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Contributions to the Bulgarian tables for food chemical composition (REVIEW*)*

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ABSTRACT

Standardized approach to describe and document food composition data is needed. The traditional tables for chemical composition of Bulgarian foods can no longer fully meet the information needs of physicians, nutritionists, chemists, food technologists, biologists, and specialists in agricultural sciences; especially the free movement of foodstuffs and their diversity becomes overwhelming. National Center of Public Health and Analyses is responsible for Bulgarian food composition tables and is a general contractor as undertaken in EuroFIR Project. The good collaboration with leadership of the EuroFIR Project contributed to the launching of a new modern Bulgarian food composition database.

Key words: food composition, EuroFIR, nutrients, training

Introduction

EuroFIR (2005-2010), the world-leading European Network of Excellence on Food Composition Databank systems is a partnership between 40 universities, research institutes and small-to-medium sized enterprises (SMEs) from 21 countries (Church, 2006). EuroFIR (European Food Information Resource) is a non-profit international Association, which supports use of existing food composition data and future resources through cooperation and harmonization of data quality (Bell et al., 2012; Gyurova, 2014), functionality and global standards. The project is funded by the European Community's Sixth Framework Programme (Priority 5: Food Quality and Safety; Contract no FP6-513944). The purpose of the Association is the development, management, publication and exploitation of food composition data, and the promotion of international cooperation and harmonization through improved data quality, food composition database search ability and standards, for example, with the European Committee for Standardization (CEN) on the standard for food data (Becker, 2010). EuroFIR aims to develop and integrate a comprehensive, coherent and validated databank providing a single, authoritative source of food composition data for Europe (Church, 2006).

There has been a growing interest in food composition data interchange and harmonization, both within Europe and further afield (Church, 2009). Based on earlier work (Schlotke et al., 2000), EuroFIR has developed a framework for the documentation of food composition data, which formed the basis of a new European Standard (Becker et al, 2008).

Discussion

National Centre of Public Health and Analyses (NCPHA), Bulgaria, a general contractor as undertaken in the project, is responsible for Bulgarian food composition database (Gyurova, 2011).

According to Møller & Ireland (2003), the most basic principles for compiling food composition database are:

• Document – Document – Document.
• Work systematically.
• Work according to recommendations.
• Work according to standards and standard procedures.

A database is an organized collection of data whose content must be quickly and easily:

• Accessed.
• Managed.
• Updated.

The most recent "standard" is the draft EuroFIR Standard with specifications in the Technical Annex (Becker et al, 2008). The five suggested entities are:

• Food.

• Component.

• Value.

• Method.

• Reference.

VALUE DOCUMENTATION is a three step process and included:

1. Food description

• LanguaL indexing.

• EuroFIR Classification.

LanguaL stands for "Langua aLimentaria" or "language of food". It is an automated method for describing, capturing and retrieving data about food (Hendricks, 1992). LanguaL (Møller & Ireland, 2003) has been developed in collaboration with the US National Cancer Institute (NCI), and, more recently, its European partners, notably in France, Denmark, Switzerland and Hungary. As constructed, LanguaL is a multilingual thesaural system using facetted 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.

2. Value Reference Documentation

Value Reference Documentation - the bibliographic reference for each value is documented:

• Original Reference Code.

• Reference Type (THS).

• Acquisition Type (THS).

• Citation.

• title, authors, publication date, original language, …

Note: THS: thesaurus (EuroFIR thesauri)

3. Full Value Documentation

Full Value Documentation – all mandatory fields in EuroFIR Technical Annex concern the following entities:

FOOD:

• Original Food name.

• English Food name.

• Scientific name (if applicable).

• LanguaL indexing.

• [nitrogen-to-protein conversion factor (NCF)].

• [fatty acid conversion factor (FACF)].

• [Remarks] (not mandatory).

COMPONENT:

• Original Component Code.

• Original Component Name.

• EuroFIR Component Identifier.

• [English Component Name] (not mandatory).

• [Remarks] (not mandatory).

VALUE:

• Original Component Code.

• Original Food Code.

• Selected Value.

• Unit (THS).

• Matrix Unit (THS).

• Value Type (THS).

• Acquisition Type (THS).

• Method Type (THS).

• Method Indicator (THS).

• Method Parameter (NCF/FACF).

• Value Reference.

• [Date of generation] (not mandatory).

• [Date of evaluation] (not mandatory).

• [Remarks] (not mandatory).

REFERENCE:

• Original Reference Code.

• Reference Type

• Acquisition Type.

• Citation.

• title, authors, publication date, original language.

National compilers within the EuroFIR consortium have undertaken documentation of their datasets, according to the value documentation framework developed.

BULGARIA

The first Bulgarian food composition table was published in 1966. It included 918 foods including non-alcoholic beverages and covered macronutrients, vitamins and minerals. The origin of the data was mostly foreign (borrowed data). In 1975, the second edition of the Bulgarian food composition tables was published, with 749 foods and an extended range of nutrients (Church, 2006).

In recent days, Bulgarian FCDB is structured according to some standards or recommendations: LanguaL food description and EuroFIR Standard - II. Technical Annex.

Bulgarian Food Composition Data Base consists of 828 foods with 37 nutrients for each food:

• English food names and Bulgarian food names

• No Scientific names

• 828 food codes

• Original Food Group

• Nitrogen to protein conversion factor (NCF) and the Fatty acid conversion factor (FACF) were provided for a number of foods

• LanguaL food description - for all foods

• 37 components for each food: protein; protein animal; fat, total; fatty acids, total saturated; fatty acids, total monounsaturated; fatty acids, total polyunsaturated; cholesterol; carbohydrate, fibre; sodium; potassium; calcium; phosphorus; magnesium; iron, total; iron, animal; copper; zinc; manganese; vitamin A; vitamin E; vitamin D; vitamin C; vitamin B1; vitamin B2; vitamin B6; vitamin B12; niacin, available; folic acid; sugar added; alcohol (ethanol); all-trans retinol; β- carotene; pantothenic acid; biotin; selenium, total and iodide.

Component names are in original language and in English, as well as corresponding EuroFIR component identifiers (Gyurova, 2011).

According to Ershow (2003), food composition databases should be include the foods most commonly eaten by the national or study population together with a selection of other foods, e.g. those that are important sources of one or more nutrients in population subgroups. Samples should be representative of the national level or study population.

What we need to do to improve our databases?

• To define key foods and key nutrients, and according to that to complete missing values.

• To provide additional information (definition of nutrients, methods, conversion factors).

• To include references for all entries.

• To use Langual description system.

Conclusion

Currently, Bulgarian food composition database is updated annually with new foods that are subjected to chemical analyses. At present, their number amounted to 953. Still missing data for some nutrients due to restrictions related to limited number of qualified staff and available analytical equipment. For most analyzed foods, no precise and complete information about their composition, this makes LanguaL indexing difficult. Evaluating each specific situation, laboratory documentation and data analyses best practices ensure data quality, reliability and comparability.

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