EXTERNAL SCIENTIFIC REPORT

Pilot project on the implementation of FoodEx2 as part of the Standard Sample Description for the electronic transmission of harmonised chemical occurrence data to EFSA[1](NP/EFSA/DCM/2012/03/01)

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ABSTRACT

EFSA's Working Group on Food Classification launched in late 2011 the first version of a new and more comprehensive classification and description system for food and feed suitable for exposure assessment in different areas of food safety which was designated FoodEx2. Before being fully implemented, FoodEx2 needs to be tested in different applications, and commented on by users at national level and consequently be improved. Thus, in parallel to the development and implementation of the 'CFP/EFSA/DATEX2011/01 - Implementation of Electronic Transmission of Chemical Occurrence Data in Portugal' project, INSA submitted an offer to the tender 'Pilot projects on the implementation of FoodEx2 as part of the Standard Sample Description for the electronic transmission of harmonised chemical occurrence data to EFSA'. Foodex2 system consists of a large number of individual food items, representing the minimum level of detail necessary to code/describe a food and feed sample to estimate dietary exposure, aggregated in groups and broader categories of food in a hierarchical structure like 'parent-child' relationship. This characterization is improved with the use of facets. The term facet refers to a set of descriptors which allow detailing the characteristics of a food product according to various aspects such as physical state or preservation technique, among others. These activities of this project performed by INSA in the period October 2012-April 2013 are summarised in the present report.

KEY WORDS

FoodEx2, food classification, food description, food categories, food core list, facets, performance evaluation.

DISCLAIMER

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[1] Question No EFSA-Q-2012-00878.

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BACKGROUND AS PROVIDED BY EFSA

According to Regulation (EC) No 178/2002, the European Food Safety Authority (EFSA) shall provide scientific advice and scientific and technical support for the Community's legislation and policies in all fields which have a direct or indirect impact on food and feed safety. In order to do this, EFSA should collect and analyse data to allow the characterisation and monitoring of risks which have a direct or indirect impact on food and feed safety.

EFSA has launched a series of harmonisation projects to ensure smooth collection of comparable data. These included, amongst others, food consumption and chemical occurrence data.

In order to harmonise the collection and electronic transmission of chemical occurrence data EFSA published two guidance documents: "Standard Sample Description" (SSD)[2] and the "Guidance on data exchange"[3], and have also launched a series of Article 36 grants to support the implementation of SSD and the electronic data transmission in Member States.

The DCM Unit (Dietary and Chemical Monitoring) of EFSA developed a preliminary draft food classification system (FoodEx1) which has proven to be insufficient to meet all the demands of the Member States. At the end of 2011, the Working Group on Food Classification released the first version of FoodEx2 a comprehensive new food classification and description system for exposure assessment, suitable for use in different food safety areas.

Before being fully implemented, FoodEx2 needs to be tested in different applications, and commented on by users at national level and consequently be improved. In particular, the National Competent Authorities having implemented in the framework of any of the above mentioned Article 36 grants the electronic transmission of SSD compliant data to EFSA, have the right and necessary systems in place to perform a comprehensive test of FoodEx2 in the chemical occurrence domain.

TERMS OF REFERENCE AS PROVIDED BY EFSA

The contractor was requested to:

1. revise the translation tables (based on FoodEx1 as food classification) prepared while performing the data transmission grant project and integrate them with the FoodEx2 full code.
2. provide an accurate translation of the FoodEx2 terminology into the contractor's national language.
3. critically evaluate the performance of FoodEx2 in classifying and describing the food items present in the respective national database(s) and provide a final report containing comments and suggestions for modifications or inclusion of eventually missing important items.

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[2] http://www.efsa.europa.eu/en/supporting/pub/1457.htm
[3] http://www.efsa.europa.eu/en/efsajournal/pub/1895.htm

This contract was awarded by EFSA to:

Instituto Nacional de Saúde Doutor Ricardo Jorge (INSA, IP) Avenida Padre Cruz, 1649-016 Lisboa, Portugal.

Contract title: Pilot project on the implementation of FoodEx2 as part of the Standard Sample Description for the electronic transmission of harmonised chemical occurrence data to EFSA

Contract number: NP/EFSA/DCM/2012/03/01

INTRODUCTION AND OBJECTIVES

Food classification systems are essential to analyse data for exposure assessment and their quality and fitness for purpose determines their capability of accurately classifying and describing foods and consequently condition the final adequacy of data analysis.

FoodEx2 aims to be comprehensive new food classification and description system for exposure assessment, suitable for use in different food safety areas.

Portugal is currently implementing its food chemical occurrence data management system under the scope of the project 'CFP/EFSA/DATEX2011/01 - Implementation of Electronic Transmission of Chemical Occurrence Data in Portugal' and has the expertise and the resources to test and evaluate the performance of FoodEx2 in the context of classifying and describing food samples collected for monitoring chemical occurrence.

The purpose of this project is to:

1. Revise the translation tables, from food classification controlled vocabularies used by national data sources to FoodEx1, prepared while performing the data transmission grant project 'CFP/EFSA/DATEX2011/01 - Implementation of Electronic Transmission of Chemical Occurrence Data in Portugal' in order to complement them with the FoodEx2 full code;

2. Provide an accurate translation of the FoodEx2 terminology from English into Portuguese language;

3. Evaluate the performance of FoodEx2 in classifying and describing the food items present in the respective national database(s);

4. Present a final report on FoodEx2 containing comments and suggestions for modifications or inclusion of eventually missing important items.

MATERIALS AND METHODS

MATERIALS

- Foodex2 Browsing Tool - Foodex 2.0 win 32 0.1.3.exe – provided by EFSA

- Instructions for using the Browsing Tool – available on http://www.efsa.europa.eu/en/datex/datexfoodclass.htm

- Excel file Lists for translation-PT - provided by EFSA

- Excel file English-Portuguese LanguaL descriptors_FINAL_07042011 – provided by INSA

METHODS

In order to meet the objectives of this project, the following tasks were performed:

1.   Revision of the different National systems-SSD translation tables

In the scope of project 'CFP/EFSA/DATEX2011/01' Portugal had three national competent authorities with controlled vocabulary used on their LIMS. They are the Autoridade de Segurança Alimentar e Económica/Food Safety and Economic Authority (ASAE), the Instituto Nacional de Investigação Agrária e Veterinária/National Institute of Agricultural and Veterinary Research (INIAV) and the Instituto Nacional de Saúde Doutor Ricardo Jorge/National Health Institute Doutor Ricardo Jorge (INSA). Leveraging translation tables compiled for the project mentioned above, we proceeded to match the vocabulary used with existing codes in foodEx2. This correspondence was done mostly on 'exposure hierarchy' but sometimes, when this was not sufficient to achieve the best product description, the 'building hierarchy' was also used.

The percentages of full codes, described codes and poor coding according to data sources is reported as well as difficulties encountered for matching with FoodEx2.

2.   Translation of FoodEx2 terminology into Portuguese language

The translation was performed in the following fields/tables of FoodEx2 ('Foodex 2 Browser' electronic tool provided by EFSA):

a. 'Name', 'Common names', 'Scope notes' in the table DATA (including also facets and facet descriptors)

b. The field 'Name' of the tables HIERARCHIES, APPLICABILITYFLAG, COREXFLAG, and STATEFLAG.

Test FoodEx2 on the Dataset submitted for 2012 continuous call.

In order to test the FoodEx2 classification system we classified manually the datasets submitted for the 2012 continuous call for collection of chemical contaminants occurrence data in food and feed, based on S14 Product full text description. Those datasets had also been manually classified with FoodEx1 based on S14 Product full text description.

3.   Evaluate the performance of FoodEx2 in classifying and describing the food items

As the mapping of food and feed controlled vocabularies was being done, we proceeded to note the limitations of the system classification for its flexibility and descriptive capacity of the food and feed items characteristics.

The percentage of simple direct matches will be reported as well as difficulties encountered and decisions taken for matching with a FoodEx2 full code. Whenever possible, suggestions for improvement are given.

RESULTS

4.   Revision of the different National systems-SSD translation tables

The different national food classification systems (food and feed controlled vocabulary used by national data sources) were additionally mapped with the FoodEx2 codes. Only three of the Electronic Transmission Project data sources have controlled vocabulary (ASAE, INIAV and INSA) so this mapping was only performed for these entities.

To ensure the mapping quality, FoodEx2 codification was performed in parallel by two members of the project team and a validation was carried out using the Excel function 'EXACT' to compare the codes assigned; this function returns the information 'TRUE' or 'FALSE'. Whenever the information was divergent Excel returns the code 'FALSE', and in these situations a third team element performed a correction step which consisted on assigning the code that best identifies the product in question. Figure 1 shows an example of the application of this procedure.

Approximately 40 % of 'FALSE' answers were obtained and have to be corrected. Some of this was due to different opinions and some due to a different order in assigning facets.

The mapping tables were provided to EFSA as one of the deliverables of the project. Difficulties encountered when matching with FoodEx2 are reported in 'Observations' column. Lines highlighted in yellow refer unsolved problems that must be addressed by the data sources. The percentages of full codes, described codes and poor coding according to data sources were respectively as follows: ASAE – 31 %, 36 % and 33 %; INIAV – 19 %, 0 % and 81 %; INSA – 12 %, 0 % and 88 %.

INIAV - Food Groups	FoodEx1		FoodEx2		Executed	Date	FoodEx2 AL_control	Date	Exact	Supervisor	Validation	Observations
Água	A.01.001573	Drinking water (water without any additives except carbon dioxide; includes water ice for consumption)	A0BXK#F01.A0BYJ	RPCs of mineral or synthetic origin	FR	07-03-2013	A0BXK#F01.A0BYJ	14-03-2013	TRUE		Ok	
Açúcar e mel	A.01.001268+A.01.001340	Sugars+Honey	A04PA	Sugar and other sweetening ingredients (excluding intensive sweeteners)	FR	07-03-2013	A04PA	14-03-2013	TRUE		Ok	Generic item group Item group
Alimentação animal	G.0.0	Feed terms (Commission Regulation (EU) No 575/2011)	A0BB9	Feed	FR	07-03-2013	A0BB9	14-03-2013	TRUE		Ok	
Alimentos para animais	G.14	COMPOUND FEED	A0BT0	COMPOUND FEED	FR	07-03-2013	A0BT0	14-03-2013	TRUE		Ok	
Bebidas não alcoólicas	A.01.001470	Non-alcoholic beverages (excepting milk based beverages)	A0BX7	Non alcoholic beverage composites	FR	07-03-2013	A0BX7	14-03-2013	TRUE		Ok	
Carne e produtos cárneos	A.01.000727	Meat and meat products (including edible offal)	A01QR	Meat and meat products	FR	07-03-2013	A01QR	14-03-2013	TRUE		Ok	
Cereais e leguminosas	A.01.000001+A.01.000486	Grains and grain-based products+Legumes, nuts and oilseeds+	A000L#F02.A066P+A011Y#F02.A066P+A04RE	Cereal and cereal-like grains+Legumes, fresh seeds+Legume greens, legumes sprouted and other sprouts	FR	07-03-2013	A000L#F02.A066P+A011Y#F02.A066P+A04RE	14-03-2013	TRUE		Ok	Belong to 3 groups
Condimentos e especiarias	A.01.001580	Herbs, spices and condiments	A0BXD	Condiments and sauces composites	FR	07-03-2013	A0BXD	14-03-2013	TRUE		Ok	
Fígado	A.01.000727	Meat and meat products (including edible offal)	A01XD	Animal liver	FR	07-03-2013	A04MQ	14-03-2013	FALSE	A01XD	Ok	Validated by supervisor
Frutos e produtos hortícolas	A.01.000544+A.01.000317	Fruit and fruit products+Vegetables and vegetable products (including fungi)	A0BXJ+A07XJ	RPCs of fruit type+Garden vegetables	FR	07-03-2013	A0BXJ+A07XJ	14-03-2013	TRUE		Ok	Belong to 3 groups
Gordura	A.01.001347	Animal fat	A037T#F02.A06AR	Animal fats and oils, processed	FR	07-03-2013	A037T#F02.A06AR	14-03-2013	TRUE		Ok	
Leite e produtos lácteos	A.01.000948	Milk and dairy products	A02LR	Milk and dairy products	FR	07-03-2013	A02LR	14-03-2013	TRUE		Ok	
Mel	A.01.001340	Honey	A033J#F02.A06EF	Honey	FR	07-03-2013	A033J#F02.A06EF	14-03-2013	TRUE		Ok	
Músculo	A.01.000727	Meat and meat products (including edible offal)	A0BXF	RPCs of animal origin	FR	07-03-2013	A0BXF	14-03-2013	TRUE		Ok	
Óleos	A.01.001367	Vegetable oil	A036N#F02.A068M	Vegetable fats and oils, edible	FR	07-03-2013	A036N#F02.A068M	14-03-2013	TRUE		Ok	
Ovo e ovoprodutos	A.01.001252	Eggs and egg products	A031E	Eggs and egg products	FR	07-03-2013	A031E	14-03-2013	TRUE		Ok	
Pescado e produtos da pesca	A.01.000876	Fish and other seafood (including amphibians, reptiles, snails and insects)	A026T	Fish, seafood, amphibians, reptiles and invertebrates	FR	07-03-2013	A026T	14-03-2013	TRUE		Ok	Generic item group
Pré-cozinhados	A.01.001789	Composite food (including frozen products)	A03VA	Composite dishes	FR	07-03-2013	A03VA	14-03-2013	TRUE		Ok	
Produtos pastelaria	A.01.000253	Pastries and cakes	A00AF	Pastries and cakes	FR	07-03-2013	A00AF	14-03-2013	TRUE		Ok	
Rim	A.01.000727	Meat and meat products (including edible offal)	A01YG	Animal kidney	FR	07-03-2013	A01YG	14-03-2013	TRUE		Ok	
Sangue	G.9.8	Blood products	A0BN5	Blood products	FR	07-03-2013	A0BN5	14-03-2013	TRUE		Ok	

Figure 1:   Example of the procedure used for mapping controlled vocabulary to FoodEx2.

5. Translation of FoodEx2 terminology into Portuguese language

The translation was performed by two members of the team according their experience with the different food groups, and revised by two different team members.

The translation was made with the assistance of the LanguaL terminology translation into Portuguese language performed within the implementation of EuroFIR project (Figure 2), and with on-line dictionaries.

Figure 2: Screenshot of the excel file of the English-Portuguese LanguaL descriptors_FINAL_07042011.

The translation of FoodEx2 terms into Portuguese language was provided to EFSA as one of the deliverables of the project.

6. Test FoodEx2 on the Dataset submitted for 2012 continuous call

For this test, the FoodEx1 code remained in the EFSAProdcode and the FoodEx2 full code chosen using all the information available was recorded at the beginning of the 'Prodcom' field – S.21. The classification of data entries with FoodEx2 codes was double checked by two members of the project team (quality control procedure).

Since the data collection of the project 'CFP/EFSA/DATEX/2011/01/02' was performed manually using information contained in the collection records and analytical reports it was not possible to classify the food items according to the LIMS controlled vocabularies used by institutions, and the classification to FoodEx1 codes was made based on the descriptive information existing in the referred documents. Given that data collection and data entry were done manually and directly on the Generic Reporting Format (GRF), the items classification in field S.12 was conducted based on the information

introduced in S.14, which was more detailed and descriptive on food or feed than it would have been if the data source controlled vocabulary was used. This fact increased substantially the number of Foodex1 different codes in the datasets. Consequently, the classification of food samples with FoodEx2 was based on the same assumption.

However, in order to test the impact of coding FoodEx2 automatically using the controlled vocabularies translation tables prepared for this purpose, we made a reverse classification of the 2012 transmission datasets, i.e. matching the item described on field S.14 to the data source controlled vocabulary. This will allow us in a near future to test the capability of the IT system under development in the Electronic Transmission project to classify food samples with FoodEx2 and also to evaluate the impact of automatic classification trough translation tables *vs.* manual classification using S14 information in the number of different FoodEx2 codes in a particular data transmission.

Data submitted for 2012 continuous call was coded with FoodEx2 in 'Prodcom' field – S.21 and resubmitted on the 10th April 2013 in XML format trough EFSA DCF.

7.   Evaluate the performance of FoodEx2 in classifying and describing the food items

FoodEx 2 allows to include in the same code more detailed information relating to food, particularly regarding the information that was present on S.15, S.16 and S.17 (method of production, packaging and product treatment) SSD fields as well as other information that makes the product description more complete. It also has a more comprehensive food listing than FoodEx1 which allows include/classify particular food products usually consumed and country specific products that the previous system did not have (some types of fish, seafood, meat products, etc). However, this list still has, regarding the Portuguese scenario, some shortcomings which hindered somehow the correct mapping of controlled vocabularies (greater difficulties were felt with Autoridade de Segurança Alimentar e Económica (ASAE) food list which contained a larger number of regional items). On one hand this item increase in the food list is positive and improves the descriptors of the products, but on the other hand, it can result on very extensive lists, making the classification more painful - there may be more than one code suitable for a particular product and that may lead to have different codes for the same product given by different technicians.

SPECIFIC TECHNICAL ISSUES

During the mapping we have encountered several problems that are explained below:

INSTITUTO NACIONAL DE INVESTIGAÇÃO AGRÁRIA E VETERINÁRIA (INIAV)

The controlled vocabulary used by this entity is very restricted because it has a small number of food groups which complicates the assignment of FoodEx2 codes. As showed on the figure below he encountered several food groups that had more than one matching FoodEx2 code.

INIAV - Food Groups	FoodEx1		Foodex2	
Água	A.01.001573	Drinking water (water without any additives except carbon dioxide; includes water ice for consumption)	A0BXK#F01.A0BYJ	RPCs of mineral or synthetic origin
Açúcar e mel	A.01.001268+A.01.001340	Sugars+Honey	A032G + A033J#F02.A06EF	Sugars + Honey
Alimentação animal	G.0.0	Feed terms (Commission Regulation (EU) No 575/2011)	A0BB9	Feed
Alimentos para animais	G.14	COMPOUND FEED	A0BT0	COMPOUND FEED
Bebidas não alcoólicas	A.01.001470	Non-alcoholic beverages (excepting milk based beverages)	A0BX7	Non alcoholic beverage composites
Carne e produtos cárneos	A.01.000727	Meat and meat products (including edible offal)	A01QR	Meat and meat products
Cereais e leguminosas	A.01.000001+A.01.000486	Grains and grain-based products+Legumes, nuts and oilseeds+	A000L#F02.A066P+A011Y#F02.A066P+A04RE	Cereal and cereal-like grains+Legumes, fresh seeds+Legume greens, legumes sprouted and other sprouts
Condimentos e especiarias	A.01.001580	Herbs, spices and condiments	A0BXD	Condiments and sauces composites
Fígado	A.01.000727	Meat and meat products (including edible offal)	A01XD	Animal liver
Frutos e produtos hortícolas	A.01.000544+A.01.000317	Fruit and fruit products+Vegetables and vegetable products (including fungi)	A0BXJ+A07XJ	RPCs of fruit type+Garden vegetables
Gordura	A.01.001347	Animal fat	A037T#F02.A06AR	Animal fats and oils, processed
Leite e produtos lácteos	A.01.000948	Milk and dairy products	A02LR	Milk and dairy products
Mel	A.01.001340	Honey	A033J#F02.A06EF	Honey
Músculo	A.01.000727	Meat and meat products (including edible offal)	A0BXF	RPCs of animal origin
Óleos	A.01.001367	Vegetable oil	A036N#F02.A068M	Vegetable fats and oils, edible
Ovo e ovoprodutos	A.01.001252	Eggs and egg products	A031E	Eggs and egg products
Pescado e produtos da pesca	A.01.000876	Fish and other seafood (including amphibians, reptiles, snails and insects)	A04HZ + A026T	Fish, fish products, shell fish, molluscs and other marine and freshwater food products + Fish, seafood, amphibians, reptiles and invertebrates
Pré-cozinhados	A.01.001789	Composite food (including frozen products)	A03VA	Composite dishes
Produtos pastelaria	A.01.000253	Pastries and cakes	A00AF	Pastries and cakes
Rim	A.01.000727	Meat and meat products (including edible offal)	A01YG	Animal kidney

Figure 3: INIAV food groups and the correspondent FoodEx classification.

In order to solve this situation we had to make a decision to classify these groups by the most generic FoodEx2 code, losing with this action, important information about the item. For instance in the first case showed we have chosen the FoodEx2 code A04PA – Sugar and other sweetening ingredients.

Since the mapping of the dataset submitted for the 2012 continuous call was done manually the impact of the situation described above was not felt but future reports of this data source might have far fewer FoodEx2 codes.

AUTORIDADE DE SEGURANÇA ALIMENTAR E ECONÓMICA (ASAE)

ASAE's controlled vocabulary is extremely differentiated and sometimes very difficult to correspond to FoodEx2 codes. In the future it would be important to consider a thorough revision of the controlled language used to eliminate designations that make no sense and include others to meet EFSA system classification.

There are several specific situations and the most important are described below.

- For the designation used 'Outras pomoídeas e prunoídeas n.e. cortadas com outro tratamento refrigeradas' we cannot find on FoodEx2 an adequate code that covers the entire designation pome fruits and stone fruits.

- The controlled vocabulary used on this entity has the designation Salmon and according to FoodEx2 it is possible to give more than one code (Figure 4).
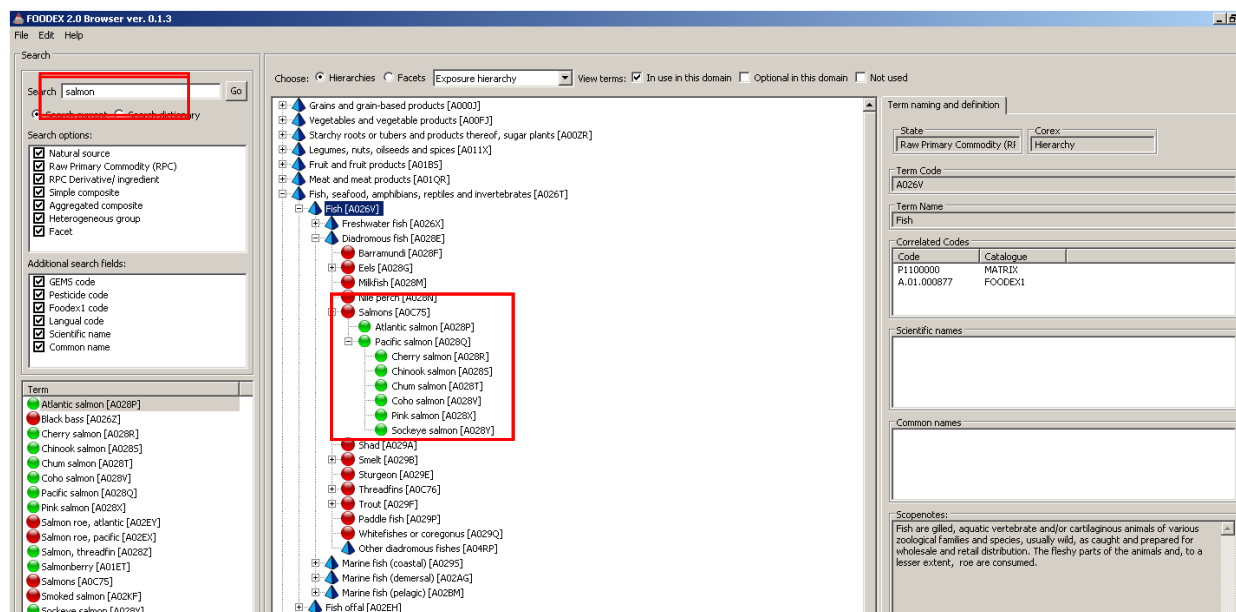
Figure 4: Printscreen of FoodEx2 system with salmon classification possibilities.

- On the particular product ASAE designation of the 'Queijo curado de leite de ovelha, de pasta semi-dura e mole, produzido a partir de leite pasteurizado' we cannot introduce the pasteurization facet.

- On the particular product ASAE designation of the 'Queijo curado de leite de vaca, de pasta semi-dura e mole, produzido a partir de leite crú ou com tratamento térmico de baixa temperatura' we cannot introduce the low temperature treatment facet because it only admits one treatment facet (F.28 facet);

- For particular cheeses and cottage cheeses made with milk from more than one species it is not possible to include all the species that originated the product.

- In the case of pâté it is not possible to differentiate the species from which it is produced.

In the particular case of the designation 'Pratos prontos para consumo contendo produtos descascados e sem concha à base de moluscos e crustáceos cozidos' we cannot introduce information about the unshelled products.

- In some products in which sweeteners are used we cannot introduce this information. An example of this situation is the designation 'Cacau em pó, com adição de açúcar e outros edulcorantes' for which we couldn't put the addition of other sweeteners.

- For some non-dairy desserts that are made from pasteurized egg and cream that underwent heat treatment and that are chilled we cannot introduce the information about the cream treatment. - Ex: Sobremesa não láctea com ovo pasteurizado e creme que sofreu tratamento térmico refrigerada.

- In the particular case of the Portuguese designation of 'Bagaços' and 'Borras' (an alcoholic drink and an by-product of alcoholic production) we cannot find any FoodEx2 code that could describe this kind of product.

- There are no FoodEx2 codes for some specific fish, such as molluscs and crustaceans species that are usually consumed in Portugal.

- The ASAE controlled vocabulary has two different designations for cod that do not correspond to a FoodEx2 code.

- The ASAE controlled vocabulary has a particular designation for honey which includes the information 'non tropical' that does not correspond to a FoodEx2 code.

- We have several ready to eat products that include offal and we are not sure that this kind of products can be included 'Meat based products'.

- There is no generic FoodEx2 code to classify materials from mineral origin.

- On 'Milk and dairy products' we cannot add liquid or solid presentation and ready to eat or non ready to eat facets.

- Regarding 'Whey/ - Whey concentrate / - Whey powder' we cannot add 'low in lactose' facet.

- Regarding 'Tomato concentrate' we cannot add information about the brix grade.

- We cannot find any code for the specific regional Portuguese product 'Alheira' and 'Farinheira' that are two important meat products in the national diet.

- On the 'Dishes, incl. ready to eat meals (excluding soups and salads)' group we could not add the ingredient blood because, although it is possible to add ingredients, this particular ingredient is not available. On the 'Exposure hierarchy' we cannot find a specific code to describe lemons and limes together.

- Some codes were built from 'Building hierarchy' since there was no correspondence code on the 'Exposure hierarchy'.

- In some dairy products we cannot introduce more than one F.28 facets.

- There is no FoodEx2 code for blood as food. We have several Portuguese dishes and products that are produced with blood from animals.

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The controlled vocabulary used by this entity is very restricted because it has a small number of food groups which hampers the assignment of FoodEx2 codes. For instance, in the particular case of the food item 'Açúcar, produtos açucarados e mel' since FoodEx2 has different codes for honey and sugar the final classification given tends to loose information. The same situation happens for the item food 'Pescado e derivados' where we also loose information by giving the top chain code.

CONCLUSIONS AND RECOMMENDATIONS

The FoodEx2 refers to a classification system more developed than the previous one that includes more detailed and descriptive information concerning the products. However, we still had several terms in the national food classification controlled vocabularies that had no correspondence in FoodEx2.

During classification of the products various difficulties were observed.

A difficulty had to do with the selection of some Portuguese cheeses which are often produced from milk from more than one species. For example for a cheese which is made from cow's and goat milk, there is no possibility to capture this information as the system allows only the inclusion of one species. Portugal has several products (e.g. cheeses, meat products) that are specific (DOP – Protected designations of origin and IGP – Protected geographical indication or other special denominations used). In the particular case of cheeses, the FoodEx2 list includes several examples from numerous countries, but in the Portuguese specific case, there are missing cheeses that are important from a consumption point of view. Some examples are DOP cheeses like 'Queijo de Azeitão', 'Queijo Rabaçal', 'Queijo Serra da Estrela', and so on. Our recommendation is to include all the products with specific designations laid down in the European regulations.

When we search for pig or swine we get different lists of terms available.

The group Legumes, nuts, oilseeds and spices is a very ambiguous group, at least from the nutritional point of view. In our opinion it should be more subdivided in order to facilitate food classification.

FoodEx2 does not have any particular code for by products of alcoholic beverages.

The existing distribution of the Spices and Aromatic Herbs groups is very challenging for us because in the particular case of ASAE controlled vocabulary we have food items that need both codes to be properly classified (Figure 3).
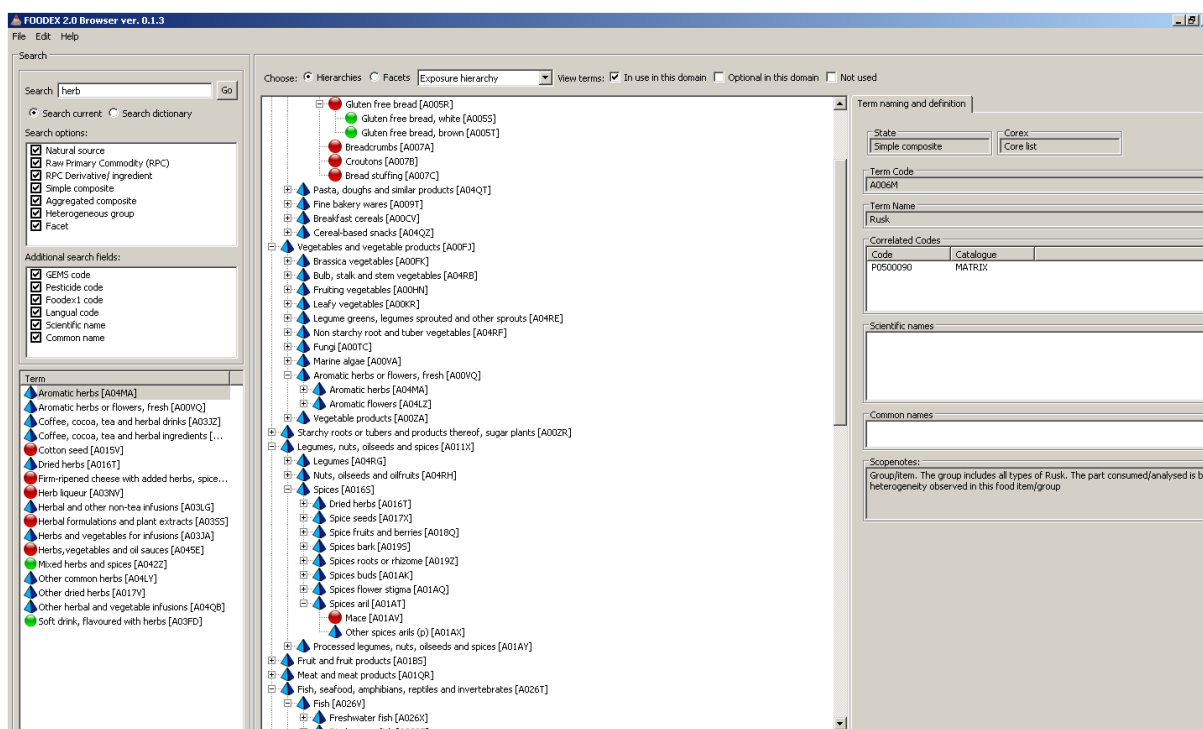
Figure 5: Screenshot of distribution of the spices and aromatic herbs groups on FoodEx2.

Another problem had to do with the order of the facet descriptors. The technician had to be very careful while performing the classification in order to follow exactly the product description; otherwise different codes for the same term may be assigned. For instance in a product that has two types of treatment (pasteurization and dehydration), the order of attributing each facet code influences the final result. Our **recommendation** is that the assignment of codes in the final code should be done according to a FoodEx2 system internal order within the same facet and not by the order of introduction. As we can see by the following example (highlighted in blue), we have the same product, with the same facets, but given with a different order. The quality control procedure implemented for the translation tables returns the information 'FALSE', although the same descriptors were used.

A02LV#F01.A057E$F02.A06AZ$F28.A07HS$F28.A07KP

and

A02LV#F01.A057E$F02.A06AZ$F28.A07KP$F28.A07HS

Another difficulty experienced had to do with the impossibility of doing a search through code. We **recommend** the introduction of this functionality in the near future to facilitate its fast and adequate use.

Our major **recommendation** for the future is the importance of the preparation and development of a FoodEx2 system user's guide in which should be explained in detail all the possibilities of use and its most appropriate forms of application. The lack of such a guide resulted made the process more time consuming and difficult. This guidance would help enormously in the assignment of FoodEx2 codes by the future system users, especially those who are not familiar with this classification tool. Also, practical training with relevant examples is highly **recommended**.

The general perception that remains at the end of this project is that continuous use of the system results in a more prompt and correct use of it. In our opinion the system has to be used by technicians with some kind of experience not only with food classification but also with food processing technology. As we mentioned before, the future appropriate use of this system involves the preparation/development of a guidance manual with very specific and systematic rules to apply. It also can imply an adjustment of the controlled languages used by each entity involved in the official control plans/programmes. This could mean an improvement on the quality of available data but it could also mean some resistance from data providers due to economic constrictions and the need for specialized personnel.

The Portuguese participation in this project was very important, but extremely time consuming. The translations into our national language required enormous resources of personnel and took a long period of time. Also mapping the controlled vocabularies used by the data sources was very difficult largely due to the enormous amount of food items that at least one of the data sources presented, and the difficulty in some cases in finding the FoodEx2 code to describe the product. This requires, as noted above, technical experience with English language and with matters related to food processing.

The experience gained with the execution of this project allowed us to identify deficiencies in the food classification systems (controlled vocabularies) in use by our national data sources and may contribute to improve them depending on the availability of financial and human resources.

Also this project made it possible to realize that using the automatic FoodEx2 classification through the translation tables will decrease the detail of sample description and a lot of information from SSD S14. The product full text description field will be lost. Some improvement in our data management system developed under the Article 36 project can be foreseen to identify and manually code some particular food items in FoodEx2. However, achieving a level of detail and quality similar to human food classification is not feasible.

REFERENCES

Foodex 2.0 win 32 0.1.3.exe - https://sciencenet.efsa.europa.eu/portal/server.pt/gateway

Instructions for using the Browsing Tool - http://www.efsa.europa.eu/en/datex/datexfoodclass.htm

GLOSSARY AND ABBREVIATIONS

ASAE	Autoridade de Segurança Alimentar e Económica/Food Safety and Economic Authority
DCF	Data Collection Framework
DCM	Dietary and Chemical Monitoring
EFSA	European Food Safety Authority
EUROFIR	European Food Information Resource Network
GRF	Generic Reporting Format
INIAV	Instituto Nacional de Investigação Agrária e Veterinária/National Institute of Agricultural and Veterinary Research
INSA	Instituto Nacional de Saúde Doutor Ricardo Jorge/The National Health Institute Doutor Ricardo Jorge
LIMS	Laboratory Information Management System
SSD	Standard Sample Description
XML	Extensible Markup Language