



European
Commission

JRC SCIENTIFIC AND POLICY REPORTS

Labelling of agricultural and food products of mountain farming

Authors

Fabien Santini, Fatmir Guri, Sergio Gomez y Paloma

2013



Photo: Giuliano Bernardi



Photo: Christian Poure

The project 'Study on the labeling of agricultural and food products of mountain farming ' (Mountain) is a project commissioned by the Directorate General for Agriculture and Rural Development (administrative arrangement AGRI-2011-0460 / JRC-IPTS n° 32349-2011-10)

Report EUR 25768 EN

European Commission
Joint Research Centre
Institute for Prospective Technological Studies

Contact information

Address: Edificio Expo. c/ Inca Garcilaso, 3. E-41092 Seville (Spain)
E-mail: jrc-ipts-secretariat@ec.europa.eu
Tel.: +34 954488318
Fax: +34 954488300

<http://ipts.jrc.ec.europa.eu>
<http://www.jrc.ec.europa.eu>

Legal Notice

Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use which might be made of this publication.

Europe Direct is a service to help you find answers to your questions about the European Union
Freephone number (*): 00 800 6 7 8 9 10 11

(* Certain mobile telephone operators do not allow access to 00 800 numbers or these calls may be billed.

A great deal of additional information on the European Union is available on the Internet.
It can be accessed through the Europa server <http://europa.eu/>.

JRC 77119

EUR 25768 EN

ISBN 978-92-79-28275-1 (pdf)

ISSN 1831-9424 (online)

doi:10.2791/67942

Luxembourg: Publications Office of the European Union, 2013

© European Union, 2013

Reproduction is authorised provided the source is acknowledged.

Printed in Spain



JRC SCIENTIFIC AND POLICY REPORTS

Labelling of agricultural and food products of mountain farming

Fabien Santini¹, Fatmir Guri¹,
Sergio Gomez y Paloma¹

¹ Joint Research Centre, Institute for Prospective Technological Studies, Spain

2013

The project 'Study on the labeling of agricultural and food products of mountain farming' (Mountain) is a project commissioned by the Directorate General for Agriculture and Rural Development (administrative arrangement AGRI-2011-0460 / JRC-IPTS n° 32349-2011-10)

Joint Research Centre

Acknowledgements

This report presents the findings of the project ‘Study on the labelling of agricultural and food products of mountain farming’ (Mountain) commissioned in 2011 by the Directorate General for Agriculture and Rural Development (DG AGRI) to the Joint Research centre (JRC), Institute for Prospective Technological Studies (IPTS) in form of an administrative arrangement (AGRI-2011-0460 / JRC-IPTS n° 32349-2011-10). The objective of the project was to provide a comprehensive description and analysis of the supply chain of products from mountain areas as well as an assessment of the current labelling schemes accessible for these products in the European Union.

All along the project, discussion has been organised within the Steering Group of the project where officials from Directorates General for Agriculture and Rural Development (DG AGRI), Health and Consumers (DG SANCO) and Regional and Urban Policy (DG REGIO), as well as from the JRC, were represented. The authors would like to thank all Steering Group members for their contributions, and particularly the technical manager in DG AGRI, Mrs Branka Tome for her constant support, as well as Mr Michael Erhart, Mr Marcin Zarzycki and Mr Lorenzo Orlandini, for their specific contributions.

Data facilitated by the FADN (Farm Accountancy Data Network) and from the FSS (Farm Structural Survey) has proved to be very useful and the authors wish to thank Mr Alexander Bartovic in DG AGRI and Mrs Carla Martins in Eurostat for the support related to access to data. Within the IPTS, the authors also thank all the colleagues who interacted on the subject and helped along the process to improve the final result, in particular Jacques Delincé, Maria Espinosa and Sébastien Mary, as well as Leonor Rueda, Ana Molina and Anna Atkinson.

The authors would also like to thank the authors of specific reports carried out in the framework of the project above-mentioned, namely:

- Mr Olivier Beucherie and the team gathered under the supervision of ISARA, which drafted the report ‘Study on labelling of Agricultural and food products of mountain farming’ ISARA (2012): Mrs Christine Monticelli, Mrs Delphine Vitrolles and Mrs Emma Berger from ISARA, Mrs Alexia Rouby and Mr Guillaume Cloye from Euromontana,

Mr Rob Mc Morran from the University of Highlands and Islands Perth College;

- Mr Filippo Arfini and Mr Michele Donati who drafted the report ‘Deriving from FADN data quantitative information on mountain agricultural products supply chains in the EU’ ISAGRI (2012);
- Mrs Audrey Aubard and Mrs Ester Oliva Caceres who drafted the report ‘Practices and legal aspects of the commercial use of term ‘mountain’ in the labelling of food products’. Bordeaux, AUBARD CONSULTING CONSORTIUM (2012);
- Mr Jean-Luc Reuillon and the team gathered under the supervision of the French Livestock Institute (Institut de l’Elevage), who drafted the report ‘La filière française de laits et de fromages de montagne (Mountain milk and cheese in France: a case study for mountain products supply chains)’. Institut de l’Elevage, INRA, Sidam, Cniel (2012): Mr Christophe Perrot and Mr Philippe Chotteau from Institut de l’Elevage, Mrs Marie Dervillé from INRA, Mrs Maryline Crouzet from SIDAM, Mr Laurent Forray and Mrs Anne Richard from CNIEL;
- Mr Michael Groier and the team gathered under the supervision of the Austrian Federal Institute for Less Favoured and Mountainous Areas (BABF), who drafted the report ‘Mountain milk and cheese in Austria: a case study for mountain products supply chain’ Viena, Bundesanstalt für Bergbauernfragen (2012): Mr Philipp Gmeiner, Mr Gerhard Hovorka and Mr Oliver Tamme;
- Mr Javier Sanz Cañada and the team gathered under the supervision of the Spanish Superior Council for Scientific Research (CSIC), who drafted the report ‘Mountain Olive Oils in Jaén (Spain): a Case Study for Mountain Products Supply Chains’: Mr David Garcia Brenes from the University of Seville and Mr Manuel Barneo.

Contents

Acknowledgements	3
List of Abbreviations	9
1 Executive summary	11
2 Introduction	15
3 Mountain agricultural and food supply chains: a descriptive picture	17
3.1 Overview of mountain farming	17
3.1.1 Definition of mountain	17
3.1.2 Characteristics of mountain farming	18
3.1.3 Distribution of areas and number of livestock heads	21
3.2 Agri-Food products in mountain areas	24
3.2.1 Total Agricultural Output in mountain	24
3.2.2 Livestock products	29
3.2.1 Crop products	40
3.3 Localisation of the different stages of the supply chains	47
3.3.1 Feed	47
3.3.2 Processed products: localisation of agricultural raw materials and processing facilities	52
3.3.3 Distribution of mountain products	57
4 Impact of mountain agricultural and food products for farmers and the society	61
4.1 Farm impact: farm gate prices and cost structure for mountain products	61
4.1.1 Output aspects	61
4.1.2 Production cost aspects	68
4.2 The contribution of mountain agricultural and food production to mountain sustainable development	81
4.2.1 Agricultural and food products in mountain areas and their relations to the environment	81
4.2.2 Agricultural and food products and the wider mountain rural economy	84
4.2.3 Agricultural and food products and their socio-cultural dimension	86
4.3 Consumer perspective	87
4.3.1 Perception of mountain products and understanding	87
4.3.2 Consumers' act of purchase: retail price and accessibility	90
5 Labelling of mountain products - a comparative review of the existing schemes and practices	93
5.1 Sales names and branding (collective and individual) for mountain food products	93
5.1.1 A vast diversity of branding and practices differing from Member State to Member State	93
5.1.2 Analysis of sales names in the inventory	98
5.1.3 Protection and legal provisions applicable to current commercial practices: Trademark rules ; Consumer protection and Lawful competition	99
5.2 Indirect protection of mountain agricultural and food products, with particular focus on PDO and PGI	104
5.2.1 How do PDO and PGI refer to mountain?	104
5.2.2 Mountain PDO and PGI: a screening of the designations registered	106
5.2.3 Economic coverage of mountain PDO and PGI	108
5.3 Existing examples of national labelling schemes specific to mountain agricultural and food products: success or failures?	110

6.2.1 France	110
5.3.2 Switzerland	112
5.3.3 Italy	113
5.3.4 Spain	115
5.3.5 Relevant developments within the Alpine Convention	115
5.3.6 Specific case of honey	115
5.3.7 Perception of mountain producers on the schemes available	116
6 CONCLUSIONS	117
7 REFERENCES	119

List of figures

Figure 1: Agricultural surface (ha) per agricultural labour (AWU) in Mountain Areas LFA vs. other areas	20
Figure 2: UAA utilisation in LFA mountain (EU-27)	21
Figure 3: Permanent crop structure in EU27 (in ha.)	22
Figure 4: Livestock Units (LSU) – Share of LFA mountain on total	23
Figure 5: Livestock density on grazing surface in mountain areas per MS (100 = national average)	23
Figure 6: Share of crop and livestock output in mountain farming	24
Figure 7: Cow milk production in mountain areas (% of total EU mountain production)	30
Figure 8: Net sales expressed in % of total LSU on the farm for the same category	37
Figure 9: Share of Bolzano and Trento in Italy apple and pear production	42
Figure 10: Bolzano and Trento in EU apple and pear production	42
Figure 11: Dairy animals feed composition per type of feed (T of dry matter (T d.m.) per LSU)	48
Figure 12: Share of purchased feed (% of dry matter)	48
Figure 13: Distribution of 3-years average farm results for % purchased on the total feed needs of dairy animals	49
Figure 14: Purchased feed in specialised dairy farms (Euros/LSU)	50
Figure 15: Share of purchased feed needs in dairy specialised farms (%)	51
Figure 16: No. of respondents indicating where each stage of the supply chain for the products they produce occurs in relation to mountain areas	53
Figure 17: Location of production units of dairies and share of their supply (2010)	56
Figure 18: The extent to which respondents were distributing their products at different scales	58
Figure 19: Averages of responses on estimated percentage of total annual production volume for mountain products distributed at different levels	58
Figure 20: Distribution and retail outlets of mountain products (number of actors)	59
Figure 21: Average milk price for 9 French departments (1994-2009)	65
Figure 22: Gross margin and cost differential for Austria	73
Figure 23: Gross margin and cost differential for Emilia Romagna	73
Figure 24: Gross margin and cost differential for Rhône-Alpes and Provence	74

Figure 25: Gross margin and cost differential for Andalusia	74
Figure 26: Gross margin and cost differential for Slovenia	75
Figure 27: Gross margin and cost differential for Romania	75
Figure 28: Representation of different costs of production in different lowland and mountain areas	77
Figure 29: Average production costs per type of dairy farms (2010)	78
Figure 30: Difference (€) between lowland and Massif Central dairy farmers per item in the production costs and revenues	79
Figure 31: Eurobarometer (2011) question on the perception of mountain products	87
Figure 32: Consumer perceptions of qualities associated with mountain product	88
Figure 33: Mean values of local food index (blue) and production index (red) dependent on country	89
Figure 34: Examples of direct references to 'mountains'	94
Figure 35: Examples of direct references to 'mountains' in coffee labels	94
Figure 36: Examples of direct references to terms of the same genealogy than 'mountain'	95
Figure 37: Examples of direct references to names of determined mountains	95
Figure 38: Examples of references to certain types of mountains (alpine pastures)	96
Figure 39: Examples of references to highlands	96
Figure 40: Examples of indirect references to mountains	97
Figure 41: Examples of generic names referring to 'mountain'	98
Figure 42: Examples of labels referring to mountain for products which are not wholly produced and processed in mountain areas	102
Figure 43: Labels of Arnad le Vieux (Italian Case Law)	103
Figure 44: Examples of PDO-PGI labels referring to 'mountain'	105
Figure 45: Examples of mountain PDO-PGI logos not referring to 'mountain'	105
Figure 46: Savoie PDO-PGI logos	106
Figure 47: Comparison of numbers of PDO and PGI products and their rankings (Mountain, part-mountain and peripheral)	107
Figure 48: Comparison of numbers of PDO and PGI products and their rankings (Mountain, part-mountain and peripheral) per sector concerned	108
Figure 49: Examples of mountain logos	111
Figure 50: Examples of PDM	114
Figure 51: Examples of Italian PDO referring to 'mountain'	114
Figure 52: Examples of honey labels	115

List of maps

Map 1: Municipalities fully or partly in LFA mountain areas	18
Map 2: Share of mountain agriculture output in each MS	26
Map 3: Cow milk production in mountain areas in the EU	31
Map 4: Cattle trade value in mountain areas in the EU	36
Map 5: Pome fruit production in mountain areas in the EU	41
Map 6: Olive production in mountain areas in the EU	45
Map 7: Grapes for wine production in mountain areas in the EU	46
Map 8: Price difference between mountainous and lowland cow milk	63
Map 9: Number of cow milk cheese PDOs per municipality	109

List of tables

Table 1: Share of LFA mountain agriculture in total UAA, labour, number of holding and economic size	19
Table 2: Average farm size (LFA mountain vs. other areas)	19
Table 3: Farm Economic Size per ha and per unit of agricultural labour in mountain LFA vs. other areas	20
Table 4: Main agricultural activities in mountain areas (in terms of output)	25
Table 5: Mountain output for crop and livestock activities per MS	27
Table 6: Output of mountain products in the MS	28
Table 7: Cow milk production in EU mountain area	29
Table 8: Total and mountain cow milk production by MS	30
Table 9: Weight of PDO / PGI and organic agriculture in the different dairy regions	32
Table 10: Importance of mountain in the French milk production	32
Table 11: Structure of milk supply in Austria (2011)	33
Table 12: Sheep and goat milk production in EU mountain area	33
Table 13: Total and mountain ewe and goat milk production by MS	34
Table 14: Cattle (beef) net sales in EU mountain area	35
Table 15: Sheep (lamb) net sales in EU mountain area	38
Table 16: Pigs net sales in EU mountain area	38
Table 17: Distribution of pigs in less favoured areas (000 heads)	39
Table 18: Potential production of mountain pig, estimated by regional interbranch organizations (2008)	39
Table 19: Pome fruit production in EU mountain area	40
Table 20: Nuts production in EU mountain area	43
Table 21: Stone fruit production in EU mountain area	43

Table 22: Olive production in EU mountain area (Italy excluded)	44
Table 23: Wine and grapes production in EU mountain area	44
Table 24: Feed balance in mountain areas for dairy farms in Austria	50
Table 25: Respondent (% of total respondents) indications as to where each stage of the supply chain for the products they produce occurs in relation to mountain areas	53
Table 26: Slaughterhouses (SH) in mountain areas	54
Table 27: Number of establishment per type of main production	55
Table 28: Distribution of dairy quantities processed	55
Table 29: Estimation of dairy processing capacities in French mountains	55
Table 30: Volume and value of PDO PGI meat products (2005-2008)	57
Table 31: Retailing channels (%) for sheep/goat based products in Portugal	60
Table 32: Estimated Farm gate output / T of product	61
Table 33: Cow milk price difference between mountainous areas and low land areas (€/l)	62
Table 34: Milk price lowland / mountain (€/ton)	64
Table 35: Milk producer prices in Austria in cent/kg (2010)	65
Table 36: Apple price difference between mountain areas and lowland areas	66
Table 37: Ponderated average price of olive oil (bulk) - €/kg	66
Table 38: GSP per product- difference (€/ha or €/LSU) between mountain farms and lowland ones (* not available or less than 15 observations) (2008)	67
Table 39: FADN specific cost structure in six regions (MS)	70
Table 40: Comparison of specific cost estimates – Mountain vs. Non mountain (%)	71
Table 41: Comparison of specific cost estimates – Mountain vs. Non mountain (ctd)	72
Table 42: Costs of production for milk in different areas and with different systems of production	76
Table 43: Production costs of selected dairy farms in different regions with various herd sizes	79
Table 44: Difference of labour remuneration in milk production (France)	80
Table 45: Positive and negative externalities of mountain farming	81
Table 46: Comparison of milk supply chain for France dairy industry and Savoie PDO cheese	84
Table 47: Direct employment in French dairy supply chain (estimates)	85
Table 48: Hedonic regressions for cheese for selected countries	90
Table 49: Milk retail price in France	91
Table 50: Main 'mountain' denomination TM registration trend	99
Table 51: PDO/PGI classification	106
Table 52: List of Mountain, part-mountain and peripheral PDO/GIs	107
Table 53: Estimated share of PDO and PGI in agricultural turnover at EU level	109
Table 54: Respondent opinion on the factors of greatest importance to consumers in relation to their products	116

List of Boxes

Box 1: Article 31 of Regulation (EU) No 1151/2012 15

Box 2: PMP model to estimate costs per activity 68

List of Abbreviations

ADARA	Association de Développement de l'Apiculture en Rhône-Alpes
APLM	French Association of Mountain Milk Producers
AWU	Annual Working Unit
BABF	Federal Institute for Mountain Areas and LFA (Bundesanstalt für Bergbauernfragen)
CAP	Common Agriculture Policy
CTM	Community TradeMark
DG AGRI	Directorate-General for Agriculture and Rural Development
EC	European Commission
EEA	European Environment Agency
ESU	Economic Size Unit
Euromontana	Association Européenne pour les Zones de Montagne
FADN	Farm Accountancy Data Network
IEEP	Institute for European Environmental Policy
INPI	Institut National de la Propriété Intellectuelle
IP	Intellectual property
JRC-IPTS	Joint Research Center – Institute for Prospective Technological Studies
LFA	Less Favoured Areas
MS	Member State
NMS	New Member State
ODMA	Ordonnance sur les Dénominations 'Montagne' et 'Alpage'
OHIM	Office for Harmonization in the Internal Market (Trademarks and Designs)
OIC	Organisme Intercantonal de Certification
PDM	Prodotto di Montagna
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
SGM	Standard Gross Margin
TM	Trademark
UAA	Utilised Agricultural Area
WIPO	World Intellectual Property Organization

1 Executive summary

Background

Mountains represent a significant share of the EU territory, population and economy. Most definitions, including the one established for the purpose of compensating natural handicaps for mountain agriculture (Less Favoured Areas (LFA), laid down by article 18.1 of Regulation (EC) No 1257/1999), rely on criteria relating to minimum altitude (between 500m and 1000m for mountain LFAs), minimum average slope (between 15 and 25 percent) or a combination of both minimum altitude and slope. According to the LFA definition, mountain areas represent 18.5 % of the total EU area.

In the mountains, agriculture faces several limitations, related to the existence of permanent natural handicaps, which are not easily tackled with investments. Low temperatures and the limited length of the crop growing period combines with steep slopes with less fertile soils and the need for more complex machinery and more working time. This results in lower labour productivity and lower land productivity. Such limitations also imply that farmers have less choice on the productive sectors they can invest in. Finally, farms are smaller on average compared to plains or flatter, lower-lying areas. Poor accessibility increases the difficulties of mountain farms and also affects the mountain food industries (increased collection and transport costs, smaller structures implying less economies of scale).

The existence in mountain areas of traditions and know-how relating to agricultural production and food processing is an opportunity for mountain communities, reinforced by synergies with tourism. With a view to making the mountain products on the market more clearly identifiable and thus less misleading for the consumer, the EU institutions legislated on a common definition of an optional quality term, 'mountain products', in the labelling of agricultural products. According to the Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs, the term 'mountain product' shall only be used for products for which the feed and the raw materials come essentially from mountain areas and for which the processing also takes place in mountain areas. The new Regulation empowers the European Commission to adopt implementing acts setting derogations to the general principles of the new Regulation

in order to take into account the specificities of the different sectors involved.

In this context, the present report aims to:

- i. gather information on the supply chains for agricultural and food products in mountain areas (products involved, main issues related to the location of the different stages of the supply chain such as feed, production of raw material, processing, etc.);
- ii. review the possible reasons why citizens, economic stakeholders (including farmers) and consumers might ask for clarity regarding the provenance of mountain products; and
- iii. assess past and present labelling practices for mountain products (national protection schemes in France or Switzerland, geographical indications and trademarks relating to mountain agricultural and food products).

A large diversity of mountain agricultural and food products ...

In each particular mountain area, farmers have fewer production options than in neighbouring lowland areas. However, overall, all agricultural sectors are present in one or several mountain areas within the EU. FADN (Farm Accountancy Data Network) data is used to analyse the value and volume of agricultural production in mountain areas (at farm gate).

Globally, animal production is the dominant output in EU mountain areas: 54% of the total turnover of mountain farms comes from livestock activities. However, in Mediterranean mountain areas the situation is different as crop production (arable and permanent crops) is more widespread.

The main livestock sectors in European mountain areas are the dairy sector (28% of the total turnover, three-quarters of which is related to cow milk production) and the grazing livestock meat sector (16% of the total turnover, more than two-thirds of which is related to beef and veal). The share of these two sectors in mountain farming is higher than average in EU farming. Meat production from monogastric animals (pigs and poultry) is, in contrast, less present in mountain areas than in the rest of the EU.

Cows' milk represents 25% or more of the total mountain agricultural turnover in Germany, Austria, Czech Republic, Slovakia, Slovenia and France. Sheep and goats' milk is particularly important in mountain areas of Greece (17% of total turnover). Grazing livestock meat-related activity is the most important in mountain areas of France (close to one third of the total turnover, principally beef) and the United Kingdom (more than half of the total, equally distributed between beef and sheep).

The situation is similar in terms of physical quantities. Mountain areas produce a large proportion of sheep and goat products (34% of milk and 25% of meat), a significant share for bovine products (9.5% of milk and 12% of meat) and less for other animal products such as pork meat, although this can still be more important in particular locations e.g. in Spain and Portugal.

Honey production is also significant in mountain areas, but more difficult to capture in the absence of records and because of important transhumance of beehives. Mountain production can be estimated at between 5% and 20% of the total production of honey in mountainous MS.

Crop sectors of importance are cereals (9% of total production value, half the proportion in lowlands areas) and permanent crops (fruit orchards, olive groves and vineyards). The share of the fruit sector (in particular apples, pears, stone fruit and nuts) and the olive sector in the total turnover of mountain farms (6.3% and 7.1% respectively) is significantly higher than the share of the same sectors in total EU agricultural turnover (3.7% and 2.6% respectively). In terms of physical quantities, mountain areas produce significant quantities of products from permanent crops (15% of total EU fruit production, 17% of total EU olive production, 12.5% of total EU wine production). For nuts, the share of EU production located in mountain areas is above 35%.

...the supply chains of which are often overlapping mountain areas and neighbouring zones...

If mountain farming activity is precisely defined by the LFA classification, information concerning the provenance of feed and raw materials and the location of processing facilities is not directly available.

Concerning feed, the situation is different for ruminants (bovine, ovine and caprine animals) than for other livestock sectors (pigs, poultry, etc.). Ruminants' feed is largely obtained from pastures or grass (hay, silage), which are present and produced in mountain areas. Other components need to be imported from non-mountain areas, in particular concentrated feed (cereals, protein crops, vitamins and minerals, etc.). On the basis of data related to the purchase

of concentrated feed and a theoretical model of dietary needs, it can be calculated that the majority (over 90%) of dairy cows in French mountain areas get more than 70% of their feed (dry matter contents) from mountain areas. Similar calculations for dairy cows in Austria result in an average of 12% to 13% of the feed ration being imported from non-mountain areas. Similar patterns apply in the Alps and Central Europe (Germany, Slovenia, Czech Republic, Slovakia), but the share of feed imported from lowlands is higher in Mediterranean areas (Spain, Portugal, Italy, Greece).

Ruminants intended for meat receive a higher proportion of mountain feed than dairy cows as long as they stay in mountain areas. A large proportion of bovine and ovine animals born in mountain areas are however fattened ('finished') for several months in lowlands before slaughter.

Concerning other animals, most are fed entirely from non-mountain feed (cereals and protein crops) and arable crop production capacities in mountain areas are such that only a minimal proportion of feed for pigs may reasonably be sourced from mountain areas. There are however some niche products or traditional practices in mountain areas: inclusion of dairy sub-products (whey) in pigs' rations, acorn-fed traditional breeds of pigs, outdoor pig and poultry rearing etc.

Processing of raw material does not necessarily occur in mountain areas, even if mountain farms are in general characterised by more diversification towards on-farm processing than non-mountain ones. Slaughterhouses or dairy industries are less present in mountain areas than in lowlands. The density of processing establishments per km² is 25% to 50% lower in mountain areas and the structures are smaller and less modern. The overall processing capacities within mountain areas are usually not sufficient for the processing of raw materials produced in the mountains. Only 65% to 70% of mountain milk production can be processed within mountain areas in France and Austria; the rest needs to be processed in lowlands.

Concerning meat products, the production of fresh meat in the mountains is anecdotal compared to the importance of the breeding animals in terms of turnover. Most bovine animals born and bred in mountain areas are sold alive for further fattening in non-mountain areas (e.g. traditional trade of live young bovine animals between French mountains and Italian lowlands). Cured and dried meat products produced in mountain areas (bovine and porcine) are often made from raw material imported from lowlands. Illustratively, there are many geographical indications for meat products corresponding to mountain areas. They represent 24% of the total value of meat products' geographical indications, but hardly any of them includes an obligation to source the raw material from mountain areas. *De facto*, raw material is imported from lowlands.

... might potentially be subject to misleading practice because of higher prices and specific features for citizens and consumers...

Specific costs of production (e.g. variable cost such as plant protection or feed) of mountain products (per unit of product) are on average slightly higher than in lowlands. Crop production costs per hectare might be lower in mountain areas, but they have lower yields. Livestock production costs per livestock unit are equivalent in mountain and non-mountain areas and lower yields in mountain areas result in a higher production cost per unit of product.

In addition to slightly higher specific costs in mountain areas, the weight of investments (more expensive buildings and machinery) and the impact of a lower labour productivity increase the gap between mountain farms and non-mountain farms. As shown for the dairy sector in France, with exception of the region of Jura where the vast majority of the production is dedicated to PDO cheeses, the remuneration of family employees in dairy farms is between 10% and 40% lower in mountain areas compared to the lowlands. In addition, mountain production faces higher transport and collection costs (particularly for milk), as well as higher processing costs (smaller structures, etc.).

In parallel, on average, most agricultural products benefit from a higher farm gate price (around 10% for cows' milk or bovine animals and up to 20-50% for certain sub-sectors such as apples and pears or stone fruit). In those Member States where quality segmentation is only a recent evolution (in new Member States in particular), the farm gate price premium is not always present; such a premium might also reflect different average qualities of products classified under the same sector (e.g. a higher proportion of mountain milk processed in high value added PDO cheese, more cherries than peaches in mountain stone fruit).

With higher unit costs and higher unit prices at farm gate, mountain agricultural and food products are a potential target for fraud by free riders. Operators might charge more for products by claiming a mountain provenance for them without shouldering higher production costs.

There are additional reasons why consumers might desire to be reliably informed of the mountain origin of products. Mountain farming contributes to the sustainable development of mountain areas by:

- i. means of a higher delivery rate of public goods (in particular thanks to the importance of grazing practices over pastures and meadows),

- ii. a key contribution to social aspects (traditions and know-how, among others related to transhumance) and
- iii. a decisive direct impact on the local economy, particularly because agriculture and food are sectors that are more strongly represented in local mountain economies than in the rest of the EU, or indirectly via synergies with tourism or induced contribution to the rest of the mountain economy.

Consumer perception of mountain products relates to local and cultural values first (local area identity, employment, small scale productions, etc.) and to environmental values second (extensive production systems, etc.).

... and are already somehow protected directly and indirectly.

At present, many food products on the market show labels referring to mountains, directly or indirectly (images, other terms such as synonyms, names of massifs, etc.). In many cases, the label reflects the true origin of the product; in other cases, the justification is open to debate (product only processed in a mountain area, product prepared according to a mountain tradition, pure fairy tale or unrelated marketing strategy, etc.).

Many labels that refer to mountains are combined with another quality message (a geographical indication, a regional label or compliance with organic production). There are also a few cases of products that have acquired a generic character: in the case of '*Jamon Serrano*' (Traditional Specialty Guaranteed), the product concerned was originally at least processed in mountain areas (appropriate climate for drying and curing ham), but now the designation covers a production process which can be carried out anywhere.

Many of the practices mentioned above correspond to registered trademarks. Owners of such trademarks, containing the word 'mountain' or synonyms, or graphic references to mountains, benefit from pre-existing intellectual property rights. An optional quality term is not explicitly considered to be an indication of origin and therefore might not necessarily represent sufficient grounds to impede the registration of new potentially misleading trademarks referring to mountains.

The Case Law on the matter is limited and relies primarily on Consumer Protection and Lawful Competition as well as Trademark Laws as legal basis.

In France and Switzerland, the existence of national rules on the labelling of mountain products seem to have clarified the situation to a certain extent, resulting in less unclear labels and more Case Law.

The Swiss ordinance seems to be the best developed national scheme in place in terms of defining what a mountain

product is. It contains clear rules addressing the issues of feed and processing: minimum share of mountain feed (70%) and of mountain ingredients (90%). It includes rules on minimum time spent on mountains by animals, which can be slaughtered outside mountain areas within a reasonable time (2 months). It also regulates the use of alternative terms (Alps), provides rules for a third party certification process (similar to the one for organic production) and ensures coexistence with pre-existing trademark rights.

The French rules are simpler (administrative authorisation procedure) but provide a lower level of protection: there is no protection related to terms other than *'Montagne'* and no mention of relations with trademarks rules. It is therefore unlikely that the French rules are opposable to trademark rights. In some cases, the French rules are less stringent than the Swiss rules (possibility to source all feed in lowlands for pigs), in others equivalent (70% minimum dry matter of feed from mountain areas for dairy cows) and in some cases even more stringent (impossibility to slaughter and cut carcasses outside mountain areas for meat products). Other existing rules (Italy, Spain - Galicia) are poorly or not applied.

In the absence of statistics kept by the regulators, the precise uptake of these schemes is not known. However, more than 100 million litres of French mountain milk is labelled with a reference to mountains (*'lait de montagne'*) falling under the French rules, this represents less than 12% of the mountain milk processed in mountain and not processed in PDO cheese.

PDO and PGI schemes are an alternative way to protect mountain products. In Italy, it is possible to include within the PDO or PGI specification a reference that the product is a mountain product, when this is the case. This possibility has been used in the specifications of several Italian PDO cheeses such *Asiago* or *Montasio*, allowing an intra-PDO segmentation. This is banned by the French rules which impede a 'mountain' distinction within the same PDO.

Close to 40% of the EU registered denominations refer to mountain or semi-mountain products. Mountain products are more often likely to be labelled as PDO/PGI products than as 'mountain products': in the case of milk in France, 30% of the deliveries of mountain milk are directed to PDOs (4% only to the mountain milk scheme). In all sectors, the presence of PDOs is larger in mountain areas than the EU average: 2 to 3 times more for dairy products (mostly cheeses) and fruit (in particular apples), 10% to 40% more for meat or olive products. However, there are still large segments of mountain products that are not (yet) protected as a geographical indication, leaving space to further segmentation of markets for mountain products.

Conclusions

The Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products, works on the general principle that the term 'mountain product' shall only be used to describe products for which the raw material and the feedstuffs for animals come essentially from mountain areas and, in the case of processed products, the processing also takes place in mountain areas. The Commission is empowered to adopt delegated acts to derogate from these general principles, in order to take into account the natural constraints affecting production in mountain areas.

The various aspects raised in this study contribute to better understand the agricultural production and its processing in mountain areas. This study shows that flexibility might be sought in the derogations to the rules governing the term 'mountain product':

- which kind of feed for which animals and under which threshold can be sourced from non-mountain areas to take into account the impossibility to fully source from within mountains?
- which processing stages might be authorised to take place outside mountain areas?
- what share of non-mountain ingredients (main raw material and/or secondary ones, additives) can be accepted in a mountain processed product?

The study also highlights the importance of further aspects of the labelling of mountain products, notably the need for proper enforcement and for specific arrangements such as certification going beyond the existing consumer protection and lawful competition acts. Finally, it also raises the issue of the coexistence between the new optional quality term 'mountain product' and other existing tools such as trademarks and geographical indications.

In the absence of derogation to the general principle that mountain products should be produced and processed in mountain areas, the scope for application of the 'optional quality term' would be reduced. Animals cannot be 100% mountain fed; processing capacities in mountain areas are insufficient to process all the locally produced raw material; mountain processing industries traditionally incorporate ingredients from lowlands. A fair solution may consist of implementing rules ensuring that the value added is to a great extent obtained in mountain areas.

2 Introduction

This report summarizes the major findings of the ‘Study on labelling of agricultural and food products of mountain farming’ which DG AGRI commissioned the JRC-IPTS to carry out. The objective is to provide a description and socio-

During the discussion on the Commission’s proposal, the idea of creating an optional quality term ‘mountain product’ was introduced and became a legal provision (see box 1). Accordingly, the European Commission will be responsible

Box 1: Article 31 of Regulation (EU) No 1151/2012

Article 31

1. The term ‘mountain product’ is established as an optional quality term.
This term shall only be used to describe products intended for human consumption listed in Annex I to the Treaty in respect of which:
 - (a) both the raw materials and the feedstuffs for farm animals come essentially from mountain areas;
 - (b) in the case of processed products, the processing also takes place in mountain areas.
2. For the purposes of this Article, mountain areas within the Union are those delimited pursuant to Article 18(1) of Regulation (EC) No 1257/1999. For third-country products, mountain areas include areas officially designated as mountain areas by the third country or that meet criteria equivalent to those set out in Article 18(1) of Regulation (EC) No 1257/1999.
3. In duly justified cases and in order to take into account natural constraints affecting agricultural production in mountain areas, the Commission shall be empowered to adopt delegated acts, in accordance with Article 56, laying down derogations from the conditions of use referred to in paragraph 1 of this Article. In particular, the Commission shall be empowered to adopt a delegated act laying down the conditions under which raw materials or feedstuffs are permitted to come from outside the mountain areas, the conditions under which the processing of products is permitted to take place outside of the mountain areas in a geographical area to be defined, and the definition of that geographical area.
4. In order to take into account natural constraints affecting agricultural production in mountain areas, the Commission shall be empowered to adopt delegated acts, in accordance with Article 56, concerning the establishment of the methods of production, and other criteria relevant for the application of the optional quality term established in paragraph 1 of this Article.

Source: *Official Journal of the European Union*

economic analysis of the food supply chains and agricultural products from mountain areas, as well as an assessment of the current labelling schemes accessible to these products in the EU.

This project was finalised after the Council, the European Parliament and the European Commission reached in the summer of 2012 a political agreement on the ‘Quality Package’ proposed earlier by the European Commission¹.

for drafting and implementing rules, including derogations, for the use of the denomination ‘mountain product’. The products covered are those for which raw materials and feed (for animals) come essentially from mountain areas and that are processed in mountain areas (mountain areas as defined in Article 18.1 of Regulation 1257/1999).

Taking into account the developments which led to the policy provision described in box 1, this report illustrates the extent

1 COM(2010) 733 final of 10 December 2010

to which an optional quality term² for mountain products will benefit stakeholders. It focuses on issues of relevance to enlighten the debate on implementing provisions to be elaborated by the European Commission, with regards to the following major issues: the location of production of feed and raw material, the location of processing stages, the relationship with other existing labelling schemes and intellectual property rights tools, and the best conditions for the new optional quality term to achieve efficiency and effectiveness.

Some key choices have been made concerning the scope of the study, in particular:

- i. concerning the products, the primary focus is on agricultural products, in the sense of Annex I of the Treaty, i.e. agricultural products for human consumption, that are produced and processed in mountain areas. This means first, in line with the policy proposals at this stage, that important mountain food products not covered by Annex I of the Treaty will not be addressed in the study, for example mineral water, confectionary and pastry, elaborated dishes, etc. This also means that non-food agricultural mountain products (e.g. wool, etc.) will not be examined;
- ii. concerning the location of production and processing, the primary focus will be on those stages of the chain covered by the policy provisions: feed, raw material and processing in mountain areas. However, with the nuance that raw materials and feed shall come 'essentially' from mountain areas, efforts will be dedicated to capture the reality of feed and raw materials imported from lowlands to mountain areas. For the purpose of derogations, the relations between processing facilities in the vicinity of

mountain areas and mountain farming will also be discussed.

The following section, section three, describes the mountain agricultural and food products' supply chains. After reflection on the definition of mountain areas, the agricultural output of mountain farming is assessed at the EU level. Key characteristics of the main crop and animal sectors in mountain areas are described. In the case of animal production, the share of feed sourced from non-mountain areas is assessed and subsequent stages of the supply chains (processing, trade and retail) are discussed. In the fourth section, the report builds on the main beneficial impacts (for farmers, processors, citizens and consumers) of being informed of the mountain origin of food products. It is commonly thought that farmers and processors face higher production costs in mountain areas but that agriculture in mountain areas is crucial for sustainable development. The purpose of the third section of this report is to take stock of such elements. Lastly, in section five the current labelling practices are analysed, i.e. private trademarks, quality schemes already in place, and specific existing experiences in MS and third countries on the labelling of mountain products, particularly in view of highlighting the relations between different labelling schemes.

The present report is a synthesis of several detailed reports which will be published at a later stage. It relies in particular on three more detailed case studies concerning mountain milk supply chains in France (Reuillon, Perrot et al. 2012) and Austria (BABF 2012) as well as on mountain olive oil production in the province of Jaén (Spain) (Sanz Cañada, García Brenes et al. 2012).

² An 'optional quality term' is a term defined by EU legislation which can (without obligation) be used by producers in the labelling of agricultural products with characteristics or attributes which add value. Such terms communicate these value adding characteristics or attributes to buyers in a harmonised and non-misleading way within the internal market.

3 Mountain agricultural and food supply chains: a descriptive picture

The present section of the study aims at capturing in details the potential for a possible 'mountain' labelling in terms of concrete farming and food products, as well some elements concerning the spatial distribution of the different stages of the supply chain involved (feed, agricultural production, semi-processing (e.g. slaughtering), processing and trade).

Main sources for this section are (i) the DG AGRI report on mountain farming (EC 2009) and further analysis based on FSS data concerning areas / number of heads; (ii) FADN data to estimate the output (physical and financial) of selected productions; (iii) specific targeted case studies and complementary expert knowledge to validate and/or complement the quantitative estimates derived from FADN data. Further information is available in (Guri, Santini et al. forthcoming)

3.1 Overview of mountain farming

3.1.1 Definition of mountain

Among the various definitions of 'mountain', may be the most obvious is the one used by the EU Law corresponding to 'Less Favoured Areas (LFA) Mountain', as laid down in the CAP (Article 18.1 of Regulation (EC) 1257/1999: LFA Mountain) for the purpose of the financial compensation of natural handicap (see map 1). This is the definition which will be principally considered throughout the present report. Rationale for this choice is that it relies on an established and long-standing use. Furthermore, it is the criterion mentioned in policy proposals related to the labelling of mountain agricultural products.

'Less Favoured Areas (LFA) Mountain' (hereafter 'LFA mountain') corresponds to mountain areas that are characterised by considerable limitations of the possibilities for using the land, and by an appreciable increase in the cost of farming it due to the following reasons: a) existence of, because of altitude, extremely difficult climatic conditions,

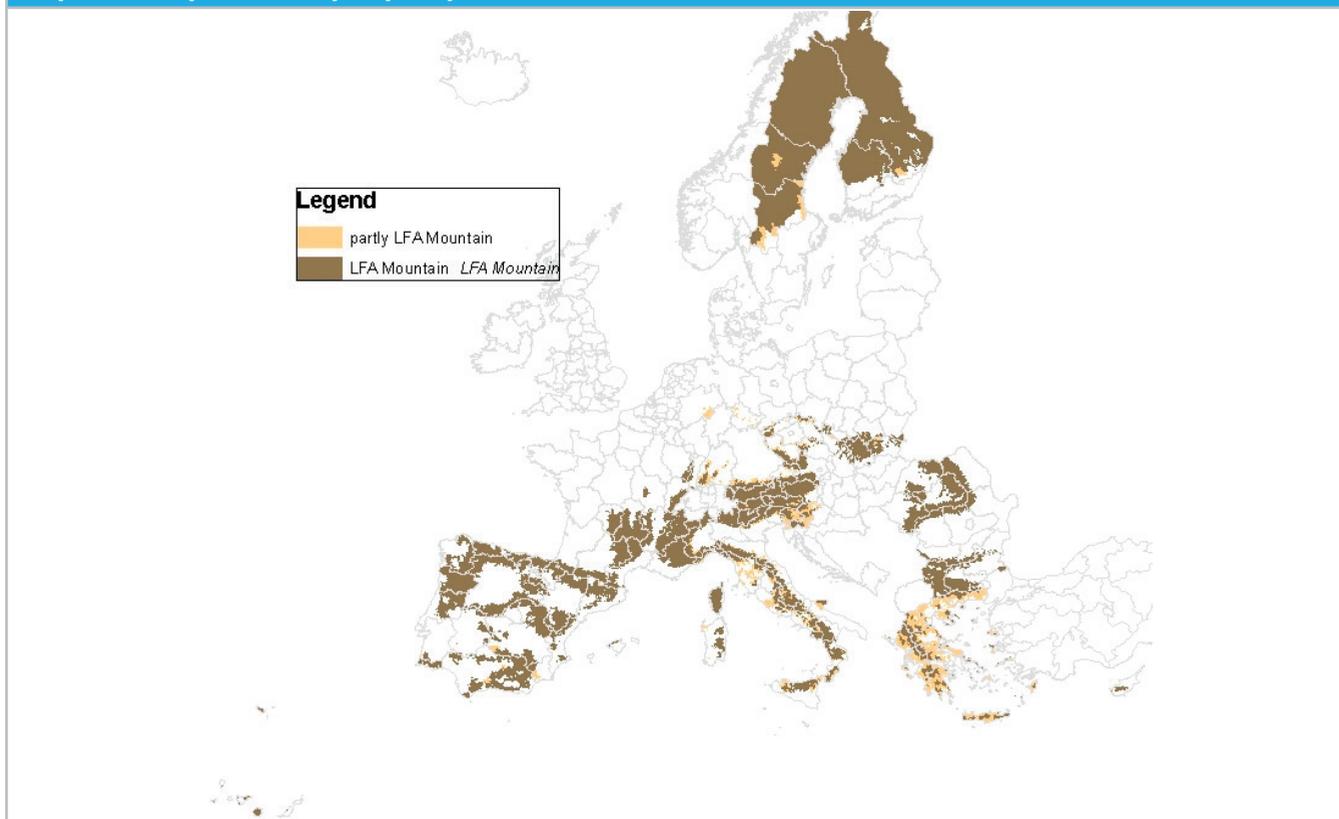
the effect of which results in the shortening of the growing season, b) at a lower altitude, the presence of slopes too steep for the use of machinery, or requiring the use of very expensive special equipment, or c) a combination of the previous two factors, which is more acute than the sum of the handicap resulting from each of the previous *a* and *b* taken separately.

However, Member States have diverged in the implementation of the general principles defining mountain areas at EU level. The threshold applied to minimum altitude in the different MS varies between 500 m and 1000 m (IEEP 2006). Nine MS also use minimum slope as a criterion to classify territories as mountain area, the threshold varying between an average slope of 15 % and 25%. Finally, nearly all MS (except Poland and Finland) use an additional criterion based on a combination of both altitude and slope (e.g. in the case of Austria, land of both 500 m. altitude and 15% slope is classified as LFA mountain. In the same MS, all land above 700 m. altitude or of average slope of more than 20% is also classified as LFA mountain).

As a consequence of single MS choices, several areas that common sense might consider to be mountainous are not included in LFA mountain (e.g. South East Sicily and large areas of Sardinia, Central Germany, etc.). At local level, these choices might entail some difficulties in identifying precisely which municipality is 'fully' and which one is 'partly' LFA mountain (many of them are in Germany, Slovenia, Italy and Greece). This is particularly the case for areas in close vicinity to mountains (valleys, piedmonts, etc.).

In addition, in order to reflect the level of handicap at farm level, several MS (Germany, Spain, Austria, etc.) apply extra farm level criteria for the eligibility of individual farms to the LFA payment, as they consider that not all farms in a LFA mountain area are facing the same degree of handicap. In those MS which are not applying farm-level criteria (e.g. France) there might be over- or under-compensation for the handicap (IEEP 2006).

Map 1: Municipalities fully or partly in LFA mountain areas



Source: DG AGRI - GIS

In addition, several MS such as United Kingdom, Ireland and Belgium have not delimited any mountain area and classified as ‘intermediate’ LFA (Art.19 of Regulation (EC) 1257/1999) most of the areas that in other MS would have been classified as mountain. In Spain, which classified National Parks as ‘areas affected by specific handicaps’ (Art. 20 of Regulation (EC) 1257/1999) (IEEP 2006) several mountain regions are not classified as LFA mountain (Sierra Nevada, Picos de Europa, High Aragon, etc.). Concerning Sweden and Finland, another difficulty comes from the fact that the whole area of latitude above the 62nd parallel is classified as LFA Mountain according to Article 18.2 of Regulation (EC) 1257/1999. For this reason, above the 62nd parallel it is impossible, on the basis of the CAP definition, to distinguish real mountain areas (significant in Sweden, but hardly present in Finland) from other arctic non-mountain areas.

Summing up, the definition of LFA mountain, to which the policy proposal refers, has the advantage to be well-defined according to clear general rules, but in its details there are discrepancies between Member States which may render comparisons difficult and, in the end, could lead MS to adapt their definitions of LFA mountain.

3.1.2 Characteristics of mountain farming

The ‘Peak Performance’ report (New Insights into Mountain Farming in the Europe Union) recapitulates the main aspects of mountain farming and highlights that on 21% of the

total EU-27 area³, ‘mountain LFAs account for 18% of the agricultural holdings, 15% of the utilised agricultural area and 18% of the agricultural labour force’ (EC 2009).

Fourteen Member States include mountain LFA (Art. 18.1) in their territory (Table 1). In terms of total mountain area, the total area classified as mountain LFA (Sweden and Finland excluded for the reasons explained in the previous section) represents 18.5% of the EU territory. The relative importance of mountainous areas at national level varies from clearly dominant (more than 60 % of the total in Slovenia and Austria), important (40 to 50% of total area in Spain, Italy, Slovakia, Greece, Bulgaria and Portugal), significant (20-30 % of the total area in France, Romania, Czech Republic and Cyprus) to marginal (less than 3% of the total area in Germany and Poland).

The share of mountain UAA in the total UAA is lower than the share of mountain in total area in all MS. Everywhere in EU, mountain areas are less used for agricultural purpose and contain more natural areas than the rest of the territory. With 7.4 million hectare Spain is by far the Member State with the largest mountainous agricultural area, followed by Italy (4.3 Mha), France (4.0 Mha) and Romania (2.7 Mha). Half of the UAA of both Austria and Slovenia is located in mountain area.

³ Sweden and Finland are included

Table 1: Share of LFA mountain agriculture in total UAA, labour, number of holding and economic size

Share of LFA mountain in Total	Total Area (km ² %)	Utilised agricultural area (ha)	Labour force directly employed (AWU)	No. of holdings	ESU SGM of the holding	LSU Livestock
Bulgaria	38.1%	7.9%	25.0%	28.8%	16.3%	21.7%
Cyprus	24.7%	n/a	n/a	n/a	n/a	n/a
Czech Republic	20.4%	11.4%	16.1%	6.5%	9.2%	10.7%
Germany	2.4%	1.8%	3.4%	4.0%	1.4%	1.8%
Greece	49.3%	37.6%	38.3%	34.7%	32.5%	46.6%
Spain	40.7%	29.7%	27.8%	29.8%	22.3%	24.3%
France	23.1%	14.5%	15.2%	16.7%	8.2%	14.2%
Italy	47.5%	33.8%	32.0%	30.9%	23.2%	21.1%
Austria	70.5%	54.7%	50.6%	52.5%	33.2%	44.6%
Poland	2.0%	1.7%	3.3%	3.4%	1.2%	1.3%
Portugal	43.0%	28.7%	51.0%	51.5%	30.4%	19.4%
Romania	29.9%	19.7%	18.5%	17.6%	15.1%	19.5%
Slovenia	63.2%	52.9%	55.4%	55.9%	46.5%	45.0%
Slovakia	45.3%	34.3%	34.1%	27.1%	23.8%	31.4%
Total EU-27	18.5%	14.2%	17.0%	17.8%	11.5%	10.2%

Source FSS 2007 (2005 for CZ)

In terms of number of farms and labour force, the share of LFA mountain areas in the total is globally higher than for the UAA (respectively 17.8% and 17.0% of the total) and this is the case in most MS, showing a global trend towards

smaller areas per farm with more employed people in mountain areas.

Mountain farms (2 436 110 farms in total) represent 17.8% of the total number of holdings in the EU 27. The share of mountain farms varies significantly between Member States: in addition to the two very mountainous MS with a high share of total area being mountains (Slovenia and Austria), there is also a high number of mountain holdings in Portugal (over 50% of the total on 29% of the national UAA). Table 2 shows the ratio between the average mountain farm UAA and the average lowland farm UAA in the same MS: if on average, the UAA per farm is 31% lower in mountains than in lowlands, the situation is not uniform throughout the MS

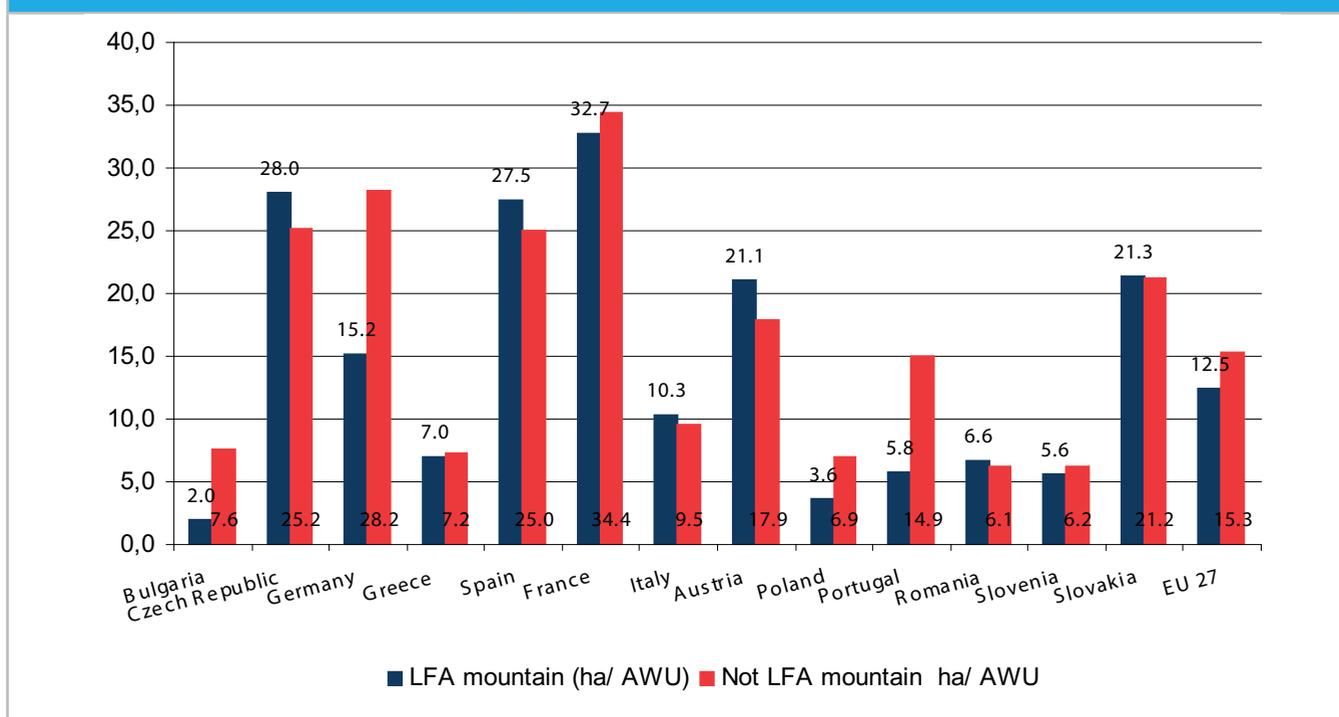
Table 2: Average farm size (LFA mountain vs. other areas)

	Farm Size Mountain (ha)	Farm Size lowland (ha)	Ratio Mountain / Lowlands
Bulgaria	1.7	8.0	4.74
Czech Republic	67.1	93.6	1.40
Germany	21.3	46.7	2.20
Greece	5.1	4.5	0.88
Spain	23.8	23.9	1.01
France	45.2	53.5	1.18
Italy	8.3	7.3	0.88
Austria	20.1	18.4	0.92
Poland	3.3	6.6	2.01
Portugal	7.0	18.6	2.64
Romania	3.9	3.4	0.87
Slovenia	6.1	6.9	1.13
Slovakia	35.5	25.3	0.71

Source: FSS 2007 (2005 for CZ)

For Czech Republic, the average area is 67 ha and for Romania, Poland and Bulgaria less than 4 ha, with intermediary situations (45 ha in France, 20-25 ha in Austria and Spain, 6-8 ha in Slovenia, Italy and Greece) (FSS 2007). In most MS, the average UAA per farm is larger in lowlands, but there are several exceptions (Romania, Slovakia, Austria and Greece). Between 1995 and 2007, the structural adjustment of farms in mountain areas has been faster than in non disadvantaged areas: the average physical size of farms increased by 23% instead of 17% in non disadvantaged areas and the productivity grew by 38% against 26% in non disadvantaged areas (EC 2009).

Agriculture in mountain areas employs 17% of the total agricultural labour force. 40% of the agricultural labour

Figure 1: Agricultural surface (ha) per agricultural labour (AWU) in Mountain Areas LFA vs. other areas


Source: FSS 2007

force in mountain areas is located in Romania and Italy (20% each). More than half of the total labour force is employed in mountain areas in Slovenia, Austria and Portugal; and more than a third in Italy, Greece and Slovakia.

On average in mountain areas, the workforce equivalent to one worker (AWU, Annual Working Unit), is employed on

12.5 ha (23% less than in non-mountain area: 15.3 ha - EU average). In a significant number of countries considered (Bulgaria, Germany, France, Poland, Portugal) each unit of labour force farms a smaller area in mountains than elsewhere (Figure 1). In some countries (Greece, Italy, Spain, Romania, Slovenia, Slovakia), the difference is not important between mountain areas and other areas: such countries are

Table 3: Farm Economic Size per ha and per unit of agricultural labour in mountain LFA vs. other areas

	Economic size/ha (mountain)€	Economic size/ha (non-mountain) €	Ratio M/L	Economic size/AWU mountain (€)	Economic size/AWU mountain (€)	Ratio M/L
Bulgaria	861	380	2.27	1 689	2 896	0.58
Czech Republic	298	589	0.51	8 123	14 969	0.54
Germany	973	1 305	0.75	14 795	36 841	0.40
Greece	1 569	1 963	0.80	11 041	14 232	0.78
Spain	781	1 148	0.68	21 446	28 745	0.75
France	698	1 325	0.53	22 825	45 597	0.50
Italy	1 615	2 731	0.59	16 694	26 018	0.64
Austria	633	1 535	0.41	13 362	27 459	0.49
Poland	449	676	0.66	1 631	4 700	0.35
Portugal	660	609	1.08	3 820	9 093	0.42
Romania	253	350	0.72	1 677	2 150	0.78
Slovenia	958	1 239	0.77	5 345	7 636	0.70
Slovakia	214	357	0.60	4 560	7 553	0.60
EU	866	1 109	0.78	10 756	16 892	0.64

Source : FSS 2007 (2005 for CZ)

characterized by a large surface of LFA mountain. Lastly, few countries are characterised by an opposite situation (Austria and Czech Republic).

Concerning the economic size⁴ of farms, mountain areas represent only 11.5% of the agricultural EU total economic size (14.2% of the UAA and 17.8% of the workforce). The average mountain economic size per hectare is 22% below the one of lowlands, and the average mountain economic size per unit of labour force is 36% below the one of lowlands. The economic size per unit of labour in mountain areas is lower than in lowlands in every individual MS (Table 3).

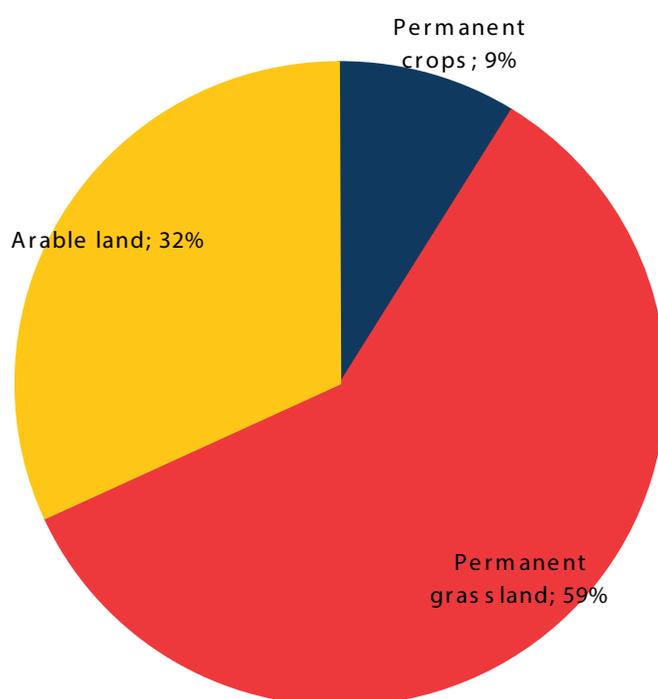
3.1.3 Distribution of areas and number of livestock heads

Concerning the distribution of the utilised agricultural area, the land structure of LFA areas is dominated by permanent grassland (59%), followed by arable land (32%) and permanent crops (9%). 'A dominant share of permanent pastures in mountainous areas is observed at regional level in most Member States with some exceptions. In only four countries, arable crops cover the majority of the UAA in mountainous regions' (Cloye 2010). Grassland is particularly important in Alpine countries, while permanent crops are more present in Mediterranean countries (Figure 2).

Arable land represents 32% of the total UAA in LFA mountain areas. Mountain arable land represents only 6.7% of the total EU-27 arable land. The Alps, Carpathians, Pyrenees and other mountain ranges of the northern and western parts of the Iberian Peninsula as well as those of the British Isles and the Nordic countries have less than 20% arable land (EEA 2010). Nevertheless, there are certain mountain municipalities and massifs in which arable land covers a significant proportion of the area, particularly at lower altitudes around massifs. In Sicily the average proportion of arable land is above 60%; arable land accounts for about half the land in the middle-mountain massifs of the Sudetes and most other parts of the Czech Republic; and many of the massifs surrounding the Mediterranean, as well as the Swiss Mittelland and the middle mountains of Germany, fall within the 21-40% range of arable crops.

Concerning the distribution per type of crop, the ratio crops / forage plants and fallow land is significantly differing between mountain areas (57/43) and other areas (75/25): not only the share of arable land is lower in mountain areas than elsewhere, but mountain arable land is also more dedicated to livestock than in other areas. This is particularly the case in Western MS with temperate climates (France, Austria, Italy, Slovenia) and much less in Eastern (NMS) and Mediterranean (Greece, Spain) Europe. The fact that pulses

Figure 2: UAA utilisation in LFA mountain (EU-27)



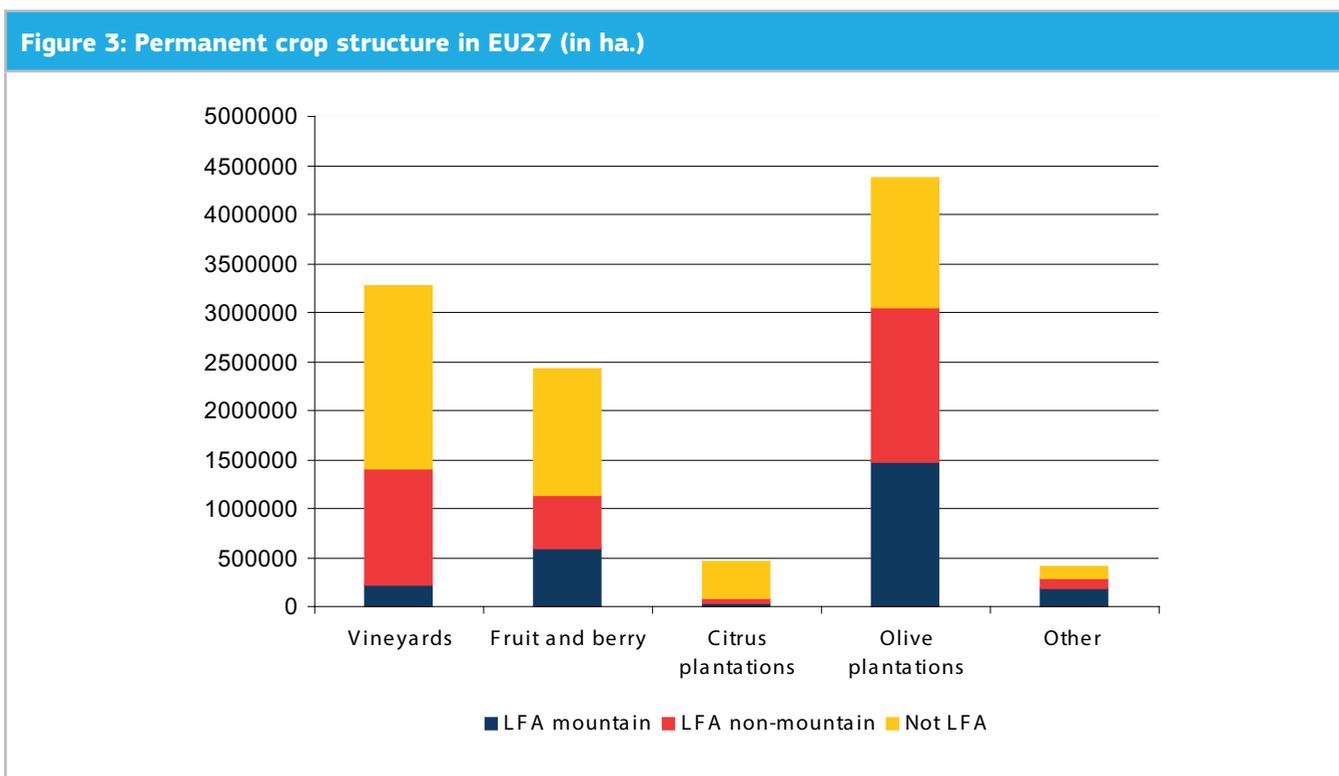
Source : FSS 2007

⁴ Economic size (ESU) is defined as the average potential gross margin (total value of output (included coupled payments) less the cost of variable inputs required to produce that output) of farms calculated on the base of the areas and livestock units declared in the FSS to which a regional (in some MS, LFA status specific) coefficient SGM - standard gross margin- is allocated.

are significantly present in mountain arable lands should also be noted, as well as that industrial crops (biofuels, etc.) are completely absent from mountain areas.

Permanent crops are more represented in mountain areas as compared to lowlands (Figure 3). Olive trees and fruits and berries are the main permanent crops in LFA mountain, reaching 59% and 24% respectively of the total mountain permanent crops area (Figure 3). Vineyards and citrus fruit are grown on marginal shares of mountain LFA areas and the total surface devoted to these crops has dropped between 1995 and 2007 (EC, 2009).

total EU-27 level). This importance of permanent grassland is observed throughout Europe: only in few MS, grassland is not dominant (EC 2009). According to Smit, Metzger et al. (2008), grasslands are important in mountainous areas, e.g. in Austria, Slovenia and Switzerland, more than 50% of the mountain UAA is grasslands, compared to 20-25% of the UAA in lowlands. FSS data shows that the proportion of permanent grassland on the mountain UAA is above



Source: FSS 2007

Six MS (France, Greece, Italy, Portugal, Romania and Spain) account for more than 98% of the European surface in mountain permanent crops (2.515.000 ha). Permanent crops cover significant proportions of the mountains of Andalucia (Spain). Both the Betic Systems massif, which includes these mountains, and Crete have between 21 and 40% of their area under permanent crops; and they are also important at lower altitudes around the Mediterranean, in other parts of Greece and Italy as well as in Portugal (EEA 2010).

Nearly half of the permanent crops in Slovenia, Portugal and Greece are located in mountain areas. Concerning fruit and berries, more than 30% of the areas are located in mountains in most Mediterranean countries (major fruit producers) and 15% in France. More than 30% of the European olive plantations are located in mountain areas (especially in Greece and Spain). Concerning mountain vineyards, these are significant in Portugal, Greece and Italy, while for Citrus fruit, the share of mountains is important only in secondary (Algarve) or marginal (Corsica) producing areas.

Permanent grassland is the main land use in mountain areas (58% of the UAA in mountain areas; only 33% at

70% in all the alpine countries (FR, AT, SI, DE) and lower in Mediterranean countries (ES, IT around 55%, due to mixed Mediterranean – temperate mountain areas; 40% in GR and PO). The highest proportions of grassland on total area are in the Northern British and Irish mountain areas or Morvan in France. Within the mountains of Wales and parts of the Norwegian mountains, the overall proportion is 41-60%; and it is less in the Massif Central (France), the western Carpathians of Romania, and Crete. Grassland is also of more local importance in other parts of Greece, Romania, and the Nordic countries, as well as the Apennines, the Central System and Pyrenees of Spain, the pre-Alps of France, and Sardinia (EEA 2010).

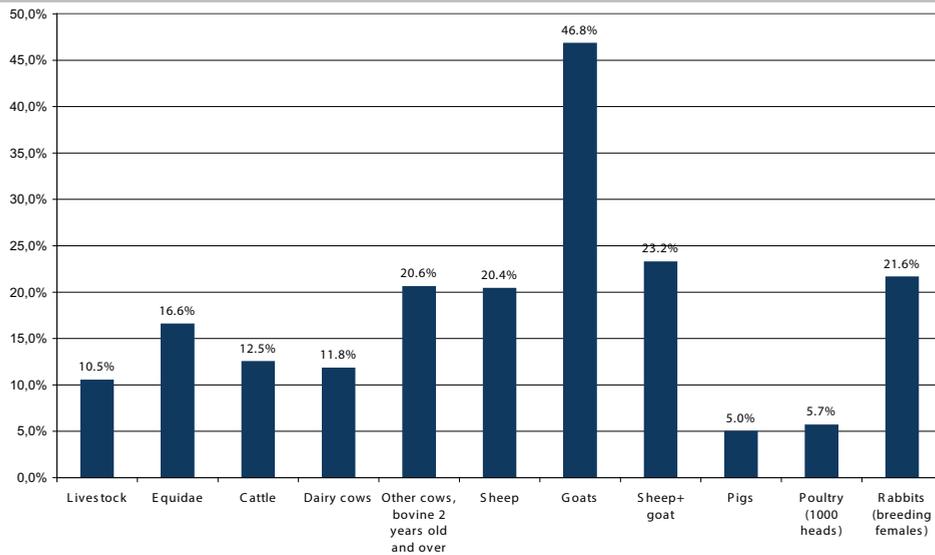
Mountain farming often relies strongly on ruminant livestock using the local forage resources (grazing, hay) (Hopkins 2011). The diverse environmental conditions in European mountains areas have resulted in a wide diversity of vegetal production which increases the possibility of livestock activity. Because of low net primary productivity of mountain pastures, low feed value and the short growing and grazing season (Hopkins 2011), pastures often serve as a link between mountain areas where animals graze in summer,

and lowland areas, from where comes the winter forage (Figure 4).

Concerning livestock, mountain areas represent 10.5% of the heads throughout the EU. Some sectors are better

In terms of total livestock units, bovine livestock represents the majority, with, for cows, a slight predominance of dairy cows. Sheep and pigs are the two main other animal productions in mountain areas. In terms of density of livestock, mountain areas are characterised by a lower level,

Figure 4: Livestock Units (LSU) – Share of LFA mountain on total

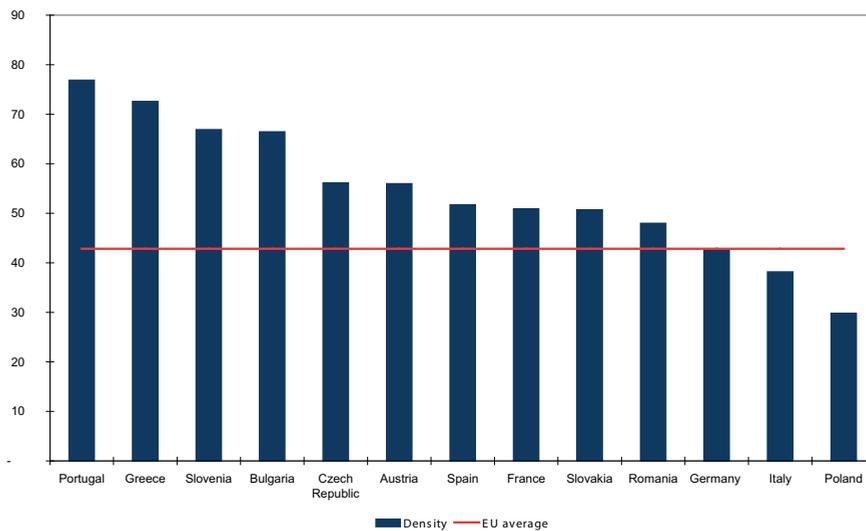


Source: FSS 2007

represented than others in mountain areas: suckler cows, sheep and goats are more concentrated in mountain areas; while dairy cows and cattle are equally present in mountains and lowlands and granivores (pigs and poultry) under-represented in mountain areas.

particularly for grazing livestock and in EU-15 (EC 2009). The livestock density on UAA is 30% lower in mountain areas than in average and 55% lower (Figure 5) in terms of density on grazing surface (= forage crops + permanent grassland) (Cloye 2010) (Figure 5).

Figure 5: Livestock density on grazing surface in mountain areas per MS (100 = national average)



Source: own elaboration from FSS 2007

3.2 Agri-Food products in mountain areas

In accordance with the information of land use and livestock, literature aiming at studying mountain agri-food products, in particular Euromontana (2004b), confirms that the main agri-food mountain productions are:

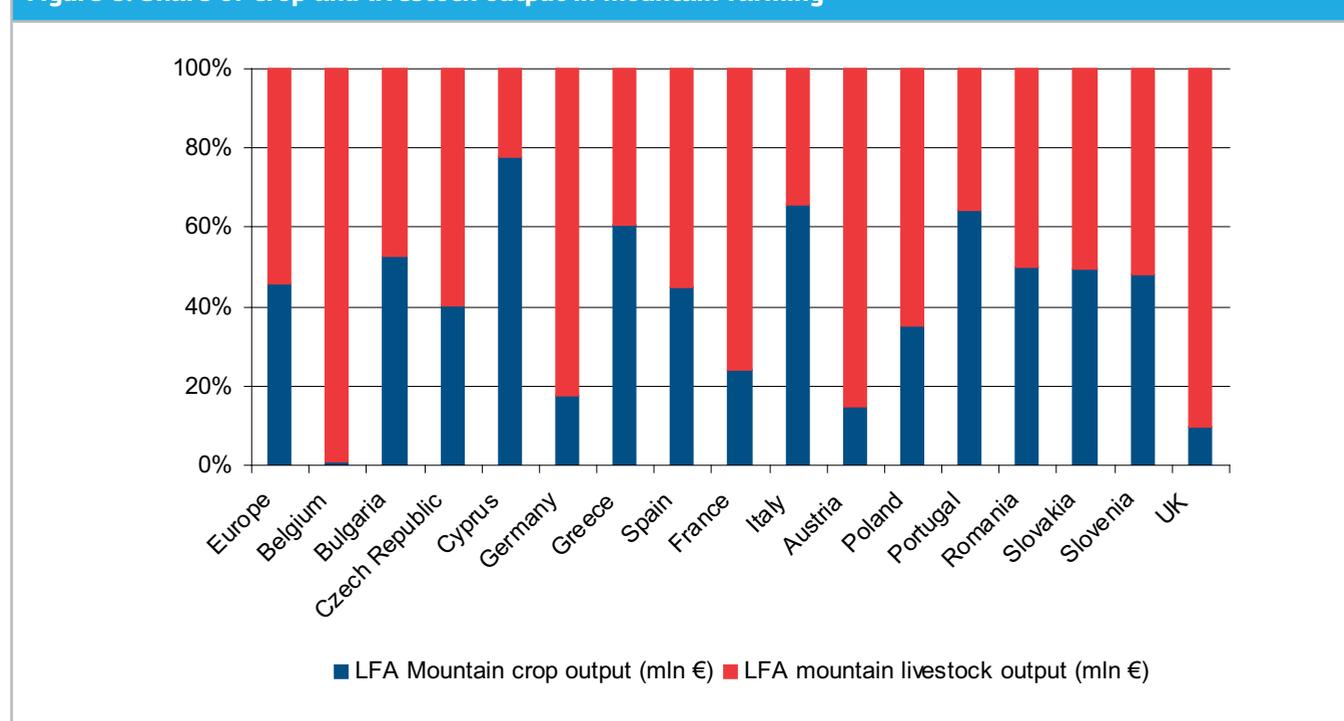
- cheeses and other dairy products representing 30% of the examples of products listed in Euromontana (2004b);
- different meat products are also important (20% of the examples, principally fresh and dried beef meat; fresh lamb meat; dried, cured and processed pig meat (ham, sausages));

3.2.1 Total Agricultural Output in mountain⁵

The European mountains provide for 8% (23.4 bn€) of the total EU agriculture output (293 bn€)⁶ (Guri, Santini et al. forthcoming). The major component of the total output is offered by livestock production (54.2% of the total), the remaining 45.8% by crop production.

The crop productions dominate the total output in South-Eastern MS and the livestock output is more important in the Northern MS. Livestock productions are strongly dominant in Germany, Austria, UK and France's mountains. On the other side of the range, crop productions are dominant in the mountains of Italy, Cyprus (over 70%) as well as in Greece and Portugal (Figure 6).

Figure 6: Share of crop and livestock output in mountain farming



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

- Different products from specialised, mostly permanent, crops represent the third family of products (20% of the examples, olive oils, fresh and processed fruit (apples and other pome fruit, nuts in particular chestnuts, small fruit, cider, etc.), wine and some vegetables (lentils, beans, mushrooms, etc.),

The remaining examples refer to (i) honey, (ii) herbs, spices and ‘teas’, (iii) fish products (mostly trout and salmon), (iv) other processed products such as alcoholic beverages and beers, different food products (soups, pastries and cakes, breads). Very few examples of cereals and oilseeds were found.

The main agri-food products in mountain (in terms of total output) are dairy productions (representing close to 30% of the total), mostly cow milk but with a significant share of ewe and goat milk. Meat products (in fact, turnover generated by

5 Taking into consideration the difference of LFA mountain definition among MS, the calculations of the present section consider an adapted definition of mountain areas as follows: Mountain areas (hereafter mountain) are LFA mountain areas (Article 18.1 of Regulation 1257/1999) for all the MS with the exception of Germany, U.K., Belgium, Finland and Sweden for which the areas considered are those with an altitude of 600m or more. An exception is made for Italy mountain areas all those areas defined as LFA (mountain or intermediate) with an altitude of 300m or more.

6 Average estimated figure for 2007 and 2008 (source FADN dataset 2007, 2008)

the sales of live animals⁷) are the second source of output for mountain farms (22% of the total, mostly bovine animals, but also sheep, goats and pigs). In order of importance, crop sectors like cereals, olive, wine and fruit follow representing respectively between 6 and 9% of the total. Vegetables in general are of less importance for mountain areas. Honey is not represented in this picture although there are evidences of the importance of such production in mountain areas, because many beekeepers are not farmers (and therefore not represented in the FADN sample or the FSS database).

The three main MS in terms of agricultural output in mountain are Italy, France and Spain representing together two thirds of the total mountain agricultural output. Other important producers are Greece, Germany and Austria (each with over 1 bn€ generated by mountain farms, representing together one fifth of the total) and the rest (around 10% of the total) is produced by 10 countries (Romania, Portugal, Poland, Slovenia, Slovakia, Czech Republic, Bulgaria, Cyprus, UK and Belgium).

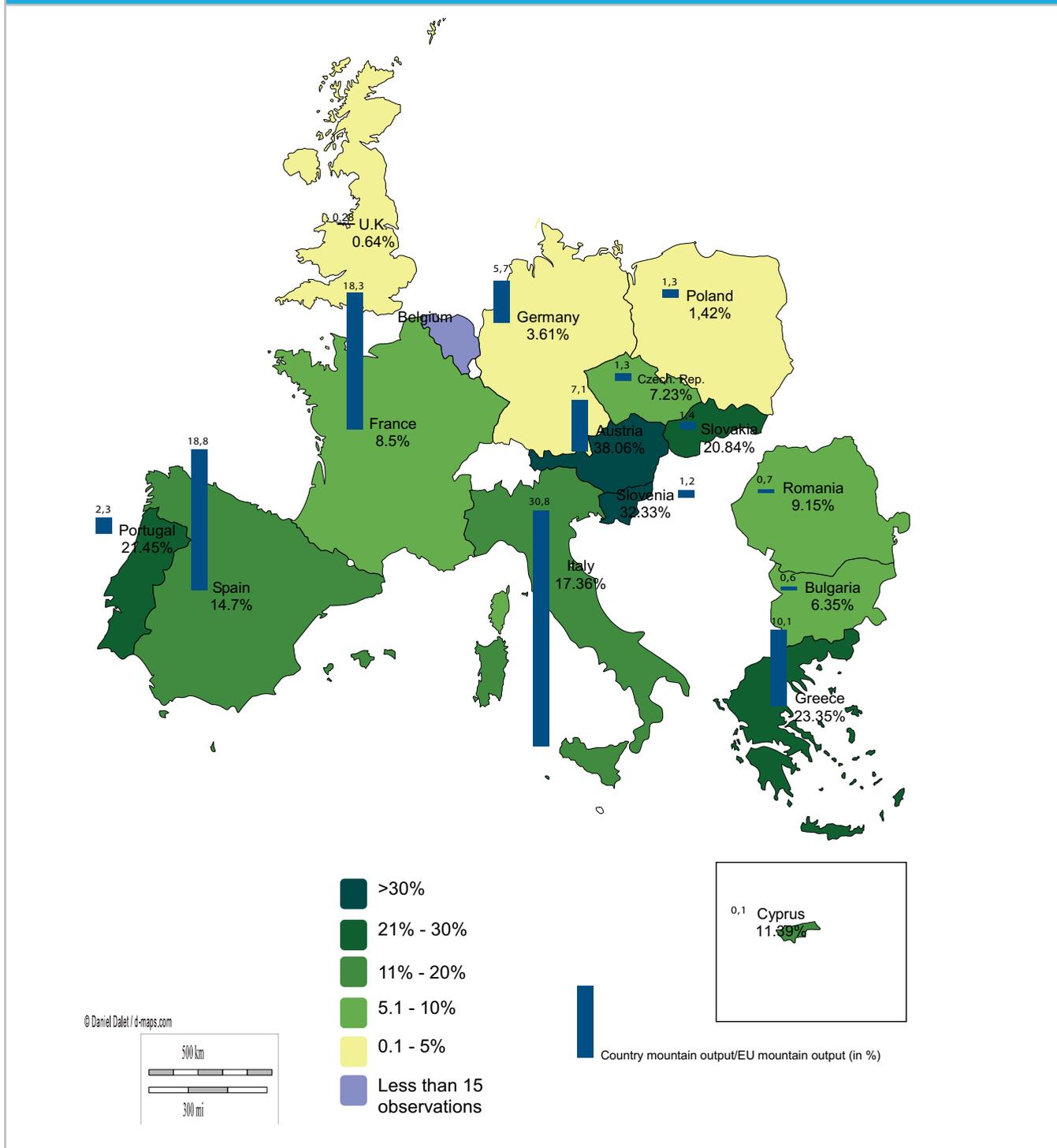
Table 4: Main agricultural activities on mountain areas (in terms of output)

	Activity output (bln €)		Share of each activity in total output (%)	
	Total	Mountain	Total	Mountain
TOTAL	293	23,4	100	100
Dairy products	55,6	6,8	18,8	29,1
<i>Cow milk</i>	51,1	5,3	17,3	22,6
<i>Sheep and goat milk</i>	4,5	1,5	1,5	6,4
Meat-related products	59,7	5,2	20,4	22,2
<i>Bovine animals</i>	21,2	2,7	7,2	11,4
<i>Sheep and Goat</i>	4,5	1,1	1,5	4,5
<i>Pig</i>	26,9	1,1	9,2	4,6
<i>Poultry</i>	7,1	0,3	2,4	1,2
Cereals	51,8	2,1	17,7	8,8
Olive groves	7,6	1,7	2,6	7,1
Vine	20,3	1,6	6,9	6,9
Fruit	13,9	1,6	4,8	6,7
<i>Pome fruit</i>	6,3	0,8	2,2	3,4
<i>Stone Fruit</i>	3,5	0,4	1,2	1,6
<i>Nuts</i>	1,1	0,3	0,4	1,3
<i>Citrus</i>	3	0,1	1	0,4
Vegetables	21,4	0,8	7,3	3,5
Fodder	5,4	0,6	1,8	2,6
Potatoes	7,9	0,4	2,7	1,5
Eggs	4,5	0,2	1,6	1,1
Other	44,9	2,4	15,3	10,3

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

⁷ Meat products are calculated according to the table E and N of the FADN dataset recording the livestock sales and inventory without knowing the final destination of the livestock (slaughter or further breeding in another farm).

Map 2: Share of mountain agriculture output in each MS



Source: own elaboration from EU-FADN (2008) – DG AGRI

More than one third of the Austrian and Slovenian agricultural output is produced in mountain, more than 20% in Slovakia, Portugal and Greece, between 10 and 20% in Italy, Spain and Cyprus (and only 8% in France).

Table 5: Mountain output for crop and livestock activities per MS

	Mountain crop output (M€)	Mountain livestock output (M€)	Mountain Output (M€)	Mountain share in total output (%)	Crop share in mountain output (%)	Livestock share in mountain output (%)
Europe	10 700	12 650	23 350	8.0	45.8	54.2
Belgium	0.08	10	10	0.2	0.8	99.2
Bulgaria	78	70	147	6.4	52.6	47.4
Czech Republic	121	180	300	7.2	40.2	59.8
Cyprus	25	7	32	11.4	77.9	22.1
Germany	235	1 085	1 320	3.6	17.8	82.2
Greece	1 435	926	2 361	23.4	60.8	39.2
Spain	1 965	2 415	4 380	14.3	44.9	55.1
France	1 035	3 230	4 265	8.5	24.3	75.7
Italy	4 745	2 450	7 195	17.4	65.9	34.1
Austria	249	1 420	1 669	38.1	14.9	85.1
Poland	104	191	296	1.4	35.3	64.7
Portugal	349	193	542	21.4	64.4	35.6
Romania	85	84	169	1.8	50.2	49.8
Slovakia	160	164	324	20.8	49.4	50.6
Slovenia	131	142	273	32.3	48.0	52.0
UK	6	59	65	0.3	9.7	90.3

Source: own elaboration from EU-FADN (2008) – DG AGRI

Table 6: Output of mountain products in the MS

Country	Dairy products						Crops						Livestock products ¹							
	Cow milk		Sheep and goat milk		Pome fruit		Nuts		Olive groves		Stone fruits		Vine		Cattle		Sheep and goat meat		Pig meat	
	M€	% ²	M€	%	M€	%	M€	%	M€	%	M€	%	M€	%	M€	%	M€	%	M€	%
Bulgaria	188	7.2	11.3	188	n/a	n/a	n/a	n/a	0.0	0.0	1.4	4.64	n/a	n/a	6.97	12.31	21.9	20.9	n/a	n/a
Czech Republic	1090	12.7	n/a	n/a	n/a	n/a	n/a	0.0	0.0	n/a	n/a	0	0.0	46.3	18.52	1.3	37.0	8.4	2.0	2.0
Cyprus	0.0	0.0	n/a	n/a	2.6	68.0	n/a	n/a	1.3	7.21	4.2	61.91	2.6	25.6	0.0	0.0	n/a	n/a	0.0	0.0
Germany	834.0	8.3	0.0	0.0	n/a	n/a	n/a	n/a	0.0	0.0	0	0.0	n/a	n/a	163	5.88	n/a	n/a	539	0.9
Greece	37.6	18.3	406.0	37.9	69.06	288	238	22.7	428.5	26.70	42.9	10.85	207.5	32.0	70.8	49.86	257.5	41.9	n/a	n/a
Spain	765.5	28.9	341.0	26.4	n/a	n/a	67.0	19.0	479.5	14.55	196.0	17.27	100.0	5.3	577	27.09	241.5	22.6	408.5	16.3
France	1 245.0	14.5	373.0	55.5	98.1	10.9	53.3	33.3	n/a	n/a	43.0	8.64	374.0	4.3	1 030	17.73	223.0	39.3	205.5	8.4
Italy	1 062.0	21.8	270.5	47.5	571.0	34.9	127.0	29.7	694.5	27.84	71.7	7.85	709.5	11.2	535	23.26	227	59.19	127.6	5.5
Austria	847.0	71.2	n/a	n/a	183	14.4	0.0	0.0	0.0	0.0	2.2	17.52	30.7	8.2	322	63.39	11.1	73.24	130.0	17.8
Poland	45.8	1.4	n/a	n/a	10.9	1.7	n/a	n/a	0.0	0.0	n/a	n/a	0.0	0.0	18.5	2.05	0	0	14.6	0.5
Portugal	37.7	7.5	24.8	43.2	14.1	16.6	25.2	78.4	40.1	36.13	7.0	60.03	146.0	47.9	50.2	24.13	28.2	36.94	44.1	23.7
Romania	45.3	3.0	n/a	n/a	n/a	n/a	n/a	n/a	0.0	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Slovakia	1066	33.0	6.5	80.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17.3	32.83	4.7	70.03	3.98	5.5	5.5
Slovenia	688	37.1	n/a	n/a	48	24.1	n/a	n/a	n/a	n/a	n/a	n/a	16.8	19.7	54.9	55.40	4.3	65.23	4.09	10.6
UK³	74.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.9	0.73	16.9	1.74	n/a	n/a	n/a
Europe	5 270.0	10.4	1 445.0	32.0	794.5	12.6	297.0	27.0	1 650	21.8	374.0	10.7	1 605.0	7.9	2 865	13.05	1 035	23.4	1085.0	4.0

1 Calculated according to the table E "Detailed animals inventory" of the FADN dataset.

2 Share of mountain product (%)

3 The UK figures shows only 2007 results, because the FADN sample do not have any observation of farms located higher than 600 m. for 2008.

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Globally, mountain farming generates significant agricultural value added. The total output (23 bn€) is mainly composed of animal production (ruminants) for half and permanent crops for an additional third. The two following sections deal with the main sectors at stake and their principal characteristics.

3.2.2 Livestock products

Animal products represent more than half of the mountain farming output. Bovine animals (dairy and meat) represent the largest share, but sheep is also an important sector throughout Europe.

i. Dairy sector

COW MILK

10.5% of total dairy livestock units (cows) are located in mountain, producing about 9.5% of the European milk and providing about 10.0% of its related turnover. The lower animal productivity (tons of milk per LSU) in mountain (9.4% lower than the EU average) results in a lower output per LSU (1.7% lower) in mountain farms compared to the European average. This gap in output is not fully compensated by higher milk price⁸ in mountain (+8.5% versus the EU average). Therefore, both the share of volume and value of production

in mountain areas is less than the share of animals (LSU dairy cows) present in mountain areas (Table 7 and Figure 7).

France, Italy, Spain, Germany and Austria together produce more than 85% of the total mountain cow milk.

At MS level, the share of mountain milk production is the highest in Austria, Slovenia and Slovakia, with respectively 71%, 39% and 33% of their national production. In Spain and Italy, the cow milk production is also significant in mountain areas (respectively 27% and 21% of their total production), while, in France, Greece and Czech Republic, the share is lower, respectively 14%, 18%, and 12% (Table 8).

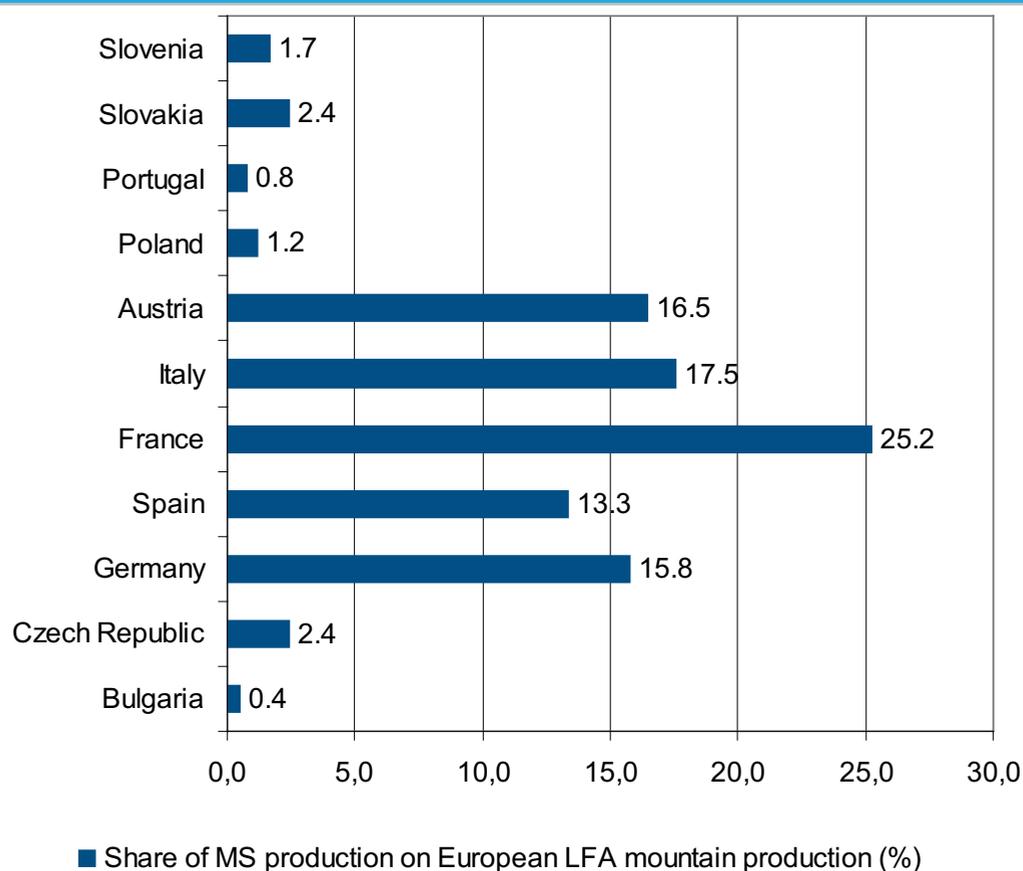
These results are in line with previous studies related to cow milk production in mountain areas. According to Griffoul (2009) mountain milk represents less than 5% of the national production in Germany, 15% in France, 33% in Spain, 75% in Austria and Finland. Following Perrot, Derville et al. (2009), in 2005 six Members States (France, Italy, Austria, Finland, Spain and Germany) concentrate more than 90% of the mountain milk production, which at EU level amounts to 11% of the total cow milk production. In both cases, the authors include the arctic zones (Sweden and Finland) into their definition of mountain areas.

Table 7: Cow milk production in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
LSU (000)	23 750.0	2 492.9	10.5	21 257.1
Farm number (000)	1 391	132	9.5	1 259
Average LSU/farm	17.08	18.97	9.5	16.9
Turnover (M€)	51 100	5270	10.3	45 830
Production (KT)	152 000	14 450	9.5	137 550
Yield ton/LSU	6.4	5.8	90.6	6.5
Output/LSU(€)	2 151.6	2 114.0	98.3	2 156.0
Output/kg (€)	0.336	0.365	108.48	0.33

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

⁸ The indicator Output/ kg (€) is estimated by the division of total output by total production.

Figure 7: Cow milk production in mountain areas (% of total EU mountain production)


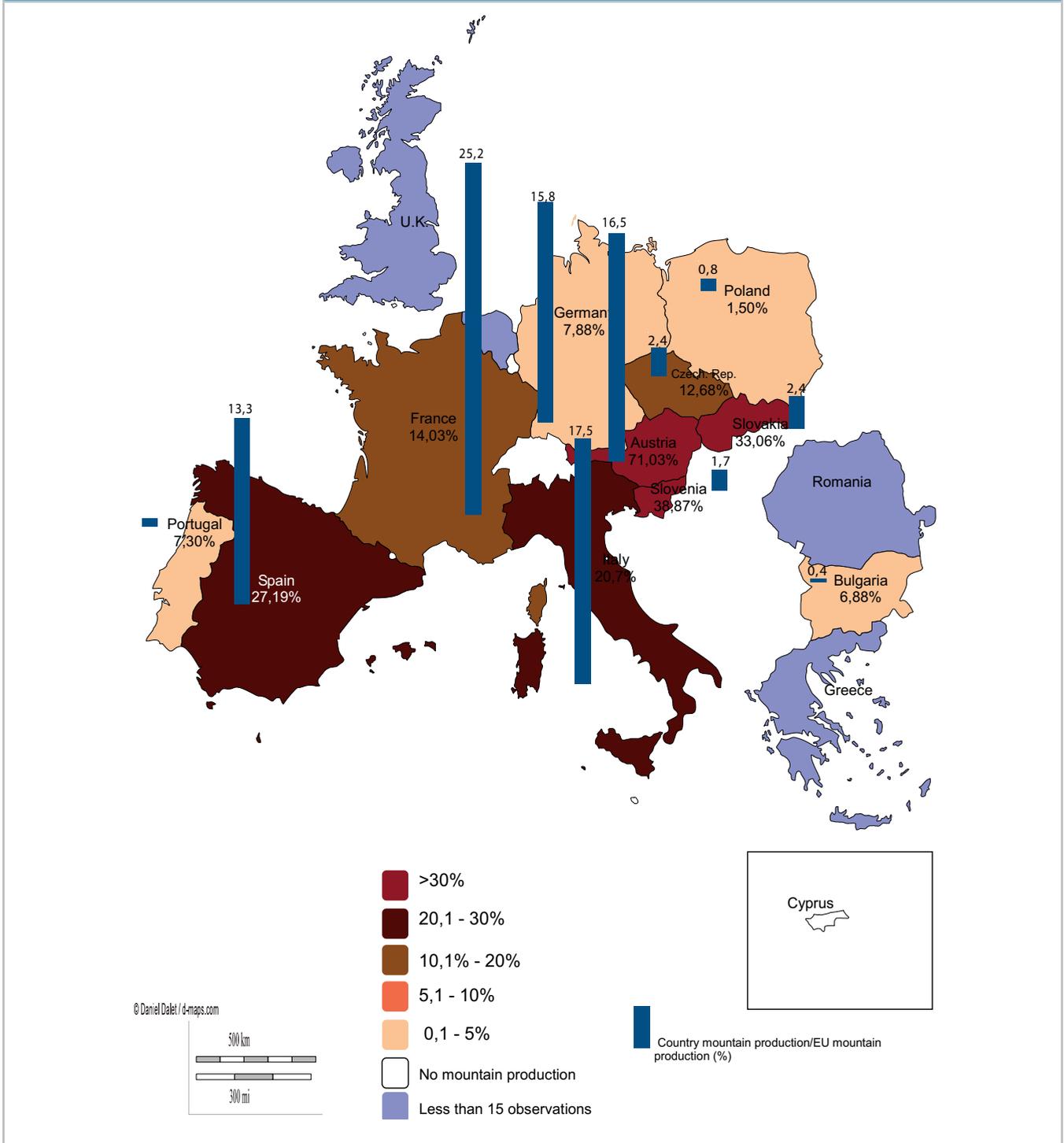
Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Table 8: Total and mountain cow milk production by MS

Country	Obs.	Milk production (kT)	Mountain milk production (kT)	MS mountain production/ MS production (%)	MS mountain production/ EU mountain production (%)
Belgium	3	n/a	n/a	n/a	n/a
Bulgaria	28	943.5	64.9	6.9	0.4
Czech Republic	83	2 729.9	346.0	12.7	2.4
Germany	203	29 200.0	2 278.3	7.8	15.8
Greece	14	n/a	n/a	n/a	n/a
Spain	497	7 093.7	1 928.7	27.2	13.3
France	397	26 000.0	3 648.2	14.0	25.2
Italy	1 009	12 250.0	2 535.2	20.7	17.5
Austria	765	3 351.0	2 380.1	71.0	16.5
Poland	92	11 500.0	172.8	1.5	1.2
Portugal	67	1 533.0	112.0	7.3	0.8
Romania	9	n/a	n/a	n/a	n/a
Slovakia	93	1 065.1	352.1	33.1	2.4
Slovenia	121	626.9	243.7	38.9	1.7
UK	8	n/a	n/a	n/a	n/a
Europe	3378	152 000.0	14 450.0	9.5	100.0

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Map 3: Cow milk production in mountain areas in the EU



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Behind the general picture on milk production, there are variations in the organisation of mountain dairy supply chains. ANDI, GEM et al. (2010) compare milk production areas in six mountain zones in Europe (Auvergne, Franche Comté, Tyrol in Austria, Jura in Switzerland, Bavaria, Emilia Romagna) and one plain region in Denmark. Tyrol and Bavaria are characterized by a significant pluri-activity, an important use of family labour and the use of alpine pastures. In Emilia-Romagna, systems are more intensive and are characterized by a higher use of

animal feed concentrates. The main way to add value to milk in these areas is cheese production, followed by milk itself. The use of quality labels is variable, there is a high usage of PDO in Emilia-Romagna and in Franche-Comté, organic production is important in Denmark, the Swiss Jura and in Tyrol (volumes of PDO cheese are also high in this region), and Bavaria has developed regional quality approaches. In the Massif Central, only a small share of the production is marketed as differentiated products (Table 9).

Table 9 Weight of PDO / PGI and organic agriculture in the different dairy regions

	Tyrol (Austria)	Jura (Switzerland)	Bavaria (Germany)	Franche- Comté (France)	Emilia Romagna (Italy)	Massif Central (France)	Denmark
Volume of milk from the area (MT)	350	91	7 041	1 081	2 098	2 167	4 510
Proportion PDO / PGI	19%	Undetermined	0.6% (estimate)	40% (estimate)	60% (estimate)	15%	4%
Proportion organic	13%	5%	4 to 10%	3% (estimate)	2%	0.5%	9%

Source: adapted from ANDI – GEM – IE, 2010

Specific case studies carried out in France and Austria illustrate these differences.

In France, mountain dairy farms are larger in size compared to other MS: 22% of the EU mountain milk is produced by 15% of the mountain dairy farms (Reuillon, Perrot et al. 2012). With larger land availability, a policy to keep quotas in mountain areas and the influence of several PDO specifications, the French mountain dairy herd is principally fed thanks to pastures and permanent grassland (grazing, hay). In 2009/10, 18 000 of mountain farmers were holding 3.5 bn litres of quotas (15% of total volume and 22% of producers) (Table 10).

In terms of processing facilities, 40% of the 869 French dairy premises are located in mountain areas and, because of a smaller average size; they produced in 2006 only 11% of the French dairy products volumes.

There are significant differences between massifs in France reflecting different histories and models of development (Ricard 1994; Derville 2012):

- Jura dairy farms are larger (in average 257.000 l of quota and 96 ha), very specialized (84% of farms are dairy specialist), not involved in diversification and highly involved in PDO (87% of farms in Comté or Mont-d'Or supply chains). Processing facilities are usually small and there is a good valorisation of milk for producers;

- In Northern Alps, dairy farms are within the French average (192.000 l), also involved in PDO (59%) and looking for diversification (23% on-farm processing). 29% of farmers use collective pastures (alps);

- The Massif Central is characterised by a high number of holdings (40% of total), smaller and less modernised (25% of them have less than 100.000 l of quota). In the Western part of Massif Central, PDOs (Cantal, Saint-Nectaire, etc.) are important (62% of farmers involved), but not in the Eastern part of the Massif (8% only). There is not much non-agricultural diversification (some on-farm processing in the Western part, 10%), but agricultural diversification towards meat-oriented cattle is important (half of farms in the Western part).

In Austria (BABF 2012), 76% of dairy farms are located in mountain areas, representing 69% of the dairy cows (an Austrian dairy farm counts 11 cows on average; 16 in lowlands). It has to be noted that 7% of dairy farms are located in mountain areas but not considered individually as mountain farms. 73% of quota holders are mountain farmers. Similarly as in France, the abolition of quotas might significantly impact the distribution of milk production in mountain areas. Deliveries of mountain milk to dairies are over 2 million tons and represent 68% of total milk deliveries. In addition, a small share of mountain milk (and dairy products thereof) is sold directly (farm and alpine pastures).

Table 10: Importance of mountain in the French milk production

Year	Quota (l)		Mountain	
	Total	Mountain	% producers	% quota
2006	23 309 217 751	3 413 075 537	21.1	14.6
2009	24 046 471 594	3 539 878 648	22.0	14.7

Source Reuillon, Perrot et al. (2012) from France Agrimer, treatment Derville (Derville 2012)

Table 11: Structure of milk supply in Austria (2011)

	Number of suppliers	%	Milk (MT)	%
Mountain areas	28 914	76	2.01	68
Non-mountain areas	8 976	24	0.94	32
Total	37 890	100	2.95	100

Source AMA (BABF 2012)

Alpine pastures are characteristics of Austria: in summer 2010, 54 000 cows were kept in alpine pastures (25% of alpine pastures are dedicated to dairy) producing 68 000 t of milk – 3.3% of total milk deliveries – of which 12 000 t were processed on-site (alp cheese). This is particularly the case in Western Austria (Tirol, Vorarlberg), where alpine pastures products offer additional income (high quality and synergy with tourism and restaurants) (Table 11).

EWE AND GOAT MILK

This sector is very important to European mountain areas. Sheep and goat production, being frequently the only possible activity in less favoured areas, are often fundamental to maintaining social activities and to keep the vegetation out of danger from fire (Rancourt, Fois et al. 2006). However in Spain and Greece, there are also intensive sheep and goat livestock. The total production of sheep and goat milk in mountains is less important than the one of cow milk: however, it represents nearly one third (28%) of the total mountain cow milk farm output (Table 12).

Table 12: Sheep and goat milk production in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
LSU (000)	7 587.0	1 875.0	24.7	5 712.0
Farm number (000)	627	137	21.9	490
Average LSU/farm	12.10	13.64	112.8	11.7
Turnover (M€)	4 510	1 445	32.0	3 065
Production (KT)	6 238	1 824	29.2	4 414
Yield ton/LSU	0.8	1.0	118.3	0.8
Output/LSU(€)	594.4	770.7	129.6	536.6
Output/ kg (€)	0.72	0.79	109.58	0.69

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

This production is concentrated in Southern Europe: Spain, France, Italy and Greece together produce more than 92% of total mountain ewe and goat milk production. The share of mountains in the total EU production is important: about 30% of ewe and goat milk is produced in mountain farms. In countries like Italy Greece and France the ratio is even

higher between 39 and 50% (Table 13) The rare literature trying to capture the extent of mountain sheep and goat milk production confirms somehow this importance: in Sardinia (Rancourt, Fois et al. 2006), 85% of the ewes are located in farms in mountain and hills farms.

Table 13: Total and mountain ewe and goat milk production by MS

Country	observations	Goat and sheep milk production (MT)	Mountain goat and sheep milk production (MT)	Country mountain production/ country production (%)	Country mountain production/ EU mountain production (%)
Bulgaria	24	149.0	22.6	15.14	1.24
Czech Republic	12	n/a	n/a	n/a	n/a
Cyprus	3	n/a	n/a	n/a	n/a
Greece	627	1 309.1	514.9	39.33	28.23
Spain	313	1 791.4	461.9	25.79	25.32
France	245	854.3	431.8	50.54	23.67
Italy	672	739.7	337.0	45.56	18.48
Austria	14	n/a	n/a	n/a	n/a
Poland	13	n/a	n/a	n/a	n/a
Portugal	131	65.7	29.7	45.13	1.63
Romania	2	n/a	n/a	n/a	n/a
Slovakia	101	12.4	10.0	80.99	0.55
Slovenia	3	n/a	n/a	n/a	n/a
Europe	2 157	6 238.2	1 824.1	29.24	100.00

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

ii. Meat livestock and meat products

BEEF

About 15.5% of the farms involved in the cattle (beef) sector are located in mountain areas. They generate a turnover representing 12.6% of the turnover generated by net sales of cattle in the EU. Farms in mountain areas have a cattle turnover per holding lower than the European average. Various factors might explain this situation such as the weight, age and destination of the animals traded in the respective areas (younger in mountain areas), the smaller number of animals per holding in mountain areas and differences in price levels (in this case, at the advantage of mountain areas) (Table 14).

'Production' of beef intended for meat is concentrated in four Member States (France, Italy, Spain and Austria). These countries hold approximately 85% of the monetary output of mountain farms in this sector (Map 4). The share of beef national 'production' is important in Slovenia and Austria (50% of the total or more) and is more limited (15-35%) in the three main other producing MS (France, Italy, Spain).

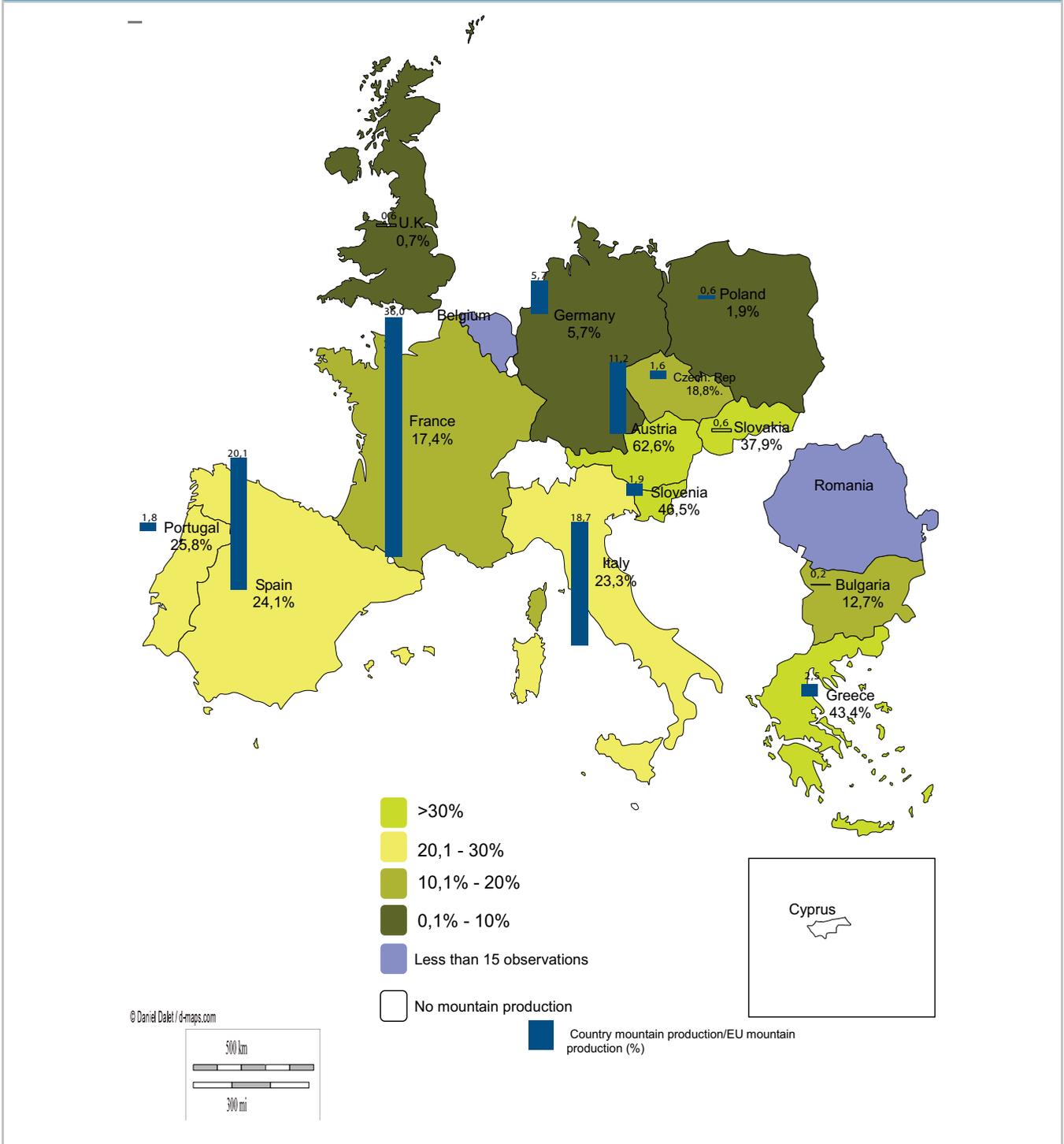
An estimation of 'price' (€/ton) for mountain beef may be calculated. It is higher for animals bred in the mountain areas than for those in other areas (by 8.4%). Mountain cattle seem to be more valued for young animals (except calves for fattening), either intended for meat or for dairy, and less for older animals (heifers, cull dairy cows).

Table 14: Cattle (beef) net sales in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
LSU number (000) ⁴	17 996	2 088	11.6	15 908
Turnover (M€)	21 158	2 661	12.6	18 497
Production (000 tons)	8 098.0	939.6	11.6	7 158.4
Output/LSU(€)	1 175.7	1 274.2	108.4	1 162.8
Output/kg (€)	2.6	2.8	108.4	2.6

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Map 4: Cattle trade value in mountain areas in the EU



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

One key element of mountain beef supply chain is that a large number of animals is not sold by mountain farmers for being slaughtered, but are rather sold to lowlands farmers in order to be 'finished'. ISARA (2012) estimates that 70% of the cows and calves bred in Massif Central are exported to Italy (annually, 1 million heads, of which 70% males and 30% females) for fattening. Micol, Picard et al. (2002) wrote a precise analysis about the localisation of the different production steps in the meat supply chain, especially on

the final fattening of cattle. They explain that mountain conditions are not adapted to the 'finishing' of meat livestock, among others because of the absence of cereals. In general, there is no maize for silage and the short grazing season limits the options for grass feeding. Therefore, animals need to be finished in lowlands. Suckling herds are on the contrary less demanding in terms of feed. Less demanding animals (females, steers; dairy breeds) can more easily be finished in mountain. In Auvergne for instance, in 2002, the Regional

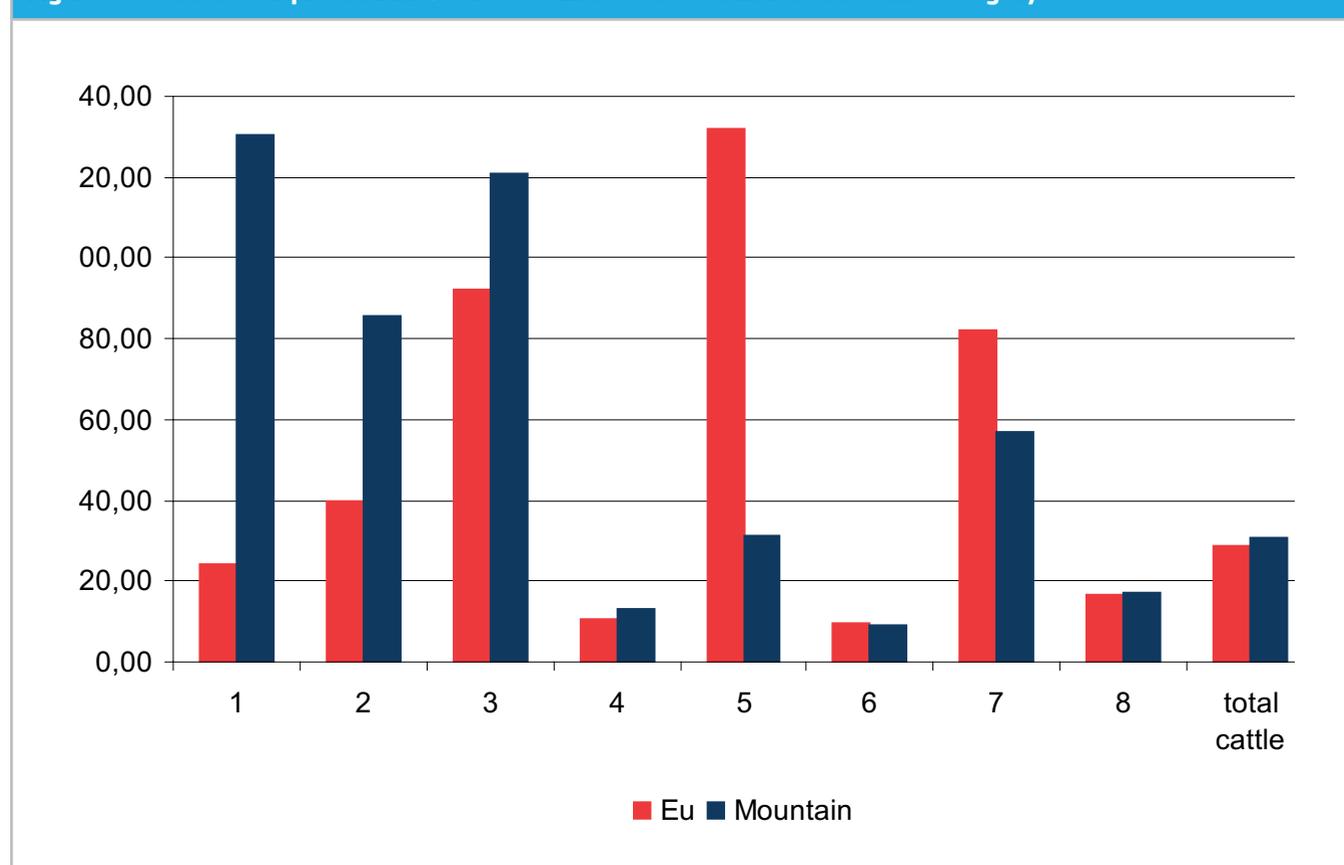
Directorate of Food, Agriculture and Forest estimated that up to 60% of finished cull cows and only 23% of finished heifers come from mountain zones (Micol, Picard et al. 2002). In 2011, within the Massif Central, only 41% of the bovine animals sold were finished and 59% were sold for further fattening out of the area. The proportion is the opposite for France as a whole (66% finished) (Bouleau, Sanne et al. 2012).

Such trend can partly be captured by comparing the level of net sales of bovine animals per group of age and sex (Figure 8). The net sales for the first three groups in Figure 8 (all calves and males less than 2 years old) are much higher in mountain area that at global EU level. It is interesting

to underline that the highest level of relative net sales in mountain areas is recorded for male animals between 1 and 2 years old (net sales equal to 120% of the average LSU number of heads on the farm⁹). In lowlands, the group of male animals over 2 years old is on the contrary the most sold (nearly 140% of the average LSU number). This confirms that a large share of the mountain born animals is finished in lowlands.

In the case of Italy, the situation is extreme, as lowlands farms are selling four times (298%) more bovine male animals over 2 years old than the average composition of their herd while this ratio is only 26% in Italian mountain areas.

Figure 8: Net sales expressed in % of total LSU on the farm for the same category



cattle categories are: 1) calves for fattening; 2) other cattle <1 year; 3) male cattle 1-<2 years; 4) female cattle 1->2 years; 5) male cattle >=2 years; 6)breeding heifers; 7)heifers for fattening;8) dairy cows.

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

⁹ The average number of LSU is calculated (according to the Table D of the FADN dataset) taking in to account the real period in which the animal stays on farm: a bovine sold at 18 months and therefore having stayed only six months on the farm as a bovine between 1 and 2 years will count as half LSU

SHEEP AND LAMB

Mountains represent a higher share (21.5%) of the total 'output' for sheep and lamb than for bovine animals (Table 15). The total turnover related to sheep meat is about one third of the turnover generated by bovine meat animals in mountain areas. For goats, the total economic size of the sector is limited (10% of the sheep sector), with an even higher share in the mountain areas (over 40% of the production).

Four countries (Greece, Italy, France, and Spain) concentrate about 92% of the total value of mountain sheep production in Europe reflecting the fact that sheep meat is a characteristic production of Southern Europe (Mediterranean and Pyrenean) mountain areas.

For sheep, the localisation of animals for meat production is also an issue: traditionally, young animals are exported

(e.g. from UK and Ireland) to be finished in southern countries (Spain, Greece). It is however impossible to extract information from the FADN databases which would reflect this issue, of lesser importance than for bovine animals. O'Rourke and Kramm (2009) describes the past practices for lamb in the Iveragh peninsula¹⁰, where traditionally lambs were following their mothers up the hills for summer grazing and were sold in autumn to lowlands producers for fattening.

PIG MEAT

Mountains represent a smaller share of pigs and poultry EU production than for ruminants (4% of total output for each sector) (Table 16). However, pigmeat products play an important role in mountain food supply chains and represents as much as sheep meat in terms of value of production (4,7% of total mountain turnover).

Table 15: Sheep (lamb) net sales in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
LSU (000)	7 240	1 576	21.8	5 664
Turnover (M€)	4 000	858	21.5	3 141
Production (kT)	3 258.2	709.4	21.8	2 548.8
Output/LSU(€)	552.4	544.4	98.5	554.6
Output/kg	1.2	1.2	98.5	1.2

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Table 16: Pigs net sales in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
LSU (000)	49 316	2 011	4.1	47 305
Turnover (M€)	26 852	1 074	4	25 778
Production (000 tons)	22 222.7	905.2	4.1	21 317.5
Output/LSU(€)	544.4	533.8	98	544.9
Output/kg (€)	1.2	1.2	98.2	1.2

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

10 Iveragh peninsula is in the westernmost part of Ireland

The mountain pig production is concentrated in four MS: Spain represents 40% of the total output; France, Austria and Italy together represent another 40%. However, the highest mountain share of pig production is in Portugal (24% of the national production). The production is quite important also in Spain and Austria (around 15% of the total national production) and less in France (8%) and Italy (5%).

Some further analysis has been dedicated to mountain pork in France (Tables 17 and 18). 20% of the French farms involved in the pig sector are located in mountain areas: they however own less than 5% of the total number of pigs in France. In addition, the total number of heads decreases faster in mountain areas than in the rest of France. The decrease is more drastic for sows (-25% between 2000 and 2007) than for fattening pigs (-9%) (ISARA 2012).

Other estimates of mountain pork production are produced by the regional interbranches involved and allow assessing the regional shares within three main areas: Massif Central, Pyrenees and Jura.

iii. Honey

For honey, the FADN database and the FSS do not provide sufficient information to evaluate the proportion of mountain production in the total EU. Beyond the issue of transhumance already mentioned (and developed in section 3.3.1. below), some expert information has been gathered concerning mountain honey. For example, the Austrian mountain honey is estimated to up to 20% of the total Austrian production and the French one to 4% (in 1999) (ISARA 2012). The Rhone-Alpes beekeepers in France (ADARA 2011) have registered a production of 'mountain honey' of 7 to 14% of the total production (average over 2008-2011: 11%), with in 2011 a yield of 10.9 kg of honey per hive (average yield : 33.5 kg per hive in the region).

In terms of price for 'mountain honey', the average price is higher for mountain honey than for typical lowlands honeys (e.g. rapeseed, sunflower honey: +20-30%) and also higher than some more specialised products (+3-7% compared to chestnut or acacia honey or all flowers honey) (ADARA 2011). However, very specific honey (fir honey or lavender honey) are sold at prices 40% higher than mountain honey.

Table 17: Distribution of pigs in less favoured areas (000 heads)

	1988	2000	2003	2005	2007	% 07/00
<i>Mountain</i>	803	731	753	705	657	-10
<i>Piedmont</i>	300	263	239	259	249	-6
<i>Other LFA</i>	1 050	1 042	1 058	1 102	1 119	+7
<i>Total LFA</i>	2 153	2 036	2 050	2 066	2 025	-1
<i>Total France</i>	12 213	14 869	15 096	14 690	14 178	-5

Source : (ISARA 2012)

Table 18: Potential production of mountain pig, estimated by regional interbranch organizations (2008)

Regions	Heads of pigs (000)	%
<i>Midi Pyrénées</i>	250	35
<i>Auvergne Limousin</i>	180	25
<i>Rhône Alpes</i>	65	9
<i>Aquitaine</i>	40	6
<i>Franche Comté</i>	150	21
<i>PACA</i>	30	4
<i>Total</i>	715	100

Source: (ISARA 2012)

3.2.1 Crop products

The main groups of crops relevant for mountain farming are three types of permanent crops: i) fruits and berries, ii) olive groves, and iii) vines. Other crops are either not principally intended for human consumption (cereals, forage crops) or of less importance for mountain farming (vegetables, pulses).

i. Fruit and Berries

Farms in mountain areas represent 19.2% of the total area planted with fruit and berry orchards in Europe, and provide about 11.5% of the total production. Mountain areas also provide about 14.5% of the total European turnover in fruit and berries; however the level of output per hectare in mountain areas is lower than average (-25%), due to lower yields (about 40% lower than the European average), not fully compensated by higher price (+26%).

This sector covers different products: pome fruit, stone fruit, nuts, citrus fruit, berries, tropical fruits, etc. Only the three first subsectors are subject to further analysis below.

POME FRUIT (apples, pears and quinces)

10.3% of the EU production of pome fruit is located in mountain (Table 19). Italy is the leading European mountain

producer for this type of fruit which in mountain areas benefit from a comparative qualitative advantage due to climatic reasons: the high day/night temperature range leads to more coloured fruits (well-valued in particular for apples) and taste. The inconvenient is the shorter production season and therefore smaller overall volumes and/or size of individual fruit.

The mountain pome fruit sector covers 6.8% of the total European pome fruit area, and assures 12.6% of the sector turnover.

Mountain pome fruit production is concentrated in three countries: Italy, Greece and France, which together produce about 90% of them (Italy alone: 72%). In these countries, apples and pears production in mountain area represents different levels of the national production: 35% of Italian apples and pears are produced in mountain areas, 30% in Greece, 70% of Cyprus while in France only 11% (Map 5).

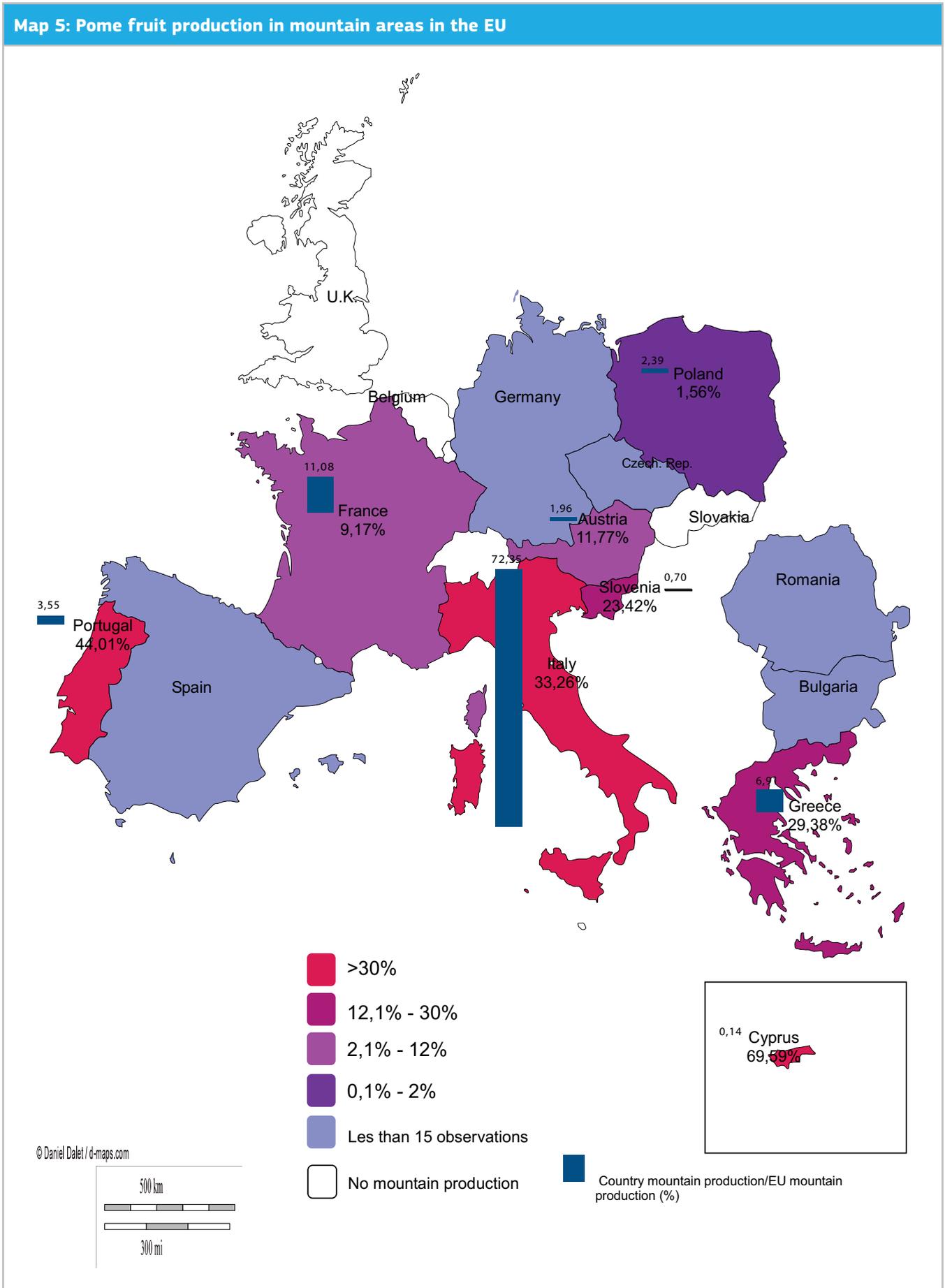
The particular situation of Northern Italy is impacting the sector (Figures 9 and 10). Production in the mountain provinces of Bolzano, Trento and Valle d'Aosta is very intensive and efficient. These provinces produce more than 60% of the total mountain EU production and being particularly productive, their impact on the EU total mountain pome fruit sector is crucial.

Table 19: Pome fruit production in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
UAA (000 ha)	796.9	54.3	6.8	742.6
Farm number (000)	281.8	36.1	12.8	245.6
Average UAA (Ha/farm)	2.8	1.5	53.3	3.0
Turnover (mln Euro)	6325.0	794.5	12.6	5530.5
Production kT	16700.0	1720.6	10.3	14979.4
Yield ton/ha	21.0	31.7	151.2	20.2
Output/ha(€)	7936.6	14630.9	184.3	7447.1
Output/kg	0.38	0.46	121.9	0.37

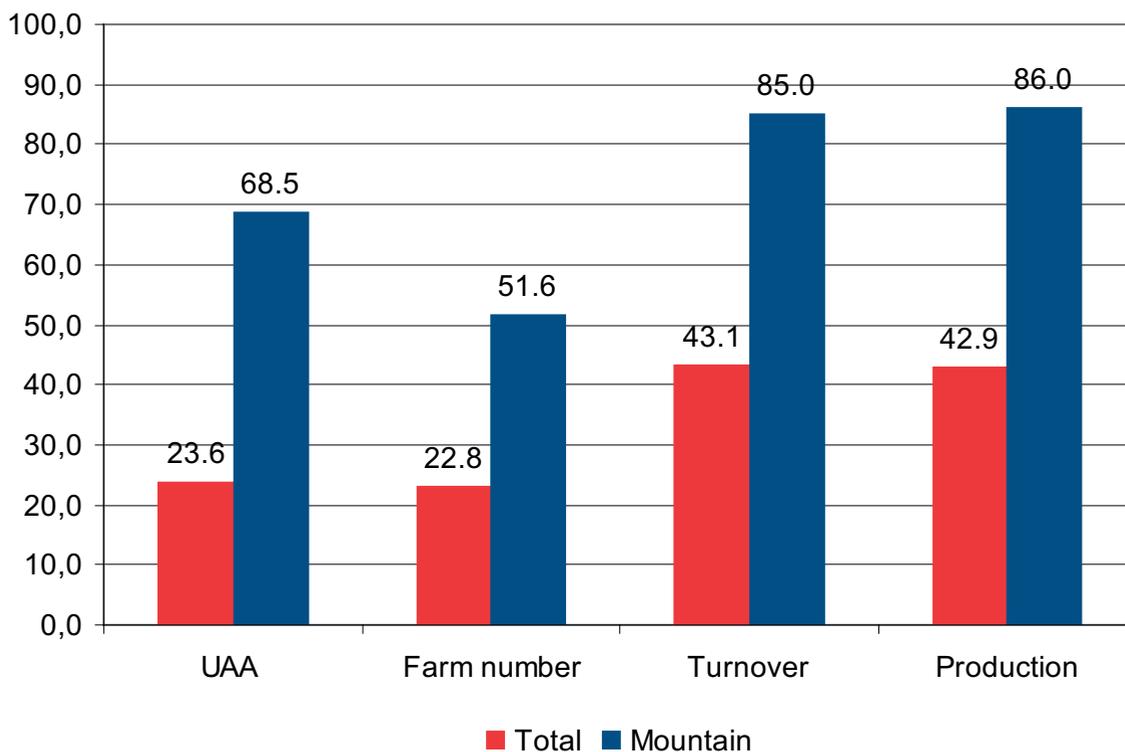
Source: own elaboration from EU-FADN (2007,2008) – DG AGRI

Map 5: Pome fruit production in mountain areas in the EU



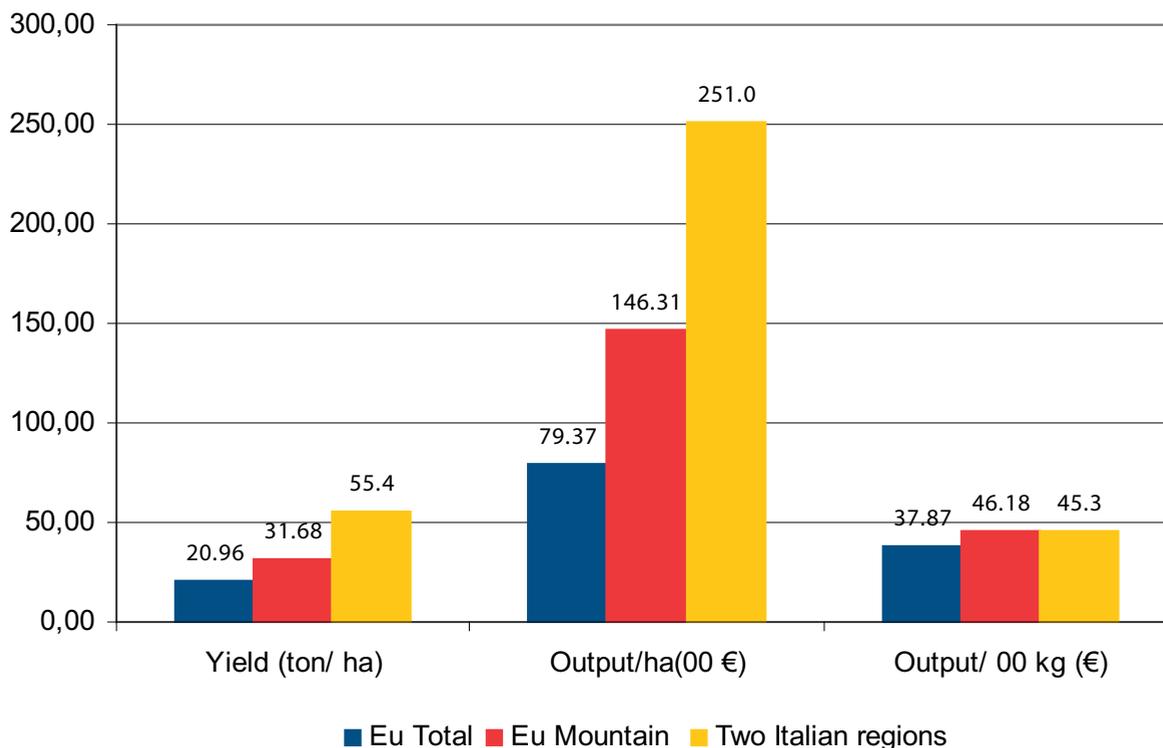
Source: own elaboration from EU-FADN (2007,2008) – DG AGRI

Figure 9: Share of Bolzano and Trento in Italy apple and pear production



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Figure 10: Bolzano and Trento in EU apple and pear production



Source: own elaboration from EU-FADN (2008) – DG AGRI

NUTS (almonds, chestnuts, walnuts, hazelnuts, etc.)

25% of the EU production of nuts is located in mountain areas on 41% of the total area (Table 20). The yield differential between mountain and lowlands is important (mountain yield is 33% below the average EU yield): many nuts orchards in mountains are extensive (an illustration being extensive almond orchards in Spain), and in absence of a large price differential (only 5% above average in mountain areas), the output per ha in mountain areas is much lower than the average.

Mountain nuts production is mainly concentrated in three countries which produce more than 80% of the total: Italy (44%), Spain (23%) and France (18%). In many countries mentioned above, large shares of the national production come from mountain areas: 80% in Portugal, one third in France and Italy and 15-20 % in Greece and Spain.

STONE FRUIT

Stone fruit are less typical from mountain areas: only 7.5% of the EU production is located in mountain areas on 8.5% of the areas planted in stone fruit orchards (Table 21).

The production structures in mountain areas are characterised by smaller surfaces (-19%), and slightly lower physical productivity (-12%). But the output per ton ('price') in the mountain areas is higher than in the lowlands. The distribution of species within the group is different in mountain areas (more cherries) and lowlands (more peaches): this can explain the differences above.

In terms of distribution within MS, 4 MS represent 93% of the mountain stone fruit production (Spain (50%), Italy, France and Greece). More than 60% of the stone fruit are produced in mountain in Portugal and Cyprus; 17% in Spain, 10% in Greece and around 8% in France and Italy.

Table 20: Nuts production in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
UAA (000 ha)	836.8	340.1	40.6	496.7
Farm number (000)	162	57	35.1	105
Average UAA (Ha/farm)	5.2	5.8	113	4.7
Turnover (M€)	1100	297	27.0	803
Production (kT)	879.5	218.7	24.9	660.8
Yield ton/ha	1.1	0.6	61.2	1.3
Output/ha(€)	1 314.5	873.3	66.4	1 616.6
Output/kg	1.25	1.36	108.57	1.22

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Table 21: Stone fruit production in EU mountain area

	Total	Mountain	Share of mountain (%) on Total	Non mountain
UAA (000 ha)	607.2	51.3	8.5	555.8
Farm number (000)	292	30	10.4	262
Average UAA (Ha/farm)	2.1	1.7	81	2.1
Turnover (M€)	3 485	374	10.7	3 111
Production (kT)	6 565	490	7.5	6 075
Yield ton/ha	10.8	9.5	88.3	10.9
Output/ha(€)	5 739.8	7 286.3	126.9	5 596.9
Output/kg	0.53	0.76	143.75	0.51

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

ii. Olives

Mountains represent 22% of the total EU olive output (Italy included).

Olives produced in mountain areas account for about 20% of the total cultivated area and provide about 19% of turnover and 17% of the production (Table 22). The below average yield in mountain areas (-15%) is partly compensated by higher 'price' (+11.5%).

Concerning the share of olive production in mountain areas, it ranges from a small share (8-14% in Spain, Cyprus and France) to larger shares in Portugal (40%) and Greece (30%). In terms of turnover, in Italy, around 30% comes from mountain areas. Spain represents more than 75% of the EU mountain production of olives, Italy excluded (Map 6).

iii. Wine

Concerning wine (and table grapes), mountain vineyards represent 7.6 % of the total EU vine surface, contributing to a similar share (8.7%) of the total EU production, with

slightly higher yields than average (overrepresentation of Mediterranean production areas and/or less quality wines).

Both in France and Spain, mountain production of grapes is below 5% of the total grape production and mountain wine industry seems to be potentially important in Portugal (40% of the production) and in a series of country (Italy, Romania, Slovenia, Greece and Cyprus) where the share of grapes produced in mountain areas is between 15 and 30% of their national production (Map 7).

In sum, the main products from mountain farming for human consumption are diversely represented. Dairy products are essential in temperate mountains (Alps, Massif Central, Northern Apennines, Pyrenees and Cantabric chain, etc.) and they are dominated by cheese, with cow, ewe and goat milk. For meat products, mountains are principally a place of birth of animals, but not of finishing. There is however a meat processing tradition in mountain areas and some local traditions for fresh meat (lamb in certain Northern and Mediterranean massifs, pigs in the Iberian Peninsula, other niche products etc.). Permanent crops are confirmed to be essential in certain areas (apples and pears in Northern Italy and French Southern Alps, nuts in Italy and Spain, olive groves in Greece, etc.).

Table 22: Olive production in EU mountain area (Italy excluded)

	Total	Mountain	Share of mountain (%) on Total	Non mountain
UAA (000 ha)	3 017.2	599.1	19.9	2 418.1
Farm number (000)	609	150	24.7	459
Average UAA (Ha/farm)	4.96	3.98	80.4	5.3
Turnover (M€)	5 045	953	18.9	4 092
Production (KT)	7 099	1 203	16.9	5 896
Yield ton/ha	2.4	2.0	85.3	2.4
Output/ha(€)	1 672.1	1 590.7	95.1	1 692.2
Output/kg	0.71	0.79	111.51	0.69

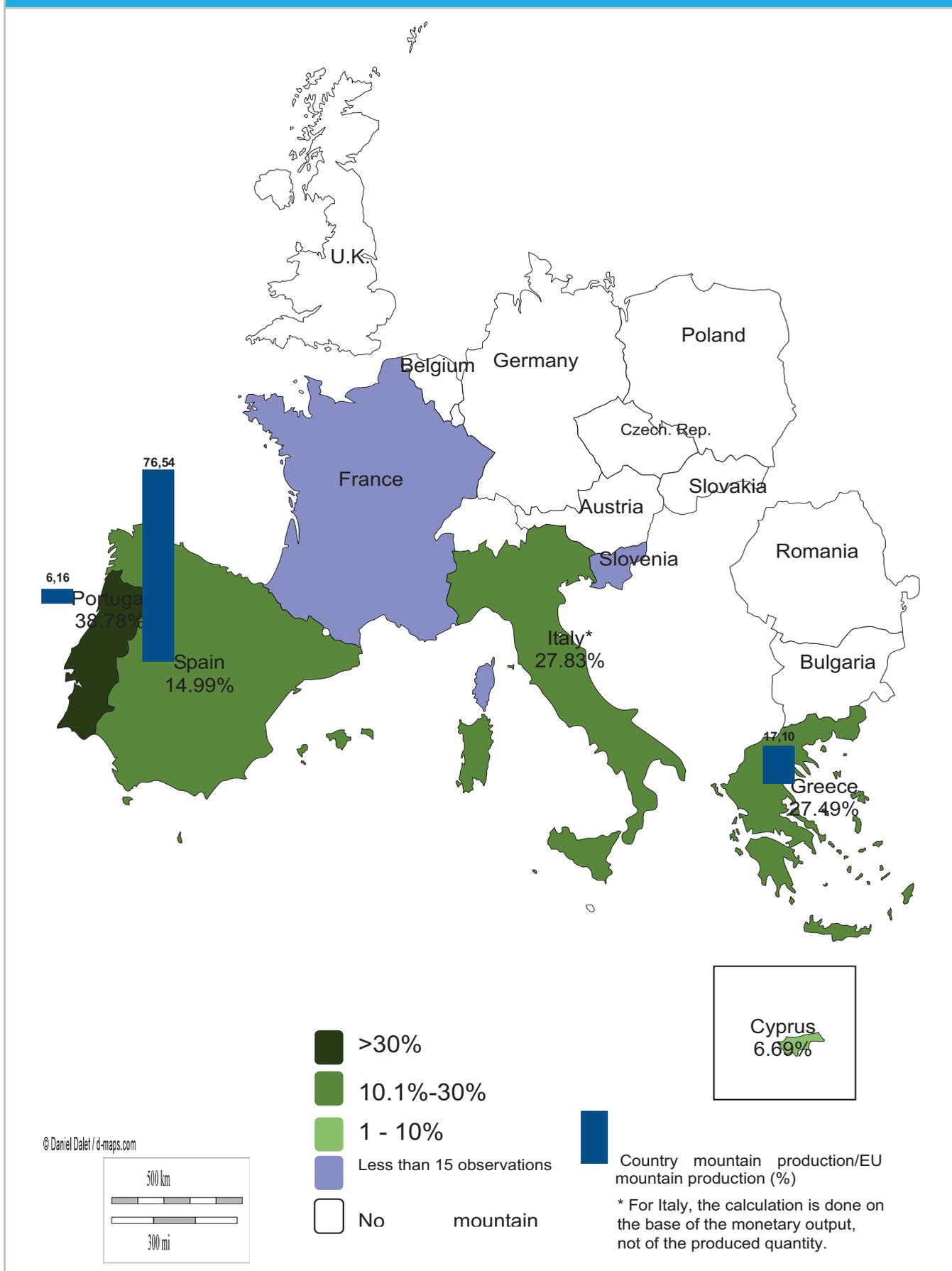
Source: own elaboration from EU-FADN (2007) – DG AGRI

Table 23: Wine and grapes production in EU mountain area

	Total	LFA Mountain	Share LFA mountain (%) compared with the total	Not LFA mountain
UAA (000 ha)	3215.6	243.2	7.6	2972.4
Farm number (000)	724.4	135.9	18.8	588.5
Average UAA (Ha/farm)	4.5	1.8	40	5.1
Turnover (M€)	20300	1605	7.9	18695
Production (KT)	25800.0	2240.5	8.7	23559.5
Yield (ton/ ha)	8.0	9.2	114.8	7.9
Output/ha(€)	6313	6600	104.5	6290
Output/ kg (€)	0.79	0.72	91.04	0.79

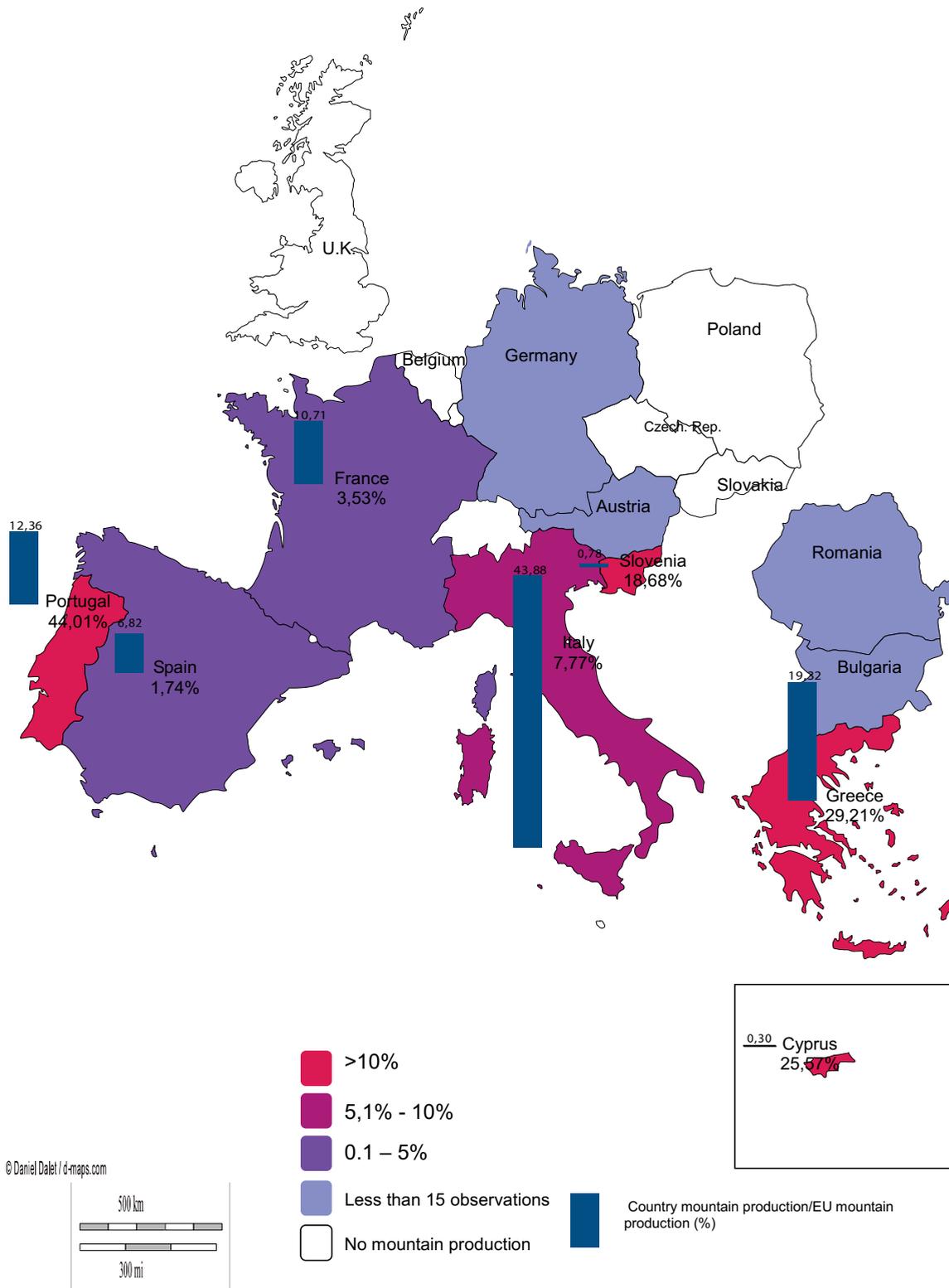
Source: own elaboration from EU-FADN (2007) – DG AGRI

Map 6: Olive production in mountain areas in the EU



Source: own elaboration from EU-FADN (2007) – DG AGRI

Map 7: Grapes for wine production in mountain areas in the EU



Source: own elaboration from EU-FADN (2007) – DG AGRI

3.3 Localisation of the different stages of the supply chains

The production process of agricultural products (those listed in Annex I to the Treaty) covers different stages which can take place within or without the mountain areas strictly speaking, in particular the production of feed for animal products and the processing or semi-processing of raw material. As mentioned in section 5 of this report, such aspect of mountain agricultural products was at the heart of complex debates when national provisions on mountain products have been laid down (similar debates are important for PDOs and PGIs too).

3.3.1 Feed

i. Introduction

Feed provide to animal the nutrients they need (energy, protein, vitamins, minerals). Feed is a complex product which is composed of many ingredients in a formula. Animal needs evolve according to their age but also in their production cycle. Diet plans therefore adapt animal rations according to their physiological stage (growth, pregnancy, lactation, feeding etc.) and cycle time (early, middle, late lactation or fattening for example). A single raw material is generally not able to fulfil all the needs of an animal and a ration will be composed of:

- Forage, which quality depends not only on the plant nutritional value but also on the conditions of harvesting, storage and conditioning (forage, hay, dried hay barn, wrapping, silage, dehydration).
- Concentrates (cereals, oilseeds, pulses and by-products, but also by-products of the dairy industry etc.), characterized by a high energy content and, for some, nitrogenous contents.
- Mineral supplements and / or vitamin.
- Additives, having a favourable effect on the feed to which they are incorporated (molasses, whey powder etc.) and / or production (enzymes, plant extracts etc.). They mostly have functions other than nutrients such as technology or improving the presentation, conservation or the palatability of the feed.

In this report, we only look at the localisation of the production of the two first components of feed (coarse fodder and concentrates), at the exclusion of vitamins and additives (which are very unlikely to be of mountain origin if added to feed).

Moreover there are several types of feed depending on the type of animals (e.g. grazing livestock / ruminant versus monogastric animals).

Rationing of ruminant herbivores is based on forage and other coarse fodder and the addition of concentrates may be necessary to supplement the energy and protein needs, mainly via grain or protein crops. Usually forage is produced on the farm, whereas concentrates can be self-produced or purchased in whole or in part in the form of complementary feed. Minerals (macro and micronutrients) are also incorporated into rations to reduce deficiencies. The intake of vitamins supplements is necessary for the animals remaining in barns.

The feeding of monogastric animals (pigs, poultry) is based on concentrates. The combination of at least two elements is necessary most of the time (cereal + component rich in nitrogen). The addition of minerals and vitamins is made for all types of monogastric animals.

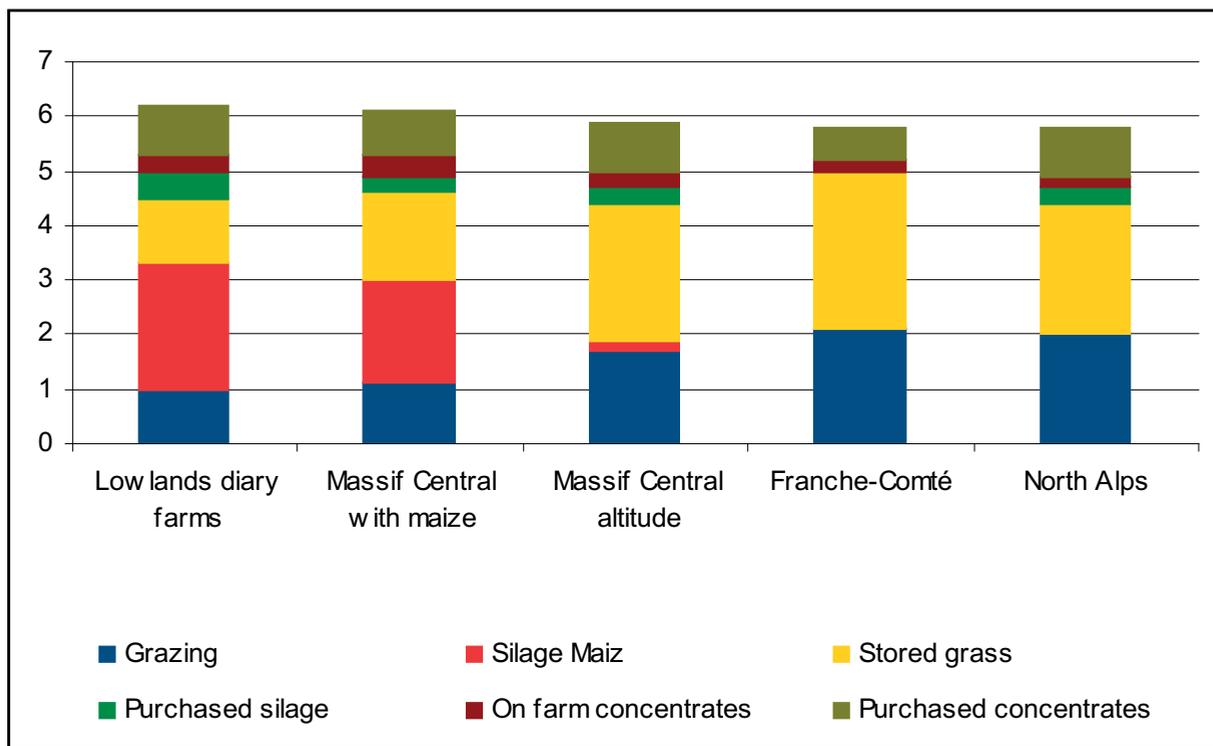
Within FADN, the only potentially usable information is related to the cost (in €) of feed (which is disaggregated between purchased feed and feed produced on the farm, respectively for ruminants, pigs and poultry): however, the valuation of grass and other coarse fodder produced on farms is not reliable enough to directly use this source of information. First, a case study approach has been conducted for France and Austria dairy cows.

ii. A case study for French dairy cows

For France, Reuillon, Perrot et al. (2012) based their calculations on a network of 'reference farms' for which more techno-economic information is gathered than within the accountancy scope of the FADN.

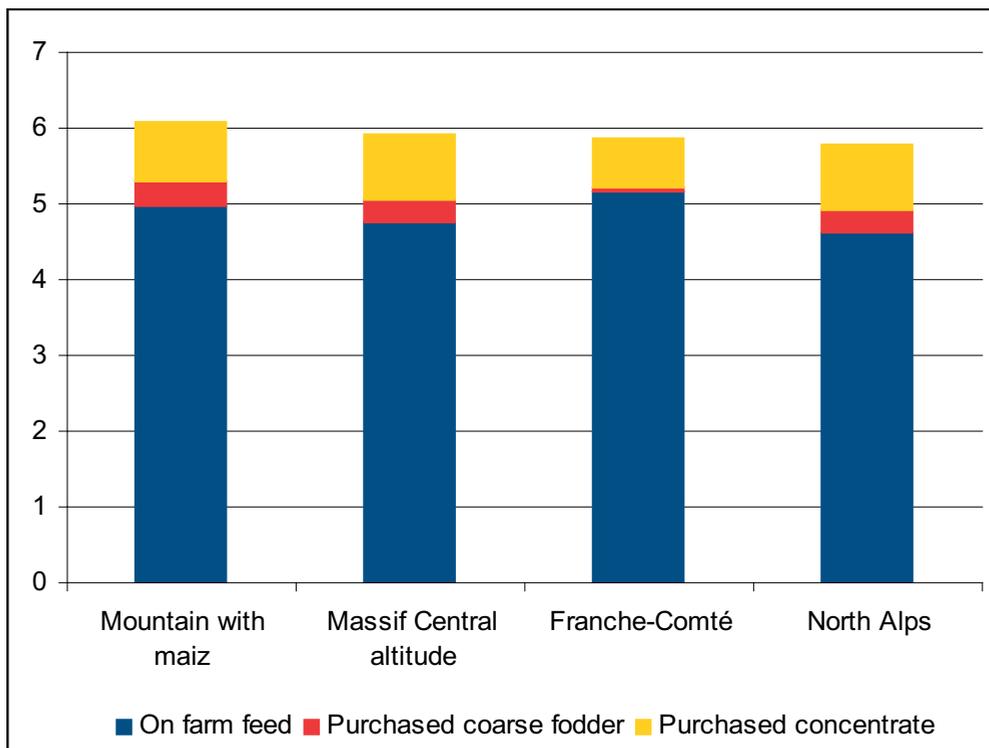
The average composition of the ration of dairy cows depends on the localisation, and in particular on the possibility of growing maize for silage or not. Lowlands rations are similar to those in mountains where maize silage can be produced. Half of the ration comes from grass (one third from grazing, two thirds from stocks and purchase, e.g. of hay); the other half from maize silage and concentrates. In other mountain areas, 80-90% of dry matter is brought by grass.

Figure 11: Dairy animals feed composition per type of feed (T of dry matter (T d.m.) per LSU)



Source: (Reuillon, Perrot et al. 2012)

Figure 12: Share of purchased feed (% of dry matter)



Source: (Reuillon, Perrot et al. 2012)

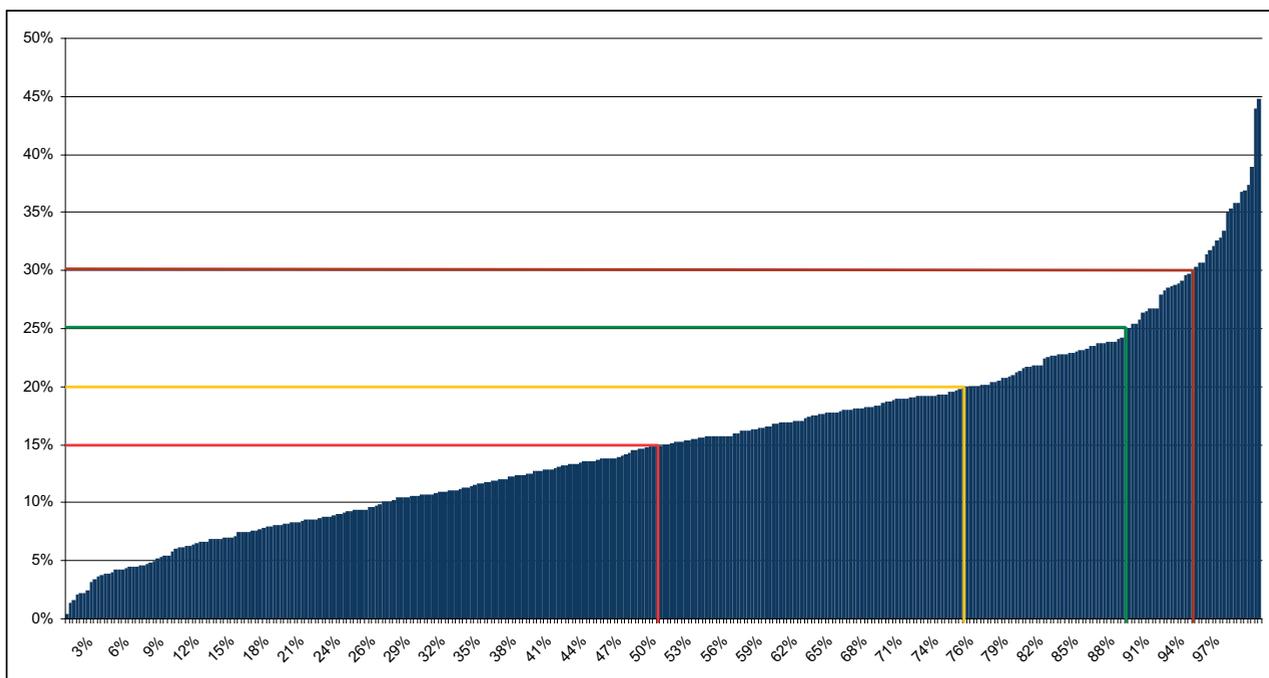
The share of purchased feed is of around 20% in French mountain areas (except Franche Comté where it is lower, around 10%). The assumption can be made that purchased feed are coming from lowlands. On average 2008-2010, the share of purchased feed on the total dietary needs of dairy animals is different in each farm of the reference network considered. 50% of the reference farms purchase between 0 and 15% of the needs from outside the farm, 25% of farms between 15 and 20%, 20% of farms between 20 and 30% and only 5% of farms more than 30%. The mean and average values are both 15% of the needs of animals being purchased from outside the farms (by assumption from outside mountain areas).

need to be imported¹¹ from lowland areas respectively for 40% and 90% of the total needs of cereals and protein crops.

Mountain farms involved in dairy activity are importing about 10-11% of the feed needs from lowlands (depending whether expressed in tons, protein contents or energy). This ratio is slightly higher for farms involved only in dairy production (and not combined with meat oriented production): 12-13% of average feed needs are imported from lowlands (Table 29).

Similar shares (or slightly higher) are estimated by experts (ISARA 2012). In the Austrian mountain areas, ruminants are generally grass-fed. For dairy, cattle farmers also use grain

Figure 13: Distribution of 3-years average farm results for % purchased on the total feed needs of dairy animals



Source: (Reuillon, Perrot et al. 2012)

iii. A case study for Austrian dairy cows

In Austria, BABF (2012) analysed, on the base of Guggenberger (2012), feed balances within mountain farms having a dairy activity. The main result is that coarse fodder (roughage) production in mountain area is exceeding the needs of mountain dairy farms by 30%. On the contrary, cereals and protein crops are not produced in sufficient quantities in mountain areas and therefore complements

coming from arable areas in Eastern Austria. Soybean for protein traditionally came from overseas. Recently, waste from bio ethanol production from Austrian grain has been used as a protein source for dairy cows, replacing overseas soybean (dried, distilled, soluble grains), but it does not originate from mountain areas. The biggest problem lies in the supply of concentrate feed which comes from all around the world. It is estimated that imported feedstuffs represent around 15 - 20% of total feed by weight.

¹¹ By contrast to the French case study, in this case, the quantities are imported from lowlands as the base study carries out an overall mountain areas feed balance (not a farm by farm approach)

Table 24: Feed balance in mountain areas for dairy farms in Austria

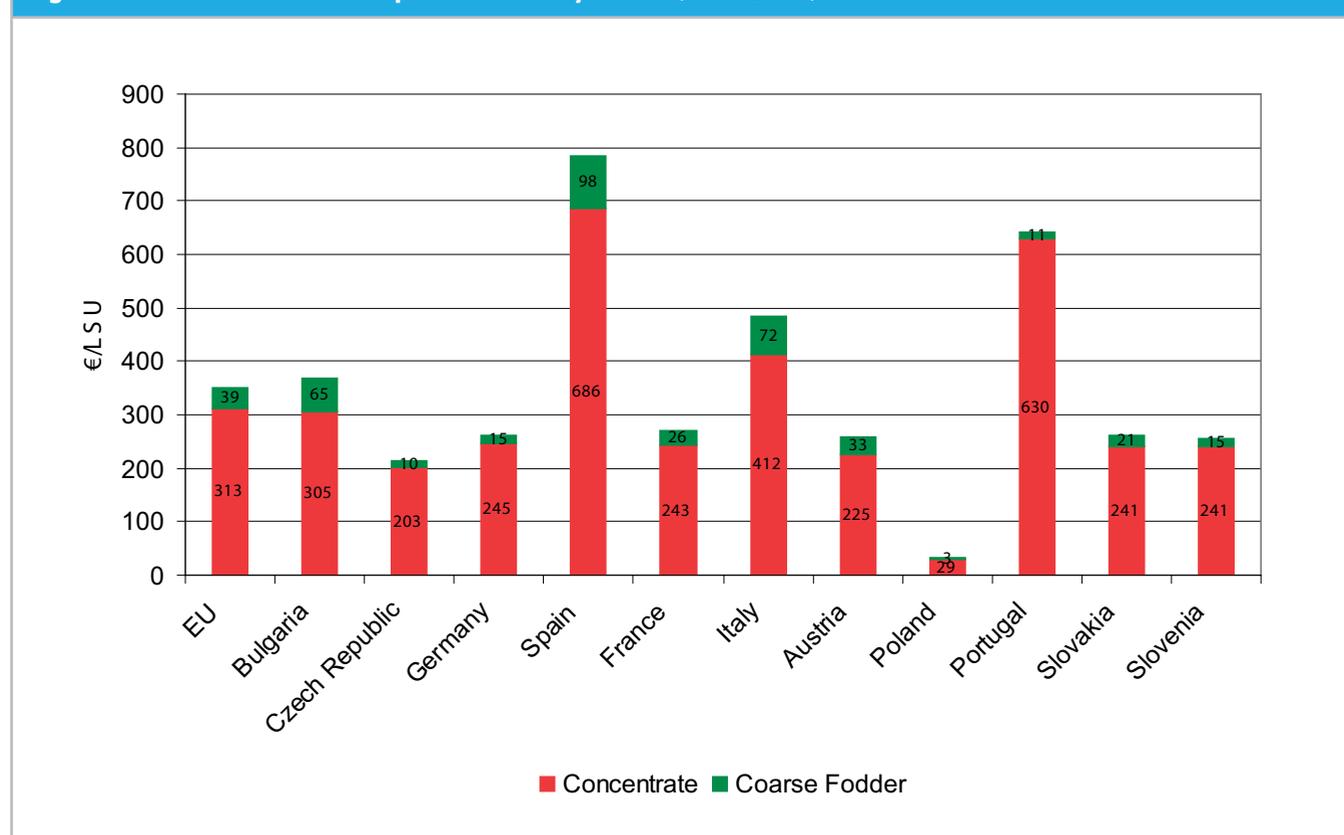
	Quantity of feed (T)	Protein (T)	Energy (GWh)
All farms involved in dairy – Needs	4 869 144	715 169	24 515 912
All farms involved in dairy – Cereals and protein purchased	470 602	82 381	2 499 280
All farms involved in dairy - % imported from lowlands	9.7%	11.5%	10.2%
Dairy farms exclusively – Needs	2 676 023	386 776	13 447 498
Dairy farms exclusively – Cereals and protein purchased	334 182	47 027	1 749 233
Dairy farms exclusively - % imported from lowlands	12.5%	12.2%	13.0%

Source: own elaboration from (BABF 2012)

iv. EU wide picture for ruminants

Figure 14 shows the value of purchased feed per total LSU of the herd in dairy specialised farms of different Member States (concentrates and coarse fodder).

Figure 14: Purchased feed in specialised dairy farms (Euros/LSU)



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

The main feed cost corresponds to concentrates (cereals and protein crops). In several Member States, total feed purchases are less than 300 €/LSU (Czech Republic, Germany, France, Austria, Slovakia and Slovenia), indicating predominance of grazing and on-farm produced feed (hay and silage; possibly some cereals) in their diet plan. In Spain, Italy and Portugal, feed includes more purchased elements, in particular concentrates: up to nearly 800€/LSU in Spain. A reasonable assumption can be made that purchased feed by mountain farms are of non-mountain origin.

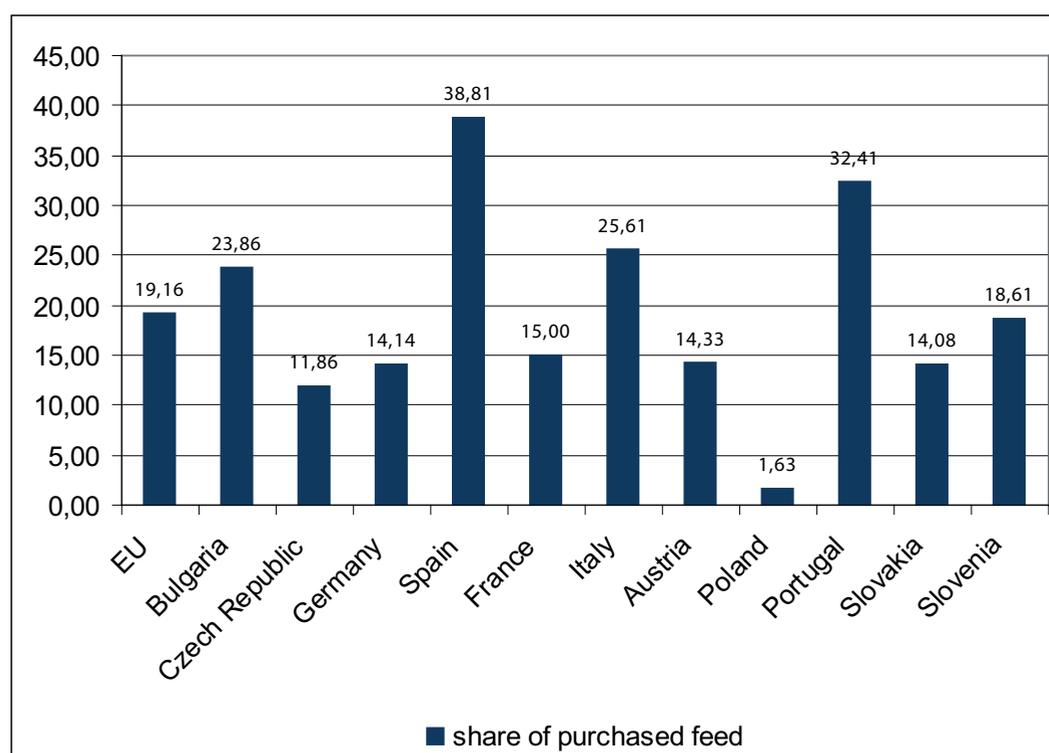
In order to estimate the share of non-mountain feed for mountain dairy farms, an equation¹² (Reuillon, Perrot et al. 2012) is used to calculate average total feed needs per animal in the different member States, taking into consideration the average milk yield and the herd structure (dairy cows and other cows) in each Member State. Three more assumptions need to be made: (i) the average share of purchased feed in the total needs in French mountain farms is 15% (Reuillon, Perrot et al. 2012), this being the point of reference for all other MS; (ii) the price of 1 Ton dry matter of feed is the same in all MS, and (iii) the average farm at national level is representative of farm systems in the MS concerned.

Figure 15 confirms there are two groups of countries, those for which 15% or less of feed on average is sourced from non-mountain areas (France, Germany, Austria, Czech republic, Slovakia). Slovenia shows a slightly higher purchase rate compared to the other countries (18.6%), probably due to a smaller average herd size (12.7 LSU). In Italy, Portugal, Spain and Bulgaria, between one-fourth and one-third (even more in Spain) of the dairy farms feed needs are sourced out of mountain areas (on average). Such averages are hiding heterogeneity between individual farms (see example from France in figure 13).

v. Transhumance

Apart from movements of feed, the animals themselves might change location in order to follow the geographical availability of feed. Traditional vertical transhumance processes for bovine and ovine animals, such as summer transhumance (animals from valleys and lowlands are moved to pastures during summer) and winter transhumance (animals from valleys and mountains are moved to lowlands during winter time) are still taking place throughout the EU (many examples such as ovine transhumance in Provence

Figure 15: Share of purchased feed needs in dairy specialised farms (%)



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

12 The farm level feed needs are calculated by the following formula: $[4.2TDM * 0.35 \text{ milk yield (lt./LSU)/1000}] * \text{dairy cows (LSU)} + [\text{total LSU} - \text{dairy cows (LSU)}] * 5TDM$.

or Spain, movement of ovine and caprine in the Balkans and Greece, at the heart of the traditional production of Feta and other typical Greek cheeses (Goltsiou 2011), rough

grazing in Scotch and Irish highlands, 'Inalpe' and 'Desalpe' in Switzerland and Aosta valley, etc.). In 2005 it was reported that more than 4 millions ha of agricultural land in Europe depend on transhumance, though the practice is vulnerable but vital for landscapes (Herzog, Bunce et al. 2006). Usually, pastoralists keep a permanent base (where the household is based, and where during transhumance, a few animals, in particular lactating females, are staying). This base is in a mountain area (valley) or not (piedmont / lowland), while part of the family or an external shepherd follow the transhumant cattle. With the development of roads and transports, animals are moved without the farmer/shepherd having to overnight in the summer pastures. In this context, it is difficult to appreciate the quantity of forage originating from mountain areas in the ration of transhumant animals throughout the year.

A study on bovine transhumance in Pyrénées-Atlantiques (Western French Pyrenees) (Heitzmann 2003) calculates that close to 10% of the bovine are transhumant (30.900 animals, close to twice more than in the early 70ies), mostly suckler cows (98% of the total transhumant animals): 20% of the suckler cows in the area are transhumant while only 1% of dairy cows of the area are concerned. The few dairy cows concerned are accompanying transhumant dairy ewes (for the purpose of mixed milks mountain cheeses). The type of transhumance has also changed in recent years: mostly lowland and piedmont animals are following a summer vertical transhumance, while the opposite movement (winter transhumance) has disappeared (as well as most valley farmers who were practising winter transhumance). It is evaluated that transhumant animals of these regions spend a third of the year in mountain, being fully fed by summer pastures, which represent over the year one third of the ration (Heitzmann 2003).

Transhumance also applies to beehives: lots of beekeepers go up into the mountains for special blossoms to produce 'mountain' honey. There is no evaluation of such process in terms of number of beekeepers and beehives concerned and quantity of honey produced by transhumant and non-transhumant bees. In the region of Languedoc (South of France), 342 beekeepers are transhumant, approximately 10% of the total number of beekeepers in the region. However, transhumance for beehives is more practiced by professional beekeepers because of the heavy material requirements needed to move 20 to 100 beehives on a distance of more than 100 kms (ADAPRO 2006). Vertical summer and winter transhumance happens: beekeepers from the coastal plain (Hérault, Gard) are moving towards the mountains of Lozère in summer to take advantage of different natural characteristics (chestnut and heather honey), while mountain beekeepers of Lozère and Haute Loire are transferring their beehives towards the Mediterranean coast in winter to limit the impact of low temperatures. Another source mentions that 2/3 of the mountain honey is produced by transhumant beehives (ISARA 2012).

vi. Non ruminant animals

The situation is different for non ruminant livestock: grain composes a higher share of the feed, and little grain is produced in mountain areas. Mountain pig production is therefore limited and some mountain pig fatteners use to have their own arable land in lowlands.

ISARA (2012) calculates what surfaces of cereals would be needed to feed the present number of mountain pigs in France: 168 000 T equivalent to 32 300 ha of cereals (to which would have to be added up to 20% of protein crops, hardly available at all in mountains). As a comparison, this area represents three times the present production of cereals in Cantal (56 800 T). At farm level, in the example of a 120 sow case, a 100% mountain ration would imply 112 ha of cereals, beyond what can reasonably be expected from an average farm in a French mountain area. A 20% ration would represent 22 ha of cereals, more in line with possibilities. Given the facts that in the twenty last years, maize has started to be cropped over 600 m up to 900 m – 1000 m height thanks to improved seeds and mechanisation, as well as probably also climate change impact, and transport cost permanently increase, it is not unlikely that cereals production develop in mountain areas and can bring feed to mountain pigs; however, probably not up to a 100% ration.

In other context, feed comes from mountain areas to a certain extent: this is the case in particular for specific supply chains for example, pigs fed with acorns (cerdo iberico in Spain, porco alentejano in Portugal and other niche products such as Basque or Gascony pigs).

On feed, the conclusion is that even the mountain animal production systems strongly oriented towards grass are relying on significant amounts of imported feed from lowlands areas. Alpine and Massif Central systems can cope with a reduced import of dry matter: this is less the case with systems where grass production is more limited (Mediterranean areas) or where there is a tradition of animal production disconnected from local forage resources. Concerning pigs, there a limited possibility to feed the animals with local resources in mountain areas.

3.3.2 Processed products: localisation of agricultural raw materials and processing facilities

Raw material obtained from mountain farming can be processed or semi-processed within or without mountain areas. In addition, processing of non-mountain raw materials can occur in mountain areas. As for the issue of feed, mountain areas and their neighbouring areas are closely interlinked with regards to processing.

i. Processing mountain raw material

Three different surveys of mountain food products (Euromontana 2004b; EuroMARC 2009; ISARA 2012)

have listed agri-food products understood to be mountain products.

Within the first database obtained, 59% of surveyed products are wholly obtained and/or processed exclusively in mountain areas. The ratio is higher for cheese: almost 85% of cheese processing industries operate exclusively in mountain areas. Almost all animal products are wholly produced in units located in mountain areas. Conversely, processing of confectionery, bread, sweets and alcohol, tends to be either mixed (both within and outside mountain areas) or completely external to mountain areas.

Six years later, the European FP6 EuroMARC (2009) programme tried to describe the strategic question of the location of the production and processing steps in the food chains of mountain products. About the location of the different stages of production, the main results show that

raw material came exclusively from a mountain area in 78% of the cases and mainly from a mountain area in 13% of the cases.

Lastly, in the survey carried out in 2012, respondents were asked to indicate where each stage of the supply chain (sourcing of raw materials; production; slaughter of livestock; processing; and marketing) for their product(s) primarily occurs in a mountain area; partly in a mountain area and partly in a lowland area; or completely in a lowland area (Table 25).

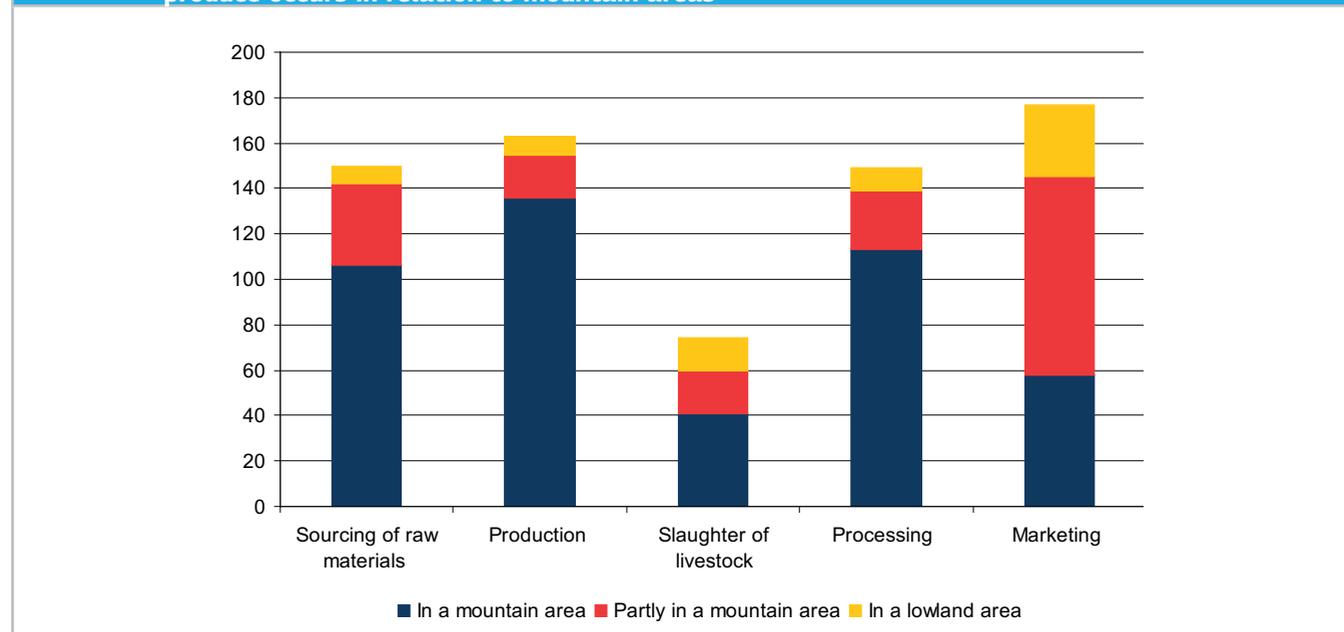
The production (83.4%) and processing (75.8%) elements of the supply chain were strongly concentrated in mountain areas. The majority (70.6%) also sourced their raw materials in mountain areas. Only a small majority (53.2%) of those slaughtering animals (74 respondents) managed to do so in mountain areas.

Table 25: Respondent (% of total respondents) indications as to where each stage of the supply chain for the products they produce occurs in relation to mountain areas

Stages of the Supply Chain	In a mountain area total	In a mountain area %	Part mountain/ part lowland Total	Part mountain/ part lowland %	In a lowland area Total	In a lowland area %
Sourcing of raw materials	106	70.6%	36	24%	8	7.5%
Production	136	83.4%	19	11.6%	8	4.9%
Slaughter of livestock	41	53.2%	19	24.7%	14	18.2%
Processing	113	75.8%	26	17.4%	10	6.7%
Marketing	58	32.7%	87	49.1%	32	18.1%

Source (ISARA 2012)

Figure 16: No. of respondents indicating where each stage of the supply chain for the products they produce occurs in relation to mountain areas



Source (ISARA 2012)

SLAUGHTERING AND MEAT PROCESSING

There is a general opinion that slaughtering in mountain areas is not always easy for mountain breeders and butchers. Slaughterhouses seem to be slowly disappearing from the mountain areas in Austria (ISARA 2012). In Scotland, the number of slaughterhouses present in mountain is very low: already in 2004, ‘there were only 5 slaughterhouses left in the Scottish Highlands for 3.5 million ha’ (McBeth Scotch beef case study in (Euromontana 2004b)). Slaughterhouses are all located in lowlands in Ireland.

A count of establishments recognised as slaughterhouses (SH) according to hygiene rules¹⁴ has been carried out (table 26). The results show that in general the density of slaughterhouses in mountain area (per total km²) is lower than in lowlands, with the exception of Germany and Czech Republic.

approach). In addition, there is no information available on the capacities and actual activity of slaughterhouses. There are doubts on the updating of hygiene databases with regards to businesses which have closed (on the base of expert knowledge, several closed establishments have been spotted within the databases). Slaughterhouses located in mountain areas are likely to be smaller and less competitive than the ones located in lowlands. In addition, duration of transport within a mountainous area is necessarily longer than in a flat area of the same size.

This implies that the availability of slaughterhouses is lower in mountain areas than in lowlands, particularly in certain MS such as Spain, Portugal, Italy, Poland and Slovakia (ratio between 0.5 and 0.6). This is also the case, but less evidently in Austria, Slovenia and France. In Germany, the mountain area is quite limited and comprised within two Länder known for a rather dense network of farmers and SME-s (Bayern

Table 26 – Slaughterhouses (SH) in mountain areas

	PT	ES	FR	IT	DE	AT	SI	CZ	PL	SK
Share of SH in mountain area (% of Nr estab.)	31%	35%	22%	35%	5%	62%	57%	22%	1%	29%
Relative density per km ¹³	0.60	0.54	0.95	0.60	2.38	0.70	0.76	1.12	0.54	0.51

Source: own calculations based on national databases of recognised establishments (DG SANCO)

These results should be analysed taking into account the differences of registration modalities in the different MS: some MS do register as slaughterhouse (SH) many butchers (DE, CZ, AT), while others limit themselves to industrial and semi-industrial premises (FR having the most restrictive

and Baden Württemberg), contrary to the larger areas of Northern and Eastern Germany. This might explain that the density of SH in German mountain areas is higher than on average in Germany.

¹³ Relative density/km² = (Total Nr of SH / Total area) / (Nr of SH in LFA mountain / Total area LFA mountain)

¹⁴ section I – meat of domestic ungulates

DAIRY PROCESSING

Reuillon, Perrot et al. (2012) provides for some information on dairy processing in France (Tables 27, 28 and 29). 40% of dairy establishments are located in mountain areas and 59% of them combine both collection and processing (where establishments in lowlands are more specialised in collection or processing)

Both in terms of number of establishments and volumes produced, French mountains are specialised in cheese production: 54% of cheese mountain establishments

produce 20% of total French cheese volumes in mountain areas. Accordingly, mountains are also producing significant volumes of melted cheese, cream and lactoserum powder (whey). Mountains also have a significant production of drinking milk (11%) but are not producing other products (butter and industrial products).

Converted into a standard measure (MSU = 'Mesure Standard Utile' in French), a total of 11% of all dairy products are processed in mountain areas: 73% of the mountain processing is represented by cheese and 14% by drinking milk.

Table 27: Number of establishment per type of main production

	Number of establishments				Production			
	TOTAL	Non Mountain	Mountain	%	TOTAL	Non Mountain	Mountain	%
Drinking milk	57	49	8	14	3 673 658	3 275 912	397 746	11
Fresh products	96	80	16	17	2 190 165	2 179 050	11 115	1
Cheese	501	230	271	54	1 064 976	852 794	212 182	20
Fresh cheese	164	124	40	24	627 276	618 916	8 360	1
Melted cheese	42	36	6	14	132 660	122 636	10 024	8
Fats	195	99	96	49	427 891	424 134	3 756	1
Cream	227	125	102	45	330 680	298 927	31 753	10
Concentrated milk	4	4	0	0	12 050	12 050	0	0
Lactose, lactoprotein	16	15	1	6	70 097	66 879	3 218	5
Milk powders	17	17	0	0	98 093	98 093	0	0
Lactoserum powder	39	32	7	18	650 123	594 173	55 949	9
Casein	11	9	2	18	42 660	42 291	369	1

Source : Reuillon, Perrot et al. (2012) from EAL 2006 – treatment (Derville 2012)

Table 28: Distribution of dairy quantities processed

	Total MSU (T)	Drinking milk	Cheese	Fresh products	Butter & Cream	Industrial products	Export bulk (milk and cream)
Non mountain	1 399 917	12.2%	35.1%	8.7%	19.1%	24.1%	0.9%
Mountain	147 470	14.0%	72.7%	0.4%	7.5%	5.3%	0.1%
TOTAL	1 547 387	12.3%	38.7%	7.9%	18.0%	22.3%	0.8%

Source : Reuillon, Perrot et al. (2012) from EAL 2006 – treatment (Derville 2012)

Table 29: Estimation of dairy processing capacities in French mountains

	Estimation of deliveries (T)	Estimation of processed quantities (T)	Processing capacity
Non mountain	19 104 528	20 093 265	105.2%
Mountain	3 106 407	2 116 669	68.2%
TOTAL	22 209 935	22 209 935	100.0%

Source : Reuillon, Perrot et al. (2012) from EAL 2006 – treatment (Derville 2012)

In total, the processing capacities in French mountain are not sufficient to process the full mountain milk production: 2.1 billion litres are processed (while deliveries are of 3.1 billion litres). The dairy processing capacity of French mountain is of 65%. 989 million litres of mountain milk are likely to have been processed in 2006 in lowlands dairy plants. This demonstrates the interdependency between mountain milk production and neighbouring areas with regards to processing.

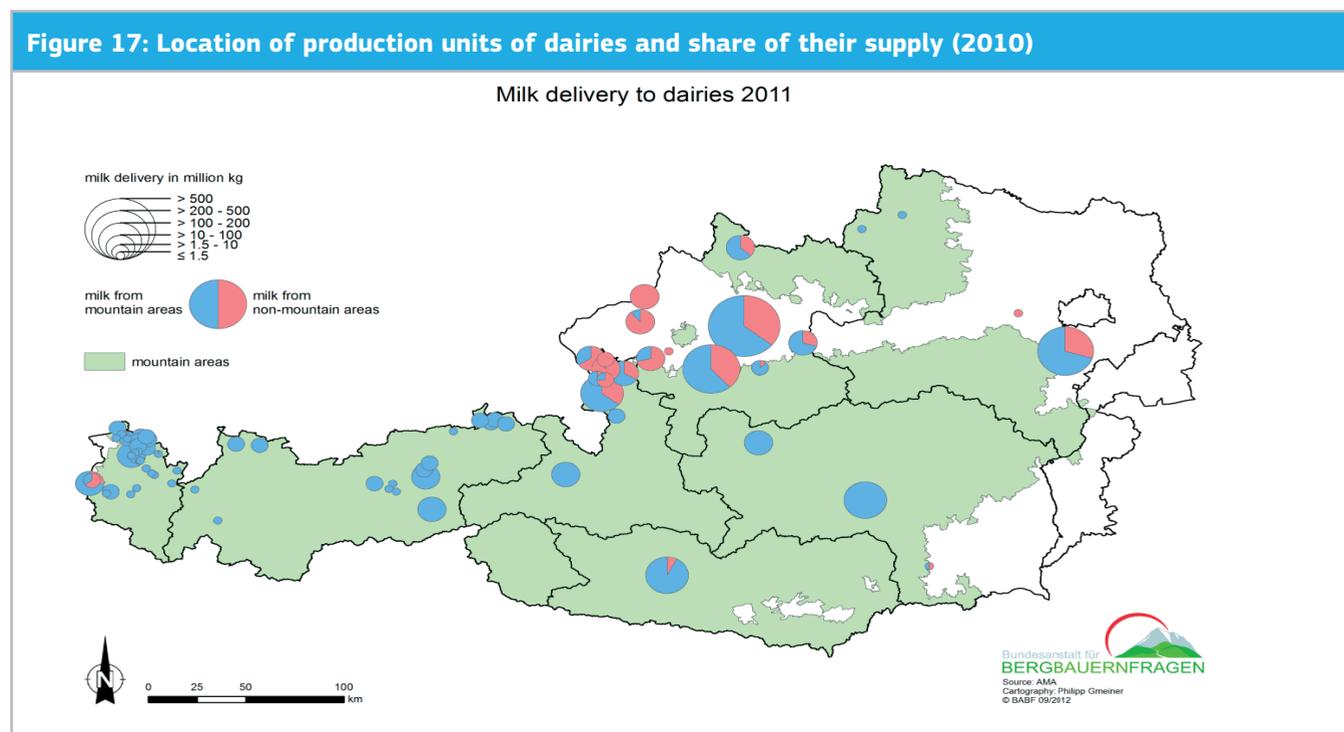
A study on the Austrian dairy mountain supply chains (BABF 2012) gives similar results. 82% of the dairy establishments are in mountain areas but they process only 47% of the total milk supply. Most of the dairies in mountains are small and a small number of large dairies in lowlands are processing more than half of the total Austrian production. In terms of processing capacity, mountain dairies process 1.39 million tons of milk, which represents 69.2% of the mountain milk deliveries. There is in addition an Austrian specificity compared to France: most dairies are mixing supplies from mountain and non mountain origin. 95% of dairies in mountain areas are processing both mountain and non mountain milk.

areas and they produce 48.1% of the oil of the province. In this case, mills are located close to the production areas and there are sufficient capacities in mountain areas to process mountain olives.

ii. Processing in mountain areas

Non-mountain agricultural raw materials are also processed in mountain areas, particularly for meat products as there is a tradition of drying and curing meat products in mountain areas (thanks to colder and dryer climate, with more circulation of air). Not only the main raw materials (meat, principally pigmeat, but also some beefmeat products) are coming from lowlands, but also many ingredients: salt, pepper, spices, etc. There is no data on the flows of raw material (meat).

One proxy to capture the extent of this phenomenon is to look at the data on PDOs and PGIs for cured pig and beef meat processed in mountain areas depending on the area of provenance of the raw material. Designations have been classified in four groups: 'M+M' (wholly produced and processed in mountain areas, e.g. Salpicão de Vinhais in Portugal), 'M+P' (wholly processed in mountain areas,



Source: BABF (2012)

OLIVE MILLING

Concerning olive oil, a study in the region of Jaen (Sanz Cañada, García Brenes et al. 2012) showed that there is a close connection between production and processing: in the province of Jaen, 55.5% of farms involved in production of olives are located in mountain areas and they own 45.5% of the olive groves. 51.8% of the mills are located in mountain

for example Bresaola della Valtellina, Sudtiroil and Tirol Speck, Jamon de Trevelez and de Huelva, Schwarzwälder Schinken), 'P+P' (partly produced and/or processed in mountain areas from raw material partly or not produced in mountain areas, for example Cecina de Leon or Prosciutto de Parma), 'Others' (absent from mountain areas, for example Prosciutto San Daniele, Culatello de Zibello, Thüringer Würsten).

Table 30: Volume and value of PDO PGI meat products (2005-2008)

Average 2005-08	M+M	M+P	P+P	Others	Total
Production (T)	273	43 506	117 842	94 659	256 280
Value (k€)	1 102	488 081	989 839	547 966	2 026 988
Valorisation (€/kg)	4,04	11,22	8,40	5,79	7,91

Source: own elaboration from DG AGRI data on volume and value of PDO-PGI

The number and economic weight of meat products wholly produced and processed in mountains is limited, and no flagship product falls in this category (which might explain the particularly low level of valorisation). Products processed in mountain areas from raw materials the origin of which is not limited to the processing area form a significant part of the total (17% of the production, 24% of the total value) and their unit valorisation on the market is 40% more than the average. Even designations that are partly produced and processed in mountain areas benefit from a 6% above average valorisation. This result seems to acknowledge that the localization of processing of meat products in mountain areas might add significant value to products, and that meat products produced and processed in mountain area are at present not available on the market in significant quantities.

ISTAT recorded specific information on the pig sector covered by PDO and PGI in Italy: 22.6% of the processors of PDO and PGI pig meat are located in mountain areas, while only 3.9% of the farms sourcing them are in mountain areas (and only 2.3% of sows) (ISARA 2012): this confirms the fact that mountain meat processors are widely sourcing fresh meat from lowlands.

Concerning meat products, in Austria the limitations of grains available for mountain pigs implies that pork meat products, typical of Austrian mountain areas – speck, for example- cannot be produced on a large enough scale for an international market using the meat of animals bred in mountains. Processors import raw pork meat from outside the mountain area (and often from outside Austria) and transform it in mountain regions. Pork comes from the cheapest place – which could be Denmark, Poland, Germany, etc. For example, Tyrol Ham PGI only sources 10% of his pork from Austria itself (ISARA 2012).

3.3.3 Distribution of mountain products

The final steps of food chains for mountain products are affected by the distance from the market and the accessibility to mountain areas. These two factors have a particularly high impact on the structural and sustainable development

of market channels. According to the European Union Peak Performance report (EC 2009) ‘only few mountain areas – except those with a major tourism industry – have levels of accessibility comparable to those in lowland areas’. This might affect both the geographical localisation of markets for mountain products and the organisation of the distribution stages.

i. Market localisation

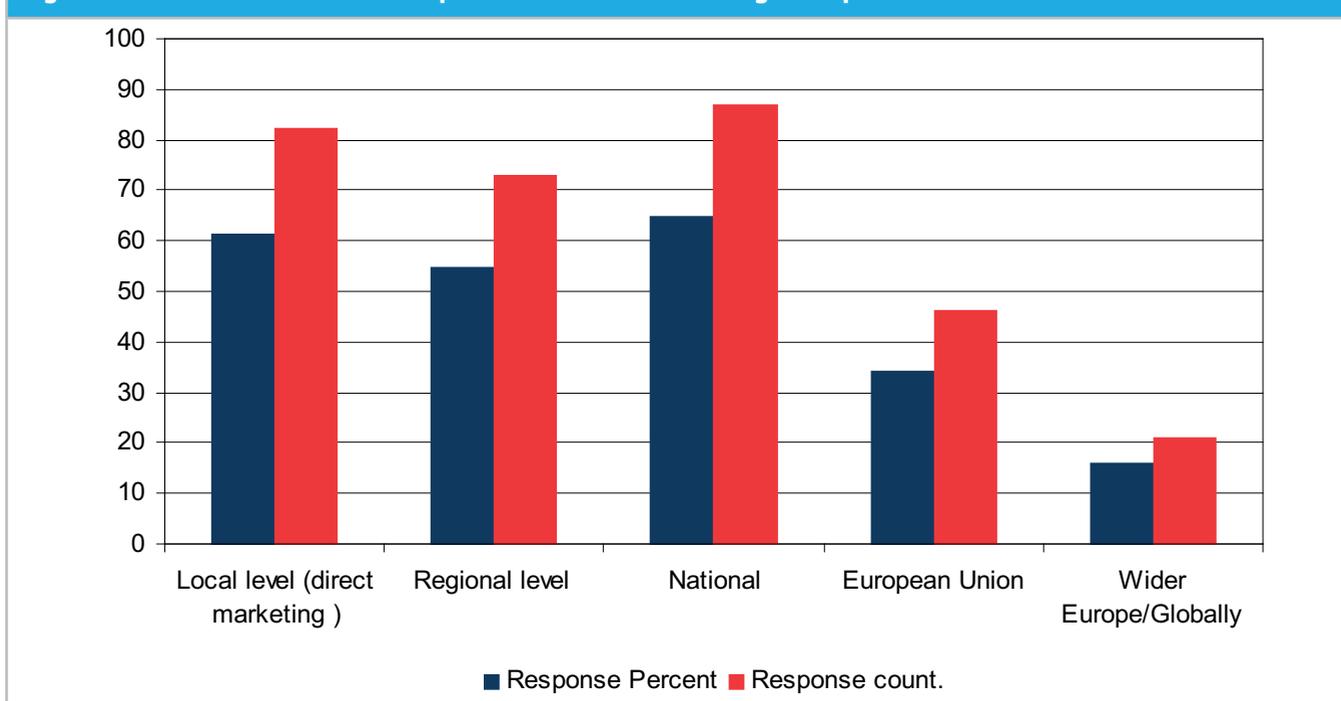
Previous studies carried out in the framework of the two European research projects on mountain foods have shown that mountain products are sold on all markets, from local to international markets.

Products of the EuroMARC case studies for example are often sold partly locally in mountain areas (in some instances predominantly). The importance of tourism (and local sales to tourists) is often emphasised. It is also confirmed by Tischer, Ansbacher et al. (2008), which underlines in its Guideline for Cooperative Regional Marketing, that ‘supply of regional food products and crafts is getting more and more important for the marketing of regional destinations and thus the ‘selling’ of the territory’ and that tourism and gastronomy meet in ‘short chains’. But some products are predominantly sold out of mountain areas (e.g. pommes de Savoie).

The Autonomous Province of Bolzano (Italy) provided considerable information about the geographic distribution of apples, wine and dairy products. While the largest part of the production remains in Italy (at least 54%), the province exports high volumes of apples (55% of the total), of wine (33%) and less of dairy products (3%).

A recent survey (ISARA 2012) confirms that sales markets of mountain products are local (61.2% of the respondents market their products locally), regional (54.5%), national (64.9%), at EU level (34.3%) and wider European or global level (15.7%). Mountain food products are distributed at all levels, with local level (direct marketing) and national level being the most common ones, but with export stages representing more than a third of the cases.

Figure 18: The extent to which respondents were distributing their products at different scales

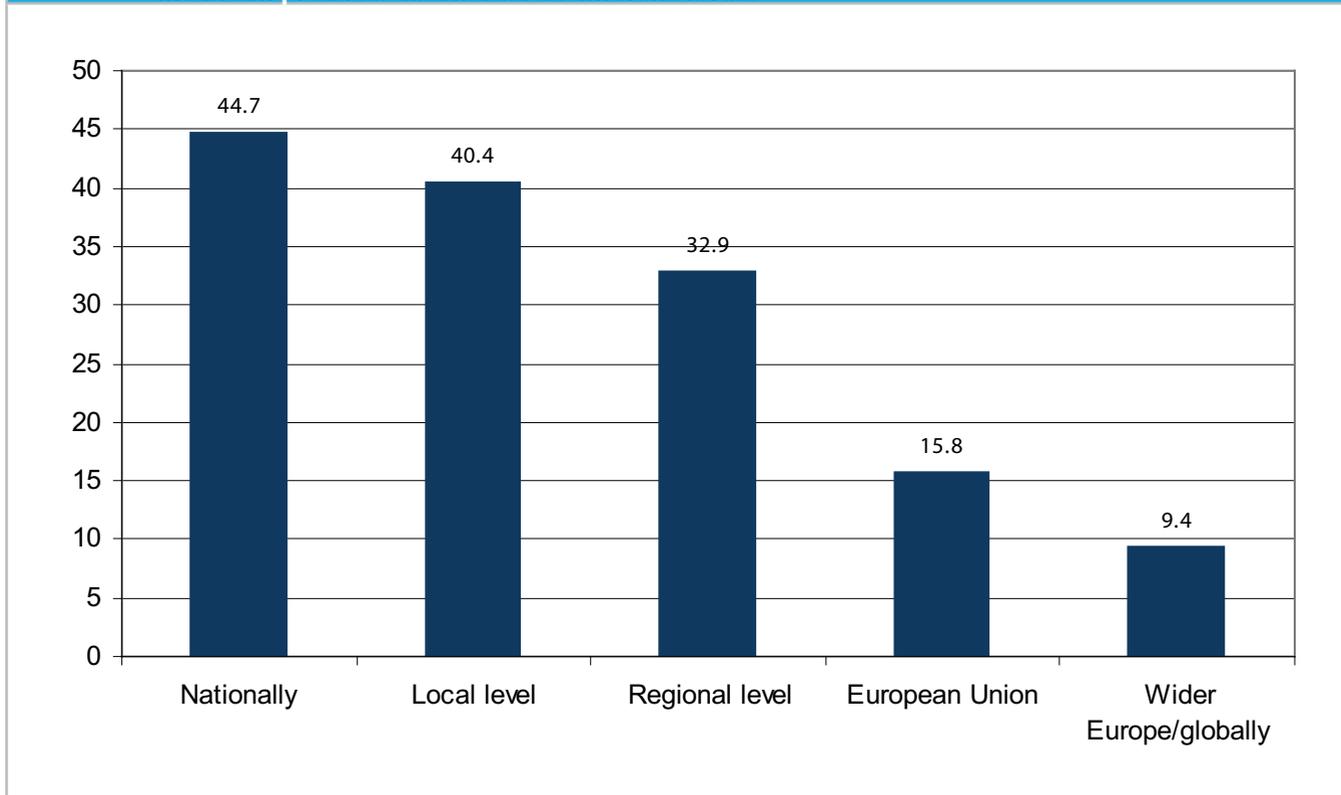


Source: ISARA 2012

Respondents were also asked to estimate the percentage of their total annual production distributed at each of the five proposed levels of distribution (local, regional, national, European Union and Wider Europe/Global). The average

response for each level is shown in Figure 19. The firms concerned by export (one third of the total) do export (within EU and in third countries) nearly one fifth of their sales.

Figure 19: Averages of responses on estimated percentage of total annual production volume for mountain products distributed at different levels



Source: ISARA 2012

The presence of mountain products in long distance markets is confirmed in the case of the French dairy supply chain (Reuillon, Perrot et al. 2012). 70% of mountain dairy firms export their products beyond the borders of France and 11% of the ones located in mountain have a turnover based on exports for at least 25% of its total. 8% of the French mountain milk supply chain corresponds to exports, principally towards Europe. However, lowlands milk firms are more present than mountain ones at export stage (industrial products, a major component of exports, are nearly exclusively produced in lowlands): in total mountain firms only represent 4% of the total French dairy exports (compared to 15% of the production and 11% of the processing).

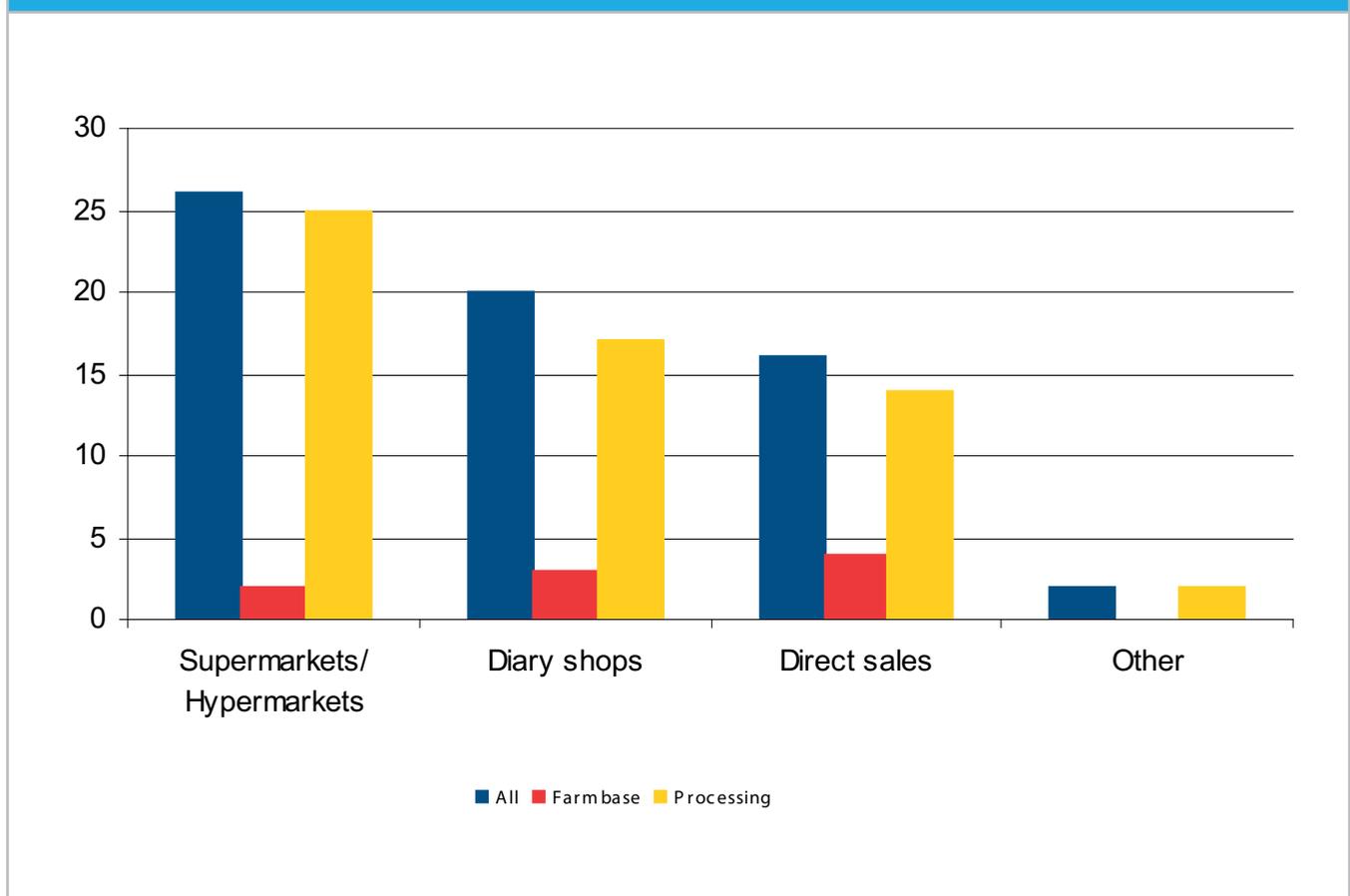
ii. Supply chains organisation

There is information concerning the organisation of supply chains for mountain products: many case studies have been carried out, however they do not provide with an overall picture. It seems that mountain products are in general sold by all types of retailers, including mass ones, and that the share of direct sales and their connection to local tourism can be important.

In Austria, for example, about 80% of retail market is in the hands of 4 companies (supermarkets) and mountain food products are also principally sold by supermarkets: there is no specific market channel for them. Mountain food products can be found in every channel. In Spain, 50% of the olive oil, whether mountain or not mountain, is sold under retailers brands. Only less than 20% of the volumes are sold locally or regionally in short channels such as direct sales (ISARA 2012).

The French Institute Centre National Interprofessionnel de l'Economie Laitiere (Cniel) analysed in 2009 the distribution channels of mountain dairy products. The study evidences that trade channels are diversified, despite mass retailing appearing as a key actor. Among 35 structures processing mountain dairy products, 33 provided information on their distribution channels: 26 provided their sales through large retailers, 20 provided product to wholesalers, 16 provided products to cheese stores and 13 marketed their products through direct sales (including 4 farm producers).

Figure 20: Distribution and retail outlets of mountain products (number of actors)



Source: CNIEL 2009

For dairy products, the type of product is more important to determine the type of retailing than the origin (mountain or not): 92% of generic dairy products (96% for cheese) are purchased by households in large retailers in France (Reuillon, Perrot et al. 2012). The share sold locally or via short supply chains is higher for PDO products and for on-farm processed

distribution. Depending on the product the distribution channels are highly variable. For instance, 98% of the distribution of Terrincho male lamb occurs in grocers' channels; 90% of distribution occurs in restaurants for Bragançano lamb; and 95% in mass retailers for the Nordeste Alentejano male lamb. The same variability can be observed in retailing channels for goat based products.

Table 31. Retailing channels (%) for sheep/goat based products in Portugal

Product	Butcher	Restaurant	Grocers'	Mass retailer	Direct sale
Lamb / Sheep (Borrego / Cordeiro)	2.7	2.3	0.5	89.8	4.6
Goat (Cabrito)	23.0	32.5	23.9	12.6	23.0

Source: IDRHA, 2005 quoted by (Costa Teixeira 2009)

products. For the latter, the share of French dairy farmers involved in direct sales is twice more in mountain area than in the lowlands (13% of farmers versus 6.6%), and the part of the quota allowed for direct sales (of on-farm processed cheese and other products) is 5.4% in mountain areas versus 0.7% in lowlands. Direct sales represent between 10 and 13% of the quota in the Pyrenees, Alps and Vosges massifs.

The importance of direct sales in the Austrian dairy supply chain is equivalent both for mountain products and lowland ones: approximately 1% of the total quantities marketed (BABF 2012). The quantities directly sold on alpine pastures (12 000 T, e.g. 0.5% of total milk deliveries, but close to 20% of the total summer milk production in alpine pastures).

Spanish Idiazabal cheese is marketed through a combination of short supply channels (more used by individuals) and marketing to large supermarkets (more used by factories). About 90% of cheese is commercialized in the Basque country and Navarra though (ISARA 2012).

For lamb and goat meat, Costa Teixeira (2009) identifies how mountain producers of sheep and goats organize their

Other products, of higher quality and covered by a PDO, are principally sold locally (direct and local sales): for the French Tome de Bauges, direct sales at the cheese dairy shop account for between 25% and 63% of turnover; Polish Oscypek smoked cheese distribution is mainly characterized by direct sales involving many individual actors. As production developed, specialists note further distribution to Krakow and coastal tourism destinations.

Processing of products from mountain areas is usually partly realised in neighbouring lowlands. There is an interlinkage between mountain economies and their surrounding areas. Processing capacities are in general not sufficient in mountain areas. However, there are some sectors, in particular meat products, where processing in mountain areas needs lowlands raw materials. For the final stages of the supply chains, mountain products do not fundamentally diverge from any other food supply chain: mountain products are sold in mainstream trade channels, everywhere in Europe and beyond. Due to the importance of niche products and traditions, there might be an importance slightly higher than average of local sales and short supply chains for mountain products, in connection with rural and mountain tourism.

4 Impact of mountain agricultural and food products for farmers and the society

The purpose of this section is to analyse the point of view of farmers (and other stakeholders), citizens and consumers and the reasons for them to ask for information on the provenance of mountain agricultural and food products (and of raw materials and places of processing where applicable).

farm gate prices is the key to profitability and economic sustainability of the production of agricultural goods and food in mountain areas. The purpose of this section is to better capture the reality of output and costs related to the different products supplied by mountain farming.

4.1 Farm impact: farm gate prices and cost structure for mountain products

4.1.1 Output aspects

i. Farm gate prices

ALL SECTORS

Agriculture in mountain areas suffers from several handicaps compared to lowland regions, which limits its socio-economic development and threatens its capacity to deliver public goods (e.g. landscape, cultural heritage). As highlighted by NORDREGIO (2004), low economic opportunities associated to high costs of production determine a process of abandonment which in turn produces less investment in public services and, thus, further dynamics of out-migration. The extent to which higher costs are compensated by higher

In terms of farm gate prices (Table 32), in most cases, there is a positive difference between average price levels in mountain areas and average price levels in lowlands areas, ranging from a moderate difference (milk, nuts, beef with a gap of around 10%) to a more significant one (14 % and over for ewe and goat milk, apples and pears, small fruit and berries, stone fruit, olives). On the contrary, there is no significant difference for pig and sheep / goat meat. For wine,

Table 32: Estimated Farm gate output / T of product

	Mountain	Lowlands	Difference in %
Cow milk	0.36	0.33	+9.4%
Ewe & goat milk	0.79	0.69	+14.1%
Bovine meat cattle	2.83	2.58	+9.6%
Sheep & goat meat cattle	1.20	1.21	-1.3%
Pig meat animals	1.19	1.21	-1.9%
Pome fruit	0.46	0.37	+25.1%
Nuts	1.36	1.22	+11.7%
Stone fruit	0.76	0.51	+49.0%
Small fruit and berries	1.33	1.09	+21.5%
Olives	0.79	0.69	+14.2%
Wine (grapes)	0.72	0.79	-9.7%

Source: own elaboration from EU-FADN (2007-2008) – DG AGRI

the level of price at farm gate in mountain areas seems to be significantly less than in lowlands.

DAIRY SECTOR

Similar calculations have been carried out, with different assumptions and methods, for the milk sector by Perrot, Derville et al. (2009) (Table 34) on FADN 2005 data and by EC (2009) on FADN 2006 data. They respectively obtain a farm gate price premium of 11.5% and 11% between mountain milk and lowlands milk.

Concerning milk, the EU average hides divergent patterns in the different MS. The price gap is in general positive in

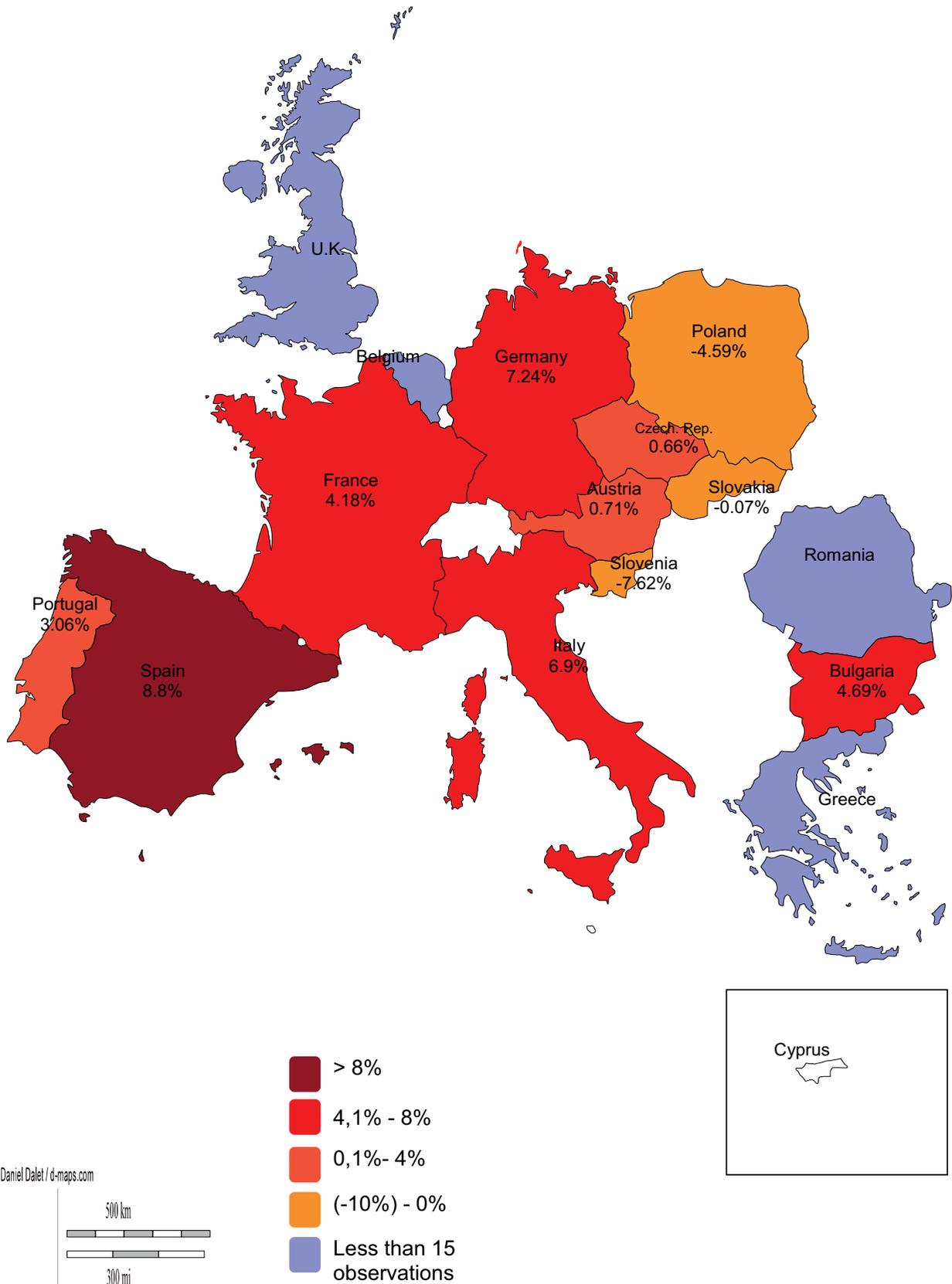
the EU-15, particularly in Germany and Italy, both according to Perrot, Derville et al. (2009) and our own calculations (Table 33). On the contrary, in EU-12, in general, mountain milk price level seems lower (Slovenia, Poland, Slovakia) than in lowlands (or with a smaller price premium in Czech Republic). This might reflect the fact that there are less quality schemes available for milk and cheese in EU-12 than in EU-15 and markets more focused on commodities rather than segmenting different qualities of products. If all products are paid at similar prices by the collecting body, the higher collection cost in mountain will be more likely to impact negatively on the farm gate price.

Table 33: Cow milk price difference between mountainous areas and low land areas (€/l)

	National price	Mountain area	low land area	diff	% of national price
Bulgaria	0.28	0.29	0.28	0.01	4.69
Czech Republic	0.31	0.315	0.313	0.002	0.66
Germany	0.34	0.37	0.34	0.02	7.24
Spain	0.37	0.40	0.36	0.03	8.85
France	0.33	0.34	0.33	0.01	4.18
Italy	0.40	0.42	0.39	0.03	6.91
Austria	0.36	0.356	0.353	0.003	0.72
Poland	0.28	0.26	0.28	-0.01	-4.60
Portugal	0.33	0.34	0.33	0.01	3.06
Slovakia	0.3028	0.3026	0.30	-0.0002	-0.08
Slovenia	0.30	0.28	0.30	-0.02	-7.62
Europe	0.34	0.36	0.33	0.03	9.38

Source: own elaboration from EU-FADN (2007,2008) – DG AGRI

Map 8: Price difference between mountainous and lowland cow milk



Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Table 34 – Milk price lowland / mountain (€/ton)

	Plain	Mountain	Gap
Italy	377	392	15
Sweden	324	330	6
Finland	324	329	5
Netherland	309		
Denmark	309		
Spain	305	313	8
France	295	323	28
Austria	289	286	-3
Germany	289	299	11
EU25	288	321	32
Portugal	279	282	5
Czech Republic	272	277	5
United Kingdom	267		
Ireland	264		
Slovenia	260	249	-11
Slovakia	244	246	2
Poland	223	211	-12

Source: Perrot, Derville et al. 2009

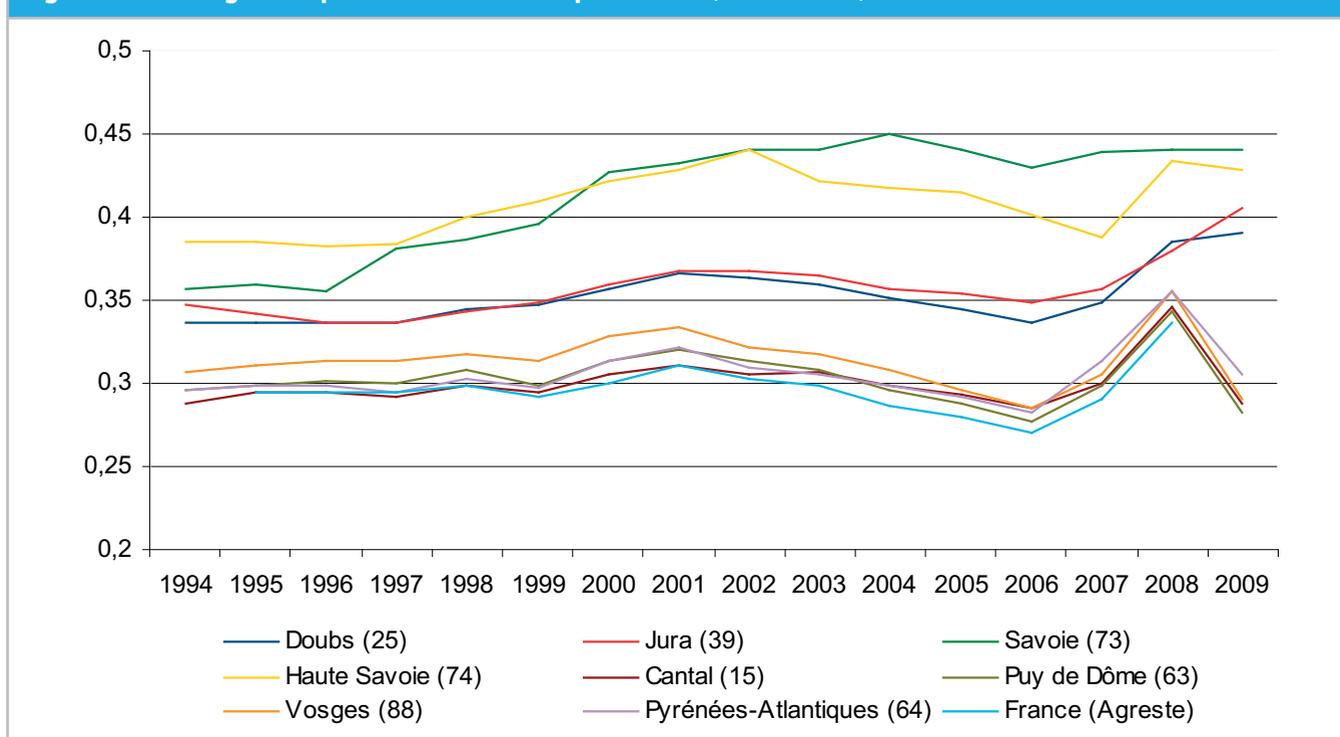
EC (2008) confirms this trend of higher prices at farm gate in average for dairy specialised farms (FADN 2005) : the average price in LFA mountain (333€ per ton) is higher than the one in farms of altitude above 600 m (316€ per ton) and than the total average (297€ per ton). Higher production prices are acknowledge in EU-15 members States, but not in some EU-12 ones (Slovenia, Slovakia, Poland).

In France (Figure 21), a regionally focused approach (Reuillon, Perrot et al. 2012) allows identifying regions where the farm gate price is significantly higher in mountains (Alps and Jura), while this is not the case in other mountains (e.g.

Massif Central). This reflects three different modalities for the distribution of value added within the dairy supply chain:

- a 'cheese' system, with strong PDOs, where milk price is directly derived from the valorisation of cheese;
- a 'generic' milk system where price is negotiated on the base of general interbranch trends;
- a mixed system where average price is fixed as in the generic system, but is complemented by a quality premium referring to PDO specifications (between 0.4€ and 24€ per 1000 l in 2011).

Figure 21: Average milk price for 9 French departments (1994-2009)



Source: Reuillon, Perrot et al. 2012

Figure 21 shows that there is an advantage to 'cheese' systems in terms of milk farm gate price. On average 1995 – 2009, milk price in the cheese system has been 30% above the French average (20% in Jura and 40% in Savoie), with an apparent lower volatility. Massif Central (Cantal, Puy de Dôme) and Vosges would fall under the category mixed system: despite the presence of several PDOs, average milk price remains close to the national average. The quality premium is not directly linked to the valorisation of PDO cheese in these regions (Reuillon, Perrot et al. 2012). In

mountains where PDOs are less present (e.g. Pyrénées-Atlantiques), the generic system applies.

In Austria (Table 35), a comparison of milk producer prices shows that dairies in provinces where organic production and/or PDO cheeses are important (e.g. Salzburg and Vorarlberg) offer higher farm gate prices. This results in a trend of higher price in the provinces with higher shares of mountain areas, specifically the Western provinces of Austria where cheese processing is important (BABF 2012).

Table 35 – Milk producer prices in Austria in cent/kg (2010)

Province	Dominating region type	Supplement organic	Supplement haymilk	Net producer price
Lower Austria	Mixed, flatland	0.62	0	34.92
Upper Austria	Mixed	0.44	0.04	34.90
Salzburg	Mixed, mountains	2.42	0.83	36.51
Styria	Mixed	0.96	0.18	35.47
Carinthia	Mixed, mountains	0.74	0	35.19
Tyrol	Mountains	0.86	0.97	35.58
Vorarlberg	Mixed, mountains	0.39	1.18	36.87
Austria		0.86	0.3	35.37

Source: BABF 2012

OTHER SECTORS

For apples and pears, on average in the EU, the mountain price is also significantly above the price of apples and pears produced in lowlands (Table 36). This is the case in most MS, but at different degrees: mountain prices are particularly good in France and Austria, while they are closer to the average in Italy and Slovenia. As for milk, for certain Member States, the price in mountain areas appears to be lower than in lowlands (Greece, Cyprus, Portugal): such results should be taken with caution though (small samples within FADN).

Concerning olives, a case study carried out in the province of Jaen (Sanz Cañada, García Brenes et al. 2012) shows that average farm gate price for olives is slightly higher for farms characterised by mountains olive groves. In average, the price premium at farm gate for olives for the LFA mountain area within the province of Jaen is of 4 to 5% (depending of the assumptions on the yields), around 2 cents per kilo of olive. After processing, the price difference of oils is also quite small for commodity trade (bulk), with a slight price premium for mountain olive oils. (Table 37).

Table 36: Apple price difference between mountain areas and lowland areas

	National Price (€/kg) (a)	Mountain areas price (€/kg) (c)	Lowland price (€/kg) (b) (d=c-b)	Price difference (€/kg)	% of national Price (d/a x 100)
Cyprus	1.10	1.08	1.16	-0.08	-7.4
Greece	0.59	0.58	0.60	-0.02	-2.7
France	0.43	0.52	0.43	0.09	21.8
Italy	0.44	0.46	0.43	0.03	6.7
Austria	0.45	0.57	0.44	0.13	29.5
Poland	0.23	0.28	0.23	0.04	17.9
Portugal	0.73	0.23	1.29	-1.06	-144.9
Slovenia	0.40	0.41	0.40	0.01	2.5
EU-27	0.38	0.46	0.37	0.09	23.9

Source: own elaboration from EU-FADN (2007, 2008) – DG AGRI

Table 37: Ponderated average price of olive oil (bulk) - €/kg

	2009/2010	2010/2011
Mountain with PDO	1.80	1.78
Mountain without PDO	1.84	1.77
Lowlands	1.81	1.74

Source: Sanz Cañada, Garcia Brenes et al. 2012

ii. Gross saleable production

When the dimension of yield is incorporated to the picture, (Table 38), the results differ. The following calculations have been made on GSP (Gross saleable production¹⁵) for six regions (or MS) (ISAGRI 2012).

In general, the slight price premium obtained per unit of product is offset by lower yields (per ha and/or LSU): crop

production and, to a lesser extent, livestock production in non-mountain areas are generally more productive than in mountain areas. In some cases, the yield is lower in mountain areas than in lowlands and this implies that the GSP is higher in lowlands although price is higher in mountain: this is the case for several crops in different regions (e.g. wheat in Andalusia or apples and pears in Slovenia), as well as for several dairy sectors in different regions.

Table 38: GSP per product– difference¹⁵ (€/ha or €/LSU) between mountain farms and lowland ones (* not available or less than 15 observations) (2008)

	Andalusia	Rhône Alpes - Provence	Emilia Romagna	Austria	Romania	Slovenia
Common wheat	-591	-110	*	-171	+105	-5
Barley	-322	-105	+62	-250	*	+106
Maize	*	-239	*	+13	+96	-37
Stone fruit	*	-2 128	*	*	*	*
Olive	-832	*	*	*	*	*
Pome fruit	*	+5 373	*	-960	- 3576	-232
Nuts	*	-605	*	*	*	*
Beef	*	-47	-101	-157	+4	+18
Goat and sheep meat	-202	*	*	+599	+62	
Cow milk	*	-126	-43	-39	-94	-68
Goat and sheep milk	-22	*	*	-59		-478

Source: ISAGRI 2012

¹⁵ Gross saleable production (GSP) = price (Euro/ton) x yield (ton/ ha or ton/ LU)

¹⁶ Negative figure indicates that the GSP/ha or LU is higher in lowlands than in mountains

4.1.2 Production cost aspects

For the purpose of estimating costs of production per product on the base of FADN data, a procedure of Generalized PMP (Positive Mathematical Programming) cost estimator

is implemented (see box 1). Such model is applied for determined NUTS 1 or 2 areas (Austria (as a region), Emilia Romagna in Italy, Rhone-Alpes and Provence (France), Andalusia (Spain), Slovenia (as a region), Romania (as a region)) by ISAGRI (2012).

Box 2 – PMP model to estimate costs per activity (ISAGRI 2012)

The objective of a PMP model is to recover a part of the information not directly collected at farm level but which is taken into account within the decision making process of farmers. The model assumes different meanings as price expectations, specific wish, production preferences linked to the technological skills of the entrepreneurs. This part of the information, which is lacking inside the FADN database, can be derived through the PMP properties. The implicit information to reveal is the vector λ_n that contain for each farm the adding marginal cost considered by farmers in defining a certain production plan with the explicit cost c_n . Adopting the generalized PMP approach the following problem can be introduced:

$$\min_{u_n, y_n, \lambda_n, Q} \left\{ \sum_{n=1}^N \frac{1}{2} u_n' u_n + \sum_{n=1}^N (b_n y_n + \lambda_n' \bar{x} + c_n' - p_n' \bar{x}_n) \right\} \quad (1)$$

Subject to:

$$A_n' y_n + \lambda_n + c_n \geq p_n \quad (w_n) \quad (2)$$

$$c_n + \lambda_n = Q \bar{x}_n + u_n \quad (z_n) \quad (3)$$

Where: $y_n \geq 0$; $\lambda_n \geq 0$ and Q is a matrix symmetric positive semidefinite as stated by Paris and Howitt (1998) and Paris (2011). w_n and z_n are the shadow prices associated to the equations (2) and (3) respectively. u_n is the vector of marginal cost deviations per farm, that is the distance between the marginal cost $c_n + \lambda_n$ and the marginal cost $Q \bar{x}_n$ of a non linear cost function to estimate, so that $c_n + \lambda_n - Q \bar{x}_n = u_n$. The parameters of Q to estimate are part of a quadratic cost function aiming to give flexibility to model responses towards to farm simulations. The model is optimized by a combined objective function, (1), that considers a least-squares technique and the minimization of the difference between the total revenue $p_n' \bar{x}_n$, and the total costs $b_n y_n + \lambda_n' \bar{x}_n + c_n' \bar{x}_n$. This latter identifies the optimal condition for the PMP standard approach, or in general terms that, at the optimum, the primal objective function should be equal to the dual one. The model above integrates the first and the second phase of the standard PMP approach by using the PMP dual properties. In this model, there is no explicit trace of the calibrating constraints nor the epsilon terms that help to break the linear dependency between structural and calibrating constraints. The constraints of the model (2) (3) concerns the equilibrium conditions with marginal cost greater than or equal to marginal revenue and the relation for shifting from a linear to a quadratic cost function. The model does not repeat the tautological procedure of the standard approach deriving the information about the output levels, already known before developing the model, but reveals the hidden information about the differential marginal costs inside the production levels and makes it available for the simulation phase.

Source: ISAGRI 2012

The results are presented as follows: (i) specific costs structure (i.e. variable costs not allocated in FADN database to an activity): the average costs structure of farms (mountain and lowland) between livestock and crop products is presented. This description allows to understand the structure of mountain farming; (ii) specific cost estimator: the results of the simulations are presented for each region. The results are supposed to represent the costs allocated for each activity of the farm. They allow to identify the differences in cost of production per type of crop or animal production; (iii) gross margin: the information derived from the cost estimator is compared to the information on the same sample concerning the output.

i. Specific costs structure

In most mountain regions (Table 39), the share of the livestock costs is larger (60 to 95% of the total costs) than the one for crops, which is not the case for lowlands farms. This is consistent with the fact that animal productions are dominant in European mountains. The share of crop specific costs is higher in regions where the importance of crop production is higher (e.g. Andalusia, Provence, Romania).

The total amount of cost per hectare for crop products is superior in lowlands than in mountain areas. In all regions (except Romania), the average cost per hectare in mountain is less than 40% of the average cost per ha in lowlands. The situation is different for animal production, where the costs per LSU in mountains and lowlands are close to each other. Livestock costs per LSU in mountain equal or exceed at least 70% of livestock costs in lowlands.

The distribution between the different types of arable crop costs is not fundamentally different in mountain areas and lowlands. For certain regions, the predominance of certain crops at regional level may lead to a particular costs structure (e.g. the permanent crops in Andalusia might explain the importance of crop protection products). For livestock, feed costs represent the main cost both in mountain and lowlands (over 80%), but in mountain areas they are concentrated on grazing livestock, while in lowlands they are also important for granivores.

Table 39: FADN specific cost structure in six regions (MS)

Specific Cost Typology	Cost Type Incidence (%)						Cost Type Incidence (%)					
	LFA Mountain						Other areas					
	Andalucia	R-A/PACA	E-Romagna	Austria	Romania	Slovenia	Andalucia	R-A/PACA	E-Romagna	Austria	Romania	Slovenia
Seeds*	3.6	9.0	1.6	6.0	10.8	2.1	17.1	19.2	13.4	17.6	5.2	
Fertilizers and soil improvers*	24.5	14.6	2.2	5.7	10.2	3.7	28.2	23.7	14.2	15.1	9.5	
Crop protection products*	12.2	8.6	0.9	2.3	7.2	1.6	23.6	22.5	9.5	8.6	4.5	
Other specific crops costs*	1.4	6.7	1.0	0.9	4.6	4.5	8.2	14.1	3.9	4.5	4.7	
Specific forestry costs*	0.0	0.0	0.0	0.5	0.1	0.4	0.0	0.0	0.2	0.0	0.1	
Total Specific Crop Costs*	41.7	38.9	5.7	15.4	32.8	12.4	77.1	79.6	41.2	45.7	24.1	
Feedingstuffs for grazing stock**	43.7	42.7	80.8	46.0	30.2	76.4	11.3	11.3	13.0	30.3	56.7	
Feedingstuffs for pigs**	10.4	5.9	0.2	11.8	10.5	3.4	6.7	2.1	32.6	7.4	12.3	
Feedingstuffs for poultry and other small animals**	0.0	3.0	0.0	11.3	15.8	0.9	2.2	3.4	5.1	8.1	1.5	
Other specific livestock costs**	4.1	9.5	13.3	15.5	10.7	6.8	2.8	3.6	8.1	8.5	5.5	
Total Specific Livestock Costs**	58.3	61.1	94.3	84.6	67.2	87.6	22.9	20.4	58.8	54.3	75.9	
TOTAL SPECIFIC COSTS*	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

Specific Cost Typology	Cost Type Incidence (€/ha or LSU)						Cost Type Incidence (€/ha or LSU)					
	LFA Mountain						Other areas					
	Andalucia	R-A/PACA	E-Romagna	Austria	Romania	Slovenia	Andalucia	R-A/PACA	E-Romagna	Austria	Romania	Slovenia
Seeds*	33.2	45.8	31.5	35.3	56.6	23.2	207.8	148.3	102.5	67.9	65.6	
Fertilizers and soil improvers*	56.5	66.6	54.1	50.6	52.8	61.3	194.7	170.3	118.0	60.5	127.6	
Crop protection products*	49.4	43.7	50.2	26.6	39.3	32.2	177.5	160.2	76.9	36.3	60.5	
Other specific crops costs*	63.3	89.2	27.0	19.6	54.5	54.8	172.0	497.3	47.5	29.9	72.5	
Specific forestry costs*	0.0	0.0	0.0	8.9	8.6	24.3	0.0	0.0	7.2	20.4	9.2	
Total Specific Crop Costs*	84.1	168.6	75.7	81.3	169.5	108.8	517.0	555.0	310.9	171.4	276.8	
Feedingstuffs for grazing stock**	295.6	250.5	920.1	290.3	420.0	569.2	339.4	214.2	267.7	270.0	647.0	
Feedingstuffs for pigs**	202.7	356.8	60.1	128.2	50.7	53.4	350.8	187.1	435.3	109.2	214.7	
Feedingstuffs for poultry and other small animals**	14.6	179.5	0.0	141.0	83.8	23.9	202.3	197.0	163.7	106.5	101.5	
Other specific livestock costs**	27.7	52.1	151.7	89.2	43.3	52.9	50.6	58.0	74.8	72.2	56.4	
Total Specific Livestock Costs**	369.3	335.1	1,067.8	486.1	266.2	641.9	411.5	331.9	537.5	372.0	741.3	
TOTAL SPECIFIC COSTS*	149.1	393.5	1,250.6	486.2	516.2	775.9	593.7	696.5	1,474.1	752.3	1,117.0	

* Cost/Ton, **Cost/LSU

Source: ISAGRI 2012

ii. Specific costs estimation per activity

The results of simulations carried out with the cost estimator are showing contrasted situations concerning costs of production and they do not allow easy conclusions as to whether production costs expressed per unit of production are higher or lower in mountain areas than in lowlands (Tables 40 and 41).

For most of the arable crops, the accounting costs in mountain are lower than in lowlands in Austria, Rhône-Alpes & Provence and Andalusia. As mentioned above, crops are cultivated in mountain areas with less input and therefore such result tends to demonstrate that in certain areas, low input agriculture is rather efficient. There are however several counterexamples, e.g. in Romania or Slovenia. Concerning forage crops, the situation is also diverse with

many situations where costs per unit of product are higher in mountains and opposite situations.

Concerning permanent crops, there seems to be a clearer trend for higher production costs in mountain areas: the two only exceptions would be apples and pears in Romania (with a very low input level reflected by an average cost of 16 €/ha) and olives for oil in Andalusia. In the other regions, in general, unit costs of production are higher in mountain areas for pome fruit, nuts or stone fruit.

Lastly, the cost estimations for animal production in mountain areas do not show a clear trend for higher or lower production costs. Globally meat products seem in general to be produced at lower costs in mountain areas, while for dairy products, the opposite situation (higher production costs in mountain areas) seems to be more frequent.

Table 40: Comparison of specific cost estimates – Mountain vs. Non mountain (%)

	Andalusia	Rhône-Alpes/ PACA	Emilia- Romagna	Austria	Romania	Slovenia
Common Wheat	-25.6	-5.5	*	-31.8	10.0	6.7
Durum wheat	-12.9	*	*	*	*	*
Barley	0.0	5.4	15.2	-20.2	*	7.6
Maize	*	-17.5	*	-24.1	18.9	11.2
Other cereals	*	*	*	-21.8		
Potatoes	*	*	*	15.4	-23.5	-5.8
Temporary grass	*	*	*	*	*	33.6
Pasture	*	*	*	*	*	-18.9
Fodder maize	*	5.8	*	-0.3	*	-0.5
Alfalfa	*	*	2.5	-1.7	-18.1	*
Rape seed	*	*	*	-5.3	*	*
Leek	*	*	*	*	*	-19.8
Pome fruit	*	40.2	*	21.5	-88.4	90.0
Stone fruit	*	66.8	*	*	*	*
Nuts	*	8.4	*	*	*	*
Oil olive	-15.9	*	*	*	*	*
Beef	*	0.6	-2.5	-4.6	-44.4	18.8
Goat and sheep meat	-6.0	*	*	14.3	-13.8	-2.9
Cow milk	*	2.2	-3.9	0.3	-24.6	-2.7
Goat and sheep milk	-5.9	*	*	31.4	-24.1	31.4

Source: ISAGRI 2012

Table 41: Comparison of specific cost estimates – Mountain vs. Non mountain (ctd)

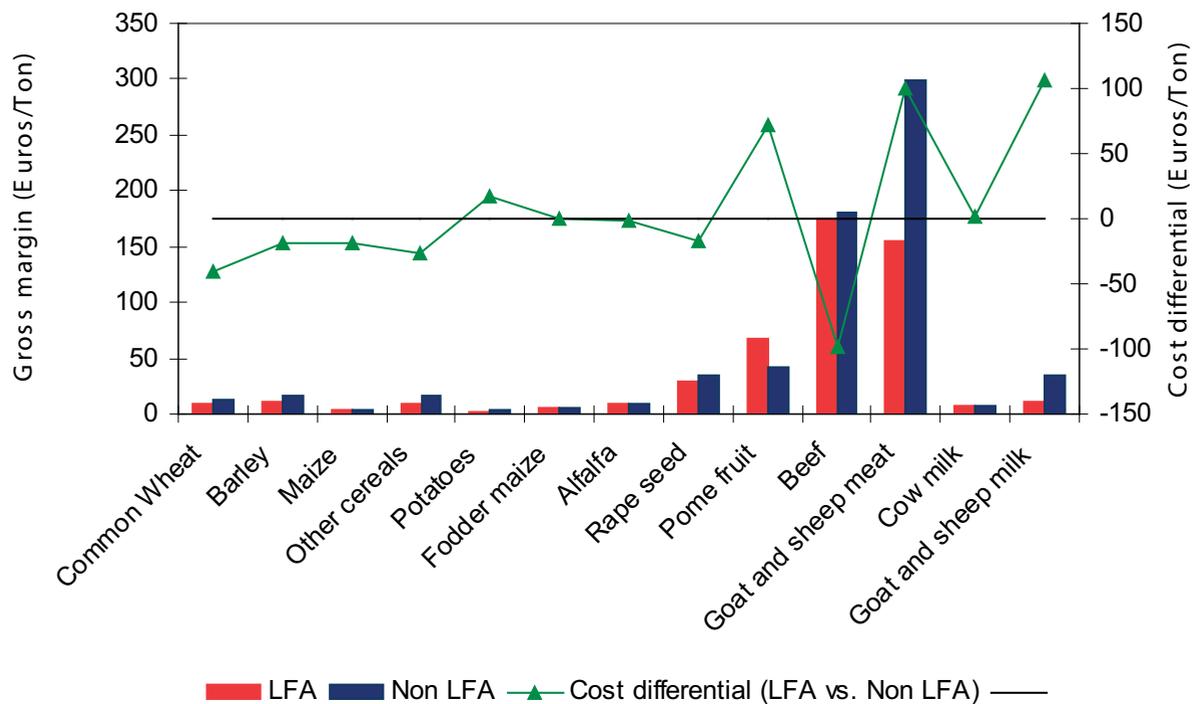
Product	Cost estimator (€/T) LFA Mountain						Cost estimator (€/T) Other areas					
	Andalucia	Rhône-Alpes/PACA	Emilia-Romagna	Austria	Romania	Slovenia	Andalucia	Rhône-Alpes/PACA	Emilia-Romagna	Austria	Romania	Slovenia
Common Wheat	141.1	124.8	*	88.8	82.8	111.7	189.8	132.1	*	130.1	75.2	104.7
Durum wheat	202.1	*	*	*	*	*	232.1	*	*	*	*	*
Barley	136.9	114.1	138.3	76.9	*	78.9	137.0	108.3	120.0	96.4	*	73.3
Maize	*	93.4	*	57.5	105.7	105.9	*	113.2	*	75.7	88.9	95.2
Other cereals	*	*	*	96.2	*	*	*	*	*	123.0	*	*
Potatoes	*	*	*	133,6	112.2	100.8	*	*	*	115.8	146.8	107.0
Temporary grass	*	*	*	*	*	32.7	*	*	*	*	*	24.5
Pasture	*	*	*	*	*	46.9	*	*	*	*	*	57.8
Fodder maize	*	23.8	*	23.7	*	23.1	*	22.5	*	23.8	*	23.2
Alfalfa	*	*	75.0	72.2	55.7	*	*	*	73.1	73.5	68.0	*
Rape seed	*	*	*	304.0	*	*	*	*	*	321.1	*	*
Leek	*	*	*	*	*	308.7	*	*	*	*	*	385.0
Pome fruit	*	562.1	*	409.3	16.7	352.8	*	401.0	*	336.8	143.0	185.7
Stone fruit	*	1 830.2	*	*	*	*	*	1 097.6	*	*	*	*
Nuts	*	2 257.8	*	*	*	*	*	2 083.3	*	*	*	*
Oil olive	485.0	*	*	*	*	*	576.6	*	*	*	*	*
Beef	*	2 098.5	1 725.7	2 041.76	206.6	890.5	*	2 086.7	1 770.2	2 140.19	371.6	749.4
Goat and sheep meat	3261.6	*	*	798.1	473.0	1 616.2	3 470.9	*	*	698.3	548.5	1664.5
Cow milk	*	346.8	374.7	374.3	146.7	194.7	*	339.2	390.1	373.2	194.6	200.0
Goat and sheep milk	464.7	*	*	446.8	155.8	446.8	493.8	*	*	340.0	205.3	340.0

Source: ISAGRI 2012

iii. Gross margin

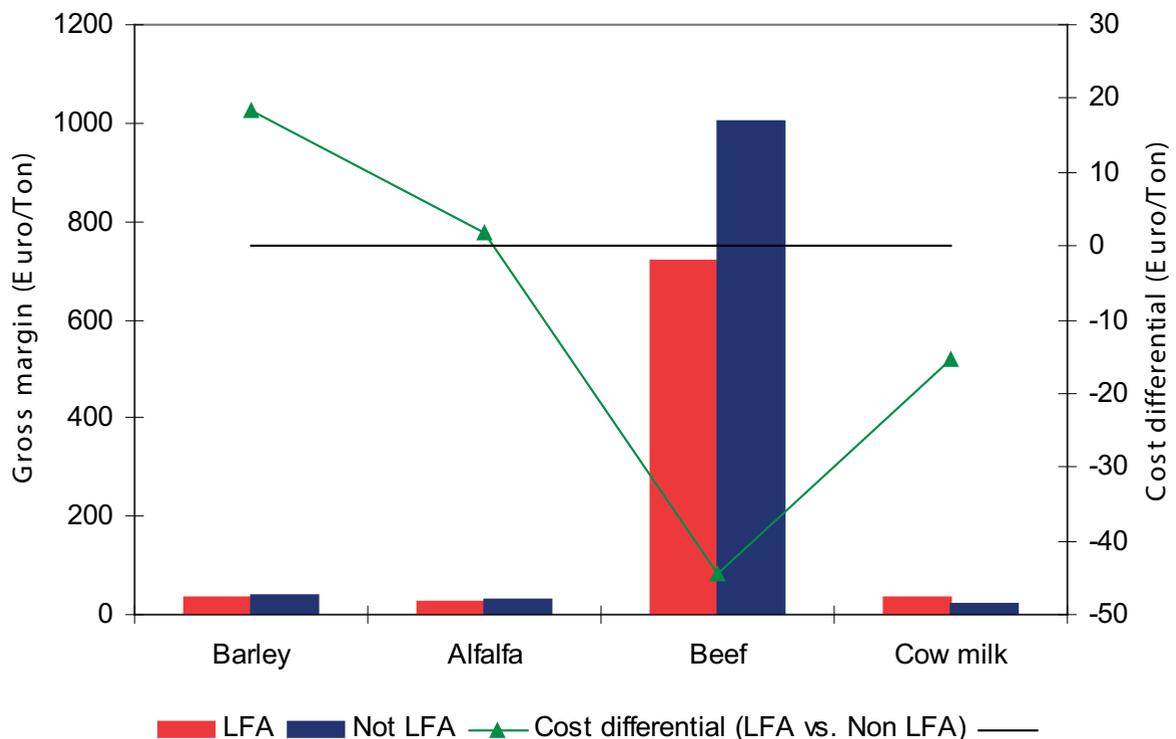
Figures 22 to 27 capture for each region considered the gross margin per product (price – cost estimated) in LFA mountain areas and in other areas.

Figure 22: Gross margin and cost differential for Austria



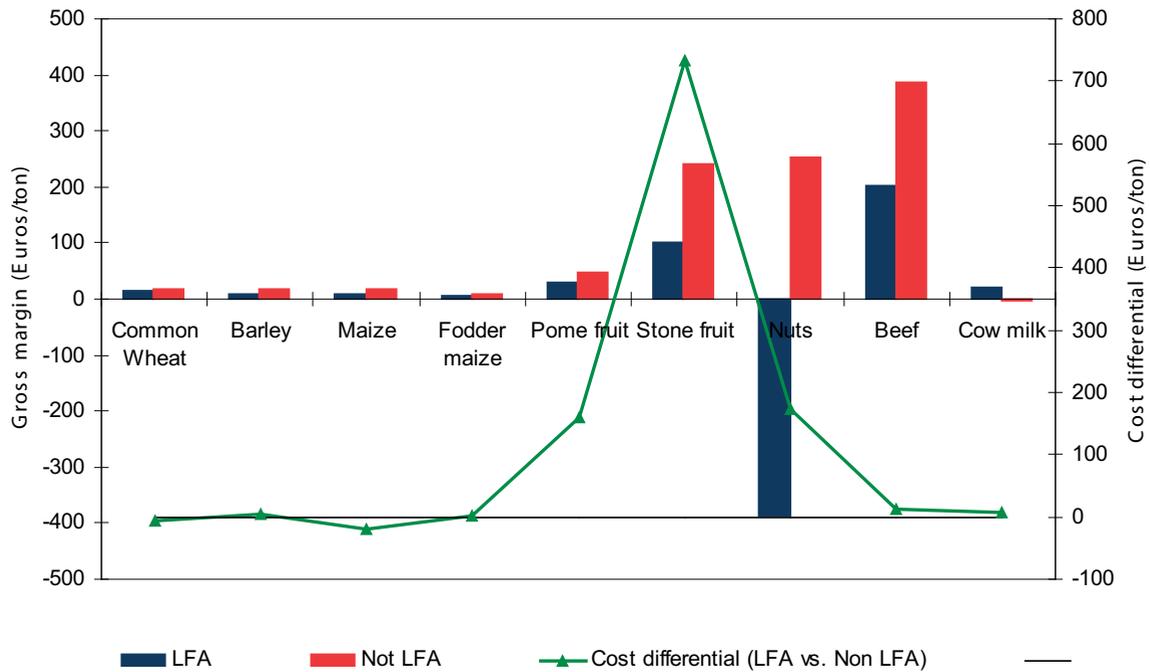
Source: Own elaboration from ISAGRI 2012

Figure 23: Gross margin and cost differential for Emilia Romagna



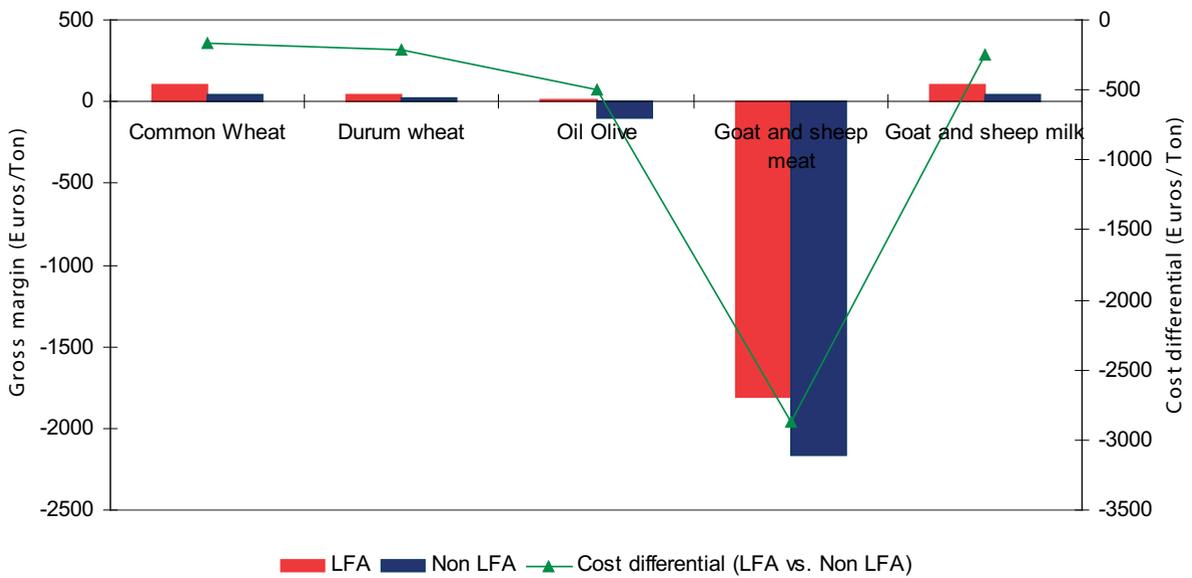
Source: Own elaboration from ISAGRI 2012

Figure 24: Gross margin and cost differential for Rhône-Alpes and Provence



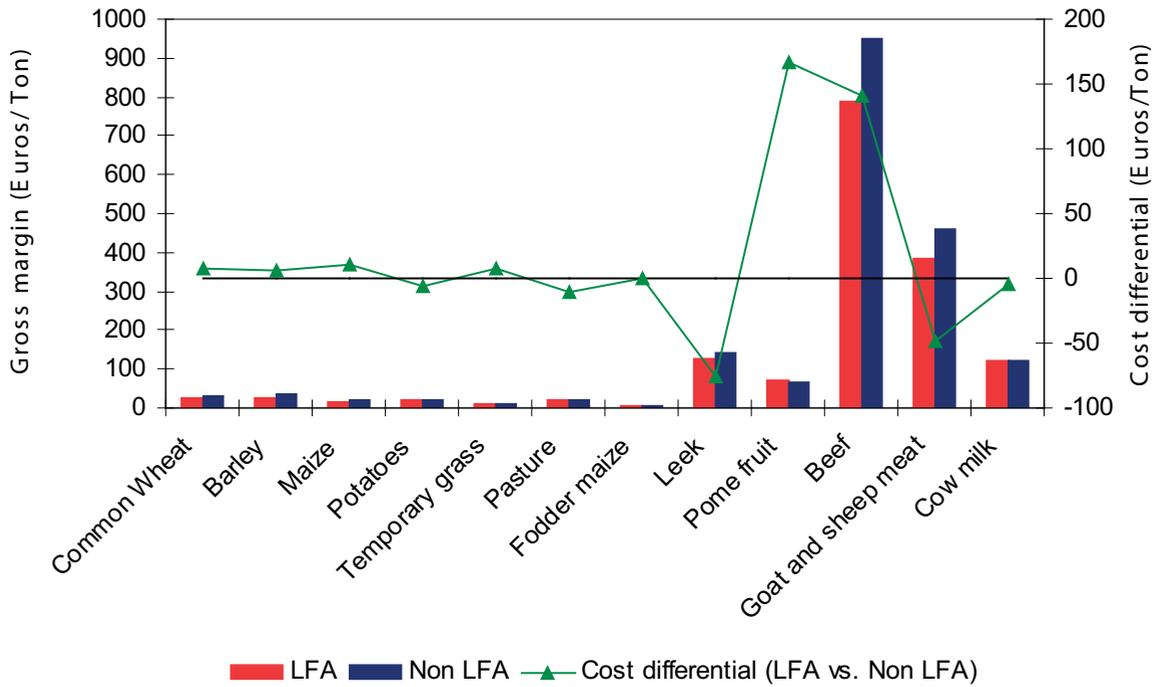
Source: Own elaboration from ISAGRI 2012

Figure 25: Gross margin and cost differential for Andalusia



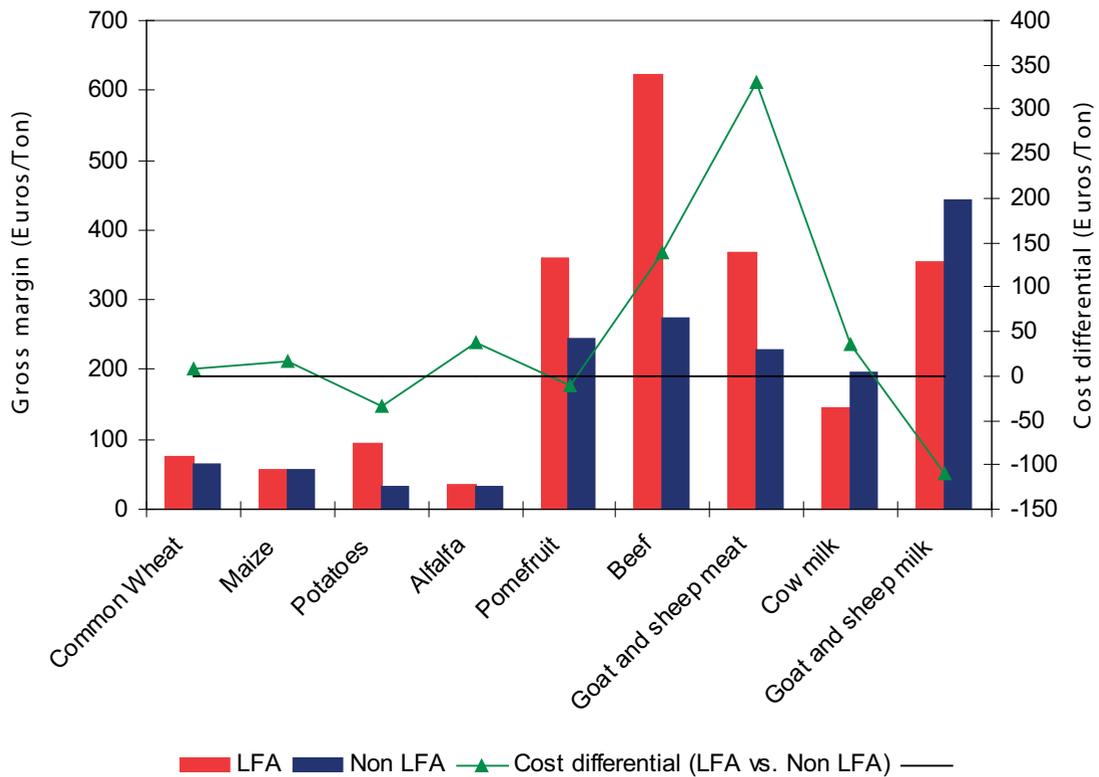
Source: Own elaboration from ISAGRI 2012

Figure 26: Gross margin and cost differential for Slovenia



Source: Own elaboration from ISAGRI 2012

Figure 27: Gross margin and cost differential for Romania



Source: Own elaboration from ISAGRI 2012

As for costs of production, results expressed in terms of gross margin are such that no straightforward conclusions can be drawn. Two of the regions (MS) concerned (Andalucia and Romania) are characterised by a situation where the gross margin per quantity produced is higher in mountain areas than in lowlands for the majority of products. In the other four on the contrary, the gross margin is generally lower in mountain areas. One possible explanation is that LFA payments are particularly low in Spain and, in 2008, only starting for Romania: this could be a reason for mountain producers to focus more on profitable productions in these two regions.

In the four regions where gross margin is lower in mountain areas, the two only productions for which there are exceptions are respectively apples and pears (in Austria and Slovenia) and dairy (cow milk) (in Rhône-Alpes & Provence and Emilia Romagna).

iv. Specific studies on dairy cost of production

Several studies conclude that milk costs of production are higher in mountain areas than in lowlands. Cniel (2009) calculates that the total cost of production of milk was of 363 € per ton in mountain areas in selected countries of the centre of Europe¹⁸ in 2005, while it was of only 338€ per ton for lowlands, principally because of feed costs (+15%), costs related to buildings (+52%) and mechanisation (+24%).

Variable costs in dairy farms are also estimated (on the base of FADN 2006 data) to be higher in LFA mountain farms (213€ per ton) than in others (184€ per ton) according to EC (2008). However, because of higher prices, the gross margin is 20% higher in LFA mountain dairy farms (137€ per ton), compared with EU level (115€ per ton).

FRANCE

The case of France is well documented. Table 42 shows that the costs of milk production in different French mountain regions are consistently higher than in the lowland independently of production systems.

Table 42: Costs of production for milk in different areas and with different systems of production

Geographic zones	Grass feeding system			Maize feeding system	
	Lowlands	Massif Central mountains	Eastern mountains	Lowlands	Mountains
Production costs (€ per eq hl)	25.9	26.9	29.8	26.9	28.6
Difference between lowland and mountain (%)	-	+3.8	+15	-	+6.3

Source: CNIEL 2006

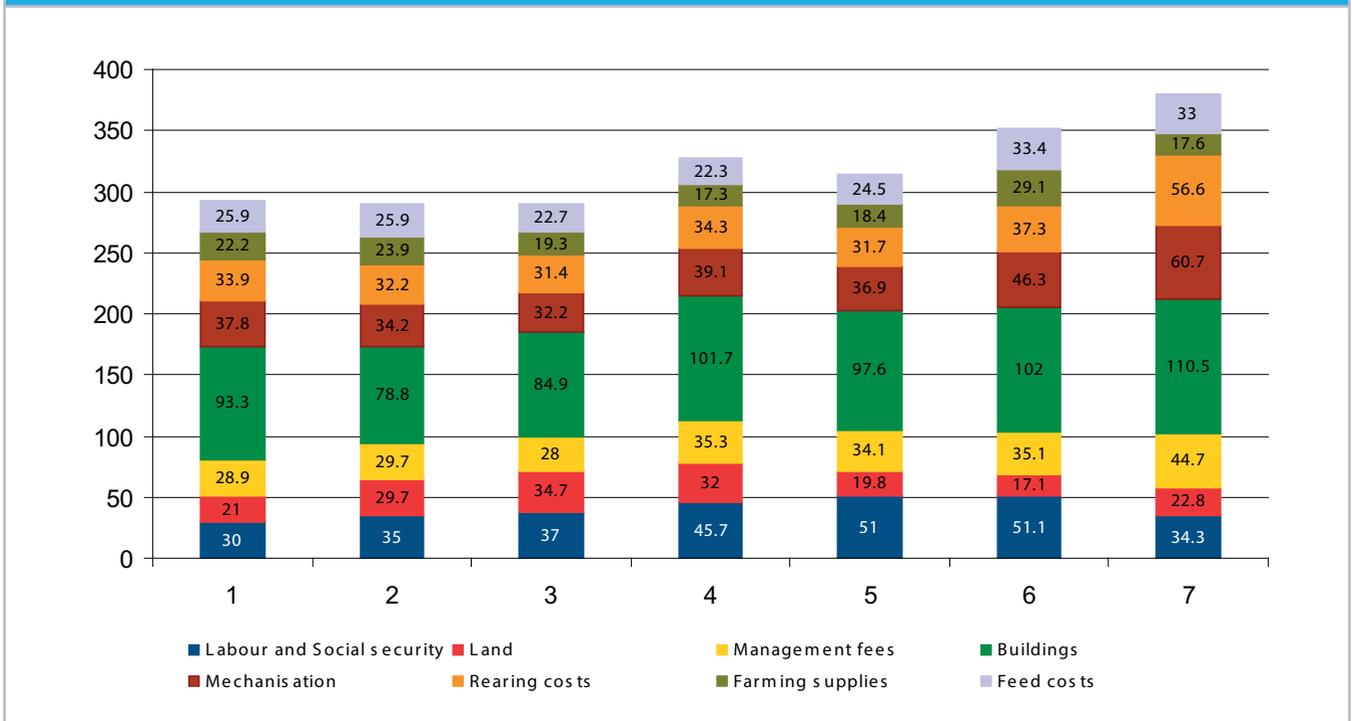
17 1) Grazing Lowlands; 2) Maize and grazing lowlands; 3) Maize lowlands; 4) Maize piedmont; 5) Grazing Massif Central; 6) Grazing Jura; 7) Grazing North Alps

18 France, Germany, Austria, Slovenia and Italy

Reuillon, Charrontin et al. (2008) show that feed costs are higher in mountain areas (Figure 28), for two main reasons: (i) transport costs are higher for feed purchased externally; (ii) extensive grazing which is widely practised in mountain farming, requires more land and working time. Higher transport costs also apply to other variable costs such as fertilisers. Figure 29 below show the distribution of production costs for different production systems localized in mountain or in lowland regions in France.

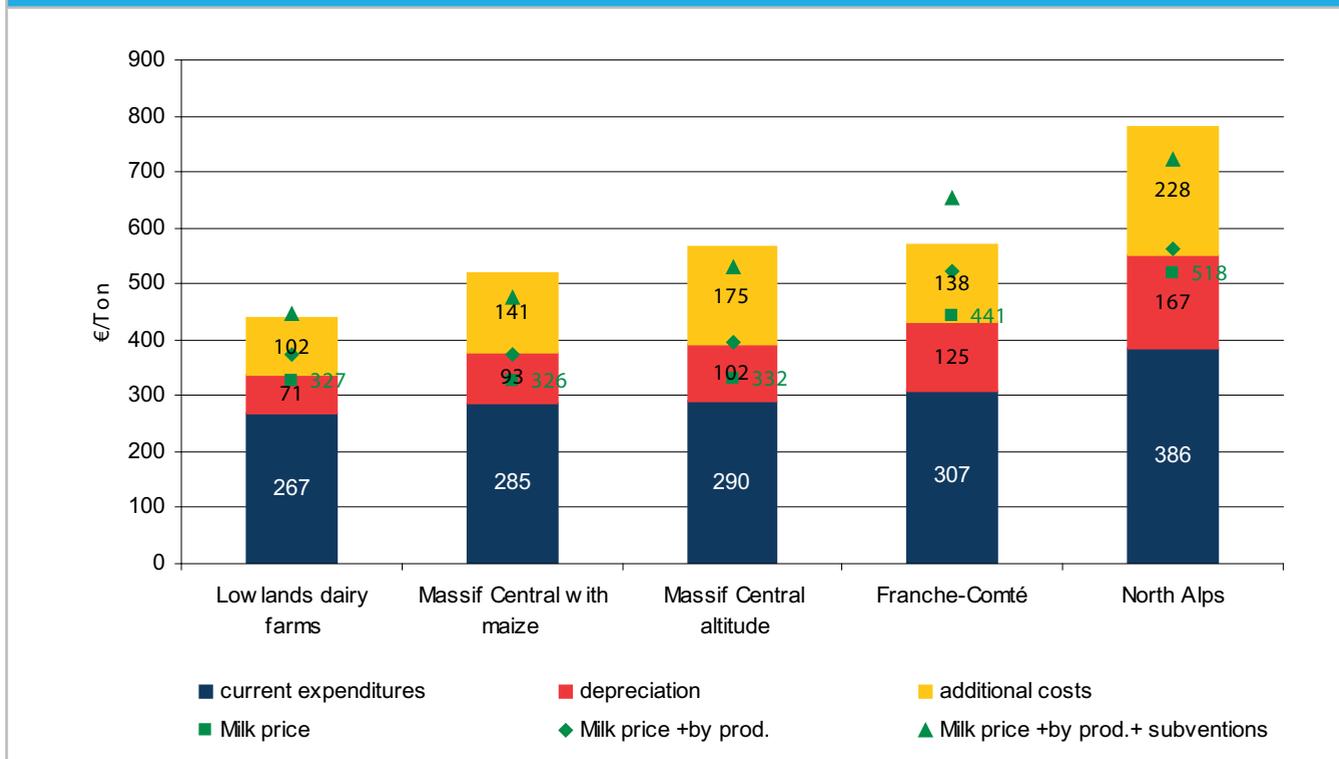
More recent studies based on a network of reference farms in France (Reuillon, Perrot et al. 2012) show that the differential of production cost between lowlands dairy producers and different types of mountain producers ranges from around 80 € per 1000 l for mountain farmers who have the climatic possibility to grow maize, to 130 € per 1000 l in the highest parts of Massif Central and Jura and up to 340 € per 1000 l in the Alps (Savoie).

Figure 28. Representation of different costs of production in different lowland and mountain areas



Source: Reuillon, Charrontin et al. 2008

Figure 29: Average production costs per type of dairy farms (2010)



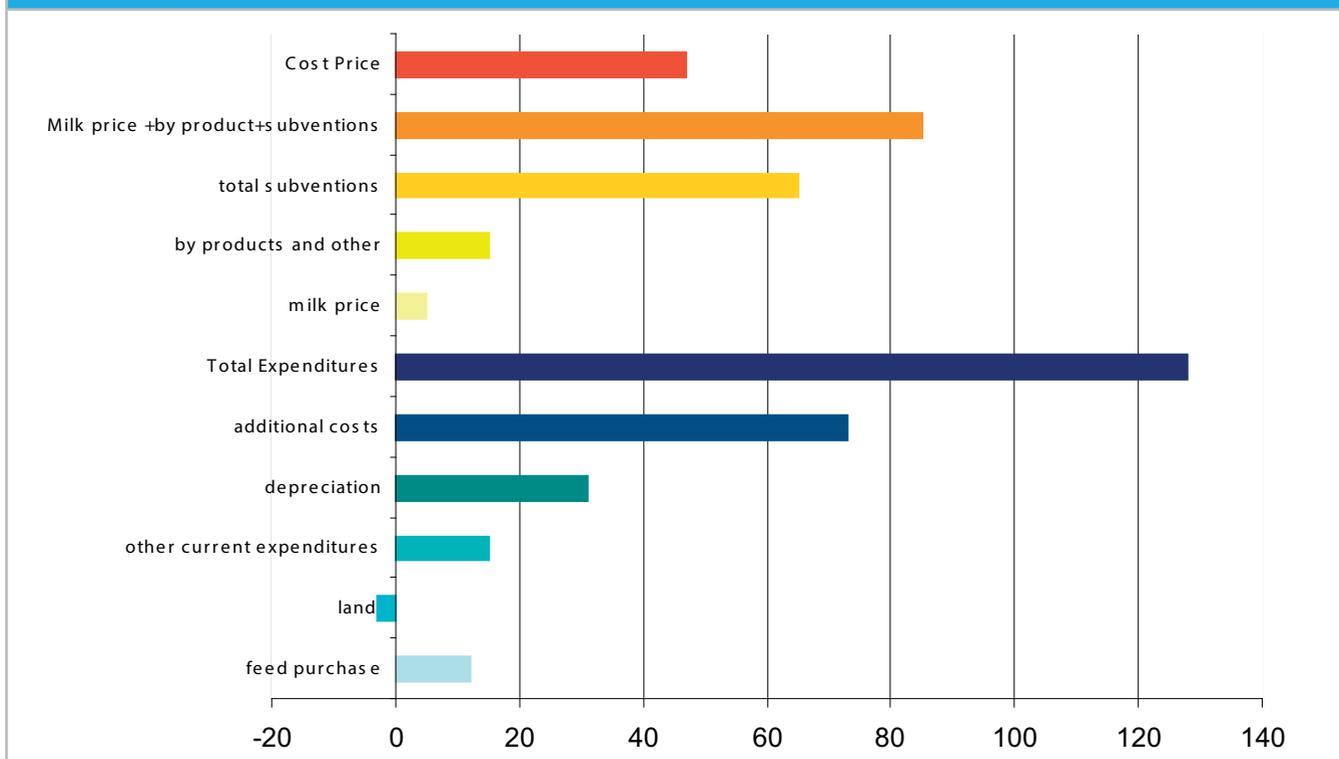
Source: Reuillon, Perrot et al. 2012

In Figure 29, labour cost is valorised at the rate of 1.5 times the French minimum wage ('SMIC'). In lowlands farms, total products (milk + joined products such as meat + subsidies) are equal to the total costs. In three of the four groups of mountain dairy farmers, total revenue is lower than the total cost: the workforce of family farmers is therefore remunerated at a rate below the wage assumption (1.5*smic).

Only in Jura, the situation is different thanks to higher milk prices (PDO cheese system).

As shown in the Figure 30 for Massif Central dairy farmers, the differences in cost of production rely mainly on labour costs and depreciation. This difference is partly (only 2/3) compensated by higher revenue (higher subsidies in particular).

Figure 30: Difference (€) between lowland and Massif Central dairy farmers per item in the production costs and revenues



Source: Reuillon, Perrot et al. 2012

AUSTRIA

According to BABF (2012), the most important parameter influencing production cost is the size of the herd. However,

for similar herd size, total cost of production recorded within the EDF-network (European Dairy Farmers) seems to be higher in mountain areas than in other areas (Table 43).

Table 43: Production costs of selected dairy farms in different regions with various herd sizes

Region	Stock of dairy cows	Costs (€/100 kg ECM ⁷)
Mühlviertel (mountain)	22	76
Innviertel	25	60
Innviertel	35	58
Vöcklabruck	23	70
Pinzgau (mountain)	22 (organic)	95
Murau (mountain)	12	137

Source: BABF 2012

PRODUCTION COST AND LABOUR PRODUCTIVITY

The difference between mountains and lowlands is not evident in terms of margin over variable costs. It is largely at the detriment of mountain areas when integrating costs of depreciation (higher mechanisation and building costs). The impact of a lower labour productivity in mountain areas is crucial to assess the difficulties faced by mountain farmers. The following table Table 44 demonstrate that the main difference between mountain milk systems and lowlands ones is due to the lower labour productivity in mountain areas. French mountains (except Jura) family workforce in dairy farms is presently remunerated 30 to 40% below the level obtained in lowlands.

There are also impacts in terms of average income (Farm Net Value Added / AWU): dairy specialised farms in LFA mountain areas generate 18 324 €/AWU, 21% less than the average at EU level (23 105€/AWU)(EC 2008).

v. The case of olive oil in Jaen

Cost of production for olives differs principally between the production systems in place. Five different systems are identified by Sanz Cañada, García Brenes et al. (2012): for

example, mountain olive groves are those with slope above 20%, not irrigated, with difficult mechanisation and a low average tree density between 100 and 120 trees per ha. Production costs per kilogram of olive produced range from 0.68 € for mountain olive groves down to 0.23 € for intensive irrigated olive groves. In LFA mountain areas, there is an over-representation of extensive olive groves falling under the production system 'mountain' (in terms of area, they represent 43% of the total) while they are less present in the lowlands of the province (8% of the area). Accordingly, the average cost of production in LFA mountain areas of the province of Jaen can be estimated to be 0.42 € per kg, 10 % above the estimation for non LFA mountain areas of the same province (estimated cost: 0.38 € per kg). The gap between mountains and lowlands in terms of production costs is therefore on average of 0.04€ per kg.

Overall, mountain products benefit from higher prices per unit produced, which partly compensate higher production costs. However, as shown by milk case studies, one important element is that the labour productivity is lower in mountain area: therefore for mountain farmers, the situation is such that, in general, family work is not remunerated as much as in lowlands.

Table 44 – Difference of labour remuneration in milk production (France)

	Lowlands	Massif Central with maize	Massif Central - altitude	Jura	Alps
Dairy AWU / farm	1.86	1.81	1.66	1.90	1.87
Milk sales (1000 l)	485	394	277	376	254
Milk price (€/l)	0.327	0.326	0.332	0.441	0.518
1000 litres of milk / AWU	261	218	167	198	136
Remuneration of AWU (expressed in minimum wage)	1.7	1.0	1.2	2.5	1.1

Source: Reuillon, Perrot et al. 2012

4.2 The contribution of mountain agricultural and food production to mountain sustainable development

Mountain agricultural and food products play an important role for each of the three elements of sustainable development (ecosystem services production, economic development, social ties). The present section aims at presenting shortly some elements found throughout literature on these aspects.

Many authors have recognized the potential of mountain agri-food products to contribute to sustainable development. Agriculture (and food processing on farm premises and small enterprises) is linking the mountain natural resources and communities. It therefore plays a central role in local and rural development of mountain.

The Mountain food products in Europe project (2002-2004) (Euromontana 2004b), analyzing the rationale behind differentiation of mountain products as compared to non-mountain products, identified two broad categories of products, showing how much mountain products relate to at

least two pillars of sustainable development: environment and social/cultural values (economy being in addition the corner stone of product development strategies):

- products for which the sales claim focuses on the fact that they are 'produced naturally in a specific protected mountain environment'. This category concerned products undergoing little or no processing, sold on highly competitive national or international markets like meat and fruits.
- products for which the sales claim refers to a 'unique product not to be found elsewhere because it calls upon specific know-how shared among productive system stakeholders in a restricted production area'. This applies to products in which local processing and know-how play a very important role. These products adopt a niche market strategy: looking for a premium price on a very small market segment.

4.2.1 Agricultural and food products in mountain areas and their relations to the environment

Robinson (2009) listed the positive and negative externalities of mountain farming (Table 45):

Table 45 : Positive and negative externalities of mountain farming

Positive	Negative
Biodiversity	
Flood and soil protection	Flooding and erosion/ sedimentation
Water quality and supply	Pollution (especially in water)
Carbon sequestration	
Avalanche protection	Fire
Fire protection	
Cultural landscapes	
Outdoor recreation	
Rural communities and cultural heritage	Out migration to urban poverty
Cost of supporting non viable mountain communities	

Source: Robinson 2009

Apart from avalanche protection, such externalities are not specific to mountains. However, in mountain areas, cultural landscapes and traditional land uses are common, whereas the scope for intensive land use and mechanisation is limited. This implies that positive externalities in mountain areas might be higher than in most lowlands.

Mountain farming is likely to produce as well negative externalities. Negative externalities of farming generally include pollution of water and air, emission of GHG, erosion, desertification and fire. All of these tend to be highly correlated to intensification of farming practices i.e. mainly increased use of chemical inputs and mechanisation, associated with increase of farm size and stocking densities. Due to the topographic constraints to farming in mountain areas, these negative impacts are less likely to occur or occur to a lesser extent than in lowland areas. In particular, slope, altitude, isolation and harsh climate constrain any potential mechanisation and farm size increase, instead dictating an emphasis on production sectors such as extensive cattle, sheep and goat rearing, based on pastoralism, and permanent crops. This explains why mountain agriculture can be described as 'low input, low output agriculture'.

Throughout the EU, many authors agree that mountain agriculture and inclusive mountain food production plays a central role in the preservation of both biodiversity and natural landscape (Perrot, Derville et al. 2009; Cloye 2010; Hopkins 2011; Penati, Berentsen et al. 2011).

i. Biodiversity

Mountains are rich in biodiversity and a crucial reservoir of species for Europe. EEA (2010) identifies 42 mountain habitats and 256 species endemic to mountain ranges. According to Euromontana (1997), 'several studies show that diversified agricultural activities (mowing, pasture, different levels of fertilization), by creating different habitats, increase the biodiversity of an area. This richness is linked to agro-ecosystems which are specific of these farming practices'. It then provides an inventory of different mountain farming ecosystems characterized by the presence of a high variety of species, such as alpine pastures and the 'dehesa' in Spain or 'montado' in Portugal.

Hopkins (2011) describes the importance of grasslands, predominant in mountain areas, as important sources of biodiversity. They host a vast number of plant and animal species. Agriculture is a driver of biodiversity loss through grassland intensification, alteration of traditional farming practices and land abandonment. In the context of a general decline of grassland areas, mountain areas now are among the main refuges of High Nature Value (HNV) grassland in Europe. Many traditionally managed mountain grasslands, which have been developed under centuries of livestock grazing, are still species-rich compared with lowlands (Macdonald, Crabtree et al. 2000; Hopkins 2011). Some quite remarkable areas of HNV grasslands remain in mountain areas including, for example, the White Carpathian

Mountains, the Apuseni Mountains in Romania, and the Hauts Plateaux of the Vercors in France (Veen, Jefferson et al. 2009; Hopkins 2011). Oppermann, Beaufoy et al. (2012) make an inventory of High-Nature-Value types of habitats and confirms that mountain habitats and farming ecosystems can widely be described as HNV farmland. HNV farmland covers around 32.8% of the mountain area, while at EU-27 level the proportion is close to twice less (17%). In some countries, the proportion is even higher with 56.8% in the British Isles, around 54% in Mediterranean islands and 35.4% in the French/Swiss middle mountains.

A relatively high proportion of Natura 2000 areas are also found in mountain areas (EC 2009). Indeed, 43% of the total area covered by Natura 2000 sites in the EU-27 are mountain areas. Natura 2000 sites cover 14.6% of the mountain area of the EU-27 (EEA 2010).

The encouragement of niche-value outputs such as premium food and regionally specific seeds or breeds contributes to preserve this biodiversity in front of increased threats on these habitats. Schmitzberger, Wrška et al. (2005) demonstrated that farmers both tradition-oriented and /or innovating (e.g. organic producers) carry a higher potential to the maintenance of biodiversity, than producers orientated towards average production.

Threats on biodiversity in mountain areas relate to the increasing intensification of their use, particularly on easily accessible sites, paralleled by abandonment of mainly, but not exclusively, the less-accessible areas e.g. conversion of traditional hay meadows to pasture resulting in loss of species and biodiversity value, losses due to afforestation, development and construction works. Land abandonment starts with extensification leading to encroachment, reforestation and progress of the habitat towards less complexity. The loss of many cultural traditions and changes in farmers' workloads, particularly in the context of small land parcels, is a contributing factor affecting mountain grassland diversity (Hopkins 2011). Land abandonment is a threat to biodiversity: nutrient-poor meadows and pastures are rich in terms of floristic composition, but both land abandonment and fertilisation or intensification of mowing and grazing puts them at risk in terms of biodiversity (Baumgartner 2000; Tasser and Tappeiner 2002; Lindemann-Matthies 2005). It has also been noted by Peco, Sanchez et al. (2006) that 'long-term grazing abandonment causes the loss of more than 60% of grassland species in dehesas': although the zones are invaded by species-rich scrub, it results at landscape scale in a drastic biodiversity loss.

Finally, in a biodiversity context, breeds raised and varieties cultivated by mountain farmers should also be mentioned, as these factors constitute a valuable heritage, especially considering the potential environmental change arising from climate change. Where farmers in lowlands have specialized on some particularly productive breeds, the majority of mountain farmers continue to use traditional breeds and varieties, with positive impacts on the quality

of food products originating from these farming systems (Euromontana 2004).

ii. Landscapes

Euromontana (1997) mentions that 'it is the original ensemble coming from the combination of forestry, agriculture and livestock farming which forms specific and complex ecosystems' or 'mosaic landscapes' typical of different regions. Mountain agricultural and food products are associated to the preservation of landscapes, which the mountain agriculture has contributed to create in its diversity giving a unique and distinctive character to regional or local areas (EC 2009).

Peyrache-Gadeau and Perron (2010), provide an example with the contribution of agriculture and cheese production to the creation of the landscape in the region of Beaufortain. This region is globally characterised by a landscape without fallow land and a clear-cut delimitation between pastures and forests, with a strong presence of agriculture on the steepest lands. Iconic elements of Alpine mountain society (typical stepping of fields, Alpine chalets, evident diversity of the nature and a preserved architectural heritage) are linked to the existence of dynamic agricultural activity based on the system of cheese production. The latest evolutions of farming practices in the region, due to mechanisation, increase of farm size and decrease of number of holdings, are contributing to modifications of the landscape. The steepest parcels are abandoned, the intermediary zone between pastures and forests are getting closed, placing at risk the typical landscape of the region.

Similar reflections are found in Rainis, Sulli et al. (2012) concerning the impact of the development of a brand for meat in North-East Italy (Carne della Montagna Friulana). This brand is suggested to have a direct impact on abandoned pastures recovery, being an incentive of farmers to mow steep parcels or have them grazed. Menadier (2008) mentions the impact of changes in the specifications for producing Saint-Nectaire cheese (ban on fermented fodders) on land use changes and barns building to stock hay (instead of silage).

Mountain landscapes also include terraced fields which shape varied landscapes, for example in the Valais where slopes covered with vineyards represent a visual attraction. Vineyards and permanent crops characterize landscapes of many of the Mediterranean southern areas, where trees cultivated on very sloped land (almonds in Portugal, etc...), alternate with traditional terraced fields with small stone walls (olive trees in Penabética, Terra Quente Transmontana), ovine and sheep herds, trees and forests adapted to the local climate. It is this combination which forms, with vegetation, landscapes that are well recognised and sought out for their beauty and originality (Euromontana 1997).

Today there is considerable interest in using mountain land to locate wind turbines, which would be used for

energy production; however, local residents often feel such developments would affect their environment, resulting in an increased incentive for valorisation of mountain areas, which includes agriculture and food production (ISARA 2012).

As for biodiversity, land abandonment is a threat for landscapes (see Rescia, Pons et al. (2008) for a reflection on the scrubbing of traditional landscapes in the Picos de Europa in Spain and its consequences), so much as is intensification. The aesthetical value of landscapes is higher for a traditional low-intensity farming system than a mixed landscape (with introduction of arable crops) (Lindemann-Matthies 2005).

iii. Erosion / natural hazards (avalanches, floods)

Concerning soil and natural hazards, Macdonald, Crabtree et al. (2000) refer to the problems posed by slope stability (landslides and avalanches). Neglecting the grazing pastures might imply the development of biomass which will weaken the stability of snow in winter and therefore increase the risk of avalanches. This has been acknowledged by, for example, some ski resorts. The resort of Peyragudes in the Pyrenees has set up a contract with breeders to ensure they exploit the slopes under municipal ownership in order to reduce avalanche risk. Through this contract, the station is able to save considerably on heavy investment requirements (Euromontana 2010).

However, problems of overgrazing have also been observed and are likely to decrease soil quality and stability (Euromontana 1997; Evans 2005). These have been reported to happen in different places as the result of limited revenues encouraging intensification by increasing stocking densities, lack of training and lack of available grazing area. In some cases, where farming areas are vast, localised overgrazing can happen via overexploitation of the land close to the farm. There are other negative externalities: in the olive sector, the general problems of erosion created by massive use of herbicides are particularly important in mountain olive groves. 38% of the soils of the province of Jaen are classified as high eroding soils (over 100 tons of soils lost per year and hectare). Problems related to residues of pesticides and nitrates in water and losses of biodiversity are also reported in mountain olive groves (Sanz Cañada, García Brenes et al. 2012).

The non-maintenance of traditional terraces increases the risks of landslides and erosion. In Mediterranean areas, fire protection is also crucial in mountain areas: the presence of pastures and arable lands might serve as buffer zones, while abandoned pastures and an excess of dry grasses might on the contrary increase the risks of fire development. In addition, areas destroyed by fire will be vulnerable to increased erosion and desertification.

iv. Water supply and water quality, Carbon sequestration

Mountains provide most of Europe's water, mountains being considered as the water towers of Europe (EEA 2010).

Mountain farming is, on average, not making use of high levels of inputs, which reduces the risks of pollution. Intensive cropping based on irrigation is also marginal. Reuillon, Charrontin et al. (2008) demonstrated that the impact of livestock based on permanent grasslands and pastures on water quality is limited as these production systems are extensive (i.e. use little fertilizers and no pesticides) and reduce erosion by enriching soil organic matter.

In the same document, figures are presented according to which carbon sequestration related to grassland management compensates for half of the emissions of greenhouse gases from the grazing animals. This means that breeding of ruminants in mountain areas, based on pastures and grasslands and valorising surfaces which could not otherwise be valorised, contributes considerably less to GHG emissions than other meat producing systems.

Overall, mountain farming positive externalities on environment seem higher than the negative ones. The production of agricultural and food products is closely linked to such positive process. The processing stages on mountain areas are usually carried out by SME-s which in general are less likely to threaten the overall positive environmental impacts. Risks might however be related as indicated by Hauwuy, Delattre et al. (2006) to the concentration of farming and food industries in certain valleys in combination to demographic pressure (e.g. relocalisation of dairy farming in lower valleys and reduction of the share of grass and pasture in the ration of animals; intensive orchards or vineyards; etc.). The relations with neighbouring lowlands and valleys (whether or not classified as mountain territory) is also mentioned by Penati, Berentsen et al. (2011), who discuss the negative consequences of the decrease of altitude grazing on farm profitability and environment. Farms that increase their size in lowlands or their milk production per LSU abandon highland grazing. The losses of additional revenues from highland cheese and Alpine grazing subsidies are being offset by an increase in milk production.

4.2.2 Agricultural and food products and the wider mountain rural economy

Economic impact of mountain farming and food production must be regarded under several perspectives, first in terms of direct employment in the sector, then in terms of indirect or 'induced' employment emerging from the existence of farming and food production activities.

i. Farm employment and farm diversification

The lower labour productivity evidenced in the previous section implies that for each unit of product, there is a higher number of employed people (family labour and other labour). For example, in France, at farm level, there is 0.73 farm AWU active per 100.000 litres of milk quota, 46% more than in the lowlands (0.46 AWU / 100.000 litres) (Reuillon, Perrot et al. 2012). In terms of diversification of the activity of mountain holdings, there are evidences that suggest that in many mountain areas the level of farm diversification is higher than on average: for example, 31% of the German mountain farms have diversified their activities (while only 22% for the national average). Farm diversification occurs principally towards food production (in southern MS) and tourism (in Central European MS) (EC 2009).

According to Hopkins (2011), multi-functionalism can be understood like extensive farming linked to tourism and landscape management or specific nature-enhancing measures, etc. He quotes O'Rourke and Kramm (2009) who describe mountain sheep farms in Ireland adapting to low farm income by linking to tourism activity and developing off-farm labour.

ii. Food industry

Beyond on-farm diversification of activity, the production of agricultural and food products has further direct employment impact in mountain areas in the food sector.

As an example, the results of Hauwuy, Delattre et al. (2006) compare the French average milk industry with specific Savoie PDO cheese industry (Table 46). The authors focus on the economic weight of PDO cheese in this French Alps region,

Table 46 – Comparison of milk supply chain for France dairy industry and Savoie PDO cheese

	France	PDO Savoie	Difference (%)
Volume of milk produced (thousands of tonnes)	12 000	186	
Number of employees per 100 000kg of milk	0.96	1.56	+63
Added value per tonne of milk (€)	325	401	+23
Farm subsidy per employee (€)	5308	3 552	- 33
Investment per ton of milk (€)	79	204	+158

Source: Hauwuy, Delattre et al. 2006

which represented in 2006, 3,000 direct jobs in farming and processing stages. Globally, in terms of employment, there are 63% more employed people per unit of production in the case of a mountain quality products compared to the average dairy industry.

Reuillon, Perrot et al. (2012) confirm this trend for the entire French dairy sector: for 100.000 litres processed in mountain areas, there is slightly more employment than in lowlands (+4%). In addition, SME-s are more present in mountain areas (31% of dairy plants in mountain areas have less than 20 employees) than in lowlands (5% only below 20 employees).

isolation of the most remote areas and social groups, and (v) opportunity to re-evaluate the heritage and its symbols, the environment and the identity.

The relation between tourism, agriculture and production of food is particularly crucial in Austrian and Bavarian Alps (Perrot, Derville et al. 2009). Rural tourism is the dominant farm diversification mode in Austria, Czech republic and Germany mountain areas. Schermer (2010) acknowledges that agriculture and tourism are interconnected and mutually dependent in mountain areas. 'Tourism often provides the economic basis for survival for mountain farms

Table 47 – Direct employment in French dairy supply chain (estimates)

	Mountain	Lowlands	Difference (%)
Family farm employment in milk	26 374	103 042	
Quota (delivery + direct sales) (100 kl)	34 131	198 961	
Family farm employment per 100 kl of milk quota	0.77	0.52	+49%
Employment in dairy industry	5 332	48 642	
Milk processed (est.) (100 kl)	21 167	200 933	
Industry employment per 100 kl processed	0.25	0.24	+4%
Total employment per 100 kl of milk (€)	1.02	0.76	+35%

Source: Reuillon, Perrot et al. 2012

Concerning mountain olive groves of the Sierra de Segura region, in relative terms, a quarter of the population in this area is related to the production of olive oil, either directly (on-farm) or indirectly (e.g. consulting, inputs supply industry, machinery etc.). The concentration of labour during a short period (December to March) allows producers to complement their income mainly from rural tourism, building and small manufacturing activities either in the area or on the coast (Ruiz Avilés and Bustamante Calabria 2004).

iii. Tourism

Mountain food and drink of high quality are key attractions for tourists visiting the areas and coming from uniformised urban areas (NORDREGIO 2004). Agricultural and food products are very often at the heart of a combined offer for tourists (Meiberger and Weichbold 2010). Iorio and Corsale (2010) summarize benefits from rural tourism which provide rural areas: economic growth, diversification and stabilisation through (i) employment creation in tourism business, (ii) provision of supplementary income in farming, craft and service sector, (iii) opportunity to realize the economic value of specific, quality-based production of food products (iv) increment in social contacts, especially in breaking down the

with a variety of income opportunities and dependent and independent subsidiaries. In Austria, this broad participation in tourism, often through self-employment, particularly leasing activity, is a key strategy for the survival of these farms in mountain areas'. In Austria, the direct marketing of milk products by farmers are part of enhanced linkages between agriculture and other sectors (gastronomy, tourism, small businesses). The Austrian ministry of agriculture launched for this purpose the label (*Genußregion Österreich*) (Regions of Delight Austria) promoting the combined offer of agriculture, gastronomy and tourism, which often focuses on cheese (e.g. *Bregenzerwälder Käserstraße*) (BABF 2012).

Many other touristic roads are developed for a specific mountain product: *route du Comté* in French Jura, *itinéraire des fromages de Savoie*, *circuit des vignobles de Savoie*, *route des fromages / ruta del fromatge* common to French and Spanish Pyrenees in Ariège and Catalunya, etc. In another part of Europe, Robinson (2009) reports that in the Haut-Jura Regional Park (France), market based agricultural production (e.g. Bleu de Gex cheese) continues whilst providing, beyond the cultural landscape and biodiversity, opportunities for hiking and skiing.

iv. Multiplier on local economy

Finally, mountain agricultural and food products, associated with tourism, have an indirect multiplying effect on the local economy (however, to our knowledge not quantified).

ISARA (2012) reports that several experts stress the induced effects of agriculture and food sectors on rural economy. In UK, the economic impact with employment creation is not just direct but also indirect due to a multiplier effect. Farms are able to diversify their activities – Bed and Breakfast, camping, farmers markets, etc.- increasing the economic impact of the agricultural activity. In some parts of the French region of Pyrénées-Orientales, more or less 80% of the direct and indirect employments are linked to the primary sector (ISARA 2012). In Italy, the 3 500 municipalities localized in mountain area are very specialized in primary sector productions: two-thirds of the activities are linked to the primary sector.

Some negative impacts on economy are underlined too. In some Austrian mountainous region especially, there is a serious competition for the land use: 'land for construction is 500€/m² which is equivalent to Vienna showing the desirability of the area, although also brings social and economic problems' (ISARA 2012).

4.2.3 Agricultural and food products and their socio-cultural dimension

Mountain areas have developed in general strong cultural identity and tradition, notably to face harsh natural conditions and problems of depopulation and peripherality. Such culture is characterised by traditions and know-how in agricultural production and food processing and also includes the associated buildings heritage and the strength of local communities. Certain characteristics of mountain culture are both a positive externality valued by the rest of society and an important factor in endogenous development, for example the importance of trust and reciprocity between local actors, who must work together to deliver amenities or to valorise them. This makes them potentially reactive to local development and innovation.

Following Holloway, Cox et al. (2006), one can say that mountain agriculture which conserves particular upland ecologies and maintain a viable agri-food business also sustains 'a viable rural community and local economy, and preserve what is regarded as unique and valuable local traditions, knowledge and practices'. Food is not only a material substance and a provider of environmental amenities, but also something which can be 'symbolic of particular relationships between people and farmed environments, as well as between producers and consumers', or as proposed by Soliva Reto, Rønningen et al. (2008) a 'provider of identity'. Robinson (2009) also explains in the Rhön case that the positive image of the products and of the area has helped inhabitants restore their sense of local identity and pride. Pasca and Rouby (2012) explains that

proud inhabitants make good ambassadors for their regions and that it contributes to better attractiveness and fight against depopulation.

Macdonald (forthcoming) described the importance of several cheeses for the local economy and the preservation of some traditional practices in front of a global homogenising trend. For example, Bitto cheese descends from an ancient tradition of high mountain cheesemaking, and several traditional practices are preserved: rearing of local goats (the cheese is made with 10 to 20% goat milk), rationing of pastures, manual milking, use of 'calècc', ancient stone huts that serve as mountain dairies. The Swedish cheese Jämtland is another example: this cellar matured goat cheese is a traditional product from the mountainous area of central Sweden. For centuries, this cheese, then simply called white goats cheese, was produced in the summer pasture villages, far away from the home farm, as a way to preserve the excellent quality, creamy milk produced from the goats that grazed in varied pastures of meadows, heath and forest.

Know-how covers all stages from production to processing. Pastoralism and transhumance as such have a very strong cultural and social dimension. In many areas like in the Pyrenees, sheep follow the same route they followed in the middle age up to the pastures. There are festivals, songs, huts associated. Mountain traditional farming also comes with specific built heritage (buildings, shepherd's huts stone walls etc.), which restoration and maintenance forms entire part of regional development strategies in those mountain areas where transhumance still takes place.

On the other hand, protecting traditional food practices and recipes might undermine local specificity at the detriment of local communities (Bowen and Master 2011), by potentially reducing the diversity of available products, creating static notions of culture and fundamentally changing or distorting the character of products in making them available at longer distance. Initiatives that merely codify cultural products without taking the social-organisational context into account risk becoming little more than 'museums of production', freezing production techniques and not allowing local communities keeping constantly adapting to changing market, social, and biophysical conditions, regulatory mechanisms fix production techniques in time and space.

Therefore, agricultural and food products produced in mountains are at the heart of the sustainable development of mountain areas: (i) they are closely linked to mountain farming practices which ensure the protection of mountain natural resources; (ii) they imply a direct employment effect both in farming and food processing and have in addition indirect impact on other sectors and induced effects on the whole regional economy; (iii) they are often central to the cultural identity of mountain communities.

4.3 Consumer perspective

4.3.1 Perception of mountain products and understanding

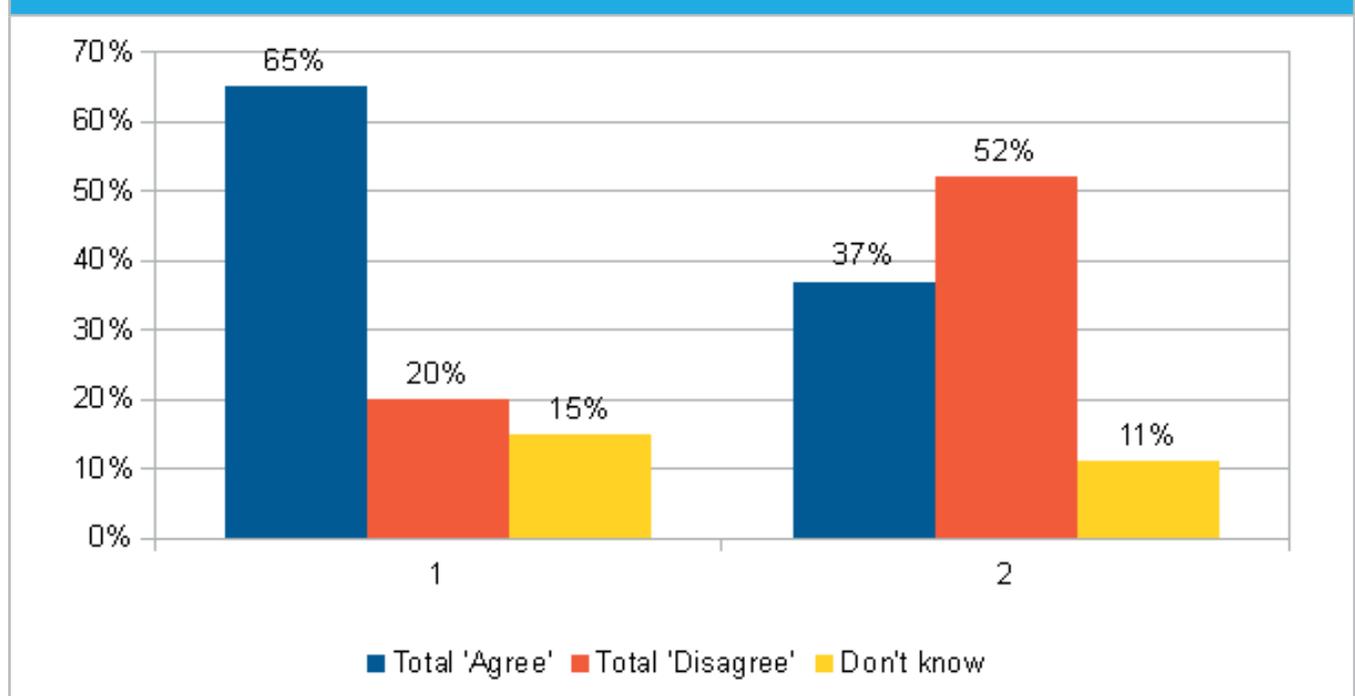
When specifically asked to think about mountain products, consumers tend to express a positive opinion, as demonstrated by the Eurobarometer (2011) survey. This study shows that 65% of EU consumers believe there are advantages to buying a mountain product (with higher shares in Member States with an important proportion of mountain territories). The positive image of mountain products includes purity, authenticity and simplicity. Consumers tend to aggregate these characteristics resulting in a special composite character of mountain products (Schjøll, Amilien et al. 2010).

However, the definition of what is a mountain food product seems to be difficult to understand for many consumers. The

Eurobarometer report (2011) shows that only a minority (37%) of consumers think that mountain products are easy to identify. In the case of local products, the proportion of consumers who thought local products were easy to identify was higher (52%).

The EuroMARC project carried out surveys in six European countries, interviewing consumers about their attitudes towards mountain food products. When asked which food products came to their mind as mountain products, the majority of respondents named dairy and meat products, but not fruit and vegetables, honey, bakery products and water. Austrian, French and Slovenian consumers associated dairy products with mountain areas more strongly than meat products whereas Norwegian and Scottish consumers named more meat products.

Figure 31: Eurobarometer (2011) question on the perception of mountain products



1) For consumers, there are benefits in buying agricultural products and foodstuffs produced in mountain areas

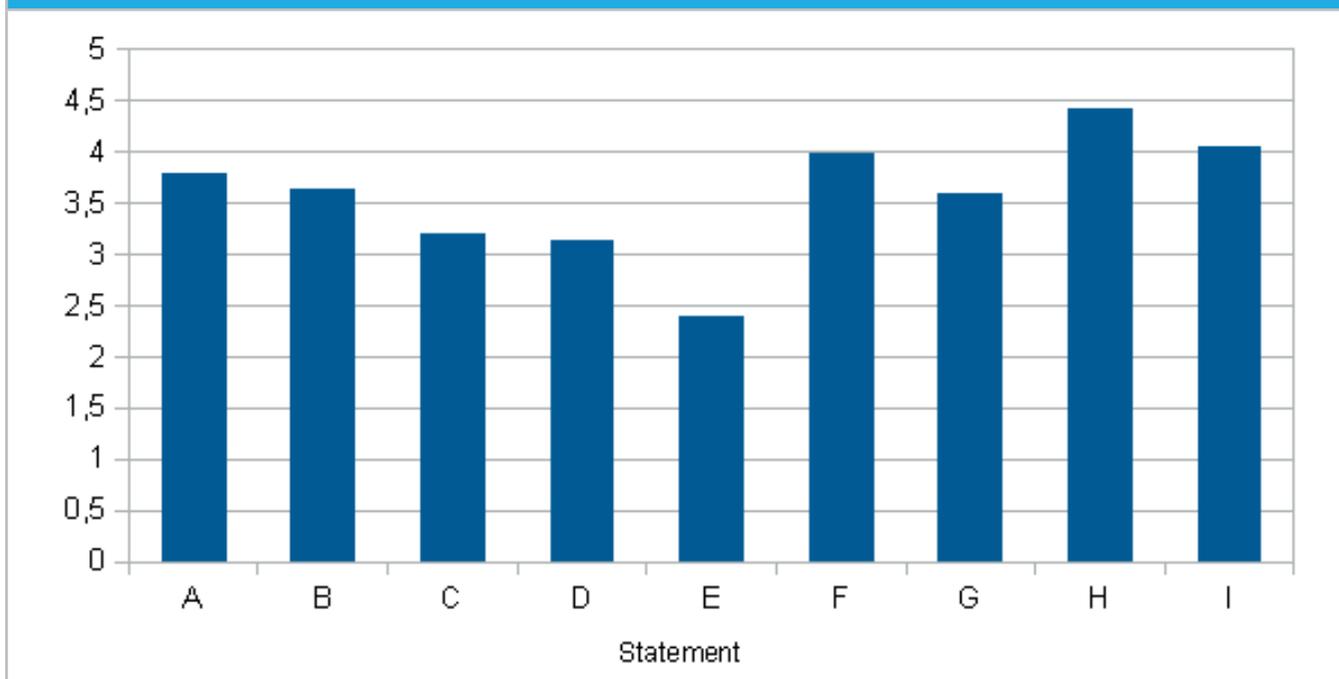
2) As a consumer, you think it is easy to identify whether agricultural products and foodstuffs are produced in mountain areas

Source: Eurobarometre 2011

Findings from the EuroMARC project show that consumers tend to make strong associations between the quality of products and their local area of production, their identity and economy (Schjøll, Amilien et al. 2010). Consumers were shown a list of 9 statements and asked to mark on a scale from 1 (strongly disagree) to 5 (strongly agree) their opinion on these statements (figure 32). Mountain products are not necessarily associated with intrinsic / organoleptic characteristics of the product but more to the place where they are produced (cultural areas, environmental impact of production, tradition and small scale production). The perception by consumers

assessed in the EuroMARC project varies depending on the age and level of education of respondents. This is consistent with previous research showing that the older, better educated, higher income consumers are more likely to purchase origin labelled products. Place of residence has a strong impact on consumer behaviour relative to these products (mountain residents are more interested by mountain products) and there is higher sensitivity of women for mountain products (as well as in general towards environmentally-friendly food products with a strong social or economic supportive dimension).

Figure 32: Consumer perceptions of qualities associated with mountain product



List of statements:

- A. Mountain products are connected to specific cultural areas.
- B. Mountain products are produced in a traditional way by small scale producers.
- C. Raw materials from mountain areas can be processed to mountain products also outside the mountain area.
- D. Mountain products are not required to be healthy products.
- E. The main raw material of mountain food products does not necessarily need to come from a mountain area.
- F. Mountain products support local employment.
- G. Mountain products are produced and processed in an environmental friendly way.
- H. Mountain products have to comply with industrial standards of hygiene.
- I. Mountain products are part of the cultural identity of local communities

Source: Schjøll, Amilien et al. 2010

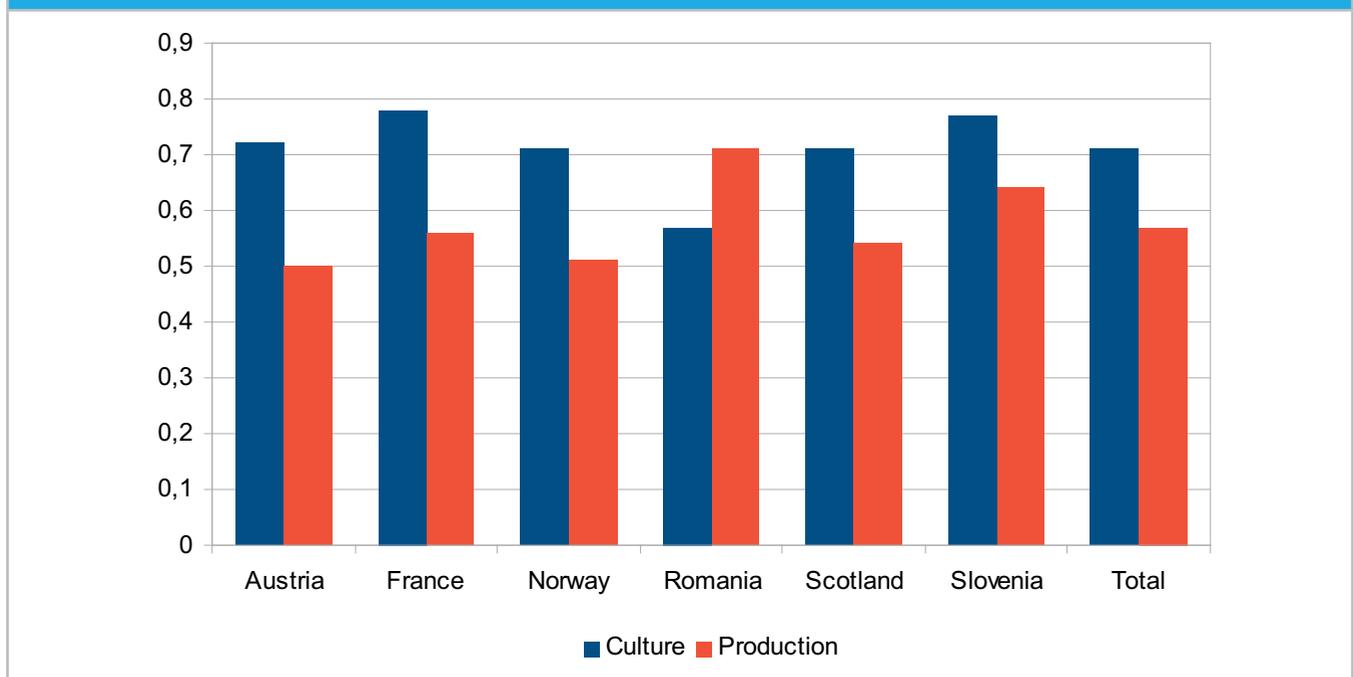
Tebby, Giraud et al. (2010) came to similar conclusions showing that mountain products consumers are more concerned about environmentally friendly production, local origin, support to small scale production, few additives, and short distance from producer to consumer than they are about price, brands and appearance (when purchasing mountain products¹⁹).

Mountain food products are also viewed as regional products, although the EU mountains do not make up a single region. Regional products can be purchased by consumers to satisfy their need for distinctiveness with respect to food, to support, protect and reflect their own identity, to preserve and defend the own culture and identity, and to learn about other regions. In the region of production, the consumption of local products by consumers can also reflect ethical and environmental concerns. Mountain products may however not benefit from the same expectations as do regional products, as the expected value of food is higher for narrowly defined areas (e.g. PDO). Schjøll, Amilien et al. (2010) constructed two composite indexes from the attributes listed above, one of which reflects

those characteristics pertaining to culture and the other index those pertaining to production (Figure 36). Such indexes are constructed in order to vary from 0 (consumer do not emphasize) to 1 (consumers emphasize strongly). In most countries, consumers give a higher value to cultural qualities rather than production qualities, with the exception of Romania, where consumers attribute more value to production than culture. France and Austria show a significantly higher value for culture than for production values. This is confirmed in the case mountain milk in France: consumers seem to associate mountain milk with a milk produced according to tradition (*“un lait produit à l’ancienne”*) (Reuillon, Perrot et al. 2012)

One striking point in Schjøll, Amilien et al. (2010) is that the processing in mountain areas of raw material from other areas does not seem to be sufficient to confer the image of a mountain product (statement E in figure 32), while the contrary (processing mountain raw materials out of mountain areas) is less of a problem.

Figure 33: Mean values of local food index (blue) and production index (red) dependent on country



Source: Schjøll, Amilien et al. 2010

19 This statement does not apply for most purchase of food for which on the contrary there is a vast literature demonstrating that the main concern of consumers are price and appearance of their purchases (as nuanced in the following section).

4.3.2 Consumers’ act of purchase: retail price and accessibility

Even if consumers express positive opinions on mountain products and claim to see benefits to purchasing them, the question is whether this positive attitude translates into an act of purchase and at which price. A perception of benefit will not necessarily translate to a willingness to pay a higher price for the product.

i. Retail price

Concerning retail price, prices for mountain and non-mountain equivalent products were collected and analysed in shelves surveys in six countries (Revoredo-Giha, Leat et al. 2008). In accordance with the complicated mix of attributes that consumers associate with mountain products, some mountain products are sold at a premium price, some are sold at a price comparable to the one of lowland products and for some products the lowland one product is sold at a premium price. As shown in the table 48 below the differentiation of the product is important in establishing cues to communicate the quality attributes of a mountain product.

Table 48 - Hedonic regressions for cheese for selected countries

Degree of differentiation	Product provenance	Role of the mountain attribute
Homogeneous product (no differentiation)	The product is produced in both mountain and non mountain areas	The attribute ‘mountain’ does not produce any discernible differentiation.
Partially differentiated product	The product is produced in both mountain and non mountain areas.	<p>The attribute ‘mountain’ may differentiate the product, relative to the non mountain product, due to a special raw-material, production environment, or production process.</p> <p>The ‘mountain’ attribute may create value, relative to the non-mountain product and can be combined with other value creating attributes (e.g. Cairngorm mountain Farmhouse Cheese).</p> <p>The ‘mountain’ attribute can be the basis of a quality label.</p>
Totally differentiated product	The product is only produced in mountain areas	<p>With no direct substitute, the ‘mountain’ attribute may be enhanced with other value creating attribute (e.g. Cairngorm Mountain Heather Yogurt) for differentiation from other mountain products.</p> <p>However, ‘mountain’ can still be the basis for a quality label</p>

Source: Revoredo-Giha, Leat et al. 2008

Hedonic regressions were carried out for apples, sausages, water and cheese, and significant variations of retail price were recorded only for cheese and sausages in some countries (Revoredo-Giha, Leat et al. 2008). The premium price at retail stage for mountain cheeses was between 0 and 25% of the average cheese price (depending on the countries). According to Pieniadz, Hanf et al. (2009), the consumer prices on the local markets in Romania do not show a difference despite the fact that consumers perceive the mountain products very positively.

There are few information on mountain products retail prices, in particular because there are few products for which prices are recorded specifically for the 'mountain' equivalent of a certain product. Two cases can be described: milk and honey. At retail stage, the mountain milk price is situated between first price milks and specialty milks (Table 49). 60% of French consumers surveyed in 2011 thought it is fair that mountain milk is sold at a higher price than average drinking milk. The same proportion declared they were ready to pay more than 0,90 € /litre (Reuillon, Perrot et al. 2012).

Concerning honey, mountain honeys are sold at intermediate retail price level between lowlands types of honeys (rapeseed or sunflower honey) or multi-floral honeys and very high value added specialty honeys (lavender, fir, etc.).

ii. Availability

Concerning the availability of products, according to EuroMARC (2009), 62% of consumers think that mountain quality food products are directly available from the producer and 56% believe they are available from farmers markets and other markets. It is shown that the easy availability of mountain products for consumers is a significant factor to explain whether they will purchase it. The results in EuroMARC show

that 60% of consumers say they buy mountain products when visiting the particular area of production. This is an important factor for mountain products for which origin and locality is such a major factor in the appeal for consumers. These products can be highly emblematic and representative of their area. As mentioned previously, Tebby, Giraud et al. (2010) found that consumers who already shop through mountain type distribution channels such as specialty shops and direct purchase are more likely to purchase mountain products. This may be influenced by the fact that these types of distribution channels already attract consumers whose purchase criteria fit mountain products but may also be because it is easily available for people who shop this way. It may then be argued that increased availability in more mainstream channels may lead to increased consumption. It may be also argued on the contrary that consumers would focus on price in supermarkets and that this would not result it higher uptake of mountain identified products.

Although most consumers associate mountain products with short-supply chains or direct sales, Schermer (2010) find that consumers generally wish to find mountain products in the supermarkets where they regularly do their shopping, suggesting that they are not generally available there. Austrian consumers expected to find mountain products in regular supermarkets or grocery stores far more often than other consumers from countries (54.4% and 34.8% respectively).

Consumers express interest towards the concept of mountain products, in particular for their cultural dimension (identity of certain territories and traditions) and, at the time of purchase, there are some evidences that they are willing to pay a higher price for such attributes, although not as much as for other types of products. There seems however to be a problem of availability of such products.

Table 49 – Milk retail price in France

	€/litre	
	Brick	Bottle
Organic milk (retailer's brand)	n.a.	1.02
Special ⁸ milk (non-mountain) (private brands)	1.07	1.60
Organic milk (private brands)	n.a.	1.38
Private brand milk	0.61	1.06
MOUNTAIN MILK	0.80	0.90
Retailer's brand milk (non-mountain)	0.65	0.82
First price milk	0.58	n.a.

Source: Reuillon, Perrot et al. 2012

5 Labelling of mountain products - a comparative review of the existing schemes and practices

The last section of the present report aims at describing the extent to which the present labelling modalities of mountain products refer effectively to mountain (and the framework of such labelling) as well as to reflect on the possibilities of misuses and misleading practices. Three main type of labelling practices / schemes will be discussed from the more general ones to the more specific ones:

(i) the purely commercial labelling practices found in trade (sales names, individual and collective trademarks) with a view to reflect the diversity and the heterogeneity of practices throughout the EU;

(ii) the indirect protection granted to mountain products, in particular via the specific relation between mountain products and geographical indications and the extent to which the latter might convey, among others, the information to consumer of the mountain origin of agricultural and food products;

(iii) lastly specific schemes directly protecting mountain products at national / regional level (Switzerland, France, Italy) from which lessons could be drawn for the EU-27 level scheme are described.

5.1 Sales names and branding (collective and individual) for mountain food products

Number of examples of agricultural and food products labelled with a reference to mountains have been collected in a non-exhaustive inventory of cases compiling information on the products and their labels, the existence of trademarks and/or any other quality schemes and an attempt to identify its relation with mountain areas (wholly / partly / not produced and processed in mountain areas). On this last point, in many cases, the products are clearly of mountain origin or provenance (with in general less information on the composition, provenance and origin of feed), in other cases,

the relation to mountain is less evident (products partly produced in lowlands or processed only in mountain areas, etc.) and finally, a third group is composed of fancy names.

5.1.1 A vast diversity of branding and practices differing from Member State to Member State

The present section aims at analysing the contents of the non exhaustive inventory of sales names and commercial practices.

i. Different products concerned

The products identified are in majority those sectors identified in section 3 of the report:

- Meat products: fresh meat, cured, salted, dried meat etc. (pig, beef, lamb, etc.);
- Dairy products: fresh milk, yogurt and cheese etc.;
- Fruits and vegetables: apples, pears, etc.;
- Honey ;
- Collected fruit and plants: fresh fruits, teas and medicinal plants, mushrooms, etc.
- Tropical non EU products such as coffee and tea

Other food products which have no link (or a less obvious one) with mountain farming may refer to mountains in their labels: Pasta, Chocolate, Confectionery, Cereals, Biscuits, Seafood, Citrus fruits, Soup.

ii. Different terms employed

The inventory leads to the conclusion that a wide range of terms or denominations related to mountain are used. These uses depend on the culture, the traditions, the habits, the markets, the attractiveness for the consumers etc.

*** Direct references to ‘mountains’**

The use of the term ‘Mountain’ and its translations (montagne, Berg, montagna, montanha, montaña, gora, etc.) is frequent (Figure 34). Some examples of the use of the term ‘mountain’ in labels and brands of agricultural and food products: ‘Bio von Berg’ label in Tyrol (Austria), registered as an international trademark at WIPO by Bioalpin Bioproduktehandel since 2003 (countries covered: Italy, Switzerland and Germany). Most retailers in France do sell a specific mountain milk (*lait de montagne*), such as Carrefour, Auchan and Leclerc (Marque Repère). Because of the existence in France of a national Regulation on the term ‘montagne’, these products should be in conformity with such definition. The term is also used in Italian language (e.g. Patata di Montagna and Prosciutto di Montagna), Portuguese (Montanha) or Slavian languages (Gorski in Slovenian)

Various trademarks verbal, semi-figurative or labellings are registered for coffee or tea within the Alicante database of CTM (Community TradeMark) at the OHIM (Figure 35). Some of the products are likely to be of mountain origin (Blue Mountain, Ngoro Ngoro, Andean) while others are global brands (Red Mountain, Green Mountain) for many products, not particularly of mountain provenance.

Some other sales names and brands are using terms derived from the same genealogy as the term ‘mountain’ (Figure 36): one very well-known brand in France refers to ‘Monts’: Riches Monts brand under which ‘mountain’ products (left) can be found but also other ones not specifically made of mountain raw material (right). The term ‘Monte’ is also used significantly principally in Spain and Portugal.

Figure 34: Examples of direct references to ‘mountains’



Figure 35: Examples of direct references to ‘mountains’ in coffee labels



Figure 36: Examples of direct references to terms of the same genealogy than 'mountain'



*** Direct references to names of determined mountains**

Names of specific massifs (Tyrol, Alps, Savoie, Pyrenees, Carpathians, etc.) or of a certain type of mountain area (alp, alpage, highlands, etc.) are also employed to convey the idea of mountain origin in labels of agricultural products and can be more attractive (Figure 37). Some examples are:

(i) Handl Tyrol²⁰ brand (the Company provides Tyrolean ham, uncooked sausage and roast specialties with raw material not necessarily coming from Tyrol or Austria)

(ii) a long list of products referring to the Alps, among them Alpen Yogurt (from Milchhof Sterzing, Latteria Vipiteno located in Italy), Alpsko milk, from a firm established in Ljubljana (This milk refers directly to the mountain origin (name and images); however it does not seem to come

Figure 37: Examples of direct references to names of determined mountains



20 Apart of the brand which appears on the top of the label of the product, there are 3 more references to a Tyrolean origin on the package (for snack, specialty from Tyrol and processed in Tiro air)

from Alps); Alpina (firm based in Savoie (France) producing pasta and communicating on the geographical origin and the tradition; however raw materials do not come necessarily from mountain area); the Alpen brand from Weetabix (the company refers to the Alps reputation and image for selling

(v) In UK, the highland denomination is used, including trademarks to promote products from 'mountain' origin. Most of the products are elaborated in the Scottish Highlands (Figure 39).

Figure 38: Examples of references to certain types of mountains (alpine pastures)



Figure 39: Examples of references to highlands



products which do not seem to come from a mountain area; the brand is presented to be the original 'Swiss style muesli').

(iii) some examples referring to the Pyrenees: Copirineo is a brand owned by a cooperative of dairy products located in the Spanish Pyrenees and has several trademarks registered; Farm French Pyrenees cheeses are sold under the name of 'Fromage Artisanal des Pyrénées'; in parallel there is a PGI 'Tomme des Pyrénées' (industrial product, made only partly of mountain milk).

(iv) Other terms referring to certain types of mountain areas are also used (Figure 38), in particular the reference to the alps (summer pastures). This is in particular the case in German, French and Italian language. The Swiss Regulation on mountain terms covers the term 'alp'.

*** Indirect references to mountains**

There are generic denominations for mountain areas which are relevant for certain countries (Sierra or Serra in Spanish and Portuguese, Valle or Val in Spanish and Italian). Some are more attractive than others and the situation varies in the different MS (Figure 40). Some examples: an important producer of oil and olive oil (SOVENA) owns the brand Oliveira da Serra (for which it does not seem that olive groves concerned are in mountain areas); there are many brands of meat products referring to sierra in Spain (for example 'Sierra Lora' from the Galan Group, based in the province of Badajoz in Spain (non mountain area) and referring to the products from 'white pigs' (by contrast to the Iberic ones)). The terms Valle and Val are also frequently used, particularly in Italy, for example in the apple brand Valle delle Mele (from Val di Non in a mountain area, also covered by a DOP), registered in OHIM.

Figure 40: Examples of indirect references to mountains



Some labels also refer, indirectly to mountain, using the name of a hero of famous tales which take place in mountain areas. This is the case for Heidi brand products in Switzerland and the Kecec Pašteta in Slovenia (Figure 40).. The Heidi brand covers products sold by the Swiss retailer MIGROS. The range of products covers dairy products, meat products, cereals (muesli), etc. All the marketing relies on the evocation of 'mountain' origin, though the popular character of Heidi. Within these products, some refer explicitly to mountain production in their sales designation (Lait de montagne / Bergmilch; Berg Tomme) and the following TV advertisement includes clear messages:

http://www.youtube.com/watch?v=hyZ_LC3-V8c

Other products sold under the brand Heidi display less clear labels: 'assiette du montagnard', 'jambon de la grange' or 'fromage du lutteur' with regards to their concrete provenance. It is possible that raw material does not comply with the Swiss mountain regulation but as long as the label does not use 'mountain' name, it cannot be challenged on this ground.

Concerning the Kecec Pašteta in Slovenia, the industrial appearance of the product implies it is not likely to be produced in a mountain area.

* Genericity of sales names

(i) Case of Jamon Serrano

'Jamón Serrano' was recognized at EU level as a Traditional Specialty Guaranteed in November 1999²¹, and includes a reference to 'sierra' ('serrano'), a synonym to mountain in Spanish language. However, there is no sign whatsoever of a relation and valorisation of the mountain areas through this name, both within the TSG specifications or in the minimal requirement of the Spanish Ministry of Agriculture for the elaboration of Jamón Serrano. There is no requirement on production and processing in mountain areas. Probably the term 'serrano' was used in past because the ham was traditionally cured in the mountains. Now the process of

21 Official Journal C371 01.12.1998, L291 13.11.1999

Figure 41: Examples of generic names referring to ‘mountain’



curing has evolved and the term ‘serrano’ is worldwide recognised as meaning Spanish-style ham and not as referring to mountain areas. Hence, the name ‘Serrano’ is close to a generic significance. Accordingly, 10 different trademarks containing the expression ‘Jamon Serrano’ are registered at the Spanish Intellectual Property Office; all of them are semi figurative and they do not refer in their figurative elements to a mountain landscape.

Some producers of Jamon Serrano make reference to a mountain provenance, through the image of their brands. Some of them are processed in a mountain area such as Jamones Seron but others are not processed in such area.

(ii) Other Generic names

Several Bergkäse (mountain cheese), Alpkäse (alp cheese) or Bergwurst (mountain sausage) have been identified in Austria or Germany, included or not in PDO or PGI. These names are not necessarily linked with a mountain origin but designate a certain type of product. Therefore, these names can be regarded as generic names. ‘Bergkäse’ denomination has been defined by the Austria Codex alimentarius, the official Austrian food standards.

For example (Figure 41), the Alma trademark covers a non-PDO ‘Bergkäse’, term which is used by several reknown PDOs (e.g. Tiroler Bergkäse, Vorarlberger Bergkäse).

In France, cheeses designated as ‘Tomme de Montagne’ can be found on the market. This denomination is usually found for cheese elaborated in the Auvergne or Alps regions. They seem to be a residual designation for covering cheeses

made of mountain milk but which are not under a PDO or a PGI system.

5.1.2 Analysis of sales names in the inventory

i. Direct/Indirect use

Most of the labels identified directly to mountain, using the ‘mountain’ term or a related term and some images of mountain landscape. Other products refer to mountain as an origin or a ‘type of product’. Few labels can be regarded as ‘fanciful’ use of mountain denomination because they are disconnected with a mountain origin. Few labels identified use only the image of mountain (purely figurative) without a verbal component referring to mountain.

The indirect reference seems to be more used for products whose real mountain origin is less certain or for ‘generic products’, seeking to give the impression to consumers that products have a link with mountain area. In these cases, there may be some misuses but not systematically.

ii. Individual/Collective

Most of the sales names and brandings found throughout the inventory belong to individual stakeholders regarded as a person, a company or a cooperative. Thus, individual uses compose the major trend rather than collective uses, which is not the case for PDO or PGI because of the collective character of these quality schemes.

This is important in view of the fact that branding might imply the appropriation by individuals of a geographical name in a label and/or a trademark and might not always

be consistent with the correct use of indication of sources by the responsible of labelling.

iii. Type of message conveyed

The principal message conveyed in the labels using the mountain term is referring to the origin or the provenance of the product. Apart from the origin, aspects related to 'traditions' are also highlighted. Specific mountain quality is less communicated on the labels, even if the product complies with a specific mountain scheme. However, some logos or seals placed next to the terms (examples in France, Switzerland, Italy) may be used to highlight the origin of the product. In addition, one third of the labels identified are coupled to another quality scheme, which can be an EU scheme (geographical indication or organic production, respectively 10% each) or a regional scheme (10%). This does not grant a guarantee that products are originating 100% from mountain areas. Few cases, such as Bio vom Berg in Austria or Pro Montagna in Switzerland, correspond to the use of the 'mountain' term within a collective strategy of producing completely in mountain areas.

In some countries, specific mountain area seems to be more attractive than the 'mountain' term as such: Tyrol for Austria, Savoie for France. This origin seems more relevant than a general term.

iv. Trend on trademarks

Many labels identified are not coupled to the existence of a trademark. Intellectual Property tools are known and used by big firms which have lawyers, not by small farmers or SMEs. The first register their brands, not the small producers.

A thorough search in trademarks databases of several selected countries has been carried out: around 8.800 trademarks containing mountain or related terms have been counted (Table 50). Trademark registration is not used the same way in all analyzed countries: there is a big difference between old MS (France, Spain, UK, Portugal) and NMS where registration of trademarks is less widespread.

Trademarks registrations rely more on the term 'mountain' or its translation (around one third of the cases) than other terms such as names of mountain ranges or massifs. Among the specific terms, 'Alps' is the most used, particularly in certain countries (France, Switzerland)

5.1.3 Protection and legal provisions applicable to current commercial practices : Trademark rules ; Consumer protection and Lawful competition

The use of names and trademarks referring to 'mountains' is subject to the rules established in terms of food labelling and trademarks.

i. Trademarks Law

A trademark is a distinctive sign which identifies certain goods or services as those produced or provided by a specific person or enterprise. The system helps consumers to identify and purchase a product or service because its nature, characteristics and/or quality, indicated by its unique trademark, meets their needs. The possibilities to register trademarks are almost limitless. Trademarks may be one or a combination of words, letters and numerals. They may consist of drawings, symbols, three-dimensional signs such as the shape and packaging of goods, audible signs such as music or vocal sounds, fragrances or colours used as distinguishing features.

Trademarks can be held by a single firm (individual trademark), but two other types have a certain importance when looking at trademarks referring to geographical provenance. Collective marks are usually defined as signs which distinguish the geographical origin, material, mode of manufacture or other common characteristics of goods or services of several firms using the collective mark. The owner may be either an association of which enterprises are members. The owner of the collective mark is responsible for ensuring the compliance with certain standards (usually fixed in the regulations concerning the use of the collective mark) by its members. Certification or guarantee marks are trade marks used to designate goods and services of different persons in order to guarantee a common quality,

Table 50: Main 'mountain' denomination TM registration trend

Denomination	%
Mountain/Montagne/Montagna/Montaña	31
Sierra/Serra	11
Monte/Mont	25
Alpes/Alps/Alps/Alpages	4
Pyrénées/Pirineos	2
Tyrol/Tirol	0.3
Vallée/Valle	20
Hautes-terres/Altas tierras/Altitude	0.5

Source: Aubard and Oliva Caceres 2012

common geographic origin or method of production or another common feature of such goods and services.

Collective marks and certification marks allow for the protection of 'signs or indications which may serve, in trade, to designate the geographical origin of the goods or services'. One should also note that 'such a mark does not entitle the proprietor to prohibit a third party from using in the course of trade such signs or indications, provided he uses them in accordance with honest practices in industrial or commercial matters; in particular, such a mark may not be invoked against a third party who is entitled to use a geographical name'.

* Trademark registration:

Trademarks concerned by the term mountain can be verbal (composed of words and terms) or semi-figurative (composed of both verbal and images). The latter are often considered by IP offices as respecting the register conditions, even if there is no guarantee on the origin of the product. Trademarks must be distinctive, so that consumers can distinguish it as identifying a particular product, as well as from other trademarks identifying other products. It must neither mislead nor deceive customers or violate public order or morality.

At EU level, the Community Trademark (CTM), administered by the OHIM (Alicante), was introduced in 1996 to cover the whole of the European Union and is valid in all 27 Member States. CTM confers on its proprietor an exclusive right to use the trademark and to prevent third parties to use, without consent, the same or a similar mark for identical or similar goods and/or services as those protected by the CTM.

Verbal trademarks (more than semi-figurative ones) can be challenged due to their descriptiveness. A trademark shall not be descriptive (i.e. a trademark which describes the product or service, or if it describes a characteristic, purpose, function, quality or use of the product or service). If the trademark applied for is not descriptive on the 'mountain' origin, it can be registered. All depends on the level of 'descriptiveness' deemed by the IP Office examination and the knowledge of the mountain origin inside the trademark application. Most of the time, the IP Office will only consider the trademark as such and not its content in case of agro-food or processed products. The appropriation of descriptive terms by an individual would be problematic: despite this principle, for example in France, two verbal trademarks which could seem descriptive ('Le lait de montagne' (n° 3890382) and 'Le lait de nos montagnes' (n° 3890381)) have been registered recently (The owner is the Association of mountain milk producers). Similar examples exist in all countries and several TM could be fairly challenged on this ground.

IP Offices do not take into consideration the real origin of the product when registering a trademark. In France, for instance, the INPI will only check whether a geographical name is already registered as PDO or PGI to accept or

reject the registration of a trademark applied. Thus, there is no guarantee that a trademark including a term or an image referring to mountains corresponds to the origin or provenance evoked by the trademark. There are many of examples where trademarks have been registered, such as Cremontaña in Spain, Alpsko milk in Slovenia, Montanha queijo in Portugal, etc., while products are not of mountain origin.

The Swiss scheme on mountain product (see section on direct protection below) enables to avoid registration of trademarks containing 'mountain', 'alpage' or 'Alps' denomination. There are still verbal trademark registered such as 'Lait de montagne – Express-Bergmilch' but according to the Swiss national rules, they will not be renewed.

Unless there are specific provisions regulating the relationships between TM and 'mountain' provenance, there is no guarantee for a consumer to be correctly informed on the origin of the product thanks to the TM system. The TM system does not protect consumers but focuses on the protection of TM owners.

* Specific rules concerning indication of origin in the trademark:

Some interesting rules on collective trademarks and on the use of geographical terms in certain countries can have consequences on the 'mountain' term preventing to grant the monopoly of such terms to a single owner.

- In **Switzerland**, indications of source enjoy general sui generis protection. In other words, no registration or governmental approval for use is necessary. Geographical names are not registered directly as a trademark and the private appropriation of such names is prevented. The Trademark Law basically protects all direct or indirect references to the geographical origin of products or services against illicit usage (false or misleading geographical indications).
- In **Italy** and **Spain**, there are limitations to the appropriation of geographical terms by trademarks, and in the case of collective trademarks, the situation of monopoly or unjustified privilege with regards the use of geographical terms in TM is limited.
- For example, the Italian industrial property code provides special regulations for collective trademarks, the registration of which may be obtained for specific brands guaranteeing the origin of goods. In this case, the Italian Patent and Trademark Office may refuse, for justified reasons, the registration when the required trademark can lead to situations of unjustified privilege or can harm the development of other similar initiatives in the region. The successful registration of collective mark consisting of geographical name does not allow the owner to prohibit third parties from using the trade name, provided that this use is consistent with the principles of professional integrity

and therefore limited to the function of the indication of source.

- At **EU** level, signs or indications which may serve, in trade, to designate the geographical origin of the goods or services may constitute Community collective marks. A collective mark shall not entitle the proprietor to prohibit a third party from using in the course of trade such signs or indications, provided he uses them in accordance with honest practices in industrial or commercial matters; in particular, such a mark may not be invoked against a third party who is entitled to use a geographical name. There is no monopoly granted by the CTM for geographical collective trademark.
- In **France**, if the applied trademark is not simply descriptive of the origin (for example, 'mountain'), it can be registered. There is no other specific rule concerning the registration of geographical names. The INPI (National Institute of Industrial Property) proceeds case by case in each examination. Nonetheless, the French INPI will look during the examination whether there are relevant registered geographical indications. If so, the TM will be rejected or withdrawn if already registered. If the applied trademark uses a geographical term which is not a geographical indication, the examiners will study the consequences of granting the monopoly of such name to a single owner.
- In United Kingdom, registering geographical terms or references through trademarks are discouraged, unless they are already well established.

ii. Information of consumers and lawful competition

The Consumers protection and unfair competition legal frameworks provide protection against any misleading labelling, advertising or other unfair commercial practices. Some legal actions are foreseen to preserve the rights of interesting parties and protect fair behaviour in the course of trade.

- Misleading labelling:

All MS do have provisions following the model the EU regulation on the information provided for consumers on food products. Food information shall not be misleading, particularly as to the characteristics of the food and, in particular, as to its nature, identity, properties, composition, quantity, durability, country of origin or place of provenance, method of manufacture or production. Food information shall be accurate, clear and easy to understand for the consumer.

Advertising is usually also covered, for example, in the French consumers code: All advertising comprising, in any form whatsoever, representations, information or presentations which are false or likely to mislead, is prohibited including concerning the origin.

There are similar provisions in Switzerland (Section 4 of the Federal Law on foodstuffs provides provisions against deceptive practices on foodstuffs, Article 10 of Order from the 23rd November 2005 on foodstuffs and usual objects).

- Unfair competition law

Any unfair practices that are liable to mislead in the course of trade are prohibited. Such legal base is often closely connected to consumer deception: in most cases, the protection can only be granted if it is proven that consumers are deceived or likely to be deceived by a product in question due to an unfair commercial practice.

- Enforcement

Administrative enforcement is available in almost every country for all unfair or misleading practices. In some countries, only consumers can file an administrative complaint; competitors or other entities cannot do so. Only a few administrative authorities can act ex officio (France, UK, etc.) in the sense that administrative authorities (e.g. French Frauds National service) are entitled to act administratively prior to a court action, in their own initiative or upon request of private bodies as a prior step to actions towards courts. There is however no obligation of the administration to investigate administrative complaints.

The timeframe to make a complaint against an unfair practice varies from one country to another. A prosecution for an offence can be brought within 2 years after the date of the alleged commission of the offence in Ireland, 10 years from the date upon which the trader became aware of the infringement in France.

In few countries (UK, Ireland, Cyprus), 'passing off' gives the possibility to initiate actions because of the damage caused by these practices (not because of the practice itself). To establish the passing off, most of the time, judges require the proof of the following elements: goodwill (of the plaintiffs), misrepresentation, damage to goodwill. The plaintiff has the burden of proof to show the false representation (intentional or other). They must show likelihood and/or actual deception/confusion in the public.

These legal actions can protect from misleading practices. However interested parties do not use them often. One of the reasons is the burden of proof which relies on plaintiffs' side and proofs are not easy to establish sometimes (e.g. the ability to prove that an average consumer in a country is deceived). Moreover, taking legal actions supposes lawyers services, financial and personal investment which is not possible for everybody.

In some countries Consumers' associations can be helpful in such cases. It would be also helpful at EU level to benefit from the Class action (to take legal action collectively) to protect the interest of consumers, but instruments of this type are not very developed in the EU.

Overall, it is extremely difficult to rely on unfair competition law to secure protection of producers and consumers.

iii. Misuses and misleading

Globally, labels referring to mountain correspond to products either of full mountain origin, of only partial mountain origin (e.g. part of the raw material is coming from lowlands or only the processing stages are in mountain areas) or which are completely foreign to mountain food supply chains. It is not possible to affirm which cases are misuse / mislabel. The distinction between the acceptable and the unacceptable is somehow subjective (e.g. drying and curing hams in mountain areas is a fact and referring to this in the label of such ham is not necessarily misleading in absence of any legal definition, even if the raw material comes from lowlands). Legislators and judges should draw the line between what is acceptable or not, according to less subjective criteria.

However, within a non-exhaustive inventory of labels collected by Aubard and Olivas Caceres (2012), roughly:

- 25% of labels (34 cases on 138) correspond to product for which the economic activity related to such products has not (or very marginally) occurred in mountain areas;

- 23 % of the cases (32 cases) would correspond to products only partly produced or obtained in mountain areas (for half of these cases, there is only suspicion that production is not fully occurring in mountain areas);

- 41% are wholly produced in mountain areas for sure (57 cases).

The remaining cases are products for which there is no information on the exact provenance of the product.

Close to half of the examples found (the two first indents above mentioned) could therefore potentially fall under a misuse category (Figure 42). Concerning French and Swiss examples (the two countries where there is a direct protection scheme for mountain products), the share of potential misuses falls to 30 % only (and mainly partial or potential misuses, few of the most evident cases), which

Figure 42: Examples of labels referring to mountain for products which are not wholly produced and processed in mountain areas



tends to prove that the specific direct protection rules are likely to have a positive effect on labelling practices.

iv. Case Law based misleading rules and trademarks

Case law has been screened in order to find concrete cases of misuses / mislabelling recognised by judges. The principal result of this search is that there is hardly any case-law decision directly on the issue of mislabelling mountain products.

Most of the decisions found are quite old. They are not directly related to the issues at stake, but can be useful indirectly in the sense that they give indication on how judges would assess a 'mountain' misuse. Most of the decisions spotted are legally based on the law concerning Intellectual Property Rights.

Despite the evidences that there are misuses and mislabelling, guaranteeing the true information regarding the provenance of products does not seem to be a priority for judges, stakeholders or even consumers themselves, probably because of the length and complexity (and therefore cost) of procedures, disproportionate to the challenges.

Concerning IP rights implementation, it is relevant to observe that the validity of a trademark is assessed as a whole and without analysing the real or doubtful origin of the products, despite the evocation to mountains on their labelling. In Spanish decisions (for example, STS 14677/1991 of the Supreme Court of 20 April 1991 - Cooperativa Lechera del Cadi), the Supreme Court said that a similarity of graphic illustration (mountain pictures) does not affect the distinction of the products. Consumers would pay attention on the phonetics of the verbal part (the name) of the trademark ('Cadi' and 'Cado' in this case). The Court did not express itself on the provenance of both products (the first one, 'Cadi', was of mountain origin; the other one, 'Cado', not).

The Italian Competition Authority confirmed in the case n° 12207 of 10 July 2003 (Il Lardo di 'Arnad le Vieux') that it has the competence to evaluate a registered trademark when it offers misleading information to consumers as to the true

origin / provenance of the products, even misleading is only through a graphic representations of mountains. In this case, the company marketed two types of 'lardo': a PDO one (non mountain raw material matured at least three months in the mountain village of Arnad) and another one mentioning the term 'Arnad' in its labelling, showing images of pastures as well as the expression 'mountain taste and tradition' (with no minimum duration of maturation in mountain areas) (Figure 43). The Authority rules that the labelling was misleading and it had to be changed by deletion of graphic and verbal misleading references.

In another case (N° 22585 of 13 July 2011 'Perla alimentare - Provenienza Miele'), the Italian authority rules that a labelling of honey 'Perla dell'Etna' was misleading. The true origin (Spain) was indicated in small printed indications on the capsule of each package, while there were many other indications referring to Sicily and Etna mountain on the label.

Swiss judges adopted a different approach on the inclusion of geographical denominations in a trademark (Case 'Alpina' (watches) of the 1st Civil Court on 20 May 1986). The trademark was assessed in view of the potential deception of the average consumers. A product bearing a geographical reference within the trademark and which benefits from a reputation linked to this origin must not deceive the consumers on the real origin. In this case, the judge decided on a case-by-case approach that the average consumer of Alpina watches was entitled to expect its watch to be of Swiss origin (not only the Alps).

When consumers' protection or unfair competition rules are implemented, deceptiveness is more analysed by judges or competent authorities. However, few cases reach Courts (they are mostly dealt at administrative level). One French decision can be quoted in so far it concerned a mountain product (although sold as a geographical indication) (case 'Perles des neiges blanc de blancs', Cour de Cassation, 18 June 1997): a wine produced in the south of France was sold with a label evoking the alps. On the shelves it was offered in the same shelf as Savoie wine. The judge considered this as an unfair commercial practice, even though the terms 'mountain' was not present on the label.

Figure 43: Labels of Arnad le Vieux (Italian Case Law)



In France and Switzerland, two case law decisions were taken on the ground of the direct protection scheme on mountain labelling. The French case ‘Salaisons du Mâconnais’ (Cour de Cassation 25/9/2001) says that a mountain sausage (‘saucisson’) containing at most 40% of raw material (meat) coming from mountain area was misleading in the sense of consumer right protection. In Switzerland, a recent case (January 2012) seems to have deemed the marketing of ‘Heidi-Alpen Bergkäse’ cheese as misleading because of the origin of the milk used (first instance); however, in appeal, the decision seems to have been more flexible, recognising more flexibility for the use of the term ‘alps’ than for the term ‘mountain’.

Finally, the EU case law mainly contains one decision of importance: ‘Pistre’ (ECJ, 1997). The main points of this decision imposed to France a revision of their 1985 rules on labelling of mountain products (by opening it in practice to other MS products lawfully marketed). In addition to this key point which led to the new French rules described in the next section, the conclusions of the judge include a reflection on the fact that the description ‘mountain’ is of quite general character and transcends national frontiers. An indication of provenance or source is intended to inform the consumer that a product bearing such an indication (for example “made in ...”) comes from a particular place, region or country which may enjoy a high reputation (case C3/91 Exportur, 1992). This is not the case according to the Case Law Pistre for the term ‘mountain’ which cannot be considered as an indication of provenance and therefore cannot benefit from the protection granted to indications of provenance under Intellectual Property Right.

All in all, there are a certain number of labelling practices that could be considered being at least partly misleading for consumers, at the detriment of true mountain farmers and food producers. However, the extent of such misleading practices seems to be still contained within reasonable limits. Rules in place as well as the way they are enforced and the Case Law courts have elaborated on their base, are providing a weak protection through long, complex and expensive procedures, not focused on misleading, but on intellectual property protection.

5.2 Indirect protection of mountain agricultural and food products, with particular focus on PDO and PGI

Protected Designation of Origin (PDO) and Protected Geographical Indications (PGI) are laid down at EU level by Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. Such regulation provides that names registered as PDO or PGI may

only be used if conforming to the corresponding specification. Registered names are protected against any direct or indirect commercial use for non complying comparable products. They are also protected against any misuse, imitation or evocation, even if the true origin of the product is indicated. The relations between trademarks, designations of origin and geographical indications are based on the principle of coexistence between a geographical indication and a previous trademark (but no posterior registration of trademarks likely to create confusion). There are rules similar to the EU ones in Switzerland and Norway.

5.2.1 How do PDO and PGI refer to mountain?

Accordingly, geographical indications (PDO or PGI) provide protection only for registered geographical denominations. These denominations do not refer to the term ‘mountain’ (except in few cases) but most of the time to specific and identified geographical mountain areas. Such areas are not systematically known by consumers as being ‘mountain’ areas, although some names are clear (generic part of designations such as Tiroler Bergkäse, well-known names of massifs (Pyrénées, etc.)) and many do include within their respective logos and brands some graphic reference to mountains.

Aubard and Olivas Caceres (2012) gathered a non-exhaustive inventory of mountain PDO and PGI private logos (61 in total) and analysed the graphical reference to mountains.

These logos are of different nature, sometimes fanciful designs, other very simple designs (e.g. Switzerland, UK) referring to shape, shadow or stylisation of the product (fruits, poultry, cow, sheep), referring to the region (e.g. in France – the regional flags of Corsica or Savoie) or to a traditional presentation (e.g. in Spain, France).

Only a third of mountain PDO/PGI use a reference to ‘mountain’ inside their logos, mostly in meat or based meat products and dairy products (cheeses) (Figure 44).

Some PDOs and PGIs products do not use the mountain reference in their logo but they do use it in their communication tools: messages, website etc. (example: PDO Gruyère in Switzerland).

Other logos are not referring to the mountain character. The fact that products are of mountain origin seems to be secondary in terms of communication (Figure 45).

In some cases, the name of the PDO or PGI directly refers to mountain massifs and, for them, the usefulness and relevancy of mountain reference is not evident. The protected name and the reputation of the product may be sufficient to evoke the ‘mountain’ or ‘massif’ origin, the tradition etc. The name of the region (or its symbology) is central: the Savoie Region in France is a good example of stronger identity marker than the concept of mountain (Figure 46).

Figure 44: Examples of PDO-PGI labels referring to 'mountain'



Figure 45: Examples of mountain PDO-PGI logos not referring to 'mountain'



Figure 46: Savoie PDO-PGI logos



5.2.2 Mountain PDO and PGI: a screening of the designations registered

A two-step categorisation of designations registered has been carried out, with a view to classify PDO and PGI within the groupings in Table 51.

In addition, some third countries designations might be of interest as they are products partly or wholly of mountain origin: Darjeeling Tea, Cafe de Colombia for example.

Around one third of the PDO and PGI registered are fully or significantly located in mountain areas: this indicates a

Table 51: PDO/PGI classification

PDO/PGI Groupings	Criteria for placing PDO/PGIs into specific groupings
1. Mountain PDOs and PGIs	PDO and PGI denominations where production and processing occurs fully or predominantly in a mountain area.
2. Part-mountain PDO and PGI (By geographic area of denomination)	PDO and PGI denominations where the designated geographic area of the denomination occurs partly in a mountain area and partly outside of a mountain area and no information exists to suggest that the PDO/PGI products are only produced in lowland areas. Specifically between approximately 10% and 80% of the PDO/PGI area should occur in a mountain area.
3. Marginal PDOs and PGIs	PDOs and PGIs where a marginal element of the denomination area (approximately > 10%) occurs within a mountain region
4. Non mountain PDO -PGI	All other PDOs and PGIs not occurring in the above groups.

Specific products (mostly meat products, PGI in general, but also some PDOs registered on the base of pre-1992 national laws which are derogating from the principle that a PDO should be wholly obtained within the same area) are such that production and/or processing occurs partly in a mountain area and partly outside of a mountain area (e.g. production occurs in a mountain area and processing occurs outside a mountain area or vice versa). In general, the processing occurs within mountain areas (or partly within mountain areas) and raw materials (meat) come from larger areas. Such products have been classified in group 2 when the processing occurs wholly in mountain areas (e.g. Lard d'Arnad, Jambon de Bosses, Bresaola Valtellina, Jamon de Trevelez, Prosciutto di Norcia, Viande des Grisons), in group 3 when the processing may significantly occur within mountain areas (e.g. Jambon de Bayonne, Cecina de Leon, Prosciutto di Parma).

slightly higher concentration of PDO and PGI in mountain areas relatively to lowlands (Table 52 and Figure 47).

The distribution within individual MS reflects the importance of mountain areas in each MS. However, the distribution per product gives more illustrative results: the mountain PDO and PGI are over represented for cheese and honey (close to 60% of the designation are wholly or partly mountain) as well as for olive oil and butter (around 50%). Fresh meat and meat products are also above average (35-40% of the designations) and fruit and olives close to the average (30%). Other sector (vegetables, cereals, fish, other agricultural products – spices, vinegar, etc., food products) are much less represented (Figure 48).

The potential of PDO and PGI products for marketing mountain products now and in the future was also discussed with several experts (ISARA 2012). PDO and PGI registrations are of considerable importance for marketing high quality

Table 52. List of Mountain, part-mountain and peripheral PDO/GIs

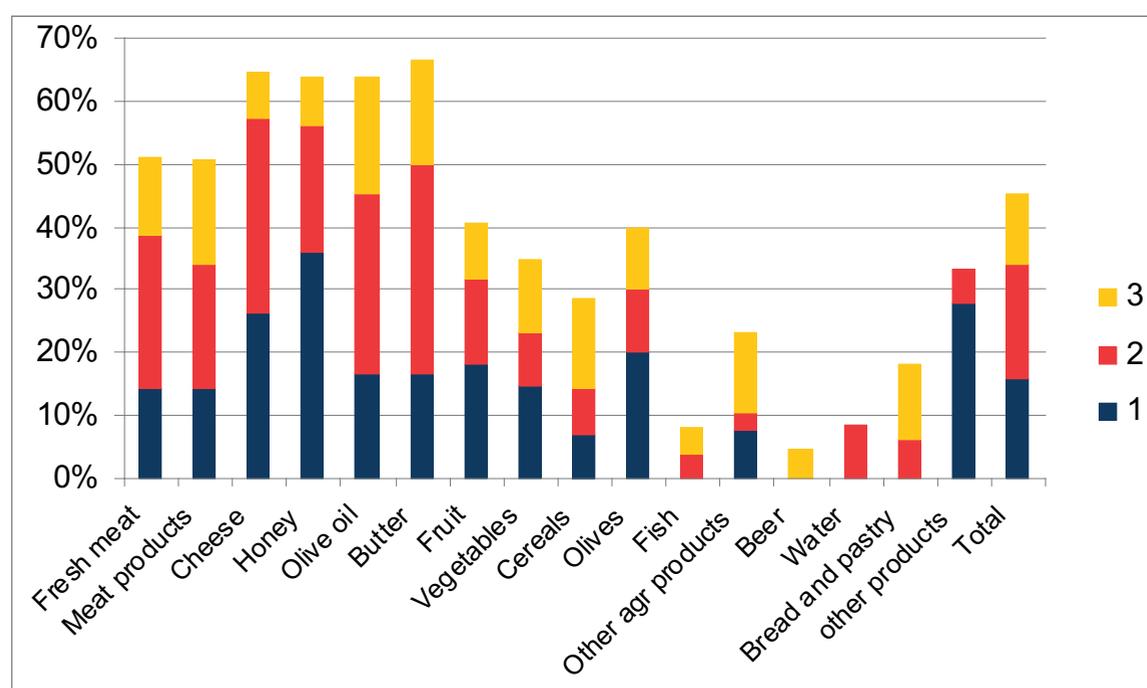
Country	Total PDO/GIs	Mountain PDO/PGIs	Part-Mountain	Peripheral
Italy	244	38	46	49
France	191	14	41	23
Spain	154	30	33	26
Portugal	116	41	24	9
Greece	96	26	40	1
Germany	84	3	3	2
Czech Republic	28	0	3	3
Austria	14	8	1	2
Slovakia	7	5	0	0
Poland	25	2	2	0
Slovenia	11	3	0	0
Ireland	4	1	0	0
United Kingdom	41	0	2	5
Belgium	8	0	1	0
Others	53	0	0	0
Total EU-27	1 076	171	196	120

Source: own elaboration from ISARA (2012) and Aubard and Olivas Caceres (2012)

products from mountain areas; however, they are much less suited to marketing larger volumes of average commodity mountain products (e.g. mountain drinking milk).

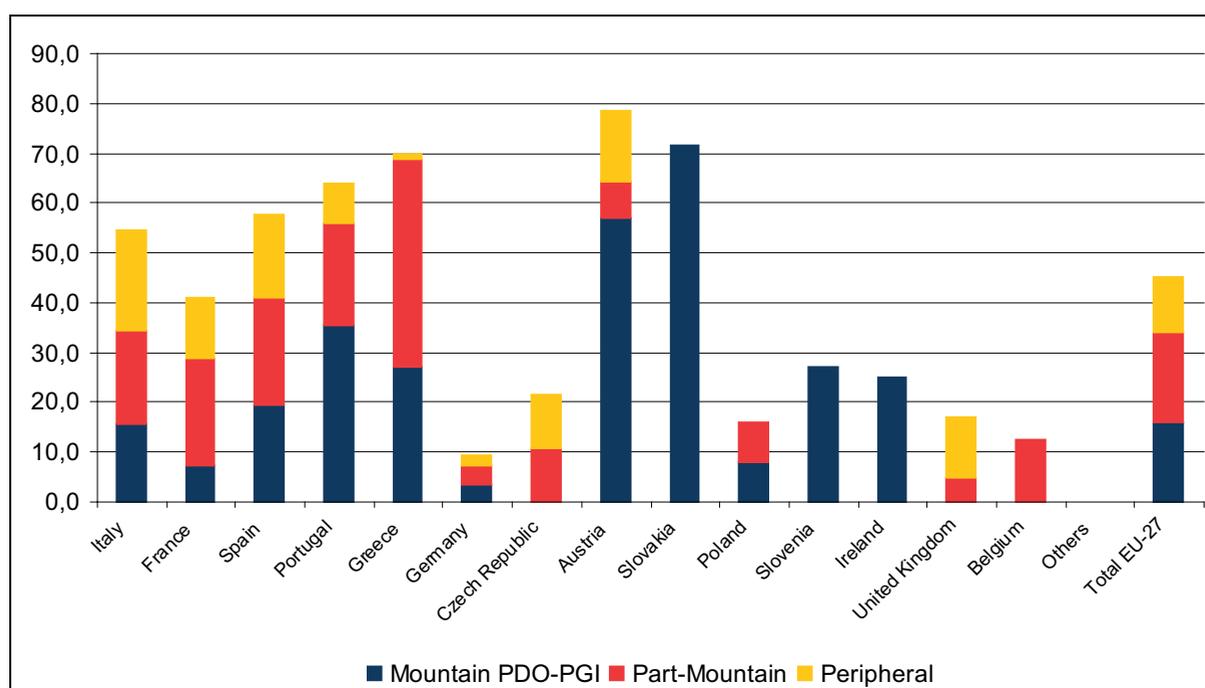
A barrier to linking the PDO and PGI systems with a mountain logo, or developing a mountain-PDO/PGI subset, is that many PDO/PGI relate to locations which include both mountain and non-mountain areas (e.g. Comté). A mountain PDO/PGI

Figure 47: Comparison of numbers of PDO and PGI products and their rankings (Mountain, part-mountain and peripheral) following expert input and further analysis (contains only registered GIs and is not fully up to date for certain countries)



Source: own elaboration from ISARA (2012) and Aubard and Olivas Caceres (2012)

Figure 48: Comparison of numbers of PDO and PGI products and their rankings (Mountain, part-mountain and peripheral) per sector concerned



Source: own elaboration from ISARA (2012) and Aubard and Olivas Caceres (2012)

system could be beneficial for those PDO/PGI products which occur completely within mountain areas; however, many are unlikely to want a second (potentially confusing) claim or logo on label of their product. Due to the overall focus and approach of the PDO/PGI systems, many of those involved place greater emphasis on the regional or local identity, as opposed to the general concept of a ‘mountain’ which is not specific to a determined region (as noted by the ECJ in Pistre).

5.2.3 Economic coverage of mountain PDO and PGI

The economic weight of PDO and PGI in mountain food supply chains can be estimated by comparing the total turnover estimated in section 3 of this study with the PDO-PGI turnover data collected by DG AGRI.

Because of the diversity of products types, an estimation of the share of volumes produced in mountains which are sold under PDO or PGI is difficult to obtain. Such calculation is made in terms of value of production. Several assumptions need to be followed: (i) estimation of the share of mixed mountain-lowlands PDO-PGI (group 2, hereafter called ‘mixed PDO-PGI’) to allocate to mountain. In this following indicative estimation, a ratio of 30% has been applied (despite there are cases for which the rate is higher, e.g. 60% for Comté cheese and 95% for Bleu d’Auvergne), (ii) assumptions concerning the distribution of value added between different

stages in the supply chain (in particular farm level value added and processing stage value added²²).

The results (Table 53) show that for all sectors investigated, the share of PDO-PGI in the total value added is higher in mountains than in average. This is particularly true for dairy products and the fruit sector (with a strong impact due to the two apples designations in Trentino Alto-Adige: PDO Mela Val di Non and PGI Mela Alto Adige / SüdTirol Apfel). In all sectors, PDOs and PGIs represent less than 5 % of the total farm turnover: the share of PDO and PGI in mountain production is three to five times more important for fruit production and dairy product (cheese in particular). In the meat and the olive sectors, PDOs and PGIs are also more important than in lowlands, but the difference is not as striking as for the two other sectors above mentioned.

However, even for dairy products, large shares of the mountain production is not valorised under designations of origin and there is evidently still room for further segmentation within the mountain agri-food supply chain.

²² In Table 52, the value added distribution key chosen arbitrarily is 1/3 at processing stage, 2/3 at farm stage. Under this assumption, the share of PDO and PGI in the French dairy sector would be 32 % in mountain and 6% for the entire France. Reuillon, J. L., C. Perrot, et al. (2012). Estimates based on real data are close: respectively 30% and 8%.

More detailed illustration can be given for the case of the French dairy supply chain (Reuillon, Perrot et al. 2012). hundreds tons (e.g. Bleu du Vercors Sassenage). Several PDOs cover mixed mountain and non mountain areas (Munster,

Table 53: Estimated share of PDO and PGI in agricultural turnover at EU level

	Mountain	Total
Milk	22.5%	4.6%
Meat	6.1%	4.0%
Fruit	12.6%	4.4%
Olive	4.4%	3.2%

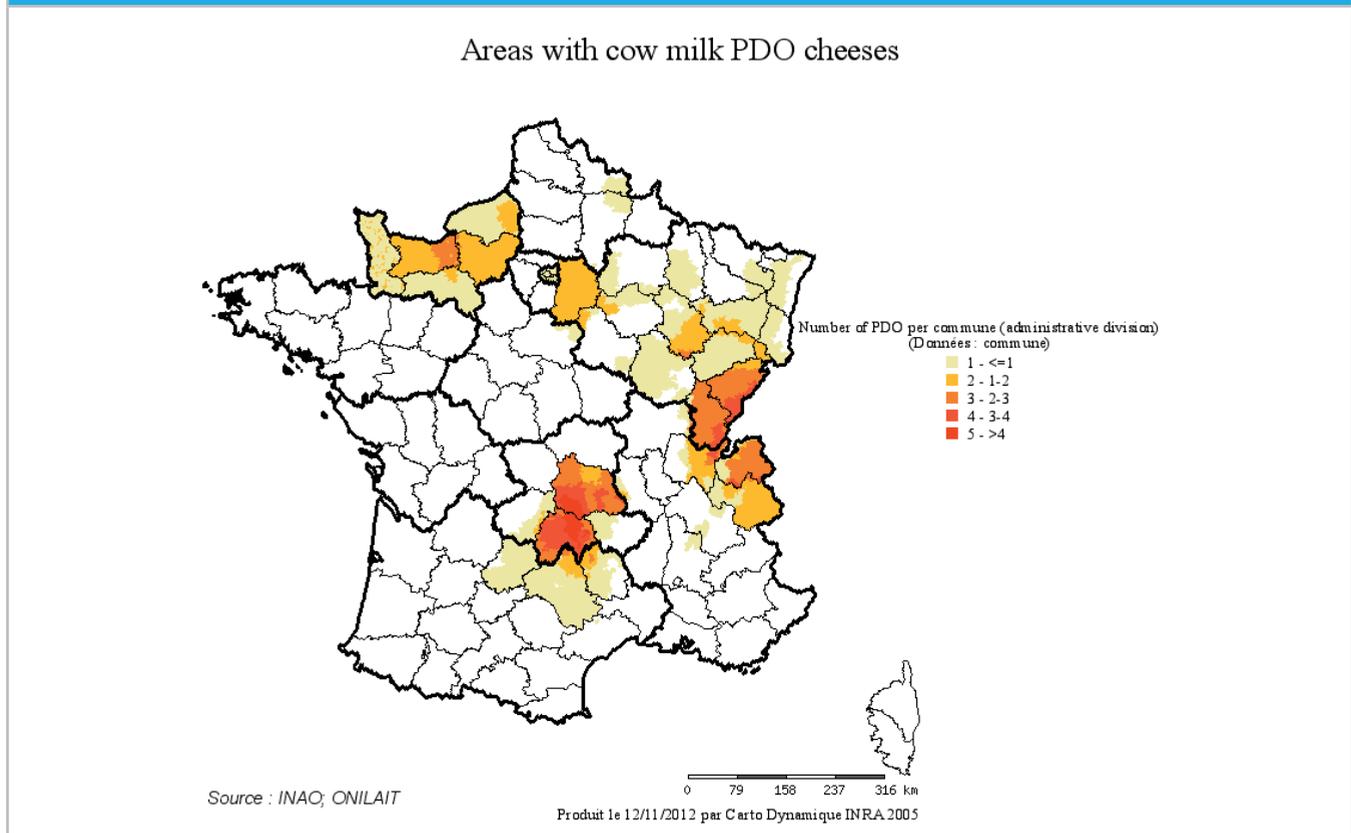
Source: own elaboration from EU-FADN 2007, 2008 DG AGRI and from DG AGRI data on volume and value of PDO-PGI

In France, 18 of the 29 PDO cheeses are produced in mountain areas and 4 PGI are also produced in mountain areas (Tomme de Savoie, Emmental de Savoie, Emmental Central Est Français and Tomme des Pyrénées). The spatial distribution of designations in French mountains is diverse: in each municipality, the potential for farmers varies between 0 and 5 potential cheese PDOs (Map 9).

PDOs are also of diverse weight: the PDO Comté counts with 48 711 tonnes in 2011 (over 250 mio € of turnover), while some designations are confidentially produced up to some

Comté, Morbier, Gruyère, etc.). For most cases in Jura and Alps, milk production for mixed PDO/PGI for cheese is centred on mountain areas (Comté and Morbier: 60% of quotas in mountain areas; Bleu d’Auvergne, Bleu des Causses: 95%). The situation is opposite for Munster (13% of quotas only in mountain area). In terms of place of processing, the situation is slightly different: only 36% of the Comté and 39% of the Morbier are processed in mountain areas. Apart from a small quantity on-farm Munster, no dairy fabricating Munster is located in mountain areas. Bleu des Causses is a counter-example (100% processed in mountain area).

Map 9: Number of cow milk cheese PDOs per municipality



Source : Reuillon, Perrot et al. 2012, from INAO treatment Dervillé 2012 on 'Carto Dynamique' platform INRA)

On this base, (Reuillon, Perrot et al. 2012) estimate that, in 2006, 55% of the 198 412 T of PDO cheese has been produced from mountain milk. Using standard processing coefficients, this represents 1.043 billion litres (31% of mountain delivery quotas). Additional 108 Million litres correspond to farm cheese (61% of the direct sales quota). Summing up, 30% of the French mountain milk is processed into a PDO cheese (8% of the total French milk is processed into PDO products; 4% of French lowlands milk). PGI cheese mentioned above should be added to this picture: they allow to valorise further remaining quantities.

The share of mountain milk used for PDO cheese in 2006 is higher in Jura (73% of the total is processed in Comté, Morbier, etc.) and Alps (43% of the total, and, in fact more (63%) in Savoie strictly speaking) than in Massif Central (20%) and Vosges (16%) It seems that in Jura the share has increased since 2006: now, close to all the mountain milk is used for PDO cheese (Reuillon, Perrot et al. 2012).

PDO and PGI are important in mountain areas and they provide already efficient marketing tools to retain value added at local level. The specificity of natural resources combined with high levels of social capital and strong identities implies that mountain areas are particularly fit for the implementation of geographical indications; there is however an important potential to further segment the market in terms of quantities.

5.3 Existing examples of national labelling schemes specific to mountain agricultural and food products: success or failures?

Most of the countries do not have rules directly regulating and protecting the use of 'mountain' or related term in food labels. Only 4 countries have a specific direct protection regulation on 'mountain' products: France, Italy and Switzerland nationally; Spain regionally (in Galicia). The Alpine Convention debates, relevant for Austria, are also presented below.

6.2.1 France

In France, the protection of the 'mountain' term is legislated through the Mountain Decree, the current version of which was passed in December 2000 (there were previous decrees and laws applicable, one of them having been cancelled following the ECJ Court Case C-321/94 to C-324/94 Jacques PISTRE et autres / Ministère Public).

This decree has since then been integrated into the Rural Code (Article L.641-14 to L.641-18 and Articles R. 641-32 to R. 641-43 and R.671-3) and sets out the legal framework for the use of the term 'montagne' on food products labels.

An amendment has been adopted in 2009 (Decree n° 2009-1196 of 7 October 2009) as well as a ministerial act of implementation ('arrêté ministériel' of 26 November 2009) concerning feed.

The objective of this legislation is to ensure the mountain term is not used in relation to products produced and/or processed outside of mountain areas, so that benefits related to mountain food production are returned to mountain areas and support mountain economies and communities.

The decree states that foodstuffs and wine can use the term 'Montagne' on their packaging only when all the stages in the supply chain (production, animal breeding and fattening, slaughtering and preparation, processing, maturing and packaging) of foodstuffs occur in mountain areas (defined as the LFA mountain area in France).

Nevertheless, the rules allow some general exceptions to this obligation. Are authorised:

(i) Raw material coming from another place if they cannot be produced in the mountain area;

(ii) Cereals, oilseeds, beetroots, alfalfa for feed coming from other areas, when due to technical conditions they cannot be produced in sufficient quantities. The feed for grazing livestock must come by more than 70% from mountain areas. This criterion was the main subject of the 2009 revision. The 70% (expressed in dry matter) criterion for ruminants was introduced by an implementing ministerial act and is calculated on a yearly base for weaned animals and on the whole farm. Derogations are foreseen in case of unforeseen event (climatic conditions, etc.);

(iii) Slaughtering in other areas, when due to technical conditions, the place of slaughterhouses cannot be located in a mountain area

(iv) Packaging in other areas, when due to technical conditions, the place of packaging cannot be located in a mountain area.

Specific technical regulations have been developed for distinct sectors. This has so far occurred for dairy products (Règlement technique lait / produits laitiers), pork products (Règlement technique viande porcine) and beef products (Règlement technique viande bovine). Consultations were attempted without success on the development of a technical regulation for honey.

These technical regulations specify the detailed derogations allowed for each sector. In relation to meat products (pork and beef), cereals, protein crops and oilseeds products used in feed can come from non-mountain areas. Dairy cows can be born outside of mountain areas, while pigs must be born within a mountain area. Butchering of carcasses (for pork and beef) can occur outside of mountain areas (but not slaughtering) provided carcasses are directly transferred

from the slaughterhouse to the final location of preparation. In certain cases (ultra-peripheral territories) derogation are provided for animal slaughtering too.

In practice, a producer wishing to use the 'mountain' term places a request to do so with the relevant regional department of Agriculture. Assuming the mountain origins of the product are satisfactorily verified, administrative authorisation to use the term will be granted.

The protection is provided by Article R.641-42 of the Rural Code. In case of infraction, the administration can withdraw its authorisation after having heard the explanations of the applicant in a timeframe of 1 month. The 'infraction' may be considered as the 'fault' of the user of 'mountain' denomination.

It is not possible to cumulate the term 'mountain product' and a PDO or PGI except under two conditions: that the producers of the denomination ask for it and that the whole area of the PDO/PGI is contained within the LFA mountain area.

There is currently no unified database of products authorised under the French legislation, with data apparently only collected at regional level (only the authorised denominations are listed: no data on production volumes or values are kept or known at any stage). As such, no information is currently available on total volumes of food products authorised as 'mountain' products in France.

Some data has been collected for the dairy sector : Cniel (2009) considers that 132 millions litres of milk are valorised through this scheme (3.9% of the mountain milk collection). 70% are marketed as fresh milk (87% of it

being semi-skimmed); 30% are as cheese. 80% of these quantities have been marketed with the logo 'Altitude'. 70% are under retailers brands: in 2007, Carrefour retailed close to the entirety of the drinking milk labelled as mountain milk (which represented one fourth of Carrefour's sales of drinking milk); since then other retailers entered the market segment (Auchan, Leclerc, Cora, etc) (Reuillon, Perrot et al. 2012).

In total, 71 dairy processors are authorised to use the 'mountain' term (32 in Massif Central, 16 in Jura, 15 in the Alps, etc): this represents one fifth of the dairy establishments in mountain areas. Three companies are principally involved, each with more than 10 million litres. One of these three companies has diversified and packs another product called 'Lait des Alpes' for Lactel (not covered by the French scheme), collected in 31 farms located in the Alps and packed in Massif Central (5 million litres of milk). The same company also packs 3 million litres of 'Lait de Savoie'. These products are intended for regional consumption and the firm believes the market is already close to its maximum potential.

Prior to the 2000 decree, a government logo for 'Produit de Montagne' existed (Figure 49). It was removed due to incompatibility with European Union regulations. In 2003, the Altitude logo (from a non-governmental cooperative stakeholder initiative) was established, with the aim of achieving clear market recognition of mountain products. A core objective of Altitude is to bring value added of mountain products obtained at retail stage to primary producers and processors. Initially Altitude aimed to establish a united logo for the four main product sectors (dairy products, pork, beef and water); however, due to the diversity of objectives between sectors this approach was unsuccessful, with

Figure 49: Examples of mountain logos



Altitude now primarily focused on dairy products. Producers wishing to utilise the Altitude logo must request authorisation from Altitude and pay a determined fee. Currently some 11 firms use the Altitude logo for dairy products. The core aim of Altitude is not the certification or regulation of the mountain origins of products (this remains the domain of the government). The APLM (French Association of Mountain Milk producers) are presently in the process to launch a new brand for mountain milk 'Mont Lait', formally launched in October 2012.

Separate organisations having been established for other product sectors. Currently Porc de Montagne is an established brand, and the establishment of a Boeuf de Montagne logo has so far been unsuccessful due to difficulties complying with requirements to process and slaughter animals in mountain areas.

Dairy firms involved in the treatment of this milk for retailers evaluate the extra price they get from buyers to 0.02€ per litre (versus 0.014 € per litre of extra collecting costs in mountain areas). Producers do not seem to get a premium price (Reuillon, Perrot et al. 2012).

ISARA (2012) carried out interviews to stakeholders on the perception of this scheme: the term 'mountain' has positive associations for milk consumers according to Cniel (2009). Information on the mountain origin of dairy products can have positive impacts on price. However, the logo is viewed as under-communicated in a market place with many existing established brands and logos. The current and potential benefits of the legislation and logo remain concentrated in the middle and end of the supply chain.

The management and control of the use of the mountain terminology is currently carried out by the French authorities for free, which is appreciated by stakeholders. The possible option of third party certification is seen as introducing a cost element for producers/processors and given the current minimal benefits for producers, in particular small-scale producers, this option is seen to imply a negative impact on the scheme uptake and impact.

Currently, the logo seems to have greater potential for marketing products in non-mountain (e.g. urban) areas. The benefits of logo participation for local and direct sales and even regional sales are considerably less. Stakeholders are also calling for similar protection beyond the French borders, where they export.

As a conclusion, the protection granted is quite low and this regulation only grants administrative authorization to use the 'mountain' denomination. There is no provision foreseen to deal with the trademarks previous or posterior which use the 'mountain' term. This protection is only dedicated to 'mountain' and not to any related terms (montagnard) or massif names.

5.3.2 Switzerland

In Switzerland, the use of the 'Mountain' (Montagne, Berg, Montagna) and or 'Alpage' (high-altitude summer grazing areas) terms are protected under the ordinances ODMA of 8 November 2006²³, replaced by the one of 25 May 2011²⁴ (applicable as of 1 January 2012) for any agricultural products (and processed foodstuffs from agricultural products).

As from 2012, the geographic term 'Alps' referring to the alpine mountain range is also protected, but only for dairy and meat.

The Swiss Regulation provides for clear rules concerning co-existence with trademarks: trademarks containing the names 'mountain' or 'alpage' registered in good faith before the 1/1/1999 can be used even if the products cannot comply with the regulation, while trademarks containing the names 'mountain' or 'alpage' registered between the 1/1/1999 and 31/12/2006 can be used until the 31/12/2013 for products which do not respect the regulation. Same provisions apply for 'Alpes' denominations.

The Swiss legislation was established to create greater coherence around how the terms 'mountain', 'alpage' and subsequently 'Alps' are being used in Switzerland to increase transparency for consumers, as well as allowing mountain producers and processors to differentiate their products on the market place.

The scheme requires that all products using the mountain term must be produced in a mountain area and processed in a mountain area or an 'adjoining municipality'. If processing occurs out of these areas, only the mountain origins of those ingredients originating within a mountain area can be specified (e.g. yoghurt made from mountain milk). With respect to mountain cheeses, the milk must always originate from a mountain region.

The term 'alpage' can only be used for agricultural products originating in summer grazing areas and processed agricultural products whose raw materials are obtained and processed in these areas (for meat or meat based products, the 'Alpage' denomination is allowed if the animals have grazed in summer during a period in respect with the regional uses).

23 Ordonnance sur les désignations «montagne» et «alpage» relatives aux produits agricoles et produits agricoles transformés, 8 Novembre 2006

24 Ordonnance sur l'utilisation des dénominations «montagne» et «alpage» pour les produits agricoles et les denrées alimentaires qui en sont issues, 25 Mai 2011

Within the Swiss legislation the possibilities for derogation are:

- Up to 10% of agricultural ingredients in processed products can be sourced from non-mountain areas where they are unavailable within the mountain area;
- in relation to animal feedstuffs, up to 30% dry matter can be sourced from non-mountain areas;
- animals can be slaughtered outside of mountain areas but must have spent at least two thirds of their life in mountain areas – slaughter must occur within 2 months of leaving a mountain area.

The spatial definition of mountain and alpage zones is based on the Swiss Order on Agricultural Areas (1998) (developed to implement a range of Swiss farming handicap payments). This demarcation divides mountain areas into four sub-zones (I-IV) based on multiple parameters including slope, altitude, orientation, temperature, season duration, vegetation and accessibility. The lower limits of these zones correspond approximately to the following altitudes: Zone I: 750m, Zone II: 870m, Zone III: 1,040m and Zone IV: 1,340m. 'Summer grazing pastures' (alpage) are situated at higher altitudes of up to approximately 2,500m.

In practice, unlike the French system, products using these terms must be certified by an accredited independent certification body. The three certification bodies currently carrying out certifications under the ODMA in Switzerland are Bio-Inspecta, Pro-Cert and the OIC (Organisme Intercantonal de Certification)²⁵. In practice, producers (farmers) providing primary products (raw materials such as milk or fruits) are controlled by inspection and are not required to hold a certificate. Since 2012 all finished products (e.g. cheese, yoghurt etc.) are required to have an approved certificate, which is re-assessed every two years. Certification procedures are similar in practice to organic certification, utilising checklists and risk based instruments, based fundamentally in the criteria of the ODMA.

As inspections are carried out by independent bodies there is currently a cost associated with these measures for producers and processors. In line with changes to legislation a new control and certification system was adopted in Switzerland in 2012, which will be developed further throughout 2013. The costs currently depend on the hours of work by inspectors necessary to complete the control and certification process. In practice, farmers are subject to controls (inspection) every four years for 'mountain' products (at a cost of approximately 100-300 SFR) or every 12 years for 'Alpage' products. Processors are subject to controls every 2 years at a cost of 400-1000 SFR. Certificates cost a further 100 SFR (per certificate). The bureaucracy and

costs associated with control and certification under the ODMA represent a potential constraint for producers and processors (particularly smaller-scale ones). To tackle this potential constraint, a collaborative project between the main certification and control bodies (excepting Procert) and the Swiss Farmers Association is underway to coordinate inspections across sites and minimise costs to producers and processors.

The three certification bodies hold a complete database of food products certified under the ODMA, but no current information exists on product volumes for certified products or on any quantifiable aspects of the impacts of the certification system.

As in France, no government administered logo for mountain products exists; however, the revised 2011 Order has provided Swiss ministers with the legal base of developing an official label for voluntary use. Currently, a number of private and cooperative brands exist in Switzerland which utilise the ODMA criteria. The primary 'mountain' brands include Pro-Montagna (developed by COOP), Heidi (developed by Migros) and Alpinavera.

Among the countries studied, Switzerland is the one who provides the best protection to mountain products (certification, protection of alternative terms). However, the 'Alps' denomination benefits from a different and a lower protection than 'mountain' and 'alpage' denominations.

5.3.3 Italy

Italy foresaw some specific provisions related to mountain products. They are found in different legal texts. There are 2 levels of protection.

Firstly, there is a direct approach with the Legislative Decree n° 228 of 18 May 2001, which establishes that the use of the term 'montagna', 'prodotto di montagna' or similar terms, may only be used for agricultural products and foodstuffs, produced and processed in the LFA mountain areas as defined in Community law (in any MS).

In complement, the System of traditional Italian products (National List of Traditional Food products), the scope of which is to promote and disseminate the typical and quality Italian agricultural and food production, includes products from different Italian regions with a reference to the term 'mountain'. 'Burro di montagna' is an example (Figure 50).

Secondly, indirectly, mountain products are protected additionally through PDO or PGI. With the Law n° 97 of 1994 on new provisions for mountain areas, in order to protect the originality of the historical and cultural heritage of mountain areas, the products already registered as PDO or PGI, were authorized to display the additional wording 'prodotto nella montagna italiana' and inserted in a register, only of agricultural food production originating in mountainous areas, both in terms of production (including raw materials)

25 For further information on these certification bodies see: <http://www.oic-izs.ch/> (OIC), <http://www.bio-inspecta.ch/html/team.htm> (Bio-Inspecta) and <http://www.procert.ch/> (Pro-Cert)

Figure 50: Examples of PDM



Figure 51: Examples of Italian PDO referring to 'mountain'



and all stages of their processing. This initial Law was derogated and substituted by Art. 85 of the Law n° 289/2002 Finance Act²⁶, keeping the relation to the registered PDO and PGI products as well as the provided register, but changing the term to indicate on their packaging/labelling to "prodotto nella montagna" followed by the geographical territory concerned.

According to the Ministerial Decree of 30 December 2003²⁷, applications for registration may be presented by consorzi di tutela of the PDO and PGI registered at EU level or the mountain community territorially competent. When the area of production of the PDO or PGI is completely contained within a mountain area, the label 'prodotto della montagna' may be added to the product once it is registered in the mountain products register. If only part of the production is made in a mountain area, the label may only be used for the products obtained from that area. Some examples of Italian PDOs using the additional mention on mountain: Asiago, Castelmagno, Montasio (Figure 51).

26 Full text of the provision Art. 85

(Tutela dei prodotti tipici delle zone di montagna)

1. Al fine di tutelare l'originalità del patrimonio storico-culturale dei territori montani, attraverso la valorizzazione dei loro prodotti protetti con "denominazione di origine" o "indicazione geografica" ai sensi del regolamento (CEE) n. 2081/92 del Consiglio, del 14 luglio 1992, ed in accoglimento della raccomandazione n. 1575/2002, approvata dal Consiglio d'Europa il 3 settembre 2002, è istituito presso il Ministero delle politiche agricole e forestali l'Albo dei prodotti di montagna, autorizzati a fregiarsi della menzione aggiuntiva "prodotto nella montagna" seguita dall'indicazione geografica del territorio interessato, da attribuire, sentite le comunità montane interessate, alle sole produzioni agroalimentari originarie nei comuni montani per quanto riguarda sia tutte le fasi di produzione e di trasformazione sia la provenienza della materia prima.
 2. Le produzioni di cui al comma 1 possono fregiarsi della menzione aggiuntiva anche se aggregate a più vasti comprensori di consorzi di tutela.
 3. L'iscrizione all'Albo di cui al comma 1 per l'uso della menzione "prodotto nella montagna" è esente dai diritti annuali di segreteria.

27 Full text of the provision Art. 1.

I prodotti registrati in ambito Unione europea, ai sensi del regolamento (CEE) n. 2081/92 del Consiglio del 14 luglio 1992, relativo alla protezione delle indicazioni geografiche e delle denominazioni di origine dei prodotti agricoli e alimentari ottenuti nel rispetto del corrispondente disciplinare di produzione, approvato con il rispettivo regolamento di registrazione comunitaria, possono essere iscritti all'albo dei prodotti di montagna, istituito ai sensi del comma 1 dell'art. 85 della legge 27 dicembre 2002, n. 289, recante disposizioni per la formazione del bilancio annuale e pluriennale dello Stato (legge finanziaria 2003).

Art. 2.

1. I prodotti di cui all'art. 1 possono utilizzare la menzione aggiuntiva «prodotto della montagna» limitatamente all'area di produzione e/o trasformazione classificata geograficamente come territorio montano.
 2. Le equiparazioni consentite dalla vigente normativa comunitaria, nazionale e regionale, in assenza del requisito indicato al comma precedente, non sono utilizzabili ai fini dell'iscrizione all'albo e del conseguente uso della menzione aggiuntiva.

The exact number of products registered as mountain PDO/PGI could not be sourced. An unofficial list of Prodotto di Montagna (PDM) products, unavailable on the Ministry's website, was sourced from regional authorities. It is unclear whether this constitutes all PDO/PGI products which are officially registered as mountain PDO/PGI products, or if it relates to all PDO/GI products recognised as potential PDM products. Most probably, the second option is the correct one: however, some products for which the area of production does not include any mountain municipality are present on this list.

The Italian rules are not providing a consistent framework and their implementation is extremely limited and of poor interest for the adoption of an EU level scheme.

5.3.4 Spain

In Spain, the competences on certain issues are transferred to the autonomous communities, one of which established legislation for labelling mountain products of their regions.

In Galicia, the Law 2/2005, of 18 February, on the promotion and defense of the Galician agro-food quality products regulates two specific categories of products, 'home-made products' (made up of material from the farm) and 'mountain-made products' (from mountain LFA areas) and grants protection to them. According to Art. 24 of this law, food craft enterprises located in mountain areas, according to the classification in the applicable Community rules and that use in the manufacture of their products mainly raw materials from those areas, may use the title 'artesano de montaña'. So far, no example of implementation of this label has been found. Most probably it has not been applied at all. There is no other regional rules of this type in place in Spain.

5.3.5 Relevant developments within the Alpine Convention

Austrian representatives are currently leading a working group within the Alpine Convention (www.alpconv.org) with the aim of defining the 'alp' and 'mountain' terms as reserved terms and/or developing a mountain foods label within the framework of the convention. The initiative is being progressed under the Mountain Farming platform of

the convention, which relates to three main topic areas: i) social services of mountain farming ii) human factors in mountain farming; and iii) Marketing, quality and labelling of mountain products. In particular, the convention contains an objective that marketing, quality and labelling of mountain products be professionalised and that cooperative initiatives between regional actors be supported to facilitate mountain product promotion.

Should reserved terms and associated criteria and/or a label become an established element of the convention, these requirements would potentially become applicable to convention signatory countries (Austria, Germany, France, Italy, Liechtenstein, Monaco, Slovenia and Switzerland). So far, proposals have centred on the Swiss approach; however, Convention Member States do not yet fully agree on terms and criteria, with some members supportive of a label, but not of reserved terms.

5.3.6 Specific case of honey

The EU directive on honey of 20 December of 2001 provides that the labeling of honey might refer, among others, to a 'topographical origin, if the product comes entirely from the indicated source'. Mountain is widely used in the labelling (Figure 53), throughout the EU. If the product with the mountain reference does not come 'entirely' from a mountain area (or several in the case of mixes of several mountain production, which seems to be the case in the case of major honey sellers), there is a misuse. According to an European Commission interpretation, the reference of a specific mountain is not compulsory. However, if the label pretends to give a territorial origin to the honey, the specific massif name must be indicated.

Honey labellings found are not subject to trademark registration in most of the cases. Only big companies have registered their brand name as 'Mieli Thun' in Italy or 'Lune de Miel' in France. Other honeys can come from small producers who cannot register their trademark for many reasons, mainly for economic constraints reasons. In France a large part of the names authorized to bear the mention 'mountain' according to the national direct protection scheme are honeys.

Figure 52: Examples of honey labels



Table 54: Respondent opinion on the factors of greatest importance to consumers in relation to their products

Answer Options	Respondent language group				Total Response Count	% Total Responses
	English	Italian	French	German		
The general 'mountain' origins of the product	9	5	21	13	48	28.1
The specific regional identity of the product	11	16	9	14	50	29.2
The association with high quality	14	32	8	6	60	35.1
Other	6	3	4	0	13	7.6

Source: ISARA 2012

As a conclusion, the mention of 'mountain' origin in the honey labelling refers to a variety or a type of honey. Most of the time, 'mountain' appears as a generic feature and the real origin (and compliance with the LFA delimitation or any other delimitation) is unknown (and unchecked). Rules for enforcement would be those on consumer protection and lawful competition.

5.3.7 Perception of mountain producers on the schemes available

To identify which factors were of greatest importance with respect to product marketing and consumers, stakeholders marketing mountain products were asked (ISARA 2012) to indicate which factors was the most important in their view: i) mountain origins; ii) regional identity; or (iii) an association with high quality.

In relation to total respondent counts no single factor ranked particularly high, although the association with high quality was highest overall at 35% (Table 53). The general mountain origin of products was viewed as the single most important factor for product marketing by 28% of total respondents. However, the association with quality was particularly emphasized by Italian speaking respondents, while French speaking respondents placed a greater emphasis on the mountain origin of products.

There are only two significant experiences of defining the concept of mountain products. They differ significantly one from the other. The French case is simple (light enforcement, no protection of synonyms and associated terms) and therefore most probably easily implemented, but the Swiss case is more complete and provides for proportionate exceptions to the general principle that a mountain products is produced and processed in mountain areas.

6 CONCLUSIONS

The points raised throughout this report aim to validate ex post the policy decision of the European Institutions to lay down the optional quality term 'mountain' within the EU Regulation on Agricultural Products Quality Policy Schemes. Mountain agricultural and food products are traded throughout Europe via all types of marketing channels, from local sales linked to tourism to long-distance trade and large scale retailers. Mountain farming and mountain food processing units are in general characterised by higher production costs and lower labour productivity. Part of the extra costs is compensated by higher prices, reflecting on one hand specific qualities and adding value attributes; on the other hand a positive perception by consumers in some Member States. Agriculture and food production contributes to the sustainable development of mountain areas, by providing a high level of positive environmental externalities and significant inputs for the local economies and societies in mountain areas. In these conditions, the absence of a definition of a 'mountain product' would result in the risk of free riders (mis)using the idea and image of mountains for non-mountain products, to the detriment of consumers and real mountain producers.

Until now, despite the significant production potential of agricultural and food products in mountain areas, misuse seems to have been of limited importance. There are labelling practices and registered trademarks which can possibly be considered to be misleading. In many instances, the absence of clear legal provisions defining 'mountain products' at EU level and the focus of protection rules on intellectual property imply limited possibilities for governments and courts to reduce such misuse. Even with national direct protection schemes for mountain products (e.g. in France) protection remains weak. There are alternative protection schemes available, the principal ones being PDO and PGI, which show a higher uptake than average in mountain areas and for mountain products, but they do not fully address the concerns described above.

Now that EU legal provisions defining the term 'mountain products' have been adopted, the European Commission needs to lay down by delegated act the necessary rules for a correct implementation of the new legislation. If the definition adopted by the European Council and the European Parliament was to be implemented without further rules, a series of important problems would appear, including, among others, the following:

(i) animal production cannot rely on obtaining 100% of its feed from mountain areas. Vitamins and minerals are produced outside mountain areas; protein crops and cereals are difficult to grow in most mountain areas for climatic reasons and because of lack of arable land; periodically (i.e. in the event of drought) even grass cannot be sourced 100% from mountain areas. If there is no derogation on feed sourcing, hardly any animal production (more than half of mountain farming turnover) will be eligible for the use of the optional quality term 'mountain products'. At the time of setting a derogation from the rule of feed originating from mountain areas the characteristics of the different animal productions and livestock systems must be considered. A reasonable solution should be sought to allow those producers that add significant value to natural mountain resources to benefit from a specific identification on markets, without excluding the vast majority of others.

(ii) On one hand, processing capacities are not sufficient within mountain areas to process (including slaughter, packaging etc.) all agricultural raw materials produced in mountain areas. On the other hand food processors in mountain areas incorporate ingredients imported from other areas in their end-products. In the case of meat products, the main ingredient (fresh meat) often comes from lowlands. Therefore, traditionally, neighbouring lowlands and mountain areas have developed mutually profitable economic inter-linkages. Important shares of the mountain agriculture and food processing industry would be excluded from the new scheme if no derogation was adopted in this respect. A fair solution on this issue should guarantee that only products whose added value is essentially obtained in mountain areas will be covered.

(iii) Intellectual property rights on trademarks and geographical indications referring to mountain areas have been granted in the past to individual firms and groups of stakeholders. Such rights need to be protected, while at the same time, obvious misuses and misleading practices should be reduced. Therefore, appropriate coexistence with the new optional quality term should be organised. The issue of terms other than 'mountain' should also be examined, as is done in the case of the Swiss rules concerning the term 'Alps'.

(iv) The definition of mountain areas referred to (LFA mountain) has been laid down for the purpose of compensating for natural handicaps faced by mountain

farmers. Member States have decided (or not) on detailed definitions of mountain areas on the basis of Less Favoured Area policy requirements, not on the basis of a quality foods labelling policy. Adaptations might be necessary at Member State and/or Commission level.

(v) Enforcement of an optional quality term can be seen as potentially weak under existing consumer protection and lawful competition rules. An alternative would be to rely on certification schemes, but it would entail higher costs for producers.

7 REFERENCES

- ADAPRO (2006). *Présentation de la filière apicole régionale et des actions de l'ADAPRO-LR*, ADAPRO: 13.
- ADARA. (2011). "Enquête Récolte et Marché 2011." from <http://www.adara.itsap.asso.fr/infos/222222.php>.
- ANDI, GEM, et al. (2010). *Etude des filières bovins lait à l'échelle du Massif Central, rapport de synthèse*. Auvergne Limousin, ANDI, GEM, IE, CRIEL: 43p
- Aubard, A. and O. Olivas Caceres (2012). *Practices and legal aspects of the commercial use of term « mountain » in the labelling of food products*. Bordeaux, AUBARD CONSULTING CONSORTIUM: 87.
- BABF (2012). *Mountain milk and cheese in Austria: a case study for mountain products supply chain*. Viena, Bundesanstalt für Bergbauernfragen: 70.
- Baumgärtner, J. (2000). *Biodiversity that Mitigates Pests in Agroecosystems. Managing Agricultural Resources for Biodiversity Conservation: A Guide to Best Practices*. UNEP, ELCI/UNEP BPSP: 8.
- Bouleau, T., E. Sanne, et al. (2012). *Définition des stratégies et des actions à mettre en oeuvre pour conforter le filières viande bovine du Massif-Central. Synthèse: Etat des lieux et perspectives*, Sidam, Institut de l'Elevage. **24**: 24.
- Bowen, S. and K. d. Master (2011). "New rural livelihoods or museums of production? Quality food initiatives in practice." *Journal of Rural Studies* **n°27**: pp.73-82.
- Cloye, G. (2010). *Dossier: Agriculture et montagne, une relation à haute valeur ajoutée*. **n°990**: pp.11-38.
- Cniel (2006). *Démarche de qualité de la filière laitière française. Dossier laitel*. CNIEL: 8.
- Cniel (2009). *Les produits laitiers de montagne: les volumes, les fabricants, les perspectives. Résultats d'une enquête réalisée auprès des fabricants de produits laitiers de montagne en 2009*. CNIEL, CNIEL: 6.
- Costa Teixeira, A. J. (2009). *Produção e comercialização integrada de produtos caprinos e ovinos com denominação de origem: uma experiência de Portugal*. *4º Simpósio Internacional Sobre Caprinos e Ovinos de Corte Feira Nacional do Agronegócio da Caprino-Ovinocultura de Corte Sincorte*. João Pessoa, Paraíba, Brasil: 9.
- Derville, M. (2012). *Territorialisation du secteur laitier et régimes de concurrence : le cas des montagnes françaises et de leur adaptation à l'après-quota*. *US-ODR INRA de Toulouse*. Paris, AgroParisTech. **PHD**: 554.
- EC (2008). *Milk sector - (4) Impact on milk margins of a price reduction completely on mountain areas* DG-AGRI. Bursseles, European Commission, Directorate-General for Agriculture and Rural Development 77.
- EC (2009). *Peak Performance - New insight into Mountain Farming in the European Union*, Commission staff working document. Bruxelles, European Commission: 31.
- EEA (2010). *Europe's ecological backbone: recognising the true value of our mountains*. Copenhagen, EUROPEAN ENVIRONMENT AGENCY: 248
- Eurobarometre (2011). *La Politique Agricole Commune*. *EUROBAROMETRE spécial 368*: 11.
- EuroMARC, E. M. A. p., *Retailing and Consumers*, Workpackage 6 Version 5, July 2009. (2009).
- Euromontana (1997). *Montagnes sèches méditerranéennes : l'intégration des préoccupations environnementales dans l'agriculture de montagne*. Euromontana. Paris, Euromontana: 117.
- Euromontana (2004). *Project "Strategic information for the development of agricultural quality products in European mountain areas. Fifth framework programme for RTD-DG Research, Oct 2002 - Sept 2004*.
- Euromontana. (2004b). "Projet PMQ 2002-2004 : Produits agroalimentaires de Montagne en Europe: Liste des zones et des produits de l'Etude." from http://www.euromontana.org/images/stories/projets/MQFP2002-2004/docs/liste_produitsmqp_fr.pdf.
- Euromontana (2010). *Ecosystem services in mountain areas. How to assess their value and set policy instruments for compensation*. Euromontana. Paris, Euromontana.

- Evans, R. (2005). "Curtailling grazing-induced erosion in a small catchment and its environs, the Peak District, Central England." *Applied Geography* **25**: 81-95.
- Goltsiou, K. (2011). Theme 4: Transhumance Routes. Report of Greece. *Pisma*, Canepal: 35.
- Griffoul, B. (2009). "La grande diversité de la montagne en Europe." *Revue laitière française* **689** 2.
- Guri, F., F. Santini, et al. (forthcoming). Agriculture on mountain areas. *JRC Scientific and technical reports*. JRC. Seville, IPTS-JRC.
- Hauwuy, A., F. Delattre, et al. (2006). "Conséquences de la présence de filières fromagères bénéficiant d'une Indication Géographique sur l'activité agricole des zones considérées: l'exemple des Alpes du Nord »." *INRA Prod. Anim.* **19**(n°5): 10.
- Heitzmann, H. (2003). La transhumance bovine en Béarn: aspects socio-economiques et sanitaires. *La faculte de medecine de Creteil*. Paris, École nationale veterinaire d'Alfort **PHD**: 109.
- Herzog, F., R. G. H. Bunce, et al. (2006). "Policy Options to Support Transhumance and Biodiversity in European Mountains a report on Transhumance Stakeholder Workshop." *Research and Development* **25**(1): 3.
- Holloway, L., R. Cox, et al. (2006). "Managing sustainable farmed landscape through 'alternative' food networks: a case study from Italy " *The geographical journal* **172**(3): 11.
- Hopkins, A. (2011). *Mountainous farming in Europe*. Grassland farming and land management systems in mountainous regions. Proceedings of the 16th Symposium of the European Grassland Federation, Gumpenstein, Austria.
- IEEP (2006). An evaluation of the less favoured area measure in the 25 member states of the European Union., Institute for European Environmental Policy: 262.
- Iorio, M. and A. Corsale (2010). "Rural tourism and livelihood strategies in Romania." *Journal of Rural Studies*(26): 11.
- ISAGRI (2012). Deriving from FADN data quantitative information on mountain agricultural products supply chains in the EU. Parma, Italy, University of Parma, Departments of Economics: 100.
- ISARA (2012). Study on labelling of Agricultural and food products of mountain farming. Lyon, Isara, Euromontana, University of the Highlands and Islands Perth College: 165.
- Lindemann-Matthies, P. (2005). "'Loveable' mammals and 'lifeless' plants how children's interests in common local organisms can be enhanced through observation of nature." *International Jour-nal of Science Education* **27**: 655-677.
- Macdonald, D., J. R. Crabtree, et al. (2000). "Agriculture abandonment in mountain areas of Europe: environmental consequences and policy response." *Journal of Environmental Management*(59): 13.
- Macdonald, K. I. (forthcoming). "The morality of cheese: A paradox of defensive localism in a transnational cultural economy." *Geoforum*.
- Meiberger, E. and M. Weichbold (2010). How can mountain quality food reduce the vulnerability of mountain farming systems? *9th European IFSA Symposium*. Vienna (Austria): 1626-1635.
- Menadier, L. (2008). "Iconography of landscape to understand relations between a typical product and its landscapes." *Dissertations Commission of Cultural Landscapes* (8): 17.
- Micol, D., B. Picard, et al. (2002). Viandes de montagne produites à base d'herbe. *ENITAC/INRA "Moyenne montagne en devenir"* ENITAC/INRA: 6.
- NORDREGIO (2004). Mountain areas in Europe : analysis of mountain areas in EU Member States, acceding and other European countries. *Final report*. E. C. c. N. 2002. CE.16.0.AT.136.
- O'Rourke, E. and N. Kramm (2009). "Changes in the Management of the Irish Uplands: A Case-Study from the Iveragh Peninsula " *European Countryside* **1**: 53-66.
- Oppermann, R., G. Beaufoy, et al., Eds. (2012). *European countries – experiences and perspectives*. Ubstadt-Weiher, verlag regionalkultur.
- Pasca, A. and A. Rouby (2012). Strategies to increase the attractiveness of mountain areas: how to approach depopulation in an integrated manner? Transversal analysis of the results of PADIMA on education and training, territorial marketing and economic diversification Final report from work package 4 "integrated approach". *Padima project*. Euromontana. Bruxelles, Euromontana: 47.
- Peco, B., A. M. Sanchez, et al. (2006). "Abandonment in grazing systems: Consequences for vegetation and soil." *Agriculture, Ecosystems and Environment* **113**: 284-294.
- Penati, C., P. B. M. Berentsen, et al. (2011). "Effect of abandoning highland grazing on nutrient balances and economic performance of Italian Alpine dairy farms." *Livestock Science*(139,): 142-149.
- Perrot, C., M. Derville, et al. (2009). *Le lait dans les montagnes européennes. Un symbole menacé*. Rencontres autour des Recherches sur les Ruminants.
- Peyrache-Gadeau, V. and L. Perron (2010). " Le Paysage comme ressource dans les projets de développement territorial." *Développement durable et territoires* **1**(2).

- Pieniadz, A., J. H. Hanf, et al. (2009). *Small farmers in the Romanian dairy market: Do they have a future?* 111 EAAE-IAAE Seminar 'Small Farms: decline or persistence'. U. o. Kent. Canterbury, UK: 14
- Rainis, S., F. Sulli, et al. (2012). "The impact on landscape, environment and society of new productive chains in a mountain area: strategies, analysis and future perspectives." Journal of Agricultural Engineering **43**(2).
- Rancourt, M., N. d. Fois, et al. (2006). "Mediterranean sheep and goats production: An uncertain future." Small Ruminant Research **62**: 167-179.
- Rescia, A. J., A. Pons, et al. (2008). "Reformulating the social-ecological systems in a cultural rural mountain landscape in the Picos de Europa region (northern Spain)." Landscape and Urban Planning **88**: 23-33.
- Reuillon, J.-L., T. Charrontin, et al. (2008) "Coût de production de lait. Recherche d'une méthode de calcul applicable aux exploitations laitières diversifiées françaises et utilisable pour des comparaisons internationales." 83.
- Reuillon, J. L., C. Perrot, et al. (2012). *La filière française de laits et de fromages de montagne (Mountain milk and cheese in France: a case study for mountain products supply chains.*, Institut de l'Élevage INRA Sidam Cniel: 73.
- Revoredo-Giha, C., P. Leat, et al. (2008). *Premia for differentiated products at the retail level: can the market put a value on the mountain attribute?* Land economy working paper series.
- Ricard, D. (1994). Les montagnes fromagères en France. Clermont-Ferrand.
- Robinson, R. (2009). *Euromontana SARD-M report on positive externalities 2008-2009, European case studies and proposals to guide Carpathian and Balkan projects*. Euromontana. M. d. b. o. c. a. e. assets. Bruxelles, Euromontana: 66.
- Ruiz Avilés, P. and M. Bustamante Calabria (2004). Diseño de actuaciones para compatibilizar los usos económicos y ambientales en la Sierra de Segura. Jaen, Spain, Jaén : Instituto de Estudios Giennenses.
- Sanz Cañada, J., D. García Brenes, et al. (2012). "Mountain Olive Oils in Jaén (Spain): a Case Study for Mountain Products Supply Chains." 60.
- Schermer, M. (2010). "Alpine ländliche Räume und ihre (Markt)Potenziale." Der Alm- und Bergbauer **12**(10): 7-9.
- Schjøll, A., V. Amilien, et al. (2010). *Promotion of mountain food: An explorative study about consumers' and retailers' perception in six European countries*. 9th European IFSA Symposium. IFSA. Vienna (Austria): 1558-1567.
- Schmitzberger, I., T. Wrbka, et al. (2005). "How farming styles influence biodiversity maintenance in Austrian agricultural landscapes." Agric. Ecosyst. Environ. **108**: 274-290.
- Smit, H. J., M. J. Metzger, et al. (2008). "Spatial distribution of grassland productivity and land use in Europe." Agricultural Systems **98**(3): 208-219.
- Soliva Reto, K. Rønningen, et al. (2008). "Envisioning upland futures: Stakeholder responses to scenarios for Europe's mountain landscapes." Journal of Rural Studies **24**(1): 56-71.
- Tasser, E. and U. Tappeiner (2002). "The impact of land-use changes in time and space on vegetation distribution in mountain areas." Applied Vegetation Science **5**(173-184).
- Tebby, C., G. Giraud, et al. (2010). *Determinants of interest in mountain food products: A European crosscountry study*. 9th European IFSA Symposium. 2010. Vienna (Austria): 1568-1578.
- Tischer, M., P. Ansbacher, et al. (2008). *RegioMarket: Guideline for Cooperative Regional Marketing*. Martin Tischer, Patrick Ansbacher and A. Seyfert. Karlsruhe, LUBW Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg: 115.
- Veen, P., R. Jefferson, et al., Eds. (2009). Grasslands in Europe of high nature value. Zeist, Netherlands, KNNV Publishing.

European Commission
EUR 25768 - Joint Research Centre - Institute for Prospective Technological Studies

Title: Labelling of agricultural and food products of mountain farming

Author(s): Fabien Santini, Fatmir Guri, Sergio Gomez y Paloma

Luxembourg: Publications Office of the European Union

2013 - 122 pp. - 21.0 x 29.7 cm

EUR - Scientific and Technical Research series - ISSN 1831-9424 (online)

ISBN 978-92-79-28275-1 (pdf)

doi: 10.2791/67942

Abstract

With a view to making the mountain products on the market more clearly identifiable and less misleading for consumers, the EU institutions legislated on a common definition of an optional quality term, 'mountain product', in the labelling of agricultural products. The term 'mountain product' should only be used for products for which the feed and the raw materials come essentially from mountain areas and for which the processing also takes place in mountain areas. The European Commission will adopt implementing acts setting derogations to the general principles of the new Regulation (EU) No 1151/2012 of the European Parliament and of the Council of 21 November 2012 on quality schemes for agricultural products and foodstuffs in order to take into account the specificities of the different sectors involved. In this context, the present report aims to (i) gather and analyse information on the supply chains for agricultural and food products in mountain areas; (ii) review the possible reasons why citizens, stakeholders and consumers need clarity regarding the provenance of mountain products; and (iii) assess past and present labelling practices for mountain products. Flexibility might be sought in the derogations to the rules governing the term 'mountain product' with regards to the exact place where feed is sourced, to the places where agricultural raw material produced in mountain areas are transformed in further processed goods, to the share of non-mountain ingredients within a mountain processed product that may be considered as acceptable. Means for a proper enforcement of the rules and to ensure coexistence between the new optional quality term 'mountain product' and other existing tools, such as trademarks and geographical indications, should be proposed. In absence of derogations, the applicability the optional quality term 'mountain products' would be impaired.

As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle.

Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new standards, methods and tools, and sharing and transferring its know-how to the Member States and international community.

Key policy areas include: environment and climate change; energy and transport; agriculture and food security; health and consumer protection; information society and digital agenda; safety and security including nuclear; all supported through a cross-cutting and multi-disciplinary approach.