

# Results of an EU wide comparison of quality related characteristics of food products

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## EXECUTIVE SUMMARY

All food placed on the EU market has to comply with stringent legal requirements to protect the health of consumers and to inform them truthfully about the characteristics of the products they intend to buy. Moreover, the EU Directive on Unfair Commercial Practices (UCPD) shall prevent consumers from being misled into believing that a good is identical to the same good marketed in several other Member States while those goods have a significantly different composition or characteristics, which cannot be justified by legitimate and objective factors.

Identifying differences in the composition or characteristics of a good is therefore a necessary, albeit not sufficient, condition to detect any such misleading practice. Studies in some EU Member States carried out between 2016 and 2018 pointed towards differences in quality related characteristics (such as composition and sensory properties) of branded and private label food products. However, because of the different approaches used for collecting samples, testing and data interpretation, the data are not fully comparable. Most of the studies have compared branded and private label products taken from the domestic market to their equivalents purchased mostly in one neighbouring EU Member State.

Among the initiatives taken by the European Commission to address this problem, the Joint Research Centre (JRC) developed in 2018 a harmonised testing methodology for assessing quality related characteristics of food, aiming at improving food product comparative tests so that Member States can discuss this issue on a sound and shared scientific basis that is the same for all.

This methodology was used to collect information on the composition of a wide variety of branded and private label food products. The nutrition declaration, ingredient list and quantitative ingredient declaration as printed on the product labels and the front-of-pack appearance was used for categorising products according to their similarity.

All EU Member States were invited by the JRC to participate in an EU wide campaign to collect information regarding the composition of selected food products offered on their markets. Nineteen EU Member States submitted information provided on the product labels and the front-of-pack appearance of 113 branded and 15 private label products. In total, information for 1380 products formed the basis of the data comparison.

Products were grouped into nine categories using as criteria whether product composition and the front-of-pack were 'identical', 'similar' or 'different'. The appearance of the front-of-pack was visually examined by a panel of JRC assessors for similarity grading to reduce the effect of individual perceptions of differences in the graphical design of the front-of-pack. However, a certain element of subjectivity in the judgment cannot be excluded.

The level of detail given by the producers to describe ingredients and the way individual elements for the nutrition declaration (content of energy, protein, fat, etc) are estimated, has an influence on the information provided on the label of food products. Moreover, the

translation of ingredient names from the different languages (used for the products in the various Member States) into English may also have an effect, although efforts were made by the JRC team to harmonise the terminology used to the extent possible.

The composition of 33 % of the evaluated products was identical but not all of them had an identical front-of-pack appearance; differences in composition but identical or similar front-of-pack were found for 9 % and 22 %, respectively, and 27 % had a different composition and also a different front-of-pack appearance. The rest of the products (9 %) had similar compositional characteristics.

Detailed information for each product type is given in the Annex of this report. Moreover, comments received from the food industry on the individual products are listed as well on each of the product sheets.

For those products where national variants of a branded product were differentiated, clusters were formed by grouping products together having the same composition. This clustering did not reveal any consistent pattern of product differentiation for particular geographical regions.

The findings described in this report relate to the observed differences in the composition, i.e. variations in the content of nutrients and/or ingredients, of the food products included in the survey. It has to be understood that such compositional differences cannot be translated into different levels of food quality. As one aspect of food quality is related to sensorial properties (e.g. taste, structure, appearance) of the concerned products, a subset of the products included in this study will undergo sensory testing by expert panels in the next months. This may clarify if a different composition of a given food product will have a noticeable impact on its sensory properties.

The results of this study relate to the sample of products which were included in the survey at the time of collecting them (November to December 2019). It needs to be stressed that it is inappropriate to conclude by inference that the findings are also valid for the whole population of branded and private label foods on the EU market.

Whether or not any of the identified cases of identical marketing of goods with significantly different composition would constitute a misleading practice, violating EU law, goes beyond the purpose of this study. According to the relevant legislation, it would require an additional case-specific assessment by a competent national authority that takes into account all other relevant factors (notably the legitimacy and the objectivity of any justification provided by the brand owner).

## 1. CONTEXT

Consumer protection authorities and consumer associations of several EU Member States reported during 2016-2018 differences in the composition and/or sensory properties of certain food products offered on their markets in comparison to the same products offered in other Member States. In his 2017 State-of-the-Union address, European Commission President Jean-Claude Juncker requested Commission services to develop a methodology to improve food product comparative tests so that Member States can discuss this issue on a sound and shared scientific basis that is the same for all. The Joint Research Centre (JRC) together with other Commission services and in close collaboration with representatives of the competent authorities of the EU Member States, food industry, the retailing business and consumer associations developed such a harmonised framework for comparative product testing<sup>1</sup>. The main elements of the framework are depicted in Figure 1.

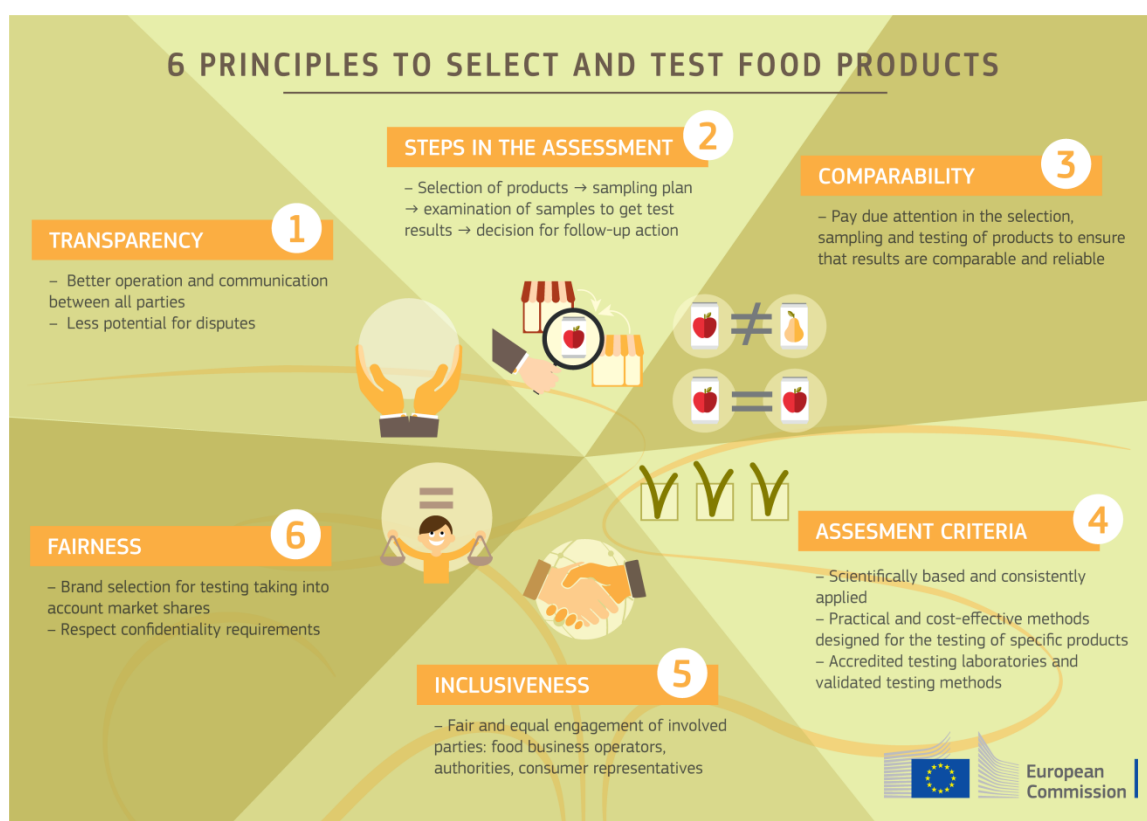


Figure 1: The harmonised methodology for assessing quality related characteristics of food

The relevant elements of the methodology were used for the execution of an EU wide campaign, organised and overseen by the JRC, to create the evidence to what extent differences in composition of branded foods (including private labels) exist in the EU Member States. Based on the study findings, sensory assessment of a subset of food products will be

<sup>1</sup>[https://ec.europa.eu/jrc/sites/jrcsh/files/eu\\_harmonised\\_testing\\_methodology\\_framework\\_for\\_selecting\\_and\\_testing\\_of\\_food\\_products\\_to\\_assess\\_quality\\_related\\_characteristics.pdf](https://ec.europa.eu/jrc/sites/jrcsh/files/eu_harmonised_testing_methodology_framework_for_selecting_and_testing_of_food_products_to_assess_quality_related_characteristics.pdf)

further organised to understand whether compositional differences of several variants of the same branded products lead to noticeable differences in the sensory characteristics of the product.

## 2. OBJECTIVES

The specific objectives of the EU wide testing campaign were:

- to compile a list of branded and private label products for which composition information has to be collected across the EU;
- to collect compositional information of the selected products with the help of the competent authorities in the Member States;
- to compare their composition (quantity of nutrients and ingredients) as well as their packaging characteristics;
- to assess whether products marketed under the same brand and with the same or very similar packaging differ in composition.

## 3. METHODOLOGICAL APPROACH

All EU Member States were invited to suggest products for inclusion in the EU wide testing campaign. Nominations of products for testing were received from Bulgaria, Czech Republic, Germany, Hungary, Lithuania, Poland, Slovenia and Slovakia. A significant part of the products were included in the study because consumer protection authorities or consumer associations had received complaints about certain products on their domestic markets that differed from products offered in foreign, mostly neighbouring, Member States. This set of products was complemented by products of a similar nature, which had not been the subject of previous studies, with the intention to increase the representativeness of the market basket.

Subsequently, all EU Member States were invited to collect information (digital pictures and compositional data provided on the product labels) for 145 products, representing 50 brand owners among them seven supermarket chains.

The JRC provided the participating competent authorities of the Member States with detailed instructions regarding data collection and electronic reporting sheets for submitting the data. Member States were requested to take digital pictures of the products and register product and composition related information in the reporting sheet. The information collection campaign started on 6 Nov 2018 with an initial deadline set to 4 Dec 2018; however, the last data set was received on 7 Jan 2019. From the 28 Member States invited, 19 submitted data: Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia, Spain and The Netherlands. The label information was translated by the competent authorities themselves into English. As part of the data acceptance process the submitted data was vetted by the JRC to eliminate inconsistencies in the used terminology, in particular for ingredients (e.g. the term 'milkfat'

replaced 'concentrated butter', butter oil', 'anhydrous milkfat' etc) to the extent possible. However, small difference as a result of translation errors cannot be excluded.

The number of datasets obtained varied depending on the availability of products in the Member States; consequently none of them submitted data for all the products on the list. The information for the private label and niche products were collected by a small number of Member States only, as this depends on the presence of the supermarket chains owning the private label.

In total, information for 128 products of the 145 selected for the study (113 branded and 15 private label) representing 1380 individual samples was recorded as digital photographs, stored in a database and used for the comparative evaluation by the JRC. For the remaining 17 products, data from less than three Member States were received and they were excluded from further analysis as they were not in-line with the requirement that comparison shall be made among *several* Member States (at least three) as required in the harmonised methodology.

## 4. RESULTS

The selection of products followed the General Principles as outlined in the EU harmonised testing methodology<sup>1</sup>. Due considerations were given to ensure:

- comparability of products, i.e. products marketed under 'the same packaging and branding' in several Member States (regardless of differences in the language used to provide information to consumers or packaging size);
- sampling of products in several Member States, representing a geographical cross-section of the EU;
- that products represented a wide range of brand owners;
- that products that were proposed by Member States on the basis of previous consumer complaints were complemented with other food products.

For each product, a dashboard was created (available in the Annex), containing the nutrition declaration and the list of ingredients as given on the product label, photos of the products and, if applicable, a graphical representation of the similarity of the national variants of a product. The sequence in the list of ingredients reflects their quantities in declining order. However, ingredients constituting less than 2 % of the finished product may be listed in a different order after the other ingredients<sup>2</sup>. Brand owners were invited to comment the

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<sup>2</sup> Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers, amending Regulations (EC) No 1924/2006 and (EC) No 1925/2006 of the European Parliament and of the Council, and repealing Commission Directive 87/250/EEC, Council Directive 90/496/EEC, Commission Directive 1999/10/EC, Directive 2000/13/EC of the European Parliament and of the Council, Commission Directives 2002/67/EC and 2008/5/EC and Commission Regulation (EC) No 608/2004. Annex VII Indication and Designation of Ingredient, Part A – Specific provisions concerning the indication of ingredients by descending order of weight



findings of the comparative evaluation and their response was copy-pasted into the individual dashboards.

#### 4.1. Availability of products in Member States

A wide range of product categories were included in this study (Figure 2). Ninety percent of the targeted products were available in at least four Member States and more than 60 % in at least nine Member States, demonstrating that a representative cross-section of the EU market was covered (Figure 3).

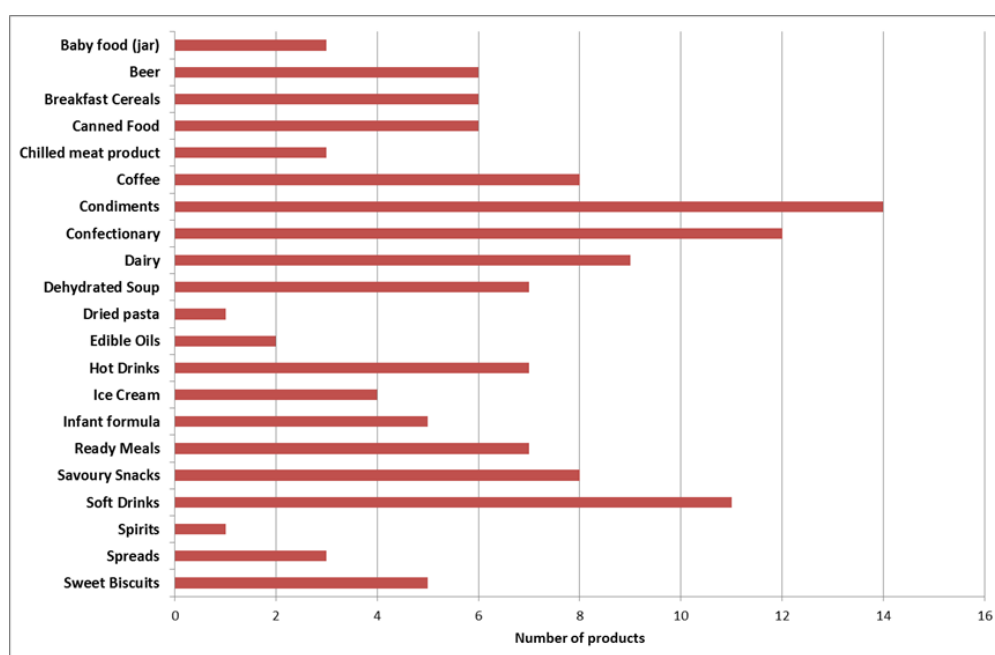
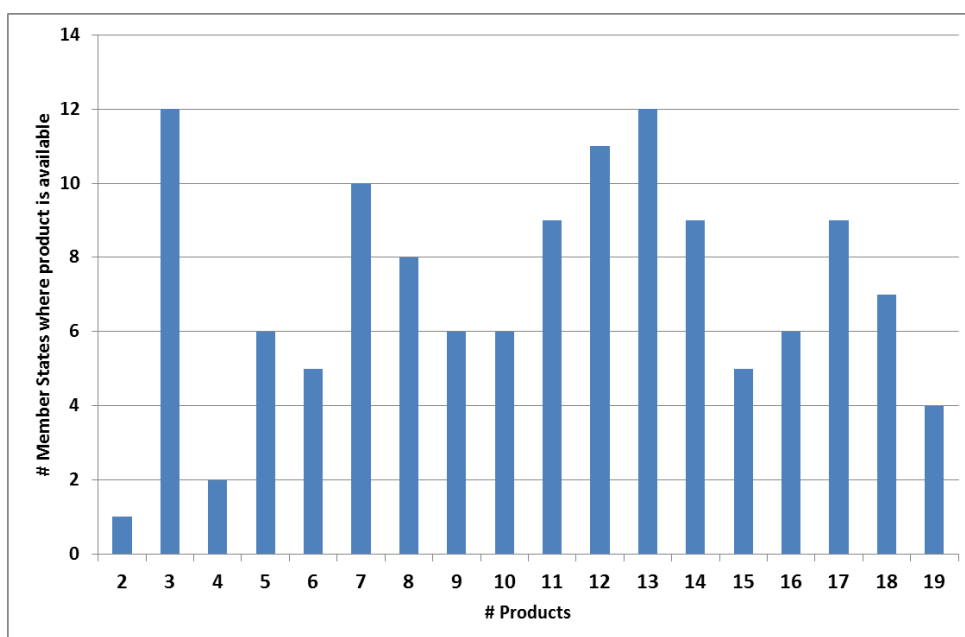


Figure 2: Breakdown of the branded products contained in the market basket in different food categories<sup>3</sup>

<sup>3</sup> Canned foods include canned vegetables & fruit, meat, fish; coffee includes powdered and instant coffee; condiments include custard powder, mayonnaise, ketchup, tomato puree, spices; confectionary includes chocolate, chocolate bars, chocolate enrobed cookies, candies, chewing gum; hot drinks include tea leaves; ready meals include frozen pizza and fish fingers; soft drinks include carbonated and non-carbonated beverages and fruit juices.



*Figure 3: Availability in the EU Member States of branded products included in the EU wide survey*

Availability of private label and niche products is determined by the presence of supermarket chains owning them. For this EU wide comparison study, products offered by chains operating predominantly in Austria and Germany and their neighbouring countries in Central Europe were covered. As a consequence, the majority of the private label and niche market products were available only in a few Member States. One of the supermarket chains has outlets across the EU, which allowed information collection in several Member States.

## 4.2. Differentiation of products

The Unfair Commercial Practices Directives (UCPD) protects consumers from unfair business practices, including those suggesting to consumers that a product, which is marketed under the same brand and with the same or very similar packaging is the same across several Member States while this is, in fact, not true<sup>4</sup>. In September 2017, the European Commission issued a Notice that provides concrete guidelines for competent authorities on how to apply EU food and consumer protection law, in particular to potential dual quality cases<sup>5</sup>. This Note explains that the marketing of goods with the same packaging and branding but with a significantly different composition and sensory profile could be contrary to the UCPD subject to a case-by-case assessment.

<sup>4</sup> Directive 2005/29/EC of the European Parliament and of the Council of 11 May 2005 concerning unfair business-to-consumer commercial practices in the internal market

<sup>5</sup> Commission Notice on the application of EU food and consumer protection law to issues of Dual Quality of products — The specific case of food (2017/C 327/01)

To increase legal certainty for national consumer protection authorities, business operators and consumers, the European Commission proposed an update to the UCPD in order to make it explicit that marketing a product as being identical to the same product marketed in several other Member States, while those products have significantly different composition or characteristics, may constitute an illegal conduct<sup>6</sup>.

The *Commission Notice on the application of EU food and consumer protection law to issues of Dual Quality of products – The specific case of food*<sup>5</sup> explicitly refers to possible unfair practices in the marketing of differentiated food products in the Single Market if food products have:

- a seemingly identical presentation;
- are marketed under the same brand;
- but have significant differences in composition and/or sensory profile.

Consequently, the products included in this study were classified by the two main criteria of the Commission Notice<sup>5</sup>:

- Similarity of product packaging
- Similarity of composition

of the same branded or private label food product.

Similarity of product packaging was visually evaluated by a JRC panel of experts comparing the features (motif, colours, logos, fonts, pictures, layout, and shape) of the front-of-pack of the different variants of the same product obtained from different markets. Comparative evaluation was restricted to the front-of-pack as this side of the packaging has the largest influence on consumers' purchasing decision. If just one of the front-of-packs of the different variants differed, the product was rated having a different appearance. The visual evaluation was done by five JRC operators working independently to minimise subjectivity and bias. Still, a certain level of subjectivity remained, in particular for deciding whether the front-of-pack of several variants of a product shall be rated as 'similar' or 'different'.

Article 22 of the Food Information to Consumers Regulation<sup>2</sup> requires to indicate the quantity of an ingredient or category of ingredients (QUID) used in the manufacture or preparation of a food where the ingredient or category of ingredients concerned: (a) appears in the name of the food or is usually associated with that name by the consumer; (b) is emphasised on the labelling in words, pictures or graphics; or (c) is essential to characterise a food and to distinguish it from products with which it might be confused because of its name or appearance.

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<sup>6</sup> Proposal for a Directive of the European Parliament and of the Council amending Council Directive 93/13/EEC of 5 April 1993, Directive 98/6/EC of the European Parliament and of the Council, Directive 2005/29/EC of the European Parliament and of the Council and Directive 2011/83/EU of the European Parliament and of the Council as regards better enforcement and modernisation of EU consumer protection rules 2018/0090 (COD) and {SWD(2018) 96} - {SWD(2018) 98}

For the purpose of this study, products with differences in QUID were regarded to have different characteristics.

To judge whether the nutrition declaration of the different variants of the same product differed to a larger extent the relative standard deviation of the declared nutrient content was computed provided that data for at least three national variants of the same product was available. In case that the value was less than 10 % for all declared nutrients, the nutrition declaration was considered to be similar, otherwise it was rated as being different. This allowance was set arbitrarily to account for smaller differences which could result from the application of different rounding rules for the nutrition declaration. The tolerances set by the Guidance Document for the Control of Compliance with the Food Information to Consumers legislation was deemed inappropriate for the purpose of this exercise because the tolerances mentioned therein refer to the analytical control of the declared nutrient values<sup>7</sup>.

It must be noted that the translation of the ingredient list from the local language into English (performed by the participating Member States) and use of different expressions for the same ingredient in different countries might have a slight impact on the classification of products as presented above. Differences in terminology used to label ingredients that are factually the same but labelled in a different way (e.g. milkfat, butter fat, concentrated butter) were, therefore, ignored for classification of products.

As a consequence, the following scheme and colour code was elaborated and used for the classification of products according to their similarities respectively differences (Table 1).

	<b>COMPOSITION</b>	<b>FRONT-OF-PACK</b>
<b>IDENTICAL</b>	Nutrition declaration and ingredients are the same	Motif, colours, logos, fonts, pictures, layout, shape are the same
<b>SIMILAR</b>	Small variations in nutrition declaration and/or ingredient list	Small variation in characteristics but generally having the same appearance
<b>DIFFERENT</b>	Different ingredients or different Quantitative Ingredient Declaration (QUID)	Different appearance

*Table 1:* Grid for classifying products according to similarities/differences

Products for which compositional differences were observed, were subjected to Hierarchical Cluster Analysis to visualise their degree of similarity if data for at least 5 national variants

<sup>7</sup> GUIDANCE DOCUMENT FOR COMPETENT AUTHORITIES FOR THE CONTROL OF COMPLIANCE WITH EU LEGISLATION ON: Regulation (EU) No 1169/2011 of the European Parliament and of the Council of 25 October 2011 on the provision of food information to consumers with regard to the setting of tolerances for nutrient values declared on a label ([https://ec.europa.eu/food/sites/food/files/safety/docs/labelling\\_nutrition-vitamins\\_minerals-guidance\\_tolerances\\_1212\\_en.pdf](https://ec.europa.eu/food/sites/food/files/safety/docs/labelling_nutrition-vitamins_minerals-guidance_tolerances_1212_en.pdf))

from the same product was available. For less than 5 data sets the outcome may not be meaningful. The numerical values for the nutrient content as well as the ingredients were used as input variables for the computation. Ingredients were coded as either present (1) or absent (0). Statistical data evaluation was done with a commercial software package<sup>8</sup>.

Based on the classification grid given in Table 1 branded food products were grouped in 9 different classes and the absolute number as well as the proportion of products falling into one of the classes is given in Figure 4.

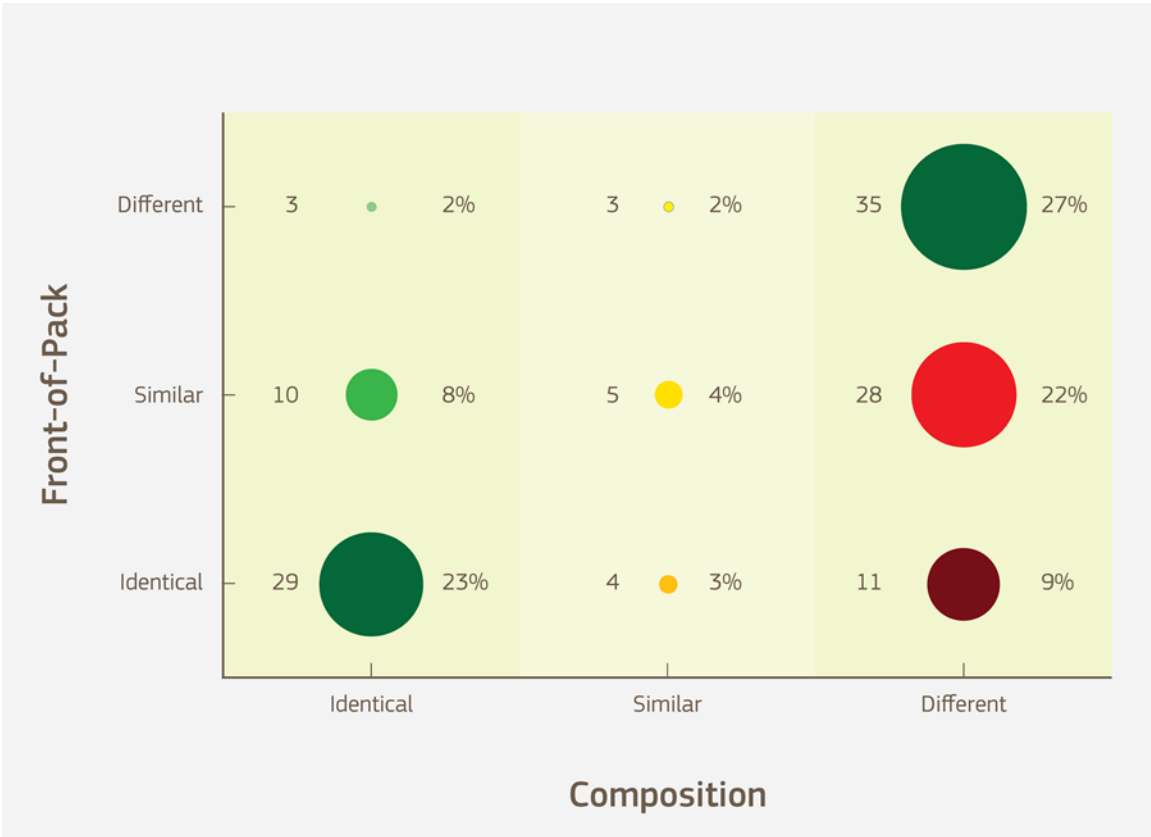


Figure 4: Classification of products included in the EU wide survey according to the similarity of variants offered on several markets (the number to the left of a bubble refers to the absolute number and to the right to the relative proportion)

#### Identical composition

Thirty-three percent of the examined branded products had an identical composition; 23 % had the same front-of-pack features, meaning that composition as well as appearance was the same; for 8 % differences in appearance but otherwise identical product composition were

<sup>8</sup> Statistica Version 13.5.0.17, Tibco Software Inc. Data were mean centred and subjected to Hierarchical Cluster Analysis using Single Linkage as amalgamation rule and the Euclidean distance as distance measure.

observed; 2 % of the products had an identical composition but their front-of-pack features differed.

This class of products informs consumers in a straightforward manner through the identical or at least similar front-of-pack appearance that the composition of the national variants of a particular product is identical.

#### *Different composition*

For 31 % of the products (visualised in red in Figure 4) differences in composition were not indicated by a different appearance on the front-of-pack; 9 % (11 out of 128 surveyed products) of them had an identical front-of-pack, while the composition was different, and for 22 % (28 out of 128 surveyed products) the features of the front-of-pack were similar. For the latter group a degree of uncertainty exists, depending on the subjective judgment to which extent features of the front-of-pack determine similarity or dissimilarity.

Twenty-seven percent of the products that differed in composition had also a different front-of-pack appearance, indicating clearly to the consumers that the products are differentiated.

#### *Similar composition*

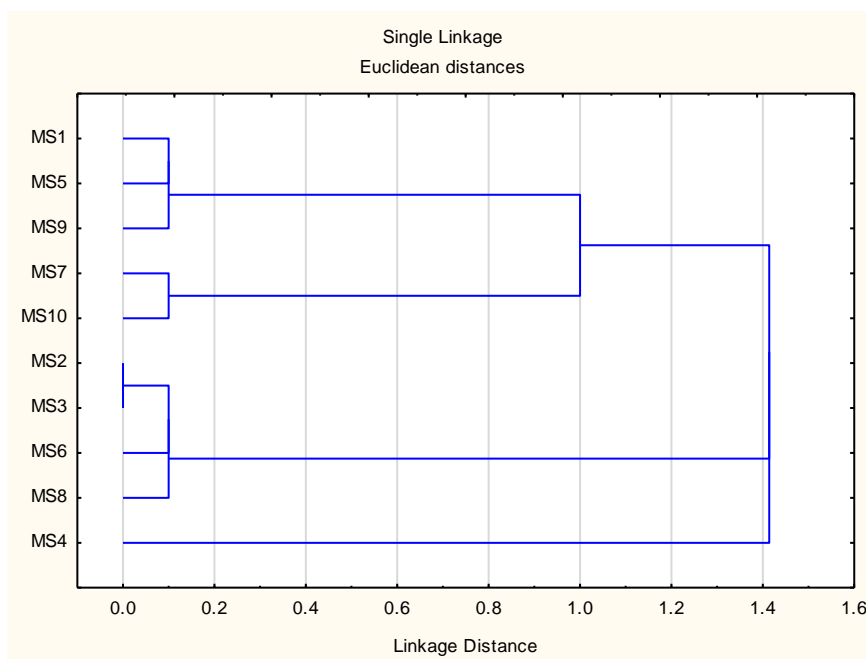
Branded products in this group (9 %; visualised in yellow) differed mostly in the declared values for certain nutrients, although the ingredient list was identical. This could be the result of different ways in estimating them, in particular if the concerned product is produced in different places.

### **4.3. Grading of similarity**

For those products for which differences in composition were observed, cluster analyses were carried out and the resulting dendrograms are included in the dashboard for the respective product (see Annex). For a better visualisation the dendrograms were translated into geographical maps; Member States sharing the same colour belong to the same product cluster.

Cluster Analysis is a statistical technique to group a set of objects in such a way that objects in the same group (cluster) are more similar to each other than to those in other groups (clusters). The graphical presentation of the result of an analysis is called a dendrogram (similarity tree). Vertical lines joining products indicate that they are similar and belong to the same group; the distance along the horizontal axis at which clusters are joined indicate their (dis)similarity.

A dendrogram for a fictive product available in several Member States (MS) is shown for illustration in Figure 5. Four different clusters (A: MS 1, 5, 9; B: MS 7, 10; C: MS 2, 3, 6, 8; D: MS 4) would best describe the similarities among the national variants of this particular product.



*Figure 5: Hierarchical Cluster Analysis of a fictive product available in several Member States.*

For 71 out of the 128 products enough data were available to perform a cluster analysis. Taking all of them together, no consistent trend of differentiation of products specific to certain geographical regions could be observed.

#### 4.4. Responses of brand owners

Brand owners were supplied with the findings for their products and invited to provide comments in case differences in composition were found. Subsequently, encoding errors in the nutrition and/or QUID declaration and/or ingredient list identified by brand owners were corrected by the JRC; no other modification to the response provide was done and it was copy-pasted into the dashboard of the respective product. In case brand owners commented that several variants of a product exist and should not be directly compared, their advice was taken into account when making the final comparison. This re-conciliation stage was necessary for avoiding biased product assessments and it highlights the need for involving brand owners in the evaluation of a potential case of unfair product differentiation.

Brand owner's comments were integrated (as received) in the dashboards for the individual products (Annex).

## 5. CONCLUSIONS

The EU wide comparison study conducted by the JRC demonstrated that

- 31 % of the products included in this survey had identical composition and the same or a similar front-of-pack arrangement, independent of the Member State where they were offered;
- 2 % of the products had an identical composition, but the front-of-pack was different;
- 9 % of the products differed in composition but without differentiating the appearance of the front-of-pack in at least one of the 19 surveyed Member States;
- 22 % of the products differed in composition and indicated to a certain extent those differences by variations in the graphical design on the front-of-pack;
- 27 % of the products differed in composition and indicated those differences by a different appearance of the front-of-pack;
- the level of detail used to describe ingredients, the sequence in which they are given in the list of ingredients and the way how individual elements for the nutrition declaration (content of energy, protein, fat, etc) are estimated, has an influence on the information provided on the label of food products;
- the results described in this report describe the situation found on the markets of the participating Member States during the period the survey was carried out (November-December 2018);
- compositional differences of the products found in the survey must not be interpreted to constitute a difference in product quality;
- no indication of consistent differentiation of products related to certain geographical regions of the participating Member States was observed;
- even if a large sample of products offered on the markets of several Member States have been taken, the results of the survey must not be interpreted as being representative of the whole population of food products offered in those Member States;
- the involvement of brand owners in the case-by-case evaluation of a potential breach of the UCPD for re-conciliation of the findings of the assessment with the product knowledge of the brand owner is necessary;
- an additional case-specific assessment by a competent national authority would be required to assess whether the identical marketing of products with significantly different composition would constitute a misleading practice, violating EU law, taking into account other relevant factors (notably the legitimacy and the objectivity of any justification provided by the brand owner).



## Annex

Due to its size, the Annex is a separate document.



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