Annex 1, Part B 3.8, 3.9 and 3.10).

The above analysis suggests that any move towards a raising or 'managed tightening' of standards (e.g. by removal or upgrading of one or more of the derogations in Annex 1, Part B.3 to Council Regulation (EC) No 2092/9) at EU level should be preceded by further monitoring over time of the evolution of such standards at Member State level. In this context, on the assumption that a move to organic production system B can be seen as a public good, consideration could be given to providing support (e.g. for training, information collection and dissemination) for certification bodies which would be involved in introducing and monitoring such a move.

At this stage, and only when the market circumstances are deemed appropriate to assure the long-term *economic sustainability* of organic production system B, consideration should be

139 Thus, for example, the sector must be relatively secure in the belief that any cost increase resulting from a move to organic production system B (A) will be absorbed by the market.

given to tightening or entirely removing some (or all) of the current derogations. For example, the renewal or reconstitution of the herd or flock when organically reared animals are not available could be tightened so that lower age and weight limits are applied (Annex 1, Part B 3.6 b and 3.7). Examples of such tightening of the current derogations are already in evidence in a limited number of countries with relatively developed organic sectors, as has been shown by this Study. Similar tightening of the other derogations could also be considered in relation to Annex 1, Part B. 3.8, 3.9 and 3.10. However, any tightening or removal of some (or all) of the current derogations should be preceded by a clear and realistic timetable for change so that organic producers and organic livestock breeding companies can plan for the significant progressive steps necessary in advance.

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Appendix 1: Glossary

This Glossary provides basic definitions of the key terms used in this Study. The definitions for these terms have been summarised from a number of sources including the Terms of Reference to this Study (Appendix 3), the Study's Steering Group, Eurostat, agricultural textbooks and the internet[140]

Aquaculture	The propagation and rearing of aquatic species in controlled or selected environments on land or in the ocean.
Assets	All the things of value used in a business, such as land, machinery, equipment, livestock, cash, stocks of inputs and fodder.
Beef cattle	Cattle that are reared for their meat
Bovine	Any of various members of the genus Bos – wild and domestic cattle
Break-even Analysis	Varying key elements of a budget to determine the level that costs will equal returns or the net result is just equal the result from an alternative action. Shows at what level of activity costs will equal returns, frequently based on a Gross Margin or Partial Budget.
Break-even Price	The selling price for which total income will just equal total expenses for a given level of production.
Break-even Yield	The yield level at which total income will just equal total expenses at a given selling price.
Breed	Race of animals of the same stock e.g. Angus Cattle To cause animals (or plants) to reproduce with a specific outcome in mind e.g. improved yield or disease resistance
Breeding livestock/animals	Breeding animals or parent, multiplier or reproduction stock in the context of this Study are taken to mean animals that are not kept primarily for the purpose of the production of meat, milk, eggs or wool, but for the production of offspring used for producing these products.
Broiler	A young chicken being raised for meat. Parent of commercial meat chicken.
Calf	In cattle a young animal of either sex from birth till weaning. The term bull or heifer precedes the word calf to indicate the sex. Also used for Red deer or Wapiti
Calving interval	Period of time between calves
Capital cost	An investment with a lifespan longer than one year. Also called a capital investment.
Carrying Capacity	The maximum stocking rate possible which is consistent with maintaining or improving vegetation or related resources. It may vary from year to year on the same area due to fluctuating forage production. Cf. Grazing capacity.
Certification body	An organisation performing certification. Sometimes referred to as the certifier or the certification agency. The certification body may use an existing standard or may set its own standard, perhaps based on an international and/or normative standard.
Chicken	The domestic fowl, Gallus domesticus, family Phasianidae. Birds including chicks, broilers, hens, pullets, cockerels and cocks. Chicken, chick – poultry one month old or less.
Closed Systems	Are those that are self contained and for which there is no interchange with the environment c.f. open systems.
Comparative Analysis	The comparison of the performance level of a farm business to the performance level of other similar farms in the same area, or to other established standards. Generally based on aggregate measures of whole farm physical and financial performance, such as yield, efficiency, gross margins and farm profit.
CAGR	Compound annual growth rate

140 http://www.ees.adelaide.edu.au/icooper/glossary/index.html

Cost	The negative (adverse) effects. Costs may be monetary, social, physical, or environmental in nature. See Fixed Costs, Variable Costs
Cost Benefit Ratio	An economic indicator of efficiency, computed by dividing benefits by costs. Usually, both the benefits and the costs are discounted so that the ratio reflects efficiency in terms of the present value of future benefits and costs.
Cow	In cattle, a mature female of any age but usually over 30 months old.
Dairy cow	Cows bred and raised for milk rather than meat
Depreciation	(a) The loss in value of an asset over its useful life. Total depreciation is the difference between purchase cost and salvage value. Allocation of the loss over the life of the asset is done by various means such as straight line (prime cost, reducing (declining/diminishing) balance, sum of years digits or change in market value.
Economic sustainability	*Economic sustainability* was defined in the *Terms of Reference to* this Study (Appendix 3) as '*the capacity to continue farming utilising the same production system in the medium to long-term*'.
Equine	Of or belonging to the family Equidae, which includes the horses, asses, and zebras
Ewe	Female sheep.
Farrow, farrowing	Process of giving birth to a litter of piglets. Thus farrowing pen, farrowing house, farrowing crate are places where a sow farrows.
Fattening pigs	A pig produced for slaughter.
Feasibility	No business or production system can survive in the short, medium or long-term unless it has sufficient cash to fund its trading activities.
Fixed Costs	Also called 'Overhead Costs', are those which will not change with a relatively small change in the size of an enterprise though they may change in magnitude over time. Examples are permanent staff wages, interest, insurance and rates. Compare with variable costs. They are unavoidable costs in the short to medium term.
Gilt	Young female pig for breeding
Gross Income	The total income, both cash and non-cash, received from an enterprise or business, before any expenses are paid (plus or minus changes in inventory).
Gross Margin	Of an enterprise (or of an activity within an enterprise) is the gross receipts less the variable expenses (e.g. Fertiliser, fuel, seed). Specific gross margins may be expressed on a "per hectare", "per labour-month", "per $ invested", etc. May be calculated on a historic basis from records or budgeted. Can also be calculated for the whole farm.
Gross Profit	Total farm income less variable costs.
Gross Revenue	The total of all the revenue received by a business over a period of time; same as gross income.
Income	Economic gain resulting from the production of goods and services, including receipts from the sale of commodities, other cash payments, increases in inventories, and accounts receivable. See Revenue.
Input	(a) A resource used in the production of an output. (b) Something which goes into a system.
Inspection body	The body performing the inspection part of certification. Where a certification body performs its own inspections, the certification body is also the inspection body.
Intensive Agriculture	System of cultivation using large amounts of labour and capital relative to land area.
Lamb	A young sheep still with its mother, or up to about five months of age. Term is used widely, e.g., milk lamb, weaned lamb, shorn lamb, ram lamb, ewe lamb, wether lamb.
Land (As A Resource)	The natural resource of land plus original plant and animal population. 2. The land as it is, excluding all fixed improvements. 3. Any part of the earth surface which can be owned as property and everything annexed to it, whether by the hand of man or by nature.
Laying hen (layers)	A female chicken kept for laying eggs.
Liabilities	External liabilities (debts) may be divided into Current Liabilities (due to be settled within the current accounting period) and Deferred Liabilities (all non-current liabilities) which may be further divided into Medium (2 to 8 years) and Long-term (greater than 8 years).
Livestock	Domesticated animals used to produce revenue such as sheep, cattle, goats and horses.
Loss	(a) The opposite of profit. (b) The disappearance of an asset, e.g. through theft, fire, death or straying.
Low-Input Farming Systems	Have a low reliance on purchased inputs such as fertilisers, fossil fuels etc.

Net Profit	The final profit for the proprietors as a return to their time and management. Obtained by adjusting the net cash income for total depreciation, net inventory changes and the value of products consumed at home. Net profit is the profit from the year's operation and represents the return to the owner for personal and family labour, management and equity used in the farm business.
Operating Margin	Operating income (gross margin) divided by total revenue (output), expressed as a percentage.
Organic production system A	In this Study, organic production system A is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do not take advantage of any of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) (origin of animals) which permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted.
Organic production system B	An organic production system B is defined as those livestock farming systems which do not take advantage of the derogations foreseen in Annex I, Part B, No. 3 (3.4, 3.6, 3.8, 3.9, 3.10 and 3.11) for *production* animals[141]. But for reproduction (i.e. breeding) purposes these systems permit non-organic animals to be brought into an organic reproduction unit when a herd or flock is renewed, restocked or reconstituted, *provided* that this is restricted to *breeding* animals[142] as regards livestock and to certain *production* animals for poultry (as defined in Annex I, Part B, No. 3). Thus, organic production system B uses: *Laying hens.* Organic chicks/pullets reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age are brought into production flocks. Their grandparent flocks need not be managed organically. *Broilers.* Organic chicks reared from parent (multiplier/reproduction) flocks that have been organically managed from at least 18 weeks of age are brought into production flocks. Their grandparent flocks need not be managed organically. *Pigs.* Organic breeding gilts reared from parent (multiplier/reproduction) herds that are under permanent organic management are brought into production herds. The production piglets are born and reared in the organic production herd. The breeding gilts brought into the parent herds are reared from grandparent herds that need not be managed organically. For in-herd multiplication (nucleus herds), organic breeding gilts must have been brought in.
Organic production system C	Organic production system C is defined as those livestock farming systems which permit non-organic *production* and *breeding* livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted in line with the derogations foreseen in Annex I, Part B, No. 3.4, 3.6, 3.8, 3.9, 3.10 and 3.11. Thus, organic production system C uses: *Laying hens*. Non-organic production pullets are brought into production flocks at a maximum 18 weeks of age and thereafter managed organically. Their parent flocks need not be managed organically. Or, where non-organic chicks are bought in at 1 or 3[143] days of age (depending on national/private standards) and thereafter managed organically. *Broilers*. Non-organic production chicks are brought into production flocks in at 1 or 3[144] days of age (depending on national/private standards) and thereafter managed organically. Their parent flocks need not be managed organically. *Pigs.* Non-organic gilts are brought into production herds for breeding and thereafter managed organically. The production herds are under permanent organic management. Their parent herds need not be managed organically.
Parent stock or reproductive stock	See Breeding Livestock
Partial Budget	A budget that estimates the difference between the extra costs and extra returns, income lost and costs saved from a change occurring in an enterprise or the current farm plan. They are used to evaluate a proposed change and only show those things affected by the change.
Poultry	Domesticated species of birds reared for eggs, meat or feathers; include chickens, ducks, geese, turkeys, guinea fowls, etc.
Production livestock/animals	A *Production A*nimal in the context of this Study is taken to mean an animal that is kept primarily for the purpose of producing meat, milk, eggs or wool. In contrast, see *Breeding Livestock/A*nimals.
Profit	The opposite of loss. (b) The reward for employing capital. (c) The excess of total revenue over total expenses over a specified period. (d) An increase in equity resulting from the operation of a business. Can be looked at in several ways Operating Profit – Revenue from operation of the business less all operating expenses. Proprietorship Profit –Operating profit plus non-operating receipts less non-operating expenses. Net Profit – Proprietorship profit plus any capital gains (or less any losses). The value that remains after all costs, including opportunity costs, have been subtracted from gross income.
Profitability	For any business or production system to be sustainable in the medium to long-term, it has to make and retain profits on an annual basis (i.e. income must exceed expenditure).

Revenue	Income or returns to a business produced by its activities. Includes cash receipts, credit sales and forecast proceeds receivable, increases in inventories and capital gains.
Sow	Female pig that has had at least one litter.
Stocking Density	The relationship between number of animals and area of land at any instant of time. It may be expressed as animal-units per hectare. cf. stocking rate.
Stocking Rate	The number of specific kinds and classes of animals grazing or utilising a unit of land for a specified time period. Maybe expressed as animal unit months or animal unit days per hectare, or the reciprocal (area of land/animal unit month or day). When dual use is practised (e.g. cattle and sheep), stocking rate is often expressed as animal unit months/unit of land or the reciprocal.
Suckler cow	Beef cow suckling calves that are destined for the beef herd
Sustainability	In agriculture, sustainable practices are those which are, and will continue to be, profitable for farmers; that will conserve soil and water resources and protect the environment; and that will assure adequate and safe food supplies.
Sustainable Agriculture	Is a set of goals or objectives for agricultural systems. It is about managing the land with a healthy ecological balance, a sensitivity to the land's capabilities, using technologies and practices which have minimal impact while maintaining production and economic viability.
Variable Costs (Expenses/ Payments)	Also called 'Direct Costs' are those which vary according to the size of the enterprise or activity over a small range of size of enterprise or activity. In accounting they are generally allocated to an enterprise. cf. fixed costs.
Viability	The viability of a business activity/enterprise can be assessed in terms of its profitability, worthwhileness and feasibility
Worthwhile	In order to survive and grow, a business or production system must show an acceptable return on money (capital) invested in it if it is to, over the medium to long-term, be able to withstand inflationary costs and fund future expansion.

141 Production animal means an animal that is kept for the purpose of the production of meat, milk, eggs or wool.
142 *Breeding animals or parent, multiplier or reproduction stock means, in general, animals that are not kept primarily for the purpose of the production of meat, milk, eggs or wool, but for the production of offspring used for producing these products.*
143 *EU standard*
144 *EU standard*

Appendix 2
Detailed statistics on EU-25 organic farm structure

A2.1 Certified and policy-supported organic and in-conversion farms and land area

Table A. 1: Number of certified and policy-supported organic and in-conversion farms in the EU-25

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004*
Austria	420	500	600	880	1,191	1,539	1,970	6,000	9,713	13,321	18,542	19,433	19,996	20,316	20,121	19,031	18,292	18,576	19,056	20,257
Belgium	50	70	103	125	150	160	170	176	160	168	193	228	317	480	577	624	697	722	688	670
Cyprus															15	15	30	45	45	45
Czech Rep					3	30	132	135	141	187	176	168	211	348	473	563	654	717	810	836
Denmark	130	150	163	219	401	523	672	675	640	677	1,050	1,166	1,617	2,228	3,099	3,466	3,525	3,714	3,510	3,510
Estonia								41	50	60	119	100	70	76	89	231	369	583	746	583
Finland	60	70	82	160	373	671	950	1,305	1,599	1,818	2,793	4,452	4,458	4,984	5,197	5,225	5,104	5,171	5,074	4,900
France	2,500	2,600	2,660	2,700	2,700	2,700	2,730	2,968	3,231	3,556	3,538	3,854	4,935	6,233	8,668	8,985	10,364	11,288	11,377	12,202
Germany	1,610	1,720	2,006	2,330	2,685	4,188	5,774	10,225	11,248	14,727	15,055	14,106	21,303	24,621	29,518	34,465	39,770	42,540	44,329	44,329
Greece				5	10	25	50	75	165	469	568	1,065	3,086	4,183	4,923	5,343	6,710	5,964	6,028	8,269
Hungary									50	80	105	120	137	330	451	471	1,040	995	1,255	1,610
Ireland	8	21	52	75	97	150	200	195	238	198	378	696	583	762	972	852	918	919	889	889
Italy	600	700	800	1,100	1,300	1,500	1,830	2,500	4,656	8,597	10,630	17,279	30,701	38,616	47,705	52,796	56,199	51,118	44,039	34,836
Latvia								35	50	50	90	100	100	100	100	74	220	352	550	1,043
Lithuania									9	14	36	65	106	144	271	356	452	594	700	1,178
Luxembourg	10	12	13	12	11	10	13	12	12	12	19	20	23	26	28	31	49	53	59	66
Malta																			2	4
Netherlands	215	278	300	300	359	399	439	490	455	512	561	656	746	835	1,004	1,129	1,219	1,560	1,522	1,190
Poland					27	49	94	174	225	225	236	300	400	500	555	1,419	1,787	1,977	2,304	3,500
Portugal	1	4	7	20	34	50	60	70	73	213	349	240	278	560	750	763	983	1,093	1,507	1,145
Slovak Rep						36	38	39	40	41	34	45	46	81	69	88	82	88	90	113
Slovenia								10	20	25	30	35	40	41	343	620	883	1,150	1,429	1,582
Spain	264	300	320	330	350	350	346	585	753	909	1,042	2,161	3,526	7,392	11,812	13,394	15,607	16,521	17,028	17,028
Sweden	150	321	466	665	1,959	1,859	1,857	1,867	1,897	2,081	4,206	8,268	10,869	13,527	16,000	17,000	17,700	16,915	16,062	3,562
UK	300	500	600	600	620	700	829	800	655	715	828	865	1,026	1,462	2,538	3,563	4,049	4,104	4,017	4,017
EU-25	6,318	7,246	8,172	9,521	12,270	14,939	18,154	28,377	36,080	48,655	60,578	75,422	104,574	127,845	155,278	170,504	186,703	186,759	183,116	167,364
(% change)		14.7%	12.8%	16.5%	28.9%	21.8%	21.5%	56.3%	27.1%	34.9%	24.5%	24.5%	38.7%	22.3%	21.5%	9.8%	9.5%	0.0%	-2.0%	-8.6%

Note e: Provisional

*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

Table A. 2: Certified and policy-supported organic and in-conversion land area in the EU-25 (ha)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004*
Austria	5,880	7,000	8,400	12,320	16,674	21,546	27,580	84,000	135,982	192,337	335,865	309,089	345,375	287,899	272,635	272,000	276,410	296,154	328,803	343,183
Belgium	500	700	972	1,000	1,200	1,300	1,400	1,700	2,179	2,683	3,385	4,261	6,818	11,744	18,515	20,667	22,410	24,874	24,163	23,728
Cyprus				3											30	52	100	166	500	867
Czech Rep					260	3,480	17,507	15,371	15,667	15,818	14,127	17,022	20,239	71,620	110,756	165,699	218,114	235,136	254,995	263,799
Denmark	4,500	4,800	5,035	5,881	8,283	11,035	17,155	18,138	19,761	20,688	38,334	44,991	59,963	93,201	136,629	157,661	168,377	174,350	165,146	154,921
Estonia							500	2,350	1,600	1,600	3,000	3,000	3,000	3,080	4,000	9,872	20,555	30,623	42,573	46,016
Finland	1,000	1,200	1,400	1,500	2,300	6,726	13,281	15,859	20,340	25,822	44,695	84,556	102,342	126,176	136,662	147,268	147,943	156,692	159,987	162,024
France	45,000	50,000	55,000	60,000	65,000	72,000	81,225	85,000	87,829	94,806	118,393	137,084	165,406	218,792	315,770	369,921	419,750	517,965	550,990	534,037
Germany	24,940	27,160	33,047	42,393	54,295	90,021	158,477	202,379	246,458	272,139	309,487	354,171	389,693	414,293	452,327	546,023	632,165	696,978	734,027	767,891
Greece	0	0	0	50	100	150	200	250	591	1,188	2,401	5,269	10,025	15,402	21,451	26,707	31,118	77,120	244,457	249,508
Hungary							2,500	5,400	6,400	8,630	12,325	9,300	19,625	21,565	32,609	47,221	79,177	103,671	113,816	133,009
Ireland	1,000	1,100	1,300	1,500	3,700	3,800	3,823	5,101	5,460	5,390	12,634	20,496	18,687	24,411	29,360	27,231	30,017	29,754	28,514	30,670
Italy	5,000	5,500	6,000	9,000	11,000	13,218	16,850	30,000	88,437	154,120	204,494	334,175	641,149	785,738	911,068	1,040,377	1,237,640	1,168,212	1,052,002	954,362
Latvia								1,240	1,250	1,250	1,147	1,200	1,500	1,426	1,628	4,400	10,549	16,935	24,480	43,982
Lithuania									148	267	582	1,118	1,568	4,006	3,995	4,709	6,469	8,780	23,289	36,864
Luxembourg	350	400	412	450	550	600	634	500	497	538	571	594	618	744	888	1,068	2,006	3,121	3,004	3,158
Malta																			3	14
Netherlands	2,450	2,724	3,384	5,000	6,544	7,469	9,227	10,053	11,150	11,340	12,909	14,456	16,960	22,268	26,350	32,334	35,876	42,610	41,865	48,155
Poland					300	550	1,240	2,170	3,540	5,000	6,855	8,000	9,000	10,000	11,000	25,000	38,732	43,828	49,928	82,730
Portugal	50	200	320	420	550	1,000	2,000	2,000	3,060	7,267	10,719	9,191	12,193	29,533	47,974	50,002	70,857	91,006	120,729	215,408
Slovak Rep						15,140	14,773	14,700	14,724	14,762	18,813	27,661	27,809	50,695	46,386	58,458	58,706	49,999	54,479	53,091
Slovenia								70	100	150	200	300	100	214	2,697	5,440	10,828	13,828	20,081	22,606
Spain	2,140	2,500	2,714	3,000	3,300	3,650	4,235	7,859	11,674	17,208	24,079	103,735	151,865	269,465	352,267	380,902	485,079	665,055	725,254	733,182
Sweden	1,500	2,500	4,870	8,598	23,600	28,500	31,968	33,267	36,674	48,039	83,490	113,995	118,175	127,330	155,463	174,227	202,827	214,120	225,776	222,100
UK	6,000	7,000	8,500	11,000	18,500	31,000	34,000	35,000	30,992	32,476	48,448	49,535	54,670	274,519	390,868	527,323	679,631	741,174	695,619	690,047
EU-25	100,310	112,784	131,354	162,115	216,156	311,185	438,575	572,407	744,513	933,518	1,306,953	1,653,199	2,176,780	2,864,121	3,481,328	4,094,562	4,885,336	5,402,151	5,684,480	5,815,352
(% change)		12.4%	16.5%	23.4%	33.3%	44.0%	40.9%	30.5%	30.1%	25.4%	40.0%	26.5%	31.7%	31.6%	21.5%	17.6%	19.3%	10.6%	5.2%	2.3%

Note e: Provisional

*Source: Based on data from Lampkin (2004); and *provisional 2004 data from Eurostat (2006); Eurostat (2005); SOEL/FIBL (2002); Zarina (2005); and Metera (2005) (see notes to Table 2.1 for further details).*

A2.2 Organic livestock numbers

Table A. 3: Development of organic livestock numbers in Austria, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)			9,872[4]						
Bovine (total)	335,021[5]	357,166[5]	335,000[4]	325,950[4]	319,346[3]		319,169[4]	331,441[1]	-0.1%
Dairy cows	97,803[2]	103,287[2]	97,751[4]		87,036[3]		85,017[4]	86,896[1]	-1.7%
Beef cows	237,218[2]	253,879[2]	237,249[5]		232,310[5]		234,152[5]	244,545[5]	0.5%
- Suckler cows			57,458[4]		62,455[3]		60,014[4]	63,455[1]	2.0%
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)	101,118[2]	103,831[2]	101,162[4]	90,065[4]	81,454[3]	77,180[1]	76,880[4]	79,194[1]	-3.4%
Sheep, breeding females									
Other sheep									
Goats (total)	15,060[2]	15,915[2]	15,476[4]		17,244[3]				3.4%
Goats, breeding females									
Other goats									
Pigs (total)	39,390[2]	41,005[2]	39,203[4]	35,020[4]	33,250[3]	38,921[1]	35,698	49,084[1]	3.2%
Fattening pigs									
Breeding sows									
Other pigs									
Poultry (total)	308,421[2]	363,584[2]	312,209[4]	345,486[4]	387,348[3]	463,593[1]	664,377[4]	848,337[1]	15.6%
Broilers									
Laying hens									
Others (turkeys, ducks, geese)									

Sources: 1 Eurostat (2006); 2 Foster and Lampkin (2000) (policy supported livestock numbers); 3 Wlcek, et al. (2003); 4 BMLFUW (2005); 5 Agra CEAS calculation based on the data shown.

Table A. 4: Development of organic livestock numbers in Belgium, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)			49	72	191	102	69	334	46.8%
Bovine (total)	4,288[2]	9,219[2]	18,711	24,497	44,506	20,732	29,677	32,190	33.4%
Dairy cows	1,835[2]	3,247[2]	6,701	7,451	9,275	8,989	7,894	7,993	23.4%
Beef cows	2,453[3]	5,972[3]	12,010[3]	17,046[3]	35,231[3]	11,743[3]	21,783[3]	24,197[3]	38.7%
- Suckler cows			6,969	7,034	7,232	7,497	6,213	7,728	2.1%
- Bovines - meat production.							3,015*	8,389*	178.2%
- Bovines - fatteners									
- Young bovines							12,483*	8,016*	-35.8%
- Other bovines			5,041	10,012	27,999	4,246	72	64	-58.2%
Sheep (total)			4,779	7,530	7,480	7,770	6,521	7,086	8.2%
Sheep, breeding females			4,082	5,135	5,096	2,701	4,621	4,685	2.8%
Other sheep			697	2,395	2,384	5,069	1,900	2,401	28.1%
Goats (total)			1,173	1,552	1,323	1,316	2,310	3,505	24.5%
Goats, breeding females							1,898	0*	-100.0%
Other goats							412	3,505*	750.7%
Pigs (total)			2,541	10,399	6,523	5,361	6,210	8,359	26.9%
Fattening pigs			2,177	9,702	6,133	4,614	5,210	7,203	27.0%
Breeding sows			359	674	384	514	612	461	5.1%
Other pigs			5	23	6	233	388	695	168.3%
Poultry (total)	14,852[2]	18,096[2]	49,037	119,559	327,190	409,372	610,744	801,080	76.8%
Broilers			16,512	49,937	258,395	348,238	572,032	682,525	110.5%
Laying hens			31,093	69,327	68,582	59,714	37,932	116,379	30.2%
Others (turkeys, ducks, geese)			1,432	295	213	1,420	780	2,176	8.7%

Sources: Eurostat (2006); 2 Foster and Lampkin (2000) (Ecocert enterprises only); 3 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 5: Development of organic livestock numbers in Germany, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)					17,741[2]			23,072[2]	9.2%
Bovine (total)	206,723[3]	215,000[3]	279,858[2]		474,499[2]		528,266[2]		16.9%
Dairy cows	63,763[1]	65,000[1e]	70,341[2]		102,544[2]		109,611[2]		9.4%
Beef cows	142,960[1]	150,000[1e]	209,517[3]		371,955[3]		418,655[3]		19.6%
- Suckler cows			61,158[2]						
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)	95,841[1]	97,000[1e]	101,075[2]		229,329[2]		279,501[2]		19.5%
Sheep, breeding females									
Other sheep									
Goats (total)	8,909[1]	9,500[1e]	10,811[2]						10.2%
Goats, breeding females									
Other goats									
Pigs (total)	41,998[1]	50,000[1e]	54,058[2]		140,782[2]		144,882[2]		22.9%
Fattening pigs					14,121[2*]		13,999[2*]		-0.9%
Breeding sows					126,661[2*]		130,883[2*]		3.3%
Other pigs									
Poultry (total)			1,465,590[3]		1,960,356[3]		2,590,358[3]		15.3%
Broilers	660,503[1]	700,000[1e]	803,829[2]		1,221,381[2]		1,610,606[2]		16.0%
Laying hens			661,761[2]		738,975[2]		979,752[2]		10.3%
Others (turkeys, ducks, geese)									

Sources: 1 Foster and Lampkin (2000) (AGÖL enterprises only, e estimate); 2 DE-Statis (2005); 3 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 6: Development of organic livestock numbers in Denmark, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)		827	40	1,216	1,287	1,003	838	735	-1.9%
Bovine (total)	60,656[3]	80,768	180,257	149,767	150,512	144,977	133,279	125,200	10.9%
Dairy cows	28,251[2]	36,873	51,095	66,009	64,359	61,541	56,430	53,115	9.4%
Beef cows	32,405[2]	43,895[3]	129,162[3]	83,758[3]	86,153[3]	83,436[3]	76,849[3]	72,085[3]	12.1%
- Suckler cows		2,624	5,044	6,456	7,436	8,239	7,546	7,582	19.3%
- Bovines - meat production.		4,626*	71,317*	5,438*	7,955*	8,873*	8,139*	7,827*	9.2%
- Bovines - fatteners									
- Young bovines		36,177*	51,889*	70,879*	69,883*	65,528*	60,435*	56,018*	7.6%
- Other bovines		468	912	985	879	796	729	658	5.8%
Sheep (total)	9,388[2]	9,372	10,928	12,507	12,187	13,957	12,860	11,737	3.2%
Sheep, breeding females		9,217	10,696	12,253	11,912	13,649	12,530	11,435	3.7%
Other sheep		155	232	254	275	308	330	302	11.8%
Goats (total)	972[2]	1,017	1,990	2,033	2,193	1,945		2,147[3]	12.0%[3]
Goats, breeding females		977	1,950	2,024	2,183	1,935	2,188	2,147	14.0%
Other goats		40	40	9	10	10			-29.3%
Pigs (total)	61,786[2]	50,834	67,984	68,239	67,179	79,786	73,791	58,361	-0.8%
Fattening pigs		47,692	63,652	64,801	63,179	75,639	70,089	55,083	2.4%
Breeding sows		2,966	4,084	3,344	3,939	4,069	3,623	3,195	1.2%
Other pigs		176	248	94	61	78	79	83	-11.8%
Poultry (total)	418,310[2]	696,563	1,026,240	1,062,054	1,293,782	1,349,471	1,179,147	980,797	12.9%
Broilers		176,281	219,272	225,552	469,777	445,225	364,575	183,265	0.6%
Laying hens		495,497	688,453	664,615	682,985	658,156	565,844	777,037	7.8%
Others (turkeys, ducks, geese)		24,785	118,515	171,887	141,020	246,090	248,728	20,495	-3.1%

Sources: Eurostat (2006), 2 Foster and Lampkin (2000); 3 Agra CEAS calculation based on the data shown; 4 Statistics Denmark (2005).

*Note: * Erroneous result in source data.*

Table A. 7: Development of organic livestock numbers in Spain, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)									
Bovine (total)									
Dairy cows								2,338[2]	
Beef cows		434[1]							
- Suckler cows									
- Bovines - meat production.								51,350[2]	
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)		214[1]						146,673[2]	196.9%
Sheep, breeding females									
Other sheep									
Goats (total)								17,692[2]	
Goats, breeding females		33[1]							
Other goats									
Pigs (total)		34[1]						8,455[2]	150.8%
Fattening pigs									
Breeding sows									
Other pigs									
Poultry (total)								94,941	
Broilers								38,393[2]	
Laying hens							25,149[2]	56,548[2]	124.9%
Others (turkeys, ducks, geese)									

Source: 1 Foster and Lampkin (2000); 2 Spanish Ministry of Agriculture (2005); 3 Agra CEAS calculation based on the data shown.

Table A. 8: Development of organic livestock numbers in Greece, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)						4	45	0	-100.0%
Bovine (total)				1,560[2]		7,760	14,219	14,776	75.4%
Dairy cows				480[2]		551	400	480	0.0%
Beef cows				1,080[3]		7,209[3]	13,819[3]	14,296[3]	90.7%
- Suckler cows						0*	6,913	9,308	34.6%
- Bovines - meat production.						3,956	1,221	33	-90.9%
- Bovines - fatteners									
- Young bovines						3,223	5,668	3,946	10.6%
- Other bovines						30	17	1,009	479.9%
Sheep (total)				9,830[2]		56,374	108,996	133,619	92.0%
Sheep, breeding females						56,374	92,079	121,537	46.8%
Other sheep						0*	16,917	12,082	-28.6%
Goats (total)				9,250[2]		66,472	187,079	215,291	119.6%
Goats, breeding females						66,472	159,286	193,980	70.8%
Other goats						0*	27,793	21,311	-23.3%
Pigs (total)						1,288	3,678	27,792	364.5%
Fattening pigs				610[2]		1,238	1,770	25,180	153.5%
Breeding sows				160[2]		18	1,553	2,393	96.7%
Other pigs						32	355	219	161.6%
Poultry (total)						46,553	176,214	74,160	26.2%
Broilers						24,880	144,494	39,693	26.3%
Laying hens						20,455	31,361	34,422	29.7%
Others (turkeys, ducks, geese)						1,218	359	45	-80.8%

Sources: Eurostat (2006), 2 Greek Ministry of Agriculture (2005); 3 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 9: Development of organic livestock numbers in France, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)									
Bovine (total)									
Dairy cows	15,135[3]	19,641[3]	26,911[3]	34,861[3]	46,563	55,196	58,939	62,489	22.5%
Beef cows									
- Suckler cows	12,816[3]	15,900[3]	23,020[3]	33,350[3]	41,715	51,678	54,040	62,542	25.4%
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)									
Sheep, breeding females	29,216[3]	41,877[3]	63,545[3]	83,378[3]	100,319	109,144	115,315	127,974	23.5%
Other sheep									
Goats (total)									
Goats, breeding females	6,867[3]	7,923[3]	12,186[3]	16,368[3]	17,940	20,014	19,408	19,754	16.3%
Other goats									
Pigs (total)									
Fattening pigs	8,782[3]	20,919[3]	37,648[3]	59,303[3]	58,889				60.9%
Breeding sows					2,178	3,512	3,691	3,617	18.4%
Other pigs									
Poultry (total)	3,026,679[2]	4,878,800[3]	7,155,303[3]	7,789,156[3]	8,167,779	6,502,438	6,738,022[4]		14.3%
Broilers		3,594,000[3]	5,441,153[3]	6,079,640[3]	6,375,492	4,877,219	5,144,386	4,492,008	3.8%
Laying hens		1,044,000[3]	1,355,315[3]	1,386,788[3]	1,415,653	1,327,389	1,302,750	1,481,710	6.0%
Others (turkeys, ducks, geese)		240,800[3]	358,835[3]	322,728[3]	376,634	297,830	290,886		3.9%

Sources: Eurostat (2006); 2 Foster and Lampkin (2000) (policy supported livestock numbers); 3 Agence Bio (2006); 4 Agra CEAS calculation based on the data shown.

Table A. 10: Development of organic livestock numbers in Finland, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)				0	2	8	11	13	86.6%
Bovine (total)	6,324[4]	10,610[4]		15,084	14,795	17,134	18,227	18,029	16.1%
Dairy cows	3,503[2]	2,697[2]		3,654	3,557	4,541	4,990	5,052	5.4%
Beef cows	2,821[2]	7,913[2]		11,430	11,238	12,593	13,237	12,977	24.4%
- Suckler cows				1,891	1,842	2,066	2,561	2,692	9.2%
- Bovines - meat production.				2,799*	3,163*	3,052*	2,767*	2,449*	-3.3%
- Bovines - fatteners									
- Young bovines				6,477*	6,109*	7,333*	7,739*	7,651*	4.3%
- Other bovines				263	124	142	170	185	-8.4%
Sheep (total)				3,609	3,676	4,175	4,615	4,296	4.5%
Sheep, breeding females				3,421	3,524	3,915	4,404	4,188	5.2%
Other sheep				188	152	260	211	108	-12.9%
Goats (total)	73[2]	216[2]		65	108	115	46	37	-9.3%
Goats, breeding females				60	100	104	43	35	-12.6%
Other goats				5	8	11	3	2	-20.5%
Pigs (total)	5,245[2]	3,156[4]		5,380	4,360	4,132	3,223	2,554	-9.8%
Fattening pigs		2,716[3]		4,778	3,948	3,535	2,628	2,130	-4.0%
Breeding sows		440[3]		527	405	587	584	416	-0.9%
Other pigs				75	7	10	11	8	-42.9%
Poultry (total)	11,418[2]	20,668[3]		29,745	38,214	59,226	75,171	74,485	30.7%
Broilers		0		0	2,000	6,497	0	0	-100.0%
Laying hens		20,668[3]		29,045	35,363	51,951	75,140	74,468	23.8%
Others (turkeys, ducks, geese)		0		700	851	778	31	17	-60.5%

Sources: Eurostat (2006); 2 Foster and Lampkin (2000) (policy supported livestock numbers); 3 Häring (2003); 4 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 11: Development of organic livestock numbers in Italy, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)					2,205[2]	3,333	3,611	4,773	29.4%
Bovine (total)				334,930[2]	330,701[2]	164,536	189,806	215,022	-10.5%
Dairy cows				87,150[2]		30,971	40,754	38,284	-18.6%
Beef cows				247,780[3]		133,565[3]	149,052[3]	176,738[3]	-8.1%
- Suckler cows							49,046	48,376	-1.4%
- Bovines - meat production.							49,016	60,579	23.6%
- Bovines - fatteners							0[3]	0[3]	
- Young bovines						35,912	32,778	33,932	-2.8%
- Other bovines							18,212	33,851	85.9%
Sheep (total)					301,601[2]	608,687	436,186	499,978	18.4%
Sheep, breeding females							269,578	312,527	15.9%
Other sheep							166,608	187,451	12.5%
Goats (total)					26,290[2]	59,764	101,211	56,815	29.3%
Goats, breeding females							92,017	34,367	-62.7%
Other goats							9,194	22,448	144.2%
Pigs (total)					25,435[2]	19,917	20,513	26,508	1.4%
Fattening pigs						5,522[3]	5,288	12,503	50.5%
Breeding sows						11,632	3,995	7,432	-20.1%
Other pigs						2,763	11,230	6,573	54.2%
Poultry (total)					648,693[2]	1,018,664	1,287,131	2,152,295	49.1%
Broilers						445,778	706,786	1,607,714	89.9%
Laying hens						534,479	361,087	503,639	-2.9%
Others (turkeys, ducks, geese)						38,407	219,258	40,942	3.2%

Sources: Eurostat (2006); 2 Sistema di Informazione Nazionale sull'Agricoltura Biologica (2006); 3 Agra CEAS calculation based on the data shown.

Table A. 12: Development of organic livestock numbers in Ireland, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)									
Bovine (total)						17,807			
Dairy cows						649			
Beef cows						17,158[4]			
- Suckler cows						6,366			
- Bovines - meat production.						10,522[4]			
- Bovines - fatteners						5,094			
- Young bovines						5,428			
- Other bovines						270			
Sheep (total)						31,596			
Sheep, breeding females						31,077			
Other sheep						519			
Goats (total)						831			
Goats, breeding females						581			
Other goats						250			
Pigs (total)						329			
Fattening pigs						67*			
Breeding sows						262*			
Other pigs									
Poultry (total)						24,322[4]			
Broilers						1,935			
Laying hens						18,793[3]			
Others (turkeys, ducks, geese)						3,5943[2]			

Source: Irish Department of Agriculture and Food (2005); 2 Irish Organic Census; 3 Based on production of 257,000 organic eggs; 4 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 13: Development of organic livestock numbers in Luxembourg, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)						25			
Bovine (total)	628[3]	829[3]				952			8.7%
Dairy cows	182[2]	233[2]				243			6.0%
Beef cows	446[2]	596[2]				709			9.7%
- Suckler cows						150			
- Bovines - meat production.						177*			
- Bovines - fatteners									
- Young bovines						251*			
- Other bovines						131			
Sheep (total)	94[2]	338[2]				444			36.4%
Sheep, breeding females									
Other sheep									
Goats (total)	1[2]	1[2]				10			58.5%
Goats, breeding females									
Other goats									
Pigs (total)	40[2]	381[2]				434			61.1%
Fattening pigs						204			
Breeding sows						72			
Other pigs						158			
Poultry (total)	1,164[2]	1,970[2]				6,959			43.0%
Broilers						4,550			
Laying hens						2,409			
Others (turkeys, ducks, geese)						0			

Sources: Eurostat (2006); 2 Foster and Lampkin (2000), 3 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 14: Development of organic livestock numbers in the Netherlands, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)		819	593	864	836				0.7%
Bovine (total)		22,162	25,113	31,089	36,383	36,373	36,669	34,841	7.8%
Dairy cows		16,127	18,753	24,406	27,705	16,505	15,894	15,629	-0.5%
Beef cows		6,035[3]	6,360[3]	6,683[3]	8,678[3]	19,868[3]	20,775[3]	19,212[3]	21.3%
- Suckler cows							3,459	3,466	0.2%
- Bovines - meat production.		5,921*	6,348*	6,663*	8,476*	1,732	3,922*	4,051*	-6.1%
- Bovines - fatteners									
- Young bovines		114	12	20	202		13,153*	11,589*	116.0%
- Other bovines						18,136	241	106	-92.4%
Sheep (total)		18,004	17,199	18,882	20,604	9,736	9,389	10,115	-9.2%
Sheep, breeding females							3,341	3,218	-3.7%
Other sheep							6,048	6,897	14.0%
Goats (total)	7,366[2]	8,619	12,970	14,220	15,973	17,241	21,293	21,473	16.5%
Goats, breeding females							15,275	14,950	-2.1%
Other goats							6,018	6,523	8.4%
Pigs (total)	5,401[2]	9,129	17,602	24,449	20,965	47,524	34,249	29,268	27.3%
Fattening pigs						41,220	26,762	25,623	-21.2%
Breeding sows							4,279	3,570	-16.6%
Other pigs						6,304	3,208	75	-89.1%
Poultry (total)	84,770[2]	120,654	150,530	232,945	315,754	521,415	301,633	453,244	27.1%
Broilers						268,656		0	-100.0%
Laying hens						251,836	225,609	405,123	26.8%
Others (turkeys, ducks, geese)		25	115	10,360	10,380	923	76,024	48,121	252.7%

Sources: Eurostat (2006); 2 Statistics Netherlands (2006); 3 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 15: Development of organic livestock numbers in Portugal, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)						107	103	181	30.1%
Bovine (total)						8,202	18,329	54,351	157.4%
Dairy cows									
Beef cows									
- Suckler cows									
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)						38,072	63,026	114,664	73.5%
Sheep, breeding females									
Other sheep									
Goats (total)						1,440	2,341	4,769	82.0%
Goats, breeding females									
Other goats									
Pigs (total)						3,091	3,507	9,695	77.1%
Fattening pigs									
Breeding sows									
Other pigs									
Poultry (total)						7,024	12,164	47,158	159.1%
Broilers									
Laying hens									
Others (turkeys, ducks, geese)									

Source: Eurostat (2006).

Table A. 16: Development of organic livestock numbers in Sweden, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)									
Bovine (total)	29,114[3]	36,195[4]		43,726[3]	52,558[3]	55,207[3]	92,304[1]	91,515[1]	17.8%
Dairy cows	11,202[3]	20,569[2]		19,210[3]	20,712[3]	21,533[3]	22,218[1]	21,892[1]	10.0%
Beef cows	17,912[4]	15,626[2]		24,516[4]	31,846[4]	33,674[4]	70,086[4]	69,623[4]	21.4%
- Suckler cows	7,836[3]			11,445[3]	12,534[3]	13,468[3]	13,721[1]	13,542[1]	8.1%
- Bovines - meat production.							4,784*	4,968*	3.8%
- Bovines - fatteners									
- Young bovines							50,917*	50,450*	-0.9%
- Other bovines							664[1]	663[1]	-0.2%
Sheep (total)	22,724[4]	50,126[2]		34,864[4]	38,019[4]	40,825[4]	40,593[1]	38,193[1]	7.7%
Sheep, breeding females	8,364[3]			13,112[3]	14,615[3]	16,063[3]	16,043[1]	15,425[1]	9.1%
Other sheep	14,360[3]			21,752[3]	23,404[3]	24,762[3]	24,550[1]	22,768[1]	6.8%
Goats (total)	469[2]	414[2]					3,119[1]	664[1]	5.1%
Goats, breeding females							2,911[1]	474[1]	-83.7%
Other goats							208[1]	190[1]	-8.7%
Pigs (total)	6,573[3]	20,771[2]		25,171[3]	26,436[3]	24,825[3]	22,134[1]	22,207[1]	19.0%
Fattening pigs							18,596[1]	18,902[1]	1.6%
Breeding sows	493[3]			1,153[3]	1,229[3]	1,173[3]	1,046[1]	964[1]	10.1%
Other pigs							2,492[1]	2,341[1]	-6.1%
Poultry (total)	73,643[4]	201,087[2]		149,378[4]	204,022[4]	278,765[4]	343,563[1]	391,971[1]	27.0%
Broilers	27,820[3]			5,320[3]	17,920[3]	31,072[3]	21,600[1]	45,915[1]	7.4%
Laying hens	45,823[3]			144,058[3]	186,102[3]	247,693[3]	321,955[1]	345,998[1]	33.5%
Others (turkeys, ducks, geese)							8[1]	58[1]	625.0%

Sources: 1 Eurostat (2006); 2 Foster and Lampkin (2000); 3 KRAV (2005); 4 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Table A. 17: Development of organic livestock numbers in the UK, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)									
Bovine (total)					70,100	91,310	216,779	200,959	42.1%
Dairy cows	7,066[2]	8,295[2]	9,140[2]	9,985[2]			90,143	83,253	42.2%
Beef cows							126,636[3]	117,706[3]	-7.1%
- Suckler cows	16,187[2]	20,000[2]					71,266	49,582	17.3%
- Bovines - meat production.							27,466	34,850	26.9%
- Bovines - fatteners	3,424[2]			5,000[2]	9,000[2]	15,000[2]			34.4%
- Young bovines							26,260	32,010	21.9%
- Other bovines							1,644	1,264	-23.1%
Sheep (total)					554,717	738,820	716,426	687,863	7.4%
Sheep, breeding females					445,717[3]	578,820[3]	437,096	382,646	-5.0%
Other sheep	22,823[2]	26,000[2]		39,000[2]	109,000[2]	160,000[2]	279,330	305,217	44.8%
Goats (total)	70[2]	100[2]					698	513	32.9%
Goats, breeding females									
Other goats									
Pigs (total)					16,143	17,758	66,595	55,199	50.7%
Fattening pigs	7,190[2]	12,000[2]		32,000[2]	52,000[2]	62,000[2]	44,964	40,144	27.8%
Breeding sows							21,020	11,080	-47.3%
Other pigs							611	3,975	550.6%
Poultry (total)	350,000[2]	475,000[2]			1,360,100	1,743,308	2,561,217	2,662,347	33.6%
Broilers	125,000[2]	190,000[2]			618,431	979,606	1,059,746	1,222,355	38.5%
Laying hens					703,874	708,336	1,420,555	1,337,369	23.9%
Others (turkeys, ducks, geese)					37,795	55,366	80,916	102,623	39.5%

Sources: Eurostat (2006); 2 Soil Association (2004); 3 Agra CEAS calculation based on the data shown; Defra (2005).

Table A. 18: Development of organic livestock numbers in Cyprus, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)	0	0	0	0					
Bovine (total)	0	0	0	0					
Dairy cows									
Beef cows									
- Suckler cows									
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)	0	0	0	0					
Sheep, breeding females									
Other sheep									
Goats (total)	0	0	0	0					
Goats, breeding females									
Other goats									
Pigs (total)	0	0	0	0					
Fattening pigs									
Breeding sows									
Other pigs									
Poultry (total)	0	0	0	0					
Broilers									
Laying hens									
Others (turkeys, ducks, geese)									

Source: Agricultural Research Institute (2006).

Table A. 19: Development of organic livestock numbers in the Czech Republic, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)					1,684[2]	1,760[2]			4.5%
Bovine (total)					79,364[2]	84,109[2]		100,304	8.1%
Dairy cows								2,865	
Beef cows								97,439[3]	
- Suckler cows									
- Bovines - meat production.								50,390	
- Bovines - fatteners									
- Young bovines								45,599	
- Other bovines					4,514[2]	4,699[2]		1,450	-31.5%
Sheep (total)					19,029[2]	19,894[2]		31,631	18.5%
Sheep, breeding females					13,178[2]	12,472[2]		21,461	17.7%
Other sheep					5,851[2]	7,422[2]		10,170	20.2%
Goats (total)					1,753[2]	2,297[2]		2,620	14.3%
Goats, breeding females					1,086[2]	1,359[2]		1,708	16.3%
Other goats					667[2]	938[2]		912	11.0%
Pigs (total)					2,597[2]	2,558[2]		1,359	-19.4%
Fattening pigs					1,358[2]	1,347[2]		704	-19.7%
Breeding sows					309[2]	288[2]		163	-19.2%
Other pigs					930[2]	923[2]		492	-19.1%
Poultry (total)					3,274[2]	1,675[2]		1,715	-19.4%
Broilers					40[2]	35[2]		0	-100.0%
Laying hens					2,078[2]	1,252[2]		1,174	-17.3%
Others (turkeys, ducks, geese)					1,156[2]	388[2]		541	-22.4%

Sources: Eurostat (20006); 2 Research Institute of Agricultural Economics (2005); 3 Agra CEAS calculation based on the data shown.

Table A. 20: Development of organic livestock numbers in Estonia, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)			83	87	63	265			47.3%
Bovine (total)			815	2,931	3,365	4,327			74.5%
Dairy cows									
Beef cows									
- Suckler cows									
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines					36	32			-11.1%
Sheep (total)			196	1,007	867	1,795			109.2%
Sheep, breeding females						949			
Other sheep						846			
Goats (total)			89	105	67	219			35.0%
Goats, breeding females						126			
Other goats						93			
Pigs (total)			79	661	124	216			39.8%
Fattening pigs						14			
Breeding sows						145			
Other pigs						57			
Poultry (total)			586	2,030	836	1,376			32.9%
Broilers						8			
Laying hens						1,183			
Others (turkeys, ducks, geese)						185			

Source: Research Institute of Agricultural Economics (2005).

Table A. 21: Development of organic livestock numbers in Hungary, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)		25[2]	20[2]	221[2]	281[2]	684	354	282	49.8%
Bovine (total)		2,900[2]	2,290[2]	3,482[2]	6,180[2]	8,661	7,926	8,747	20.2%
Dairy cows									
Beef cows									
- Suckler cows									
- Bovines - meat production.									
- Bovines - fatteners									
- Young bovines									
- Other bovines									
Sheep (total)		1,517[2]	1,053[2]	909[2]	1,292[2]	17,769*	2,277	2,137	5.9%
Sheep, breeding females									
Other sheep									
Goats (total)		361[2]	26[2]	65[2]	86[2]	1,684*	268	296	-3.3%
Goats, breeding females									
Other goats									
Pigs (total)		992[2]	34[2]	254[2]	225[2]	1,951*	462	769	-4.2%
Fattening pigs									
Breeding sows									
Other pigs									
Poultry (total)		155[2]	107[2]	129[2]	195[2]	29,743*	176	613	25.8%
Broilers									
Laying hens									
Others (turkeys, ducks, geese)									

Sources: Eurostat (2006); 2 Research Institute of Agricultural Economics (2005); 3 Agra CEAS calculation based on the data shown.
*Note: * Erroneous result in source data.*

Table A. 22: Development of organic livestock numbers in Latvia, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)								352	
Bovine (total)				158[2]	373[2]	1,175[2]		10,037	182.3%
Dairy cows								3,447	
Beef cows								6,590	
- Suckler cows								914	
- Bovines - meat production.								1,375	
- Bovines - fatteners									
- Young bovines								4,223	
- Other bovines								78	
Sheep (total)				93[2]	210[2]	360[2]		1,970	114.5%
Sheep, breeding females								351	
Other sheep								1,619	
Goats (total)				60[2]	150[2]	280[2]		662	82.3%
Goats, breeding females								650	
Other goats								12	
Pigs (total)				296[2]	428[2]	780[2]		2,078	62.8%
Fattening pigs								1,207	
Breeding sows								326	
Other pigs								545	
Poultry (total)				133[2]	1,011[2]	4,976[2]		6,034	159.5%
Broilers								340	
Laying hens								4,222	
Others (turkeys, ducks, geese)								1,472	

Sources: Eurostat (2006); 2 Research Institute of Agricultural Economics (2005).

Table A. 23: Development of organic livestock numbers in Lithuania, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)						447[2]		190	-34.8%
Bovine (total)						325[2]		6,616	351.2%
Dairy cows								3,048	
Beef cows								3,568	
- Suckler cows								623	
- Bovines - meat production.								22*	
- Bovines - fatteners									
- Young bovines								2,923*	
- Other bovines						24[2]		0	-100.0%
Sheep (total)						1,070[2]		3,789	88.2%
Sheep, breeding females								3,789	
Other sheep								0	
Goats (total)								321	
Goats, breeding females								321	
Other goats								0	
Pigs (total)						211[2]		83	-37.3%
Fattening pigs								83	
Breeding sows								0	
Other pigs								0	
Poultry (total)						965[2]		890	-4.0%
Broilers								0	
Laying hens								861	
Others (turkeys, ducks, geese)						47[2]		29	-21.4%

Sources: Eurostat (2006); 2 ResearchTable A. 24: Development of organic livestock numbers in Slovakia, 1997-2004ta.

Table A. 24: Development of organic livestock numbers in Slovakia, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)					34[2]	17[2]	30	62	22.2%
Bovine (total)					6,366[2]	3,620[2]	8,786	12,761	26.1%
Dairy cows							1,269	1,550	22.1%
Beef cows							7,517[3]	11,211[3]	49.1%
- Suckler cows							455	1,658	264.4%
- Bovines - meat production.							2,661	4,276	60.7%
- Bovines - fatteners							87	0	-100.0%
- Young bovines							2,574	4,276	66.2%
- Other bovines					2,675[2]	1,408[2]	1,827	1,000	-28.0%
Sheep (total)					17,401[2]	13,912[2]	22,179	27,082	15.9%
Sheep, breeding females					13,187[2]	10,999[2]	16,857	17,903	10.7%
Other sheep					4,214[2]	2,913[2]	5,322	9,179	29.6%
Goats (total)					604[2]	675[2]	619	660	3.0%
Goats, breeding females					594[2]	663[2]	598	627	1.8%
Other goats					10[2]	12[2]	21	33	48.9%
Pigs (total)					0[2]	7[2]		31	110.4%
Fattening pigs					0[2]	0[2]		30	
Breeding sows					0[2]	6[2]		1	-59.2%
Other pigs					0[2]	1[2]		0	
Poultry (total)					4,776[2]	4,776[2]		49	-78.3%
Broilers					0[2]	0[2]		0	
Laying hens					4,776[2]	4,776[2]		45	-78.9%
Others (turkeys, ducks, geese)					0[2]	0[2]		4	

Sources: Eurostat (2006); 2 Research Institute of Agricultural Economics (2005); 3 Agra CEAS calculation based on the data shown.

Table A. 25: Development of organic livestock numbers in Slovenia, 1997-2004

	1997	1998	1999	2000	2001	2002	2003	2004	%CAGR
Equine (total)		31[2]	125[2]	378[2]	667[2]	956[2]			135.7%
Bovine (total)		107[2]	2,680[2]	5,314[2]	8,414[2]	10,891[2]		13,098	122.8%
Dairy cows								1,004	
Beef cows								12,094	
- Suckler cows								4,659	
- Bovines - meat production.								3,650	
- Bovines - fatteners								0[3]	
- Young bovines								2,659	
- Other bovines								1,126	
Sheep (total)		288[2]	3,242[2]	7,131[2]	9,926[2]	13,277[2]		17,946	99.1%
Sheep, breeding females								1,683	
Other sheep								16,263	
Goats (total)		14[2]	362[2]	1,218[2]	1,566[2]	2,239[2]		3,465	150.6%
Goats, breeding females								1,127	
Other goats								2,338	
Pigs (total)		31[2]*	579[2]*	893[2]*	1,386[2]*	1,935[2]*		14,218	177.7%
Fattening pigs		29[2]	500[2]	804[2]	1,256[2]	1,782[2]		2,125*	104.6%
Breeding sows		2[2]	79[2]	89[2]	130[2]	153[2]		10,173*	314.7%
Other pigs		1[2]	8[2]	6[2]	10[2]	264[2]		1,920	252.5%
Poultry (total)		405[2]*	2,284[2]*	3,905[2]*	7,191[2]*	9,740[2]*		1,235	20.4%
Broilers		157[2]	323[2]	281[2]	740[2]	1,434[2]		1,138	39.1%
Laying hens		180[2]	1,733[2]	3,306[2]	5,842[2]	7,386[2]		73	-14.0%
Others (turkeys, ducks, geese)		10[2]	164[2]	256[2]	414[2]	780[2]		24	15.7%

Sources: Eurostat (2006); 2 Research Institute of Agricultural Economics (2005); 3 Agra CEAS calculation based on the data shown.

*Note: * Erroneous result in source data.*

Appendix 3: Terms of reference[145]

A3.1 Background

The Institute for Prospective Technological Studies (IPTS) is one of the seven institutes of the Joint Research Centre of the European Commission. The mission of IPTS is to provide techno-economic analysis in support of the European policy-making process. IPTS' prime objectives are to monitor and analyse science and technology developments, their cross-sectoral impact, and their inter-relationship with the socio-economic context and their implications for future policy development.

The IPTS Unit on Sustainable Agriculture, Food and Health carries out prospective analysis in selected, highly-focused areas within these vast and rapidly developing fields in an attempt to explore the limits and opportunities of technological advances. The mission of the Unit is to support the Commission services and Community institutions in the process of policy formulation by interpreting and alerting them to the socio-economic implications of emerging technologies for sustainable development focussing on agriculture, food and health.

A3.2 Organically reared livestock in the European Union (EU).

Council Regulation (EEC) No 2092/91 (Cf. Official Journal L J98, 22/7/J99J P. J) lays down the rules on organic production of agricultural products. Organic livestock production rules were included in 1999, in Annex I, Part B.3 of the Council Regulation (EC) No 1804/1999 supplementing the previous regulation of 1991 (Cf. Official Journal L 222, 24/08/1999 P. 0001- 0028).

One of the principles in organic livestock production (cf. point Annex I, Part B.3, and point 3.2) is that animals must come from farms, which comply with the rules of the organic production system. Moreover, throughout the animals' life, this system of production must be applied.

However, several derogations to that principle were foreseen in Annex I, Part B.3 in 1999. The reason was that at that time several organic livestock species/categories were not sufficiently available. In particular, Points 3.4, 3.6b and 3.6c of Annex I, Part B.3 foresee derogation's, which allow bringing conventional livestock into organic production units when a· herd or flock is constituted for the first time, renewed or reconstituted. Furthermore, Annex I and II to the Council Regulation (EEC) No 2092/91 were amended by the Commission Regulation (EC) No. 2277/20033 of December 2003 (Official Journal L 336, 23/J 2/2003 P. 0068- 0074).

Harmonised rules for organic livestock production are still quite recent. It seems that the gene pool of the different organically reared livestock species is still small. Moreover, there is no clear picture of the situation in the Member States as regards availability of organically reared livestock and there are no precise figures.

145 This Terms of Reference was revised during the course of the Study in line with the revisions to the definitions of the different organic production systems, as discussed in this report.

A Study is needed in order to develop the legislative rules on organic livestock production in the following months/years. The aforementioned derogation's, which expired on 31 December 2003, have been recently extended until the end of 2004 (cf. Commission Regulation (EC) No. 2277/2003). However, the derogation's cannot be extended *sine die* without justification. But if they expire, there is a risk that certain organic livestock productions disappear. This would probably entail negative economic consequences. However, confirming exceptions to the principles of organic farming, in this case closed organic livestock cycles; could erode consumer confidence and in turn loss of markets. There is thus a need to have a clear perspective of the current and future situation as regards the different organic livestock production cycles.

The preliminary screening of recent literature shows that existing studies are technically oriented, few of them are economic oriented, which reinforces the above mentioned arguments that there is need for further analysis.

A3.3 Objectives

The aims are:

- To collect data on the availability of organically reared livestock in each Member States of the European Union.
- To evaluate the impact of the removal of the derogation permitting the use of non-organic replacement livestock on the economic sustainability of the organic livestock sector in selected EU Member States (see Section 3.2.1). Furthermore, examine needs for the current harmonised rules for organically reared livestock to be adapted.

A3.4 Tasks

The contractor must answer the following questions:

What is the state-of-the-art of the organically reared livestock sector in the EU? What will its future will be?

This section aims at reviewing existing literature and statistics on:

- Current state of organically reared livestock in each Member State of the EU.
- Prospects of the sector.

It consists in collecting, analysing, and reporting on the current status of the sector and on the most recent results of research.

All major primary and secondary information sources (e.g. statistics, databases, and journals) will be screened. Statistics will include the most recent figures and available time series. Furthermore, all major available variables - e.g. number of farms, number of hectares, number of head - will be reported and commented.

The state and prospects of the sector must include (in quantitative and qualitative terms) the characterisation of its major components; i.e. the various sub-systems must be identified and described in terms of productions and utilised methods.

More in particular the Study shall:

- Focus on the following livestock species/categories: ruminants, equidae, porcine, poultry and aquaculture species.
- For the different species/categories, the Study shall consider different productions (e.g., egg and meat production in the case of poultry).
- Consider the availability in each case for the whole life span of the animals, i.e., including breeding, parents, reproductive and productive stock.
- Estimate the available amounts of animals in each case.
- Reflect the situation for the year 2004 and also the foreseeable situation until at least 2008.
- Reflect the situation in each Member State of the EU.

What effects have had/will have the diffusion of organic production without the use of the derogation compared to organic production using the derogation?

Via selected case studies this section aims at comparing the impact on the livestock farms' economic sustainability of two different production cycles: Organic production systems that do not make use of the derogation (organic production system B (A)) and organic production systems that do make use of the derogation (organic production system C). Special attention must be given to prices (i.e. prices of input and output at farming level).

The Economic Sustainability of a given farming system is here meant as the capacity to continue farming utilising the same production cycle in the medium-long term (5-10 years). Indicators are the farmer's Labour Productivity (Added Value per Working Unit) and Income as compared to the same indicators obtained with other production cycles or farming systems.

Organic production systems B and A in this Study mean livestock farming systems which do not take advantage of the derogation's foreseen in Annex I, Part B.3 (origin of the animals) to Council Regulation (EEC) No 2092191 on organic farming as amended by

Commission Regulation (EC) No 2277/03 (Official Journal L 336, 23/12/2003 P. 0068-0074). Organic production system C in this Study means livestock farming systems which take advantage of the aforementioned derogation's.

Based on the analysis of economics associated to the two specific production methods mentioned above, this section must include the following major steps:

- Definition and selection of representative farming systems (special attention must be given to following farming systems: poultry for egg production, poultry for meat production, and pigs).
- Collection of technical and economic data at farm level
- Analyses of the economics of the selected case studies (in particular looking at different technologies and associated input costs, and output prices)

- Analysis of the impact of organic production systems B (A) and C on (i) the economic sustainability of the selected farming systems (in terms of labour productivity and of income) and (ii) on market prices.

The selection of case studies will be done by the contractor in close co-ordination with relevant European Commission staff (IPTS). Selection of case studies will·be based on a set of criteria including social, economic and environmental variables. Case studies will include relevant farming systems at national level, focussing on the following three: poultry for egg production, poultry for meat production, and pig production. Each farming system will be analysed in at least three different EU Member States. The selected countries will be representative of the different characteristics of the EU in terms of agro-ecosystems.

On the basis of the comparative analyses of information collected/elaborated via previous tasks and of the current harmonised rules for organically reared livestock the section must examine need for adapting the current provisions laid down in Annex I, Part B.3 of Council Regulation (EEC) No 2092/91 on organic farming (Cf. Official Journal L 198,22/7/1991 P. 1).

Appendix 4: Case study topic guides[146]

146 This Appendix contains two sets of topic guides. The first set contains briefing notes for the interviewer for each species case study. These were used as an outline during the semi-structured interview process. During the study, the definitions as to what constitutes organic production system C and organic production systems B and A kept changing.

Following the initial data collection process, the Study's Steering Group requested on 7 December 2005 that the original definition of organic production system C and organic production system A be changed from that set out in the Technical Specifications to this study. It was further changed on 23 February 2006 to include a new definition for organic production system B. In order to keep project team up to date with these changes, a further short topic guide for each species was prepared. These topic guides follow the first set of guides.

Briefing note for country case studies on organic laying hen (egg) production

Assessing the economic sustainability of organic egg production without the use of the derogation on sourcing non-organic livestock, compared to organic production systems that use the derogation and non-organic systems.

Background to the research

Introduction

The first regulation on organic farming (Council Regulation EEC No 2092/91) was drawn up in 1991, laying down the rules for farmers wishing to claim official recognition of their organic status. Since then, this Regulation has been amended on numerous occasions, in particular in August 1999 by Council Regulation (EC) No 1804/1999, which extended its scope to cover organic livestock production (namely for cattle, sheep, goats, pigs, horses and poultry species). The Technical Annexes to this Regulation set out the details concerning its implementation.

Part B of Annex I to Regulation (EEC) No 2092/91, as amended by Regulation (EC) No 1804/1999, lays down Community Standards for organic livestock production. These include rules on the ***origin*** of the animals, namely ***livestock must come from holdings that comply with the rules governing organic farming and must be reared in accordance with those rules throughout their lives.*** In addition, when flocks are constituted the ***breed of animal*** must be carefully chosen so that the animals are adapted to their environment and resistant to certain diseases.

However, at the time of implementing these harmonised rules for organic livestock production, the current development of the sector was such that there was not a sufficient range of biodiversity of organically reared livestock available on the market. Accordingly, the Regulation stipulated that the Commission must adopt implementing arrangements and above all amend the Technical Annexes when necessary. This would then enable the provisions of the Regulation to be kept up to date with technical and scientific developments and with the situation on the market in organic products.

Council Regulation (EC) No 1804/1999 therefore provided a number of derogations to the general principles of organic livestock production. As previously noted, one of the principles of organic livestock production is that animals ***must*** come from farms which comply with the rules of organic production systems and that throughout the animals' life these production systems must be applied.

Specifically, Part B of Annex 1 allows for a number of derogations which **permits bringing conventional livestock into an organic production unit when a flock is first established, restocked or reconstituted**. This derogation expired on 31 December 2003, but was extended by Commission Regulation (EC) No

2277/2003 of 22 December 2003 for a further 12 months[147] and now a further derogation has been provided by Commission Regulation (EC) No 2254/2004 of 27 December 2004.

These derogations are considered necessary because the sustainability of the organic production systems is dependent on the size of the current gene pool for the different organically reared livestock species. Thus, from a *supply* perspective there is concern that without a further temporary extension of the aforementioned derogation, certain organic livestock enterprises may become unsustainable, both in terms of the low availability of and price for organically reared livestock species, and may disappear.

However, it is acknowledged that this derogation cannot be extended indefinitely without justification. From a producer demand perspective there is concern that organic production systems that make use of the derogation undermine the principles of organic production and this could potentially lead to a reduction in consumer confidence for organic produce. Any reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply.

Research objectives

The aim of this research is to carry out an economic Study on the *'availability of organically reared livestock in the EU-25'* and to assess the current and future sustainability of organic production without the use of the derogation on sourcing non-organic livestock, compared to organic production systems that use the derogation and non-organic systems. It is intended that this research will provide a clear perspective of the current and future situation as regards different organic production systems, in order to assist in the development of the legislative rules on organic livestock production.

The aim of the country case studies is therefore to assess the economic sustainability of organic production systems that do not use of the derogation on sourcing non-organic livestock (hereafter referred to as 'organic production systems B (A)'), compared to organic production systems that use the derogation (hereafter referred to as 'organic production systems C')and non-organic systems.

Information requirements (organic laying hen production)

Task 1: Assessing the current size of the gene pool for organically reared poultry species and breeds of poultry

1. Are there any organic egg farms which currently **do not** take advantage of the derogation in Part B of Annex 1 of Council Regulation (EC) No 1804/1999, thereby enforcing the general principle that organic egg production should take place in organic production system B (A) (i.e. they do not permit bringing conventional (non-organic) chicks into an organic production unit when a flock is first established, restocked or reconstituted)? If so, please provide a comprehensive overview of these production systems (with detailed information on breeds used, number of holdings, proportion of the total organic holdings, number of animals, certification and any other particular characteristics of these systems in terms of breeding and feeding practice, etc.).

147 It also provided for a derogation until 24 August 2005 relating to use of conventional feedstuffs when organic feed is not available.

2. If a producer wants to rear organic laying hens under organic production system B (A), is it possible to source organically reared chicks that have been **reared from parents that were also reared organically**? If so, please provide a detailed analysis of:

    a. the current size of this laying hen gene pool, in terms of a rough estimate of the numbers of companies/farms supplying organically reared chicks (that have been reared from parents that were also reared organically).

    b. the availability of different breeds of organically reared chicks (that have been reared from parents that were also reared organically).

    c. the evolution of this gene pool in terms of the number of organically reared chicks (that have been reared from parents that were also reared organically) and the number of laying hen breeds.

    d. those factors responsible for the development and/or that have restricted the growth of this gene pool.

3. What are the industry's views on the likely evolution of the organic laying hen gene pool in the short and medium term, in terms of the number of organically reared chicks:

    a. that have been reared from parents that were also reared organically; and,

    b. the number of breeds.

Task 2: Assessment of technical, economic and financial performance of non-organic systems, organic production system B (A) and organic production system C

We need to obtain as much information as possible on how the technical, economic and financial performance of organic production system B (A) differs or would be likely to differ if introduced compared to organic production system C and non-organic production systems. The following tables set out the detailed information that we require you to collect. As technical, economic and financial performance data is not always recorded for organic systems, we realise this information may have to be estimated based on the views of a range of experts. Furthermore, we realise that in some countries organic production system B (A) may not take place, necessitating the estimation of such information. We therefore suggest that the required information be collected using the following methodology:

1. Collect farm level performance data for non-organic production systems from official national sources. Where such information is not available, consult a range of experts to reach a consensus on the performance indicators.

2. Collect farm level performance data for organic production system C from official national sources. Where official information is not available, consult a range of experts to reach a consensus on how the performance of organic production system C differs compared to the performance of non-organic production.

3. Collect farm level performance data for organic production system B (A) from official national sources. Similarly, where official information is not available, consult a range of experts to reach a consensus on how the performance of organic production system B (A) differs/would differ compared to the performance of organic production system C.

The advantage of using this three-stage approach to identify the performance of non-organic and the various organic production systems is that it allows comparisons to be made between the different production systems. In this respect it is important to highlight the need for complete and detailed information so that we can standardise the information to allow comparisons to be made between countries.

Table A. 26: Technical and economic performance indicators

	Non-organic				Organic	
	traditional cage	enriched cage	barn	free-range	system C	system B (A)
Average size of poultry flock						
Housing space allowance (birds per m^2)						
Laying hen performance data						
Age of bought-in chicks (days)						
Age of chicks at start of lay (days)						
Laying period (days)						
Empty period (days)						
Age of hen at end of laying period (days)						
Weight of hen at end of laying period (kg)						
Feed use per bird per laying period (kg)						
Number of birds managed per worker						
Mortality rate over period (%)						
Egg production performance data						
Number of eggs laid per hen per laying period						
Proportion of eggs graded as:						
Size 1 (%)						
Size 2 (%)						
Size 3 (%)						
Size 4 (%)						
Size 5-7 (%)						
Seconds (%)						

Based on the information you collect, please provide a detailed explanation for any differences found in the performance of non-organic production systems and organic production system C as well as between organic production system C and organic production system B (A), in terms of the:

1. **Average size of poultry flocks and stocking rate**.

2. **Laying hen performance data** *(age of bought-in chicks and start of lay, length of laying and empty period, age and weight of hen at end of laying period, feed use, number of birds managed per worker, mortality)*.

3. **Egg production performance data** *(including number of eggs laid and the proportion of egg grading)*

Table A. 27: Financial performance indicators

	Non-organic				Organic	
	traditional cage	enriched cage	barn	free-range	system C	system B (A)
Revenue (€)						
Price of eggs for different grades:						
Size 1						
Size 2						
Size 3						
Size 4						
Size 5-7						
Seconds						
Total revenue from eggs per bird per laying period						
Value of laying hen at end of laying cycle (€/bird) – where this is a cost then please show as a negative						
(*Less* purchase cost of bought-in chicks (€/bird))						
Variable costs (€ per bird)						
Feed						
Veterinary and medicine						
Heat and electricity						
Miscellaneous						
Total variable costs (€ per bird)						
Fixed costs (€ per bird)						
Labour costs						
Building						
Machinery and equipment						
Manure disposal						
Miscellaneous						
Total fixed costs (€ per bird)						

Based on the information you collect, please provide a detailed explanation for any differences found in the performance of non-organic production systems and organic production system C as well as between organic production system C and organic production system B (A), in terms of the:

1. **Revenue** *(Value of eggs and spent hens and purchase cost of bought-in chicks).*

2. **Variable costs** *(feed, veterinary and medicine, heat & electricity and miscellaneous).*

3. **Fixed costs** (labour, building, machinery & equipment, manure disposal and miscellaneous).

Additional information

1. Are there any one-off cash expenditures that would require an initial capital expenditure during the transition from organic production system C to organic production system B (A)? Please identify:

– the magnitude of these cash expenditures and what they would be for?

– the extent to which these form a barrier to the conversion to organic production system B (A)?

2. Are there any other barriers to conversion to organic production system B (A)?

3. Are there any one-off cash expenditures that would require an initial capital expenditure during the transition from a non-organic production system to organic production system C? Please identify:

   – the magnitude of these cash expenditures and what they would be for?

   – the extent to which these form a barrier to the conversion to organic production system C?

4. Are there any other barriers to conversion to organic production system C?

Task 3: Consumer awareness

1. Are consumers generally aware that food produced and labelled as organic is mainly produced under organic production system C?

2. Do consumers generally know the difference between organic production system C and organic production system B (A)?

   – If *yes*, are consumers generally concerned that the majority of organic livestock is produced under organic production system C?

   – If *no*, is there concern that organic production system C may lead to a reduction in consumer confidence for organic produce. Any reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply

3. Are there any published/unpublished data on:

   – Non-organic and organic egg production supply elasticities
   – Income/price elasticities of demand for non-organic and organic eggs

Task 4: Assessing the economic sustainability of organic production system B

We need to identify the industry's views on the economic sustainability of organic production system B.

1. If the current derogation laid down in Annex I, Part B.3 of Council Regulation (EEC) No 2092/91 on organic farming concerning the sourcing of organically reared livestock comes to an end in December 2005, what impact will this have on organic livestock numbers, production and the sector in general?

2. What is the industry's view on the future of this derogation?

Briefing note for country case studies on organic pig production

Assessing the economic sustainability of organic pig production without the use of the derogation on sourcing non-organic livestock, compared to organic production systems that use the derogation and non-organic systems.

Background to the research

Introduction

The first regulation on organic farming (Council Regulation EEC No 2092/91) was drawn up in 1991, laying down the rules for farmers wishing to claim official recognition of their organic status. Since then, this Regulation has been amended on numerous occasions, in particular in August 1999 by Council Regulation (EC) No 1804/1999, which extended its scope to cover organic livestock production (namely for cattle, sheep, goats, pigs, horses and poultry species). The Technical Annexes to this Regulation set out the details concerning its implementation.

Part B of Annex I to Regulation (EEC) No 2092/91, as amended by Regulation (EC) No 1804/1999, lays down Community Standards for organic livestock production. These include rules on the ***origin*** of the animals, namely ***livestock must come from holdings that comply with the rules governing organic farming and must be reared in accordance with those rules throughout their lives.*** In addition, when flocks are constituted the ***breed of animal*** must be carefully chosen so that the animals are adapted to their environment and resistant to certain diseases.

However, at the time of implementing these harmonised rules for organic livestock production, the current development of the sector was such that there was not a sufficient range of biodiversity of organically reared livestock available on the market. Accordingly, the Regulation stipulated that the Commission must adopt implementing arrangements and above all amend the Technical Annexes when necessary. This would then enable the provisions of the Regulation to be kept up to date with technical and scientific developments and with the situation on the market in organic products.

Council Regulation (EC) No 1804/1999 therefore provided a number of derogations to the general principles of organic livestock production. As previously noted, one of the principles of organic livestock production is that animals ***must*** come from farms which comply with the rules of organic production systems and that throughout the animals' life these production systems must be applied.

Specifically, Part B of Annex 1 allows for a number of derogations which **permits bringing conventional livestock into an organic production unit when a flock is first established, restocked or reconstituted**. This derogation expired on 31 December 2003, but was extended by Commission Regulation (EC) No

2277/2003 of 22 December 2003 for a further 12 months[148] and now a further derogation has been provided by Commission Regulation (EC) No 2254/2004 of 27 December 2004.

These derogations are considered necessary because the sustainability of the organic production systems is dependent on the size of the current gene pool for the different organically reared livestock species. Thus, from a *supply* perspective there is concern that without a further temporary extension of the aforementioned derogation, certain organic livestock enterprises may become unsustainable, both in terms of the low availability of and price for organically reared livestock species, and may disappear.

However, it is acknowledged that this derogation cannot be extended indefinitely without justification. From a producer demand perspective there is concern that organic production systems that make use of the derogation undermine the principles of organic production and this could potentially lead to a reduction in consumer confidence for organic produce. Any reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply.

Research objectives

The aim of this research is to carry out an economic Study on the *'availability of organically reared livestock in the EU-25'* and to assess the current and future sustainability of organic production without the use of the derogation on sourcing non-organic livestock, compared to organic production systems that use the derogation and non-organic systems. It is intended that this research will provide a clear perspective of the current and future situation as regards different organic production systems, in order to assist in the development of the legislative rules on organic livestock production.

The aim of the country case studies is therefore to assess the economic sustainability of organic production systems that do not use of the derogation on sourcing non-organic livestock (hereafter referred to as 'organic production systems B (A)'), compared to organic production systems that use the derogation (hereafter referred to as 'organic production systems C')and non-organic systems.

Information requirements (organic pig production)

Task 1: Assessing the current size of the gene pool for organically reared pig species and breeds of pigs

1. Are there any organic pig farms which currently **do not** take advantage of the derogation in Part B of Annex 1 of Council Regulation (EC) No 1804/1999, thereby enforcing the general principle that organic pig production should take place in organic production system B (A) (i.e. they do not permit bringing conventional (non-organic) pigs into an organic production unit when a herd is first established, restocked or reconstituted)? If so, please provide a comprehensive overview of these production systems (with detailed information on breeds used, number of holdings, proportion of the total organic holdings, number of animals, certification and any other particular characteristics of these systems in terms of breeding and feeding practice, etc.)

148 It also provided for a derogation until 24 August 2005 relating to use of conventional feedstuffs when organic feed is not available.

2. If a producer wants to rear organic pigs under organic production system B (A), is it possible to source organically reared pigs that have been **reared from parents that were also reared organically**? If so, please provide a detailed analysis of:

   – the current size of this pig gene pool, in terms of a rough estimate of the numbers of companies/farms supplying organically reared pigs (that have been reared from parents that were also reared organically).

   – the availability of different breeds of organically reared pigs (that have been reared from parents that were also reared organically).

   – the evolution of this gene pool in terms of the number of organically reared pigs (that have been reared from parents that were also reared organically) and the number of pig breeds.

   – those factors responsible for the development and/or that have restricted the growth of this gene pool.

3. What are the industry's views on the likely evolution of the organic pig gene pool in the short and medium term, in terms of the number of organically reared pigs:

   – that have been reared from parents that were also reared organically; and,

   – the number of breeds.

Task 2: Assessment of technical, economic and financial performance of non-organic systems, organic production system B (A) and organic production system C

We need to obtain as much information as possible on how the technical, economic and financial performance of organic production system B (A) differs or would be likely to differ if introduced compared to organic production system C and non-organic production systems. The following tables set out the detailed information that we require you to collect. As technical, economic and financial performance data is not always recorded for organic systems, we realise this information may have to be estimated based on the views of a range of experts. Furthermore, we realise that in some countries organic production system B (A) may not take place, necessitating the estimation of such information. We therefore suggest that the required information be collected using the following methodology:

1. Collect farm level performance data for non-organic production systems from official national sources. Where such information is not available, consult a range of experts to reach a consensus on the performance indicators.

2. Collect farm level performance data for organic production system C from official national sources. Where official information is not available, consult a range of experts to reach a consensus on how the performance of organic production system C differs compared to the performance of non-organic production.

3. Collect farm level performance data for organic production system B (A) from official national sources. Similarly, where official information is not available, consult a range of experts to reach a consensus on how the performance of organic production system B (A) differs/would differ compared to the performance of organic production system C.

The advantage of using this three-stage approach to identify the performance of non-organic and the various organic production systems is that it allows comparisons to be made between the different production systems. In this respect it is important to highlight the need for complete and detailed information so that we can standardise the information to allow comparisons to be made between countries.

Table A. 28: Technical and economic performance indicators

	Non-organic		Organic	
	(indoor)	(outdoor)	system C	system B (A)
Average size of pig herds				
Stocking rate (livestock units/animals per m^2)				
Sow/boar performance data				
Proportion of sows replaced annually (%)				
Proportion of boars replaced annually (%)				
Annual sow mortality rate (%)				
Sow:boar ratio				
Annual feed use per sow per year (kg per sow per year)				
Cost of sow feed (€/tonne)				
Breeding sow performance data				
Number of piglets born alive per litter				
Number of piglets weaned per litter				
Number of pigs finished per litter				
Number of litters per sow per year				
Number of pigs weaned per sow per year				
Number of pigs finished per sow per year				
Weaning piglet performance data				
Pre weaning piglet mortality rate (%)				
Age of piglets at weaning (i.e. transfer to rearing unit) (days)				
Live weight of piglets at weaning (kg)				
Creep feed use per piglet (kg per piglet)				
Cost of creep feed (€/tonne)				
Rearing pig performance data				
Rearing pig mortality rate (%)				
Age of pigs at transfer from rearing to finishing unit (days)				
Live weight of pigs from rearing to finishing unit (kg)				
Daily live weight gain of rearing pigs (g/day)				
Feed (weaner diet) use (kg per weaner pig)				
Feed (rearer diet) use (kg per rearer pig)				
Cost of weaner feed (€/tonne)				
Cost of rearer feed (€/tonne)				
Feed conversion ratio of rearing pigs (:1)				
Finishing pig performance data				
Finishing pig mortality rate (%)				
Age of pigs at finishing (days)				
Live weight of pigs at finishing (kg)				
Daily live weight gain of finishing pigs (g/day)				
Feed (finishing diet) use (kg per finisher)				
Cost of rearer feed (€/tonne)				
Feed conversion ratio of finishing pigs (:1)				
Carcass (dead) weight (kg)				
Killing out ratio (%)				

Based on the information you collect, please provide a detailed explanation for any differences found in the performance of non-organic production systems and organic production system C as well as between organic production system C and organic production system B (A), in terms of the:

1. **Average size of pig herds and stocking rate**.

2. **Sow/boar performance data** *(proportion of sows and boars replaced annually, annual sow mortality rate, Sow:boar ratio, annual feed use per sow per year, cost of sow feed)*.

3. **Breeding sow performance data** *(number of piglets born alive per litter, number of piglets weaned per litter, number of pigs finished per litter, number of litters per sow per year, number of pigs weaned per sow per year and number of pigs finished per sow per year)*.

4. **Weaning piglet performance data** *(pre-weaning piglet mortality rate, age of piglets at weaning (i.e. transfer to rearing unit), live weight of piglets at weaning, creep feed use per piglet and cost of creep feed)*.

5. **Rearing pig performance data** *(rearing pig mortality rate, age of pigs at transfer from rearing to finishing unit, live weight of pigs from rearing to finishing unit, daily live weight gain of rearing pigs, feed (weaner and rearer diet) use, cost of weaner and rearer feed and feed conversion ratio of rearing pigs)*.

6. **Finishing pig performance data** *(finishing pig mortality rate, age of pigs at finishing, live weight of pigs at finishing, daily live weight gain of finishing pigs, feed (finishing diet) use, cost of rearer feed, feed conversion ratio of finishing pigs, carcass (dead) weight and killing out ratio)*.

Table A. 29: Financial performance indicators

	Non-organic		Organic	
	(indoor)	(outdoor)	system C	system B (A)
Revenue				
Value of weaners (€/kg live weight)				
Value of finisher pigs (€/kg live weight)				
Value of cull sows (€/kg live weight)				
Average weight of cull sows				
Value of cull boar (€/kg live weight)				
Average weight of cull boars				
Purchase price of in-pig gilt				
Variable costs (€)				
Feed cost per tonne:				
- sow meal				
- creep feed				
- weaner diet				
- rearer diet				
- finishing diet				
Veterinary and medicine				
- per sow per year				
- per pig finished				
Transport				
- per sow per year				
- per pig finished				
Straw and bedding				
- per sow per year				
- per pig finished				
Miscellaneous				
Total variable costs				
Fixed costs (€)				
Labour costs				
- per sow per year				
- per pig finished				
Building				
- per sow per year				
- per pig finished				
Machinery and equipment				
- per sow per year				
- per pig finished				
Manure disposal				
- per sow per year				
- per pig finished				
Miscellaneous				
- per sow per year				
- per pig finished				
Total fixed costs				

Based on the information you collect, please provide a detailed explanation for any differences found in the performance of non-organic production systems and organic production system C as well as between organic production system C and organic production system B (A), in terms of the:

1. **Revenue** *(Value of weaners, finisher pigs, cull sows and cull boars, average weight of cull sows and boars, and purchase price of in-pig gilt)*.

2. **Variable costs** *(feed, veterinary and medicine, straw and bedding, transport and miscellaneous)*.

3. **Fixed costs** (labour, building, machinery & equipment, manure disposal and miscellaneous).

Additional information

1. Are there any one-off cash expenditures that would require an initial capital expenditure during the transition from organic production system C to organic production system B (A)? Please identify:

   – the magnitude of these cash expenditures and what they would be for?

   – the extent to which these form a barrier to the conversion to organic production system B (A)?

2. Are there any other barriers to conversion to organic production system B (A)?

3. Are there any one-off cash expenditures that would require an initial capital expenditure during the transition from a non-organic production system to organic production system C? Please identify:

   – the magnitude of these cash expenditures and what they would be for?

   – the extent to which these form a barrier to the conversion to organic production system C?

4. Are there any other barriers to conversion to organic production system C?

Task 3: Consumer awareness

1. Are consumers generally aware that food produced and labelled as organic is mainly produced under organic production system C?

2. Do consumers generally know the difference between organic production system C and organic production system B (A)?

   – If *yes*, are consumers generally concerned that the majority of organic livestock is produced under organic production system C?

   – If *no*, is there concern that organic production system C may lead to a reduction in consumer confidence for organic produce. Any reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply

3. Are there any published/unpublished data on:

- Non-organic and organic pigmeat production supply elasticities
- Income/price elasticities of demand for non-organic and organic pigmeat

Task 4: Assessing the economic sustainability of organic production system B

We need to identify the industry's views on the economic sustainability of organic production system B.

1. If the current derogation laid down in Annex I, Part B.3 of Council Regulation (EEC) No 2092/91 on organic farming concerning the sourcing of organically reared livestock comes to an end in December 2005, what impact will this have on organic livestock numbers, production and the sector in general?

2. What is the industry's view on the future of this derogation?

Briefing note for country case studies on organic broiler (poultrymeat) production

Assessing the economic sustainability of organic broiler production without the use of the derogation on sourcing non-organic livestock, compared to organic production systems that use the derogation and non-organic systems.

Background to the research

Introduction

The first regulation on organic farming (Council Regulation EEC No 2092/91) was drawn up in 1991, laying down the rules for farmers wishing to claim official recognition of their organic status. Since then, this Regulation has been amended on numerous occasions, in particular in August 1999 by Council Regulation (EC) No 1804/1999, which extended its scope to cover organic livestock production (namely for cattle, sheep, goats, pigs, horses and poultry species). The Technical Annexes to this Regulation set out the details concerning its implementation.

Part B of Annex I to Regulation (EEC) No 2092/91, as amended by Regulation (EC) No 1804/1999, lays down Community Standards for organic livestock production. These include rules on the ***origin*** of the animals, namely ***livestock must come from holdings that comply with the rules governing organic farming and must be reared in accordance with those rules throughout their lives.*** In addition, when flocks are constituted the ***breed of animal*** must be carefully chosen so that the animals are adapted to their environment and resistant to certain diseases.

However, at the time of implementing these harmonised rules for organic livestock production, the current development of the sector was such that there was not a sufficient range of biodiversity of organically reared livestock available on the market. Accordingly, the Regulation stipulated that the Commission must adopt implementing arrangements and above all amend the Technical Annexes when necessary. This would then enable the provisions of the Regulation to be kept up to date with technical and scientific developments and with the situation on the market in organic products.

Council Regulation (EC) No 1804/1999 therefore provided a number of derogations to the general principles of organic livestock production. As previously noted, one of the principles of organic livestock production is that animals ***must*** come from farms which comply with the rules of organic production systems and that throughout the animals' life these production systems must be applied.

Specifically, Part B of Annex 1 allows for a number of derogations which **permits bringing conventional livestock into an organic production unit when a flock is first established, restocked or reconstituted**. This derogation expired on 31 December 2003, but was extended by Commission Regulation (EC) No

2277/2003 of 22 December 2003 for a further 12 months[149] and now a further derogation has been provided by Commission Regulation (EC) No 2254/2004 of 27 December 2004.

These derogations are considered necessary because the sustainability of the organic production systems is dependent on the size of the current gene pool for the different organically reared livestock species. Thus, from a *supply* perspective there is concern that without a further temporary extension of the aforementioned derogation, certain organic livestock enterprises may become unsustainable, both in terms of the low availability of and price for organically reared livestock species, and may disappear.

However, it is acknowledged that this derogation cannot be extended indefinitely without justification. From a producer demand perspective there is concern that organic production systems that make use of the derogation undermine the principles of organic production and this could potentially lead to a reduction in consumer confidence for organic produce. Any reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply.

Research objectives

The aim of this research is to carry out an economic Study on the *'availability of organically reared livestock in the EU-25'* and to assess the current and future sustainability of organic production without the use of the derogation on sourcing non-organic livestock, compared to organic production systems that use the derogation and non-organic systems. It is intended that this research will provide a clear perspective of the current and future situation as regards different organic production systems, in order to assist in the development of the legislative rules on organic livestock production.

The aim of the country case studies is therefore to assess the economic sustainability of organic production systems that do not use of the derogation on sourcing non-organic livestock (hereafter referred to as 'organic production systems B (A)'), compared to organic production systems that use the derogation (hereafter referred to as 'organic production systems C')and non-organic systems.

Information requirements (organic broiler production)

Task 1: Assessing the current size of the gene pool for organically reared poultry species and breeds of poultry

1. Are there any organic broiler farms which currently **do not** take advantage of the derogation in Part B of Annex 1 of Council Regulation (EC) No 1804/1999, thereby enforcing the general principle that organic broiler production should take place in organic production system B (A) (i.e. they do not permit bringing conventional (non-organic) chicks into an organic production unit when a flock is first established, restocked or reconstituted)? If so, please provide a comprehensive overview of these production systems (with detailed information on breeds used, number of holdings, proportion of the total organic holdings, number of animals, certification and any other particular characteristics of these systems in terms of breeding and feeding practice, etc.)

149 It also provided for a derogation until 24 August 2005 relating to use of conventional feedstuffs when organic feed is not available.

2. If a producer wants to rear organic broilers under organic production system B (A), is it possible to source organically reared chicks that have been **reared from parents that were also reared organically**? If so, please provide a detailed analysis of:

   – the current size of this broiler gene pool, in terms of a rough estimate of the numbers of companies/farms supplying organically reared chicks (that have been reared from parents that were also reared organically).

   – the availability of different breeds of organically reared chicks (that have been reared from parents that were also reared organically).

   – the evolution of this gene pool in terms of the number of organically reared chicks (that have been reared from parents that were also reared organically) and the number of broiler breeds.

   – those factors responsible for the development and/or that have restricted the growth of this gene pool.

3. What are the industry's views on the likely evolution of the organic broiler gene pool in the short and medium term, in terms of the number of organically reared chicks:

   – that have been reared from parents that were also reared organically; and,

   – the number of breeds.

Task 2: Assessment of technical, economic and financial performance of non-organic systems, organic production system B (A) and organic production system C

We need to obtain as much information as possible on how the technical, economic and financial performance of organic production system B (A) differs or would be likely to differ if introduced compared to organic production system C and non-organic production systems. The following tables set out the detailed information that we require you to collect. As technical, economic and financial performance data is not always recorded for organic systems, we realise this information may have to be estimated based on the views of a range of experts. Furthermore, we realise that in some countries organic production system B (A) may not take place, necessitating the estimation of such information. We therefore suggest that the required information be collected using the following methodology:

1. Collect farm level performance data for non-organic production systems from official national sources. Where such information is not available, consult a range of experts to reach a consensus on the performance indicators.

2. Collect farm level performance data for organic production system C from official national sources. Where official information is not available, consult a range of experts to reach a consensus on how the performance of organic production system C differs compared to the performance of non-organic production.

3. Collect farm level performance data for organic production system B (A) from official national sources. Similarly, where official information is not available, consult a range of experts to reach a consensus on how the performance of organic production system B (A) differs/would differ compared to the performance of organic production system C.

The advantage of using this three-stage approach to identify the performance of non-organic and the various organic production systems is that it allows comparisons to be made between the different production systems. In this respect it is important to highlight the need for complete and detailed information so that we can standardise the information to allow comparisons to be made between countries.

Table A. 30: Technical and economic performance indicators

	Non-organic	Organic	
		system C	system B (A)
Average size of poultry flock			
Housing rate (animals per m^2)			
Bought-in chick performance data			
Age of bought-in chicks (days)			
Liveweight of bought-in chicks (kg)			
Broiler performance data			
Age at slaughter (days)			
Liveweight at slaughter (kg)			
Carcass (dead) weight (kg)			
Killing out ratio (%)			
Number of birds managed per worker			
Rearing period (days)			
Mortality rate over period (%)			
Average growth rate per day (g)			
Feed use per bird (kg)			
Feed conversion ratio (:1)			

Based on the information you collect, please provide a detailed explanation for any differences found in the performance of non-organic production systems and organic production system C as well as between organic production system C and organic production system B (A), in terms of the:

1. **Average size of poultry flocks and stocking rate**.

2. **Bought-in chick performance data** *(including. age and weight of bought-in chicks)*.

3. **Broiler performance data** *(including age and weight of broilers at slaughter, carcass weight and killing out ratio, rearing period, mortality rate, average growth rate per day, feed use, feed conversion ratio, number of birds managed per worker)*.

Table A. 31: Financial performance indicators

	Non-organic	Organic	
		system C	system B (A)
Revenue			
Value of broiler (€/kg live weight)			
Value of broiler (€/bird)			
(*Less* purchase cost of bought-in chicks (€/bird))			
Variable costs (€ per bird)			
Feed			
Veterinary and medicine			
Heat and electricity			
Miscellaneous			
Total variable costs (€ per bird)			
Fixed costs (€ per bird)			
Labour costs			
Building			
Machinery and equipment			
Manure disposal			
Miscellaneous			
Total fixed costs (€ per bird)			

Based on the information you collect, please provide a detailed explanation for any differences found in the performance of non-organic production systems and organic production system C as well as between organic production system C and organic production system B (A), in terms of the:

1. **Revenue** *(value of broilers and purchase cost of bought-in chicks)*.

2. **Variable costs** *(feed, veterinary and medicine, heat & electricity and miscellaneous)*.

3. **Fixed costs** (labour, building, machinery & equipment, manure disposal and miscellaneous).

Additional information

1. Are there any one-off cash expenditures that would require an initial capital expenditure during the transition from organic production system C to organic production system B (A)? Please identify:

   – the magnitude of these cash expenditures and what they would be for?

   – the extent to which these form a barrier to the conversion to organic production system B (A)?

2. Are there any other barriers to conversion to organic production system B (A)?

3. Are there any one-off cash expenditures that would require an initial capital expenditure during the transition from a non-organic production system to organic production system C? Please identify:

- the magnitude of these cash expenditures and what they would be for?

- the extent to which these form a barrier to the conversion to organic production system C?

4. Are there any other barriers to conversion to organic production system C?

Task 3: Consumer awareness

1. Are consumers generally aware that food produced and labelled as organic is mainly produced under organic production system C?

2. Do consumers generally know the difference between organic production system C and organic production system B (A)?

   - If *yes*, are consumers generally concerned that the majority of organic livestock is produced under organic production system C?

   - If *no*, is there concern that organic production system C may lead to a reduction in consumer confidence for organic produce. Any reduction in consumer confidence is likely to result in lower demand, which may have a price depressing effect on supply

3. Are there any published/unpublished data on:

   - Non-organic and organic poultrymeat production supply elasticities
   - Income/price elasticities of demand for non-organic and organic poultrymeat

Task 4: Assessing the economic sustainability of organic production system B

We need to identify the industry's views on the economic sustainability of organic production system B.

1. If the current derogation laid down in Annex I, Part B.3 of Council Regulation (EEC) No 2092/91 on organic farming concerning the sourcing of organically reared livestock comes to an end in December 2005, what impact will this have on organic livestock numbers, production and the sector in general?

2. What is the industry's view on the future of this derogation?

Study for the European Commission on the future of the derogations contained in Annex I, Part B of Council Regulation (EC) No 1804/1999 on origin of animals

Organic production system C is defined (as laid down in Annex I, Part B of Council Regulation (EC) No 1804/1999) as those livestock farming systems which take advantage of the transitional derogations foreseen in Annex I, Part B 3 (3.6, 3.8, 3.9 and 3.10) (origin of animals) and permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted. Thus, organic production system C for laying hens permits:

- *non-organic pullets* to be brought in at a maximum 18 weeks of age and thereafter managed organically; or,
- *non-organic chicks to be* brought in at 3 days of age and thereafter managed organically.

Question 1:

We want to know whether *your country* and certification body legislation on the minimum standards for using non-organic pullets and/or chicks in organic systems differs from that of laid down in Annex I, Part B of Regulation (EC) No 1804/1999. *Therefore*:

- *Do these minimum standards apply in your certification body, or does national legislation require higher standards?*

- *Similarly, does your certification body have higher standards than that applied at national or EU level?*

In contrast, organic production system B (A) is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do **NOT** take advantage of the transitional derogations foreseen in Annex I, Part B 3 (3.6, 3.8, 3.9 and 3.10) (origin of animals). Thus, organic production system B (A) for laying hens sources *suitable organic* chicks that have been *reared from organic parent (reproductive) stock* (i.e. the parent stock have been organically managed from at least 18 weeks of age).

Question 2:

We want to know what proportion of organic egg production certified in *your country* does **NOT** take advantage of the transitional derogations set out in Annex I (Part B 3) on the origin of animals (i.e. the proportion of organic egg production that uses *organic* chicks, which have been *reared from organic parent (reproductive) stock* that have themselves been organically managed from at least 18 weeks of age). *Therefore:*

- *What is the likely share of egg production under organic production system B (A) in your country, as a percentage of **total organic** egg production in your country?*

  approximately……..%

- *What is the likely share of egg production under organic production system B (A) certified by your certification body as a percentage of **total organic** egg production certified by your certification body?*

  approximately……..%

- *What proportion of **total** organic egg production is certified by your certification body?*

  approximately……..%

Organic production system C is defined (as laid down in Annex I, Part B of Council Regulation (EC) No 1804/1999) as those livestock farming systems which take advantage of the transitional derogations foreseen in Annex I, Part B 3 (3.6, 3.8, 3.9 and 3.10) (origin of animals) and permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted. Thus, organic production system C for broilers permits *non-organic chicks* to be brought in at 3 days of age (depending on national/private standards) and thereafter managed organically.

Question 1:

We want to know whether *your country* legislation and certification body rules on the minimum standards for using non-organic chicks in organic systems differ from that laid down in Annex I, Part B of Regulation (EC) No 1804/1999. *Therefore:*

- Do these minimum standards apply in your certification body or does national legislation require higher standards?
- Similarly, does your certification body have higher standards than that applied at national or EU level?

In contrast, organic production system B (A) is defined (as laid down in Council Regulation (EC) No 1804/1999) as those livestock farming systems which do **NOT** take advantage of the transitional derogations foreseen in Annex I, Part B 3 (3.6, 3.8, 3.9 and 3.10) (origin of animals). Thus, organic production system B (A) for broiler meat production, sources *suitable organic* chicks that have been *reared from organic parent (reproductive) stock* (i.e. the parent stock have been organically managed from at least 18 weeks of age).

Question 2:

We want to know what proportion of organic broiler meat production certified in your country does **NOT** take advantage of the transitional derogations set out in Annex I (Part B 3) on the origin of animals (i.e. the proportion of organic broiler production that uses *organic* chicks that have been *reared from organic parent (reproductive) stock* that have been organically managed from at least 18 weeks of age). *Therefore:*

- *What is the likely share of broiler meat production under organic production system B (A) in your country, as a percentage of* ***total organic*** *broiler meat production in your country?*
  approximately........%
- *What is the likely share of broiler production under organic production system B (A) certified by your certification body as a percentage of* ***total organic*** *broiler production certified by your certification body?*
  approximately........%
- *What proportion of* ***total*** *organic broiler production is certified by your certification body?*
  approximately........%

Study for the European Commission on the future of the derogations contained in Annex I, Part B of Council Regulation (EC) No 1804/1999 on origin of animals

Organic production system C is defined (as laid down in Annex I, Part B of Council Regulation (EC) No 1804/1999) as those livestock farming systems which take advantage of the transitional derogations foreseen in Annex I, Part B 3 (3.6, 3.8, 3.9 and 3.10) (origin of animals) and permit non-organic livestock to be brought into an organic production unit when a herd or flock is renewed, restocked or reconstituted. Thus, organic production system C for pigs permits non-organic gilts to be brought in for breeding and thereafter managed organically.

Question 1:

We want to know whether *your country* legislation and certification body rules on the minimum standards for using non-organic gilts in organic systems differ from that laid down in Annex I, Part B of Regulation (EC) No 1804/1999. *Therefore:*

- *Do these minimum standards apply in your certification body or does national legislation require higher standards?*
- *Similarly, does your certification body have higher standards than that applied at national or EU level?*

In contrast, organic production system B (A) is defined (as laid down in Council Regulation (EC) No 1804/1999) as those pig production systems which do **NOT** take advantage of the transitional derogations foreseen in Annex I, Part B 3 (3.6, 3.8, 3.9 and 3.10) (origin of animals). Thus, organic production system B (A) for pigs, sources *suitable organic* breeding gilts that have been reared from organic parent stock (i.e. the parent stock have been organically managed).

Question 2:

We want to know what proportion of organic pig production certified in your country does **NOT** take advantage of the transitional derogations set out in Annex I (Part B 3) on the origin of animals (i.e. the proportion of organic pig production that uses *organic* gilts, which have been *reared from organic parent stock* that have themselves been organically managed). *Therefore:*

- *What is the likely share of organic production system B (A) in your country, as a percentage of **total organic** pig production in your country?*

  approximately……..%

- *What is the likely share of pig production under organic production system B (A) certified by your certification body as a percentage of **total organic** broiler production certified by your certification body?*

  approximately……..%

- *What proportion of **total** organic pig production is **certified by your certification body?***

  approximately……..%

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Abstract

According to Council Regulation (EC) No 1804/1999, organic livestock production should take place in organic conditions; namely that livestock must come from production units in the organic production system and throughout their lives, this system of production must be applied. However, at the time of implementing these rules, there was not a sufficient range of organically reared livestock for production and breeding available. Therefore, the Regulation provides a derogation that livestock must come from production units in the organic production system.

To evaluate the impact of the removal of the derogation, DG AGRI requested JRC/IPTS to launch a comprehensive study to assess the availability of organically reared livestock in the EU-25 and to evaluate the impact of its removal on the economic sustainability of the EU organic livestock sector.

A case study methodology was used, focusing on pig, egg and broiler production systems in selected EU Member States. The study found that most countries made full use of the derogation, although the extent to which the derogation is used to its limit was found to vary considerably by livestock species and Member State. Removal of the derogation was found to have a relatively large impact on profitability, which also varied considerably by livestock species and Member State, although profitability was found to be more sensitive to changes in market prices for organic products than for the cost of organic livestock replacements *per se*.

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