

SCIENTIFIC REPORT OF EFSA

Evaluation of the FoodEx, the food classification system applied to the development of the EFSA Comprehensive European Food Consumption Database¹

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ABSTRACT

The existing food description and classification systems present several drawbacks when assessing exposure to hazardous chemicals. To tackle this issue, the Data Collection and Exposure Unit (DATEX) of the European Food Safety Authority (EFSA) developed a new system called FoodEx. It builds on different food description and classification systems and its main objective is to facilitate the assessment of dietary exposure to hazardous chemicals by allowing accurate matching of the datasets on chemical occurrence and food consumption. At the end of 2008, EFSA started a project aimed at establishing the “EFSA Comprehensive European Food Consumption Database”. FoodEx was used, within this project, to codify all foods and beverages present in the food consumption database provided by 20 Member States and collected from 22 different national dietary surveys. The main objective of this document is to present the outcome of using FoodEx for the harmonised classification of the food consumption data included in the Comprehensive Database. Based on this evaluation, suggestions for improvements of FoodEx are proposed. The present Scientific Report is intended as well to provide input to the Working Group on “Development of a Food Classification and Description System for exposure assessment” for the development of a uniformed food classification and description system. The FoodEx system proved to be user friendly and flexible enough in most situations to interface with national food classification systems. Differences in the classification systems used within the national dietary surveys have been identified. However, findings reported in the present document demonstrate that all data providers were able to classify correctly the large majority of their food items at least at the 2nd level of the FoodEx. A clear recommendation to the above mentioned Working Group is the development of a classification and description system including facets as further descriptors.

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KEY WORDS

FoodEx, food description and classification systems, exposure assessment, food consumption data, dietary surveys.

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SUMMARY

Many national and international food description and classification systems are available. Most of them are designed to be fit for purpose focusing on e.g. food consumption, food composition, legislation, trade, etc. National food classification systems are often based on national criteria and the food groups can be very specific. Several drawbacks were identified in relation to existing systems and therefore the Data Collection and Exposure Unit (DATEX) of the European Food Safety Authority (EFSA) decided to draft a food classification system (here referred to as FoodEx) that could better address its immediate needs. The main objective of FoodEx is to facilitate the assessment of dietary exposure to hazardous chemicals by allowing accurate matching of the datasets on chemical occurrence and food consumption. FoodEx is a hierarchical system based on 20 main food categories that are further divided into subgroups up to a maximum of 4 levels. It builds on different food description and classification systems. Currently, EFSA is further developing the FoodEx draft food description and classification system with the assistance of an ad hoc external Working Group on “Development of a Food Classification and Description System for exposure assessment”. The main goal of the working group is the development of a uniform food classification and description system that can address the needs of most units in EFSA and be accepted by the EFSA Member State networks on data collection in relation to food consumption, occurrence of chemical contaminants and residues as well as microbiological hazards.

At the end of 2008, EFSA started a project aimed at establishing the “EFSA Comprehensive European Food Consumption Database” (here referred to as the Comprehensive Database) building on existing information for adults and children at detailed level. In the project, 20 national organisations nominated by their respective Permanent Representative to the European Union provided EFSA with food consumption data from their most recent dietary survey within the country. The requested data should be representative at national level for at least the adult population, and was collected at individual level by means of a 24 h recall or dietary record. Data providers were asked to codify all foods and beverages present in the food consumption database according to the draft FoodEx classification system, at the most disaggregated level possible.

The main objective of this document is to present the outcome of using FoodEx for the harmonised classification of the food consumption data included in the Comprehensive Database. Based on this evaluation, suggestions for improvements of FoodEx are proposed. This Scientific Report is also intended to provide input to the Working Group on “Development of a Food Classification and Description System for exposure assessment” for the development of a uniform food classification and description system.

Data from 20 Member States and 22 different dietary surveys provided to EFSA were included in the Comprehensive database. The number of foods and beverages reported are provided with those consumed at least once within each survey and with the number of unique FoodEx codes reported for each survey. These numbers differ significantly from country to country indicating that, with respect to the description of food and beverages, the level of detail collected and reported to EFSA was not the same for all dietary surveys included in the Comprehensive Database. The use of items from the “Composite food (including frozen products)” category in FoodEx was discouraged and was to be used only if no other possibilities were available. Most countries managed to split most composite foods into their ingredients with the exception of Latvia, Sweden and Slovakia (10%, 8% and 7% of food records classified under the “Composite foods” category, respectively). Attention should be given to the FoodEx category “Composite food (including frozen products)” in the data for these countries since their breakdown of composite foods and home-made dishes into ingredients is probably not consistent with the other countries. An analysis of the food records showed that data providers were able to codify the large majority of foods at least at the 2nd level of FoodEx.

Suggestions for improvements are given for each of the 20 food categories included in the FoodEx, together with a detailed list of possible additions/exclusions for each category. The FoodEx system proved to be user friendly and flexible enough in most situations to interface with national food

classification systems. Differences between the national dietary surveys related to the level of detail requested concerning the description of food and beverages and consequently to their classification have been identified. A clear recommendation to the Working Group on “Development of a Food Classification and Description System for exposure assessment” is the development of a classification and description system including facets as further descriptors.

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BACKGROUND

In 2005, EFSA's Scientific Committee published an opinion on exposure assessment recommending the urgent collection of available consumption data at an aggregated level followed by an expanded collection of data at a detailed level. As a first response, EU Member States collaborated in the establishment of the "Concise European Food Consumption Database", operational since the end of February 2008. At the end of 2008, EFSA started a project aimed at establishing a "Comprehensive European Food Consumption Database" (Comprehensive Database) building on existing information for adults at a detailed level. It is anticipated that when the Comprehensive Database is operational it will greatly improve the accuracy of EFSA's exposure assessment calculations. However, concerns on the comparability of different dietary surveys will still apply, mainly because of various survey methodologies, different clustering of age groups and diverse food categorisation systems. Such methodological differences must therefore be considered before using the food consumption data to assess the exposure to the different hazardous substances in the remit of EFSA. An important difference is related to the level of detail concerning the description of food and beverages and consequently to their classification.

TERMS OF REFERENCE

The Working Group on Food Consumption and Exposure is requested to focus its deliberations on the specific use of the soon to be completed "Comprehensive European Food Consumption Database" rather than drafting a generic guideline covering the use of any consumption data collected at a detailed food level with respect to calculating exposure, as planned at the beginning of 2008.

Specific tasks will include:

- literature review on the use of food consumption data in exposure assessment;
- identification and evaluation of data from other sources (e.g. household budget surveys, marketing research, etc.) that could be used to complement the information included in the Comprehensive Database when assessing the exposure
- critical evaluation of the methodologies used to collect the food consumption data included in the Comprehensive Database and identification, at country level, of strengths and limitations of the available information for exposure assessment;
- development of procedure(s) for evaluating the quality of the food consumption data;
- development of standard procedures for assessing individual-based exposure, within deterministic and/or probabilistic approaches, using the Comprehensive Database by EFSA;
- development of standard procedures to assess exposure using summary statistics of the Comprehensive Database by exposure assessors not having access to the raw data.

The EFSA Working Group on "Development of a Food Classification and Description System for exposure assessment" is currently studying present and future food description and classification systems that can satisfy the needs across EFSA.

EVALUATION

1. Introduction

Many national and international food description and classification systems are available. Most of them are designed to be fit for purpose focusing on e.g. food consumption, food composition, legislation, trade, etc. National food classification systems are often based on national criteria and the food groups can be very specific. An exhaustive review of food classification and description systems, highlighting the advantages and disadvantages of the various systems, was published by Ireland and Møller (2006).

The Data Collection and Exposure Unit (DATEX) of the European Food Safety Authority (EFSA) is in charge of collecting and analysing data on food consumption and chemical occurrence with the aim of assessing exposure to hazardous chemicals. In the context of its activities, DATEX evaluated the suitability of several food classification systems in providing accurate exposure assessment results for chemical contaminants and detailed analysis of chemical occurrence. Existing systems were not considered suitable for all exposure assessments in EFSA's remit and it was therefore decided to draft a food classification system (here referred to as FoodEx) that could better address the current needs. The main objective of FoodEx was to facilitate the assessment of dietary exposure to hazardous chemicals by allowing accurate matching of the datasets on chemical occurrence and food consumption.

FoodEx is a hierarchical system based on 20 main food categories that are further divided into subgroups up to a maximum of 4 levels⁴. It does not currently use a catalogue of properties (facets) in order to describe food and beverages. In total, FoodEx comprises about 1,700 different end-points (food names). Most food names are generic to allow the user to classify several similar foods under one name. Table 1 presents the main food groups (Level 1) of the FoodEx classification according to the number of subgroups for each of the three hierarchical levels.

FoodEx builds on different food description and classification systems including the General Standard for Food Additives by the Codex Alimentarius Commission⁵ and systems created within research projects, such as the European Food Information Resource⁶ (EuroFIR) and the Cooperation in Science and Technology (COST 99) Action, in particular the Eurocode-2 (Poortvliet and Kohlmeier, 1993) and the European Food Groups (EFG) systems (Ireland et al., 2002). Legislative requirements were also considered, in particular the food classification presented in Commission Regulation (EC) No 1881/2006⁷ on setting maximum levels for certain contaminants in foodstuffs and Commission Regulation (EC) No 396/2005⁸ on the maximum residue levels of pesticides in or on food and feed of plant and animal origin. Although the level of detail required in FoodEx cannot always be reached by food consumption data, emphasis has been put on creating a level of precision that allows a detailed analysis of occurrence data.

Each food group/subgroup/end-point included in FoodEx was assigned an independent code (matrix code). The list of matrix codes is expandable up to 999,999 items and will thus allow the addition of new items without requiring a recoding of the existing items in one group or subgroup. A second coding, a hierarchical code, has been introduced in order to help the user in recognising to which upper hierarchical level a food subgroup or food item belongs. Additionally, a parent code has been

⁴ FoodEx is available in the Excel spreadsheet "StandardSampleDescription.xls" through the link "Standard Sample Description" on: <http://www.efsa.europa.eu/en/datexcallsfordata/datexsubmitdata.htm>.

⁵ <http://www.codexalimentarius.net/gsaonline/index.html?jsessionid=7C7F83D7D7AA8F6B0C4E00521D55E0A1>

⁶ www.eurofir.net

⁷ [Commission Regulation \(EC\) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs. OJ L 364, 20.12.2006, p.5-204.](#)

⁸ [Commission Regulation \(EC\) No 396/2005 of 23 February 2005 on maximum residue levels of pesticides in or on food and feed of plant and animal origin and amending Council Directive 91/414/EEC. OJ L70, 16.3.2005, p. 1/16.](#)

linked to each food item or subgroup and thus multiple hierarchical groupings have become possible by simply changing the parent code.

At the end of 2008, the EFSA started a project aimed at establishing the “EFSA Comprehensive European Food Consumption Database” (here referred to as the Comprehensive database) building on existing information for adults and children at detailed level. In the project, 20 competent national organisations nominated by their respective Permanent Representative to the European Union provided EFSA with food consumption data from their most recent dietary survey within the country. The requested data should be representative at national level for at least the adult population, and collected at individual level by means of a 24 h recall or dietary record.

All participating institutions were requested to provide EFSA with a database schema describing their food consumption and related data tables. Based on this information, the DATEX Unit developed the first draft of a data model. This model was proposed, discussed and endorsed during an ad hoc meeting in which all data providers were represented. Data providers were asked to codify all foods and beverages present in the food consumption database according to the draft FoodEx classification system developed by DATEX. Recommendations were given to the data providers for composite dishes to be disaggregated at the most possible level.

In 2008, EFSA launched a call for proposals focused on children: “Individual food consumption data and exposure assessment studies for children” (acronym EXPOCHI). Within this project, food consumption data from 13 different Member States were used to carry out exposure assessment studies in children (in particular young children, 1-3 years old) and were provided to EFSA on conclusion of the project at the finest level of detail. All food items reported within the project have been reclassified according to the draft FoodEx system by the DATEX Unit.

In November 2009 EFSA created an ad hoc external Working Group on “Development of a Food Classification and Description System for exposure assessment”. The main goal of the working group is the development of a uniformed food classification and description system that can address the needs of most units in EFSA and be accepted by the EFSA Member State networks on data collection regarding food consumption, occurrence of chemical contaminants and residues as well as microbiological hazards.

In June 2010, EFSA organised the Scientific Colloquium on “Food Classification: Unambiguous ambiguity – the challenge of describing food” in Parma to support the establishment of a uniformed food classification and description system. The objective of this colloquium was to have an open scientific debate on the requirements of such a system and to build on experiences gained from the development of existing systems. Consideration was given to different approaches to classify foods and the diversity of needs for the various areas of food safety. The discussions led to the agreement that none of the current existing systems meet the demands of all potential end users but, at the same time, the development of a unique system meeting all requirements was equally considered impossible. However, it was recognised that, despite the considerable challenges to be faced, it was still appropriate to develop a multi-faceted system that should enable end-users to analyse the data from different perspectives. A report is available on the EFSA website outlining suggested future initiatives (EFSA, 2010).

The main objective of this document is to evaluate the outcome of using FoodEx for the harmonised classification of the food consumption data included in the Comprehensive database. Based on this evaluation, suggestions for improvements of FoodEx are proposed. This Scientific Report is intended to provide input to the Working Group on “Development of a Food Classification and Description System for exposure assessment” for the development of the above mentioned uniformed food classification and description system.

Table 1: Main food groups of the FoodEx classification according to the number of subgroups for each of the three hierarchical levels

No	Main food group	Number of subgroups at		
		Level 2	Level 3	Level4
1	Grains and grain-based products	7	59	247
2	Vegetables and vegetable products (including fungi)	16	133	0
3	Starchy roots and tubers	2	16	0
4	Legumes, nuts and oilseeds	5	52	0
5	Fruit and fruit products	9	120	53
6	Meat and meat products (including edible offal)	12	92	39
7	Fish and other seafood (including amphibians, reptiles, snails and insects)	6	65	0
8	Milk and dairy products	9	234	59
9	Eggs and egg products	2	12	0
10	Sugar and confectionary	7	59	12
11	Animal and vegetable fats and oils	6	41	0
12	Fruit and vegetable juices	8	67	0
13	Non-alcoholic beverages (excepting milk based beverages)	5	22	36
14	Alcoholic beverages	7	31	0
15	Drinking water (water without any additives except carbon dioxide; includes water ice for consumption)	4	2	0
16	Herbs, spices and condiments	10	124	0
17	Food for infants and small children	6	26	0
18	Products for special nutritional use	5	35	0
19	Composite food (including frozen products)	11	54	22
20	Snacks, desserts, and other foods	3	16	0
Total		140	1260	468

2. Transmission of food consumption data

Data from 20 Member States and 22 different dietary surveys provided to EFSA were included in the Comprehensive database. Table 2 presents basic information on the dietary surveys included in the Comprehensive European Food Consumption Database per Member State (MS). The institutions having implemented the food consumption survey(s) in their respective country and providing the data together with a reference for each of the studies are also reported in Table 2.

The transmission of food consumption data was accomplished through the Data Collection Framework (DCF), an application designed by the IT Unit of EFSA. A user manual was circulated and additional specifications were provided to the participating Member States. The transmission phase started the first week of August 2009 and ended in February 2010.

Data providers were requested to submit, for each food item, the FoodEx code together with a description of the food name in both original language and English and the amount of energy (Kcal/100g), fat, total carbohydrates, proteins and alcohol (g/100g) of edible portions of the food. The DCF automatically assigned an EFSA food identifier for each food item but also the unique original (national) food identifier was transmitted and stored. A free text field was available for providing additional information about the food (e.g. further descriptions) or to report on possible problems related to its classification.

Each list of foods and beverages was checked in order to evaluate the correctness of the FoodEx codes assigned by the data providers. In case of inconsistency, a different matrix code was proposed and data providers were asked whether they agreed or, if not, to give a justification for keeping the original FoodEx code used.

SAS Enterprise software was used to extract summary information from the submitted food consumption data. The summary information was sent to the data providers, together with observations concerning missing variables, for checking and confirmation that the extracted information was correct, including clarification requests on possible outliers.

Belgium, Germany and the Netherlands used EPIC-Soft for their dietary surveys. In order to describe foods and beverages, this software program makes use of facets and descriptors which, in most cases, proved to be necessary information when assigning FoodEx codes. Sixteen different facets were, for example, reported by Germany (source, physical state/form as quantified, cooking method, preservation method, packing medium, flavoured/ added component, sugar content, fat content, type of packing, food production, enriched/ fortified, brand name/product name, skin consumed, visible fat consumed, type of fat used, type of milk/liquid used). In the case of Germany and the Netherlands, SAS Enterprise software 4.1 was used, for each food, to merge all information included in the different facets into a unique variable. In the case of Belgium the above mentioned process was performed by the data provider before the data transmission.

Table 2: Basic information on the dietary surveys included in the “Comprehensive European Food Consumption Database”

Country	Name of the dietary survey (Acronym)	Institution providing the data	Reference publication
Austria	Austrian Study On Nutritional Status (ASNS)	Institute of Nutritional Sciences - University of Vienna	Elmadfa <i>et al.</i> , 2008
Belgium	Diet National 2004	Scientific Institute of Public Health	De Vriese <i>et al.</i> , 2005.
Bulgaria	National Survey Of Food Intake And Nutritional Status	National Centre of Public Health Protection	Petrova & Angelova, 2006
Bulgaria II	NUTRICHILD	National Centre of Public Health Protection	Petrova <i>et al.</i> , 2009
Czech Republic	SISP04	National Institute of Public Health	Ruprich <i>et al.</i> , 2006.
Denmark	Danish National Survey of Dietary Habits and Physical Activity	National Food Institute, Technical University of Denmark	Lyhne <i>et al.</i> 2005,
Estonia	NDS 1997	National Institute for Public Health Development	Pomerleau <i>et al.</i> , 1999.
Finland	FINDIET 2007	National Public Health Institute - Nutrition Unit [§]	Paturi <i>et al.</i> , 2008.
France	INCA2	French Food Safety Authority (AFSSA)	AFSSA, 2009, Lioret <i>et al.</i> 2010. Dubuisson <i>et al.</i> 2010
Germany	German National Nutrition Survey II (NVS II)	Bundesforschungsinstitut für Ernährung und Lebensmittel (Max Rubner-Institut)	MRI, 2008; Krems <i>et al.</i> , 2006.
Hungary	National Repr Surv	Hungarian Food Safety Office	Rodler <i>et al.</i> , 2005.
Ireland	NSIFCS	Food Safety Authority of Ireland	Kiely <i>et al.</i> , 2001. Harrington <i>et al.</i> , 2001
Italy	INRAN-SCAI 2005–06	National Research Institute for Food and Nutrition (INRAN)	Leclercq <i>et al.</i> , 2009.
Latvia	EFSA_TEST	Food Centre Food and Veterinary Service of Latvia	Šantare <i>et al.</i> , 2008.
Netherlands	VCP2003	National institute of public health and the environment, TNO Quality of Life	Ocké <i>et al.</i> , 2005.
Poland	IZZ-FAO-2000	National Food and Nutrition Institute	Sekula <i>et al.</i> , 2004. Szponar <i>et al.</i> , 2001 and 2003
Slovakia	SK MON 2008	Food Research Institute	Not available
Slovenia	CRP-2008	National Institute of Public Health of Slovenia	Gabrijelčič Blenkuš <i>et al.</i> 2009
Spain	AESAN -Fiab	Universidad Complutense de Madrid	Requejo <i>et al.</i> , 2002.
Spain II	AESAN	Universidad Complutense de Madrid	Ortega <i>et al.</i> , 2010
Sweden	RIKSMATEN 1997-98	Swedish National Food Administration	Becker and Pearson, 2002
United Kingdom	National Diet & Nutrition Survey (NDNS)	Food Standards Agency (FSA)	Henderson <i>et al.</i> 2002

[§] currently National Institute for Health and Welfare

3. Classification of the national food codes according to the FoodEx system

The number of foods and beverages consumed at least once within the survey are shown for each country and survey in Table 3. The number of unique FoodEx codes reported for each survey is also presented. These numbers differ significantly from country to country with Germany presenting the highest number of foods (22,449 national food codes consumed resulting in the use of 813 different FoodEx codes) and Denmark the lowest (315 national food codes consumed resulting in the use of 233 different FoodEx codes). This indicates that, with respect to the description of food and beverages, the level of detail collected and reported to EFSA was not the same for all dietary surveys included in the Comprehensive database. The high number of national food codes included in the German list can be explained by the high number of facets used within this survey. The example of cow milk is here reported in order to give an idea of the type of information contained in the German food list with respect to the Danish one. “Cow milk” is present in FoodEx at the third level, under “Milk and dairy products” (1st level) and “Liquid milk” (2nd level). Four different types of cow milks, based on the fat content, are listed at the 4th level of the FoodEx system. On the other hand, 302 and 6 food codes have been classified as “Cow milk” out of those consumed at least once within the German and Danish survey, respectively. Only information about the fat content (whole, partially skimmed and skimmed) and the organic production (yes or not) are available for cow milk from Denmark whereas, in addition to the fat content (whole, partially skimmed, skimmed, partially skimmed 3/4 and fat reduced) many other information are available for the same product for Germany. For example, different codes are used according to the fact that cow milk is reconstituted from powder or liquid, enriched/fortified or not, pasteurized, UHT-treated or sterilised, sweetened or artificial sugar (light), lactose free, etc.

The proportion of the FoodEx codes used over the national food codes consumed at least once within the survey, as reported by the data providers, is reported on Table 3 and is intended to give an idea of the information lost during the mapping phase from the original national codes to the ones from FoodEx. The above mentioned percentage was particularly low in Germany (4%) and in the Netherlands (9%). This is probably caused by the fact that facets have been used in both cases (their combination makes the two food lists large) and most of them actually describe the very same food with various facet descriptors considered too detailed at the time when the FoodEx system was developed. In the case of Belgium, the other country using facets, only 2,289 different consumed foods are listed. This is due to the fact that the combination of the facets was performed by the data provider before the data transmission and irrelevant facets were not included a priori.

The number of FoodEx end-points never reported within the dietary surveys included in the Comprehensive database is presented in Table 4. The category “Milk and dairy products” presents the largest number of end-points never consumed which are mainly cheeses (94 out of 116). However, 186 different cheeses are available at the third level of FoodEx meaning that the name of the cheese is often recorded within dietary surveys.

Data providers were asked to disaggregate industrially produced composite foods or home-made dishes, such as a ready-made frozen pizza or a home cooked beef stew, into their main ingredients at a level that can be reported by the subjects. In the case of a sandwich with ham and butter it was requested to distinguish between the three components such as bread, ham and butter. For some countries, this task was automatically performed, by means of standard recipes, through their dietary software used to input food consumption information into electronic format. Other data providers performed an ad hoc task in order to break down recipes. The importance of reporting detailed information concerning each single component like the type of ingredients used in the bread, e.g. grain used or at least whether or not it was wholemeal bread or whether the ham was raw, cooked and/or smoked, was also highlighted. Foods and beverages resulting from the breakdown of composite foods or home-made dishes into ingredients were codified according to the FoodEx classification system by the data providers.

Table 3: Number of foods and beverages per dietary survey

Country	Number of national food codes consumed at least once within the survey	Number of FoodEx codes	% of Foodex codes over the national food codes consumed at least once
Austria	1290	601	47%
Belgium	2289	752	33%
Bulgaria	455	297	65%
Bulgaria II	596	315	53%
Czech Republic	447	306	68%
Denmark	315	233	74%
Estonia	386	263	68%
Finland	1050	400	38%
France	1265	566	45%
Germany	22449	813	4%
Hungary	537	357	66%
Ireland	1702	535	31%
Italy	1116	463	41%
Latvia	1339	490	37%
Netherlands	6481	554	9%
Poland	461	274	59%
Slovakia	932	445	48%
Slovenia	486	378	78%
Spain	586	381	65%
Spain II	778	367	47%
Sweden	1060	486	46%
United Kingdom	3232	678	21%

* The same food list was used in the two dietary surveys Bulgaria and Bulgaria II

** The same food list was used in the two dietary surveys Spain and Spain II

After the breakdown of composite foods or home-made dishes into ingredients, the frequency of foods reported as purchased across the food group at the 1st level of the FoodEx system, is presented per country in Table 5. The use of items from the “Composite food (including frozen products)” category in FoodEx was discouraged and should have been used only if no other possibilities were available. Most countries managed to split the majority of their composite foods into their ingredients with the exception of Latvia (10%), Sweden (8%) and Slovakia (7%). The food groups most often consumed in the majority of the countries seemed to be “Grains and grain products”, “Vegetables and vegetable products (including fungi)”, “Milk and dairy products” and “Herbs, spices and condiments”. However, when considering the quantity in grams instead of the eating occasions (Table 6), beverages like “Milk and dairy products”, “Non-alcoholic beverages (excepting milk based beverages)” and Drinking water (water without any additives except carbon dioxide; includes water ice for consumption)” dominated the intake.

Another problem is related to those categories that can be either in liquid or concentrate or dried form. A clear example is coffee, which is currently present under the category “Non-alcoholic beverages (excepting milk based beverages)” if liquid, whereas “Coffee beans and coffee products (Solid)” are listed under the “Vegetables and vegetable products (including fungi)”.

In case a food item did not fit into any FoodEx codes at the most detailed level, it was suggested to code it at the next upper level. Additional information had to be provided in the comments field as a

free text. For example, “clementine” is not currently listed under “Citrus fruit” in FoodEx. Since “clementine” is a variety of “mandarin”, it should be coded as such and it should be specified the variety “clementine” in the comment field.

Table 7 shows the percentage of food records in the database, after the break down of composite foods or home-made dishes into ingredients, classified only at the 1st level of the FoodEx system even if food items were available at the 2nd level. Most data providers were able to codify the large majority of foods at least at the 2nd level of FoodEx. Czech Republic had a problem with the category “Fruit and vegetable juices” (94% of their food records classified only at the 1st level of FoodEx) since, at national level, only two very generic food codes (“juice” and “lemon juice”) were used and therefore no further split was possible. The 1st level of FoodEx was also frequently used for the drinking water category in Estonia (92%), United Kingdom (46%) and Slovakia (44%). Consumption of water was in these countries often coded without specifying whether it was “Tap water”, “Well water”, “Bottled water” or “Water ice (for consumption)” as requested at the 2nd level of the FoodEx.

The percentage of food records, after the break down of composite foods or home-made dishes into ingredients, classified only at the 2nd level of the FoodEx system even if food items were available at the 3rd level was calculated but results are not presented in this report. A typical example was the “Cheese” subcategory which includes 186 different varieties of cheese but the list was still considered incomplete by the data providers who did not find a number of cheese varieties and were forced to use the 2nd level code when they did not find, at the 3rd level, the specific cheese consumed within the dietary survey.

A list of specific suggestions for updating the FoodEx based on the experience gained during the classification of the food consumption data included in the Comprehensive database is presented in chapter 4.

Table 4: Number of end-points never reported within the dietary surveys included in the Comprehensive database

No	Food groups at the 1st level of the FoodEx	FoodEx end-points never consumed	
		Number	%
1	Grains and grain-based products	49	16
2	Vegetables and vegetable products (including fungi)	32	21
3	Starchy roots and tubers	1	6
4	Legumes, nuts and oilseeds	15	26
5	Fruit and fruit products	49	27
6	Meat and meat products (including edible offal)	26	18
7	Fish and other seafood (including amphibians, reptiles, snails and insects)	14	20
8	Milk and dairy products	116	38
9	Eggs and egg products	4	29
10	Sugar and confectionary	17	22
11	Animal and vegetable fats and oils	5	11
12	Fruit and vegetable juices	20	27
13	Non-alcoholic beverages (excepting milk based beverages)	14	22
14	Alcoholic beverages	3	8
15	Drinking water (water without any additives except carbon dioxide; includes water ice for consumption)	1	17
16	Herbs, spices and condiments	28	21
17	Food for infants and small children	12	38
18	Products for special nutritional use	10	25
19	Composite food (including frozen products)	10	11
20	Snacks, desserts, and other foods	1	5
Total		427	23%

Table 5: Distribution of the database consumption records over the food groups at the 1st level of the FoodEx system, per country

Food groups at the 1 st level of the FoodEx	Austria (%)	Belgium (%)	Bulgaria (%)	Bulgaria II (%)	Czech Republic (%)	Germany (%)	Denmark (%)	Estonia (%)	Spain (%)	Spain II (%)	Finland (%)	France (%)	United Kingdom (%)	Hungary (%)	Ireland (%)	Italy (%)	Latvia (%)	Netherlands (%)	Poland (%)	Sweden (%)	Slovenia (%)	Slovakia (%)
Grains and grain products	11	13	15	12	13	13	27	13	12	12	14	11	11	15	13	13	17	13	14	18	13	18
Vegetables and vegetable products ...	11	9	25	18	17	9	10	17	20	18	7	13	12	15	12	18	5	7	17	6	20	11
Starchy roots and tubers	1	3	2	2	2	2	1	5	3	2	3	2	2	2	3	1	5	2	3	3	2	4
Legumes, nuts and oilseeds	1	1	2	1	1	1	1	2	2	2	1	2	2	2	2	1	0	1	0	0	1	1
Fruit and fruit products	5	6	3	3	4	7	3	3	5	5	3	5	3	4	5	6	5	4	6	7	5	6
Meat and meat products ..	4	7	5	4	5	7	8	7	8	6	3	7	5	7	5	5	8	7	8	6	7	11
Fish and other seafood ...	0	1	0	0	0	1	2	1	4	3	1	1	1	0	1	2	1	0	0	2	0	0
Milk and dairy products	7	10	8	13	6	12	15	9	9	10	8	10	14	8	14	9	11	12	6	12	6	8
Eggs and egg products	2	1	3	2	3	1	2	3	3	2	2	1	1	4	1	2	1	1	2	1	1	2
Sugar and confectionary	8	5	3	6	5	4	5	6	3	4	6	6	6	6	7	6	7	10	10	4	4	2
Animal and vegetable fats and oils	10	12	9	8	8	9	6	8	11	11	20	10	5	10	9	12	5	10	9	7	8	5
Fruit and vegetable juices	2	1	1	2	0	3	2	2	1	1	1	1	2	1	1	1	2	2	1	2	2	1
Non-alcoholic beverages ..	5	11	4	1	1	11	4	6	1	1	4	5	13	5	11	6	14	15	8	13	5	13
Alcoholic beverages	1	3	1	0	2	3	1	1	2	2	0	2	3	1	2	3	1	2	0	3	1	1
Drinking water ..	8	8	1	10	13	10	5	4	7	8	10	10	9	1	5	9	3	5	2	5	7	8
Herbs, spices and condiments	21	4	18	12	20	4	7	10	8	11	16	10	4	18	7	5	3	5	10	2	15	3
Food for infants and small children	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Products for special nutritional use	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0
Composite food ..	0	2	0	0	0	3	0	1	0	0	0	1	0	0	1	0	10	3	0	8	1	7
Snacks, desserts, and other foods	0	1	0	1	0	1	0	0	1	1	0	3	4	0	1	1	2	2	0	1	0	0

Table 6: Distribution of the quantity of food consumed over the food groups at the 1st level of the FoodEx system, per country

Food groups at the 1 st level of the FoodEx	Austria (%)	Belgium (%)	Bulgaria (%)	Bulgaria II (%)	Czech Republic (%)	Germany (%)	Denmark (%)	Estonia (%)	Spain (%)	Spain II (%)	Finland (%)	France (%)	United Kingdom (%)	Hungary (%)	Ireland (%)	Italy (%)	Latvia (%)	Netherlands (%)	Poland (%)	Sweden (%)	Slovenia (%)	Slovakia (%)
Grains and grain products	9	9	18	8	9	6	6	8	8	8	5	9	8	13	7	12	12	7	11	8	11	10
Vegetables and vegetable products ...	6	4	13	7	4	3	5	9	9	10	4	6	5	9	5	11	4	3	9	2	7	4
Starchy roots and tubers	2	4	6	3	3	2	3	10	3	3	3	3	4	6	9	2	6	3	11	4	4	3
Legumes, nuts and oilseeds	1	0	1	1	0	0	0	1	1	1	0	1	1	1	1	1	0	0	0	0	1	0
Fruit and fruit products	8	5	5	5	4	5	4	4	9	7	6	5	4	10	3	9	6	3	11	5	9	5
Meat and meat products ..	5	4	7	4	6	3	4	8	8	7	4	5	4	10	6	5	7	4	10	3	8	6
Fish and other seafood ...	0	1	1	0	1	1	1	1	3	3	1	1	1	0	1	2	1	0	1	1	1	0
Milk and dairy products	7	7	13	18	6	6	12	14	17	16	14	10	10	14	10	9	8	11	8	12	8	5
Eggs and egg products	1	0	1	1	1	0	0	1	1	1	1	1	1	1	0	1	0	0	1	0	1	0
Sugar and confectionary	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	0
Animal and vegetable fats and oils	1	1	3	1	1	1	1	1	2	2	1	1	1	2	1	2	1	1	2	1	1	1
Fruit and vegetable juices	5	3	2	7	1	6	3	4	3	3	5	3	2	2	1	2	3	4	2	3	6	1
Non-alcoholic beverages ..	18	25	13	4	4	26	26	18	4	5	21	15	23	16	30	7	25	35	25	26	17	23
Alcoholic beverages	4	6	6	0	14	7	7	7	3	5	4	4	11	4	13	4	3	7	2	7	3	4
Drinking water ..	31	22	6	31	43	29	25	7	26	26	30	31	22	7	11	31	6	14	6	18	19	27
Herbs, spices and condiments	1	1	1	0	1	1	0	3	0	0	1	1	1	1	1	0	1	1	0	1	1	0
Food for infants and small children	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Products for special nutritional use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Composite food ..	0	5	1	1	1	3	0	1	0	1	0	2	0	0	1	1	15	3	0	8	3	8
Snacks, desserts, and other foods	0	1	1	1	0	1	0	1	1	1	0	1	1	0	1	1	1	1	1	1	0	0

Table 7: Percentage of foods classified at the 1st level of the FoodEx system instead of at the 2nd level

Food groups at the 1 st level of the FoodEx	Sub-groups at 2 nd level of the FoodEx	Austria (%)	Belgium (%)	Bulgaria (%)	Czech Republic (%)	Germany (%)	Denmark (%)	Estonia (%)	Spain (%)	Finland (%)	France (%)	United Kingdom (%)	Hungary (%)	Ireland (%)	Italy (%)	Latvia (%)	Netherlands (%)	Poland (%)	Sweden (%)	Slovenia (%)	Slovakia (%)	
		Grains and grain products	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vegetables and vegetable products ...	16	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0	1	0
Starchy roots and tubers	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Legumes, nuts and oilseeds	5	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Fruit and fruit products	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Meat and meat products ..	12	0	2	0	0	3	0	0	0	0	1	0	0	0	0	0	1	0	23	0	0	0
Fish and other seafood ...	6	0	1	0	0	1	0	0	0	0	7	0	0	0	0	0	0	0	0	11	0	0
Milk and dairy products	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Eggs and egg products	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Sugar and confectionary	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Animal and vegetable fats and oils	6	0	14	0	0	6	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0
Fruit and vegetable juices	8	0	0	0	94	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-alcoholic beverages ..	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Alcoholic beverages	7	0	0	0	0	5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Drinking water ..	4	7	0	0	0	1	0	92	0	0	0	46	0	100	0	4	1	100	0	0	0	44
Herbs, spices and condiments	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Food for infants and small children	6	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Products for special nutritional use	5	4	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	14	0	0	0
Composite food ..	11	0	0	0	0	0	0	0	21	0	0	0	0	0	10	0	10	0	1	0	0	1
Snacks, desserts, and other foods	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

4. Discussion

Data providers did not report serious difficulties during the coding of their food descriptors according to the FoodEx system. The FoodEx system proved to be user friendly and flexible enough in most situations to interface with national food classification systems.

During the data transmission phase, DATEX checked all food lists. Difficulties observed in linking certain food items to the food descriptors included in the FoodEx system could be reduced by introducing some new descriptors. In the short term this can be accomplished by adding some extra food item codes. These could include food items that are not currently present in the FoodEx, e.g. fortified breakfast cereals, dried ready to eat soups, as well as processed type foods where the unprocessed food is already present, i.e. fish canned, fish pickled etc.

The use of FoodEx for the harmonised classification of the food consumption data included in the Comprehensive database highlighted the importance of having a system including facets, as further descriptors, in order to allow more detailed food descriptions. This is in line with the conclusion of the Scientific Colloquium on “Food Classification: Unambiguous ambiguity – the challenge of describing food”. Facets used in the EPIC-Soft system by three countries (Belgium, Germany and The Netherlands) proved useful and could be used as a starting point for further refinement of FoodEx. Another system that could be used in order to add facets is LanguaL⁹ which is a multilingual thesaural system using faceted classification. Each food is described by a set of standard, controlled terms chosen from facets characteristic of the nutritional and/or hygienic quality of a food, as for example the biological origin, the methods of cooking and conservation and the technological treatments.

The food consumption data collected by EFSA in the Comprehensive European Food Consumption Database through the Member States collaboration and through the EXPOCHI project are the best currently available in the EU and will be very useful in future risk assessment work conducted by EFSA. However, important methodological differences remain between the national surveys making the data unsuitable for country-to-country comparisons. In the short term, attention should be given to the FoodEx category “Composite food (including frozen products)” data from Latvia, Sweden and Slovakia since their breakdown of composite foods and home-made dishes into ingredients is not probably consistent with the one of other countries. In the long term, all foods contained in this category “Composite food (including frozen products)” should, as far as possible, disaggregated into their main ingredients.

4.1. Suggestions for the improvement of FoodEx classification system

Suggestions for improvements to each of the 20 food categories included in the FoodEx are given below. A detailed list of possible additions/exclusions for each category has also been developed but it is not presented in this report.

1st category: “Grains and grain products”

- Codes of “grains as crops” (A.01.000002 – A.01.000012) were never selected, since most of the food items (e.g. barley grain) present in this category are also reported under the category “Grains for human consumption”. **Proposal:** move “grains as crops” from FoodEx into and ad hoc list of Raw Agricultural Commodities (RACs), which are needed for the assessment of exposure to chemical contaminants and pesticide residues.
- In the subcategory “Mixed wheat and rye bread and rolls” (A.01.000129- A.01.000139), under “Bread and rolls” (A.01.000098- A.01.000167), wheat and rye are both mentioned in the food descriptors where the main ingredient is the first cited. Reporters almost always selected the first one of the list as they probably did not know which one was the main ingredient.

⁹ www.langual.org

Proposal: specify that for mixed wheat and rye bread the first mentioned ingredient is the dominant one.

- The subcategory “Pastries and cakes” (A.01.000253-A.01.000301), under “Fine bakery wares” (A.01.000252- A.01.000316), includes 46 different food items but still does not cover all of those consumed throughout EU. Most of the food items that belong to that group were classified at the upper level by the data providers. **Proposal:** add more entries within the category (e.g. mille feuille, brioche filled with jam, chocolate, cream, etc.).
- There is one product listed twice: “cheese cream cake” (A.01.000257) and “cream cheese cake” (A.01.000262). **Proposal:** delete one of them.
- In the subcategory A.01.000099 “wheat bread and rolls”, whole wheat bread is not included. (there are: A.01.000106 “wheat bread with bran” and A.01.000108 “wheat germ bread”) **Proposal:** include whole wheat bread. The definition of “Brown bread” and “Whole grain” are unclear, these groups should be better specified.
- In the subcategory “Pastries and cakes” (A.01.000253-A.01.000301), under Buns (A.01.000255) the distinction of main ingredients could be considered. **Proposal:** include subcategories under Buns including different type of Buns (wheat, rice, rye, etc.)

2nd category: “Vegetables and vegetable products”

- The subcategory “Vegetable products” (A.01.000440-A.01.000452) includes pickled and mashed vegetables. These two codes are very broad categories and were used only when the vegetable itself was not known. In all other cases the use of the matrix code was suggested for the vegetable itself and information on its state (e.g. pickled, mashed, etc.) was provided in the ‘comments’ field. For example, when pickled gherkins were reported, the matrix code of “Gherkins (Cucumis sativus)” (A.01.000344) was chosen and “pickled” was added in the ‘comments’ field variable. **Proposal:** add a facet for the state form (pickled or mashed) of vegetables.
- In this subcategory, there isn’t a group of dried vegetables products. Only tomato-dried is included. **Proposal:** addition of a facet for dried vegetables (carrots, onion, fungi).

3rd category: “Starchy roots and tubers”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout the Member State.

4th category: “Legume, nuts and oilseeds”

- Sprouts of legumes are not included in the FoodEx. It was therefore suggested to use the matrix code of the dry legume and provide any other information in the ‘comments’ field. Data providers have commented that the composition between dry legumes and their sprouts differ completely and they preferred using the upper level of this category. **Proposal:** addition of sprouts of legumes in the FoodEx.

5th category: “Fruit and fruit products”

- In the subcategory “Other fruit products” (A.01.000682- A.01.000726), there was a misunderstanding among “Fruit, canned” (A.01.000688- A.01.000700) and “Fruit compote” (A.01.000701- A.01.000713). Although in some cases it was clear from the name in the original language that the compote matrix code was correct, data providers selected the code for fruit canned, based on an inaccurate English translation. Canned fruits can be in their own

juice, in light or heavy syrup. **Proposal:** specify in the code description the differences (e.g. compote is stewed or baked fruit in sugar syrup),.

- The subcategory “Jam, marmalade and other fruit spreads” (A.01.000657- A.01.000681) does not include the sugar free or reduced sugar items. **Proposal:** add a facet to identify the sugar free or reduced sugars versions for the products included in the subcategory “Jam, marmalade and other fruit spreads”.

6th category: “Meat and meat products (including edible offal)”

- The “Sausages” (A.01.000811- A.01.000856) subcategory does not provide information on the meat origin, on the possible existence of other ingredients (like offal, cheese, vegetables, etc) as well as on national and regional varieties of each Member State. Additionally, in most cases, it is not possible to know the state of the sausage (cooked, smoked, semi-dry, etc.) described just by its brand name. **Proposal:** (i) add facet descriptors that will cover both the existence of other ingredients as well as processing techniques, (ii) include additional varieties in the list.

7th category: “Fish and other seafood (including amphibians, reptiles, snails and insects)”

- The list of fish species under the “Fish meat” subcategory (A.01.000877- A.01.000909) included in the FoodEx is insufficient in comparison with those reported by the data providers. The upper category “Fish meat” was chosen in such cases. **Proposal:** add new fish species.
- Comments concerning the different composition of processed fish meat, i.e. canned fish and especially canned tuna, in contrast with unprocessed types were received by the data providers. This is due to the fact that FoodEx does not differentiate these categories. In these circumstances it was suggested to use the code for tuna itself, but some of the data providers pointed out the different composition of the two items. They had preferred to add the preservation method in addition to the packing medium (e.g. in oil, brine, etc.) in the ‘comments’ field. **Proposal:** addition of canned fish in the list, like canned in water, oil, sauce or brine, or the addition of facets on the certain states.

8th category: “Milk and dairy products”

- The fat content for the subcategory “Cream” (A.01.001001- A.01.001007) is unclear. **Proposal:** food items under the category “Cream” should be grouped according to the fat content. For example the groups of <10%, >10% <20%, >20%-30%, >30%-40%, >40%-50% and >50% could be used. This will facilitate a better harmonisation, as fat content in cream differs among Member States.
- “Cheese” (A.01.001053- A.01.001239) subcategory includes 186 different varieties of cheese and yet the list is considered insufficient by the data providers. There are some characteristics like the animal origin, the ripening, the firmness and the information whether the milk was pasteurized or raw that are not included. Another characteristic is the fat content, which can be extracted from the variable ‘Fat’ of the Foods files collected¹⁰. **Proposal:** addition of subcategories and/or facets inside the already existing list at least for the characteristics of milk origin and firmness.

¹⁰ Details on energy, protein, carbohydrate and alcohol content were also included in the Foods file.

- “Fermented milk products” subcategory “Yoghurt cow milk, with fruit” (A.01.0001032) should specify the fruit and/or flavour. **Proposal:** addition of facets concerning the fruit and/or flavour (strawberry, banana, coconut..., or mixed fruits) in every subcategory.
- “Fermented milk products” **Proposals:** Addition of subcategory probiotic dairy products (with Bifidobacterium sp, Lactobacillus acidophilus, Lactobacillus casei, or mixture). Addition of subcategory fermented dairy products with plant sterols and stanols.

9th category: “Eggs and egg products”

- No problems identified. The category seems to cover the variety of the food items consumed throughout the Member States.

10th category: “Sugar and confectionary”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout the Member States.

11th category: “Animal and vegetable fats and oils”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout the Member States.

12th category: “Fruit and vegetable juices”

- A discrepancy was identified between “Fruit juice” (A.01.001395- A.01.001417) and “Fruit nectar” (A.01.001434- A.01.001441). Data providers were not familiar with the legislation and considered any fruit juice with added sugar as fruit nectar. **Proposal:** report the minimum percentage of fruit mentioned in the legislation (Directive 2001/112/EC¹¹) for both fruit juices and nectars and, whether the product may contain added sugars or not.

13th category: “Non-alcoholic beverages (excepting milk based beverages)”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout the Member States.

14th category: “Alcoholic beverages”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout the Member States.

15th category: “Drinking water (water without any additives except carbon dioxide; includes water ice for consumption)”

- No problems identified. This category seems to cover the variety of the food items consumed throughout the Member States.

16th category: “Herbs, spices and condiments”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout MSs.

¹¹ Directive 2001/112/EC of 20 December 2001 relating to fruit juices and certain similar products intended for human consumption. OJ L 10, 12.1.2002, p.1-9.

17th category: “Food for infants and small children”

- “Ready-to-eat meal for infants and young children” (A.01.00173- A.01.001737) could be expanded by adding other combination of foods, like vegetables and cereals, vegetable and cheese, vegetables, pasta and meat, fish and vegetables ingredients. According to the data collected, a variety of different infant foods are available in the market. FoodEx does not provide the possibility of classifying them under a certain code, thus the reporters have classified them using the upper level of this subcategory. **Proposal:** add meals that contain combination of ingredients.

18th category: “Products for special nutritional use”

- The category “Dietary supplements” (A.01.001752- A.01.001764) does not cover all types of products consumed by in the Member States. The United Kingdom, for example, used the upper level for most of their reported supplements. **Proposal:** add the already existing types of supplements.

19th category: “Composite food (including frozen products)”

- A common issue faced by the data providers in coding composite foods was the difficulty in identifying the main ingredient according to which the sub-categories are organised. For example, for a dish with meat and legumes the only available matrix code was the “beans and meat meal” (A.01.001826), without specifying the amount of each ingredient. **Proposal:** the use of standard recipes could be suggested as an alternative in order to disaggregate also these foods into the basic ingredients. However, this would not always be possible due to the lack of information concerning the ingredients (types and quantities) of the composite food. It would also require a significant workload and could not be assured to be feasible.
- Another important point was related to dried soups classified under the “Ready to eat soups” category (A.01.001856), although the data providers have included the need of dilution with liquid in the ‘Comments’ field variable. **Proposal:** distinguish between liquid and dried ready to eat soups by creating two subcategories. This should be controlled also for others composite foods (e.g. sauces).
- The subcategory “Ready to eat soup” (A.01.001856), does not include soup made with vegetables and meat. **Proposal:** add a subcategory of vegetable-meat soups.
- It could be interesting to include if any fat/oil is added to the product, and specify the type of fat/oil. **Proposal:** addition of a column with fat information.
- The same as above for salt. **Proposal:** addition of a column with salt information.
- In the subcategory “Pizza and pizza-like pies” (A.01.001800), under “Cereal-based dishes” (A.01.001790- A.01.001815), pizza with fish is not included. **Proposal:** include pizza with fish and shellfish under this category.
- Subcategory “Pasta cooked” (01.001809) under “Cereal-based dishes” (A.01.001790- A.01.001815), does not include wholegrain pasta and pasta with minced meat. **Proposal:** include wholegrain pasta subcategory and pasta cooked with minced meat (subcategories beef, pork, chicken or mixtures).
- **Proposal** for subcategory “Prepared salads” (A.01.001866- A.01.001876): add Russian Salad, also known as Olivier salad or Italian salad in some countries.

20th category: “Snacks, desserts, and other foods”

- No major problems identified. This category seems to cover the variety of the food items consumed throughout the Member State

CONCLUSIONS AND RECOMMENDATIONS

The FoodEx system proved to be user friendly and flexible enough in most situations to interface with national food classification systems.

Methodological differences between the national dietary surveys related to the level of detail requested concerning the description of food and beverages and consequently to their classification have been identified. However, findings reported in the present document demonstrate that all data providers were able to classify correctly the large majority of their food at least at the 2nd level of the FoodEx. The 3rd and 4th level can also be used but their completeness varies according to the country and food group. It is therefore recommended to publish summary statistics of the “EFSA Comprehensive European Food Consumption Database” for each of the food groups listed at the 2nd level of the FoodEx.

The use of facets resulted clearly from the evaluation of the FoodEx as an advantage for the harmonised classification of the food consumption data included in the Comprehensive database. A clear recommendation to the Working Group on “Development of a Food Classification and Description System for exposure assessment” is therefore the development of a classification and description system including facets, as further descriptors.

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Glossary and abbreviations

Comprehensive database:	EFSA Comprehensive European Food Consumption Database
DATEX	Data Collection and Exposure
DCF	Data Collection Framework
EFSA	European Food Safety Authority
EU	European Union
IT	Information Technology
MS	Member State