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US, Canadian, Australian, and New Zealand datasets seen through foreign eyes

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Abstract

Food composition databases (FCDBs) are published with such different formats and levels of documentation, that it is often difficult to compare values or import data using standard procedure. Data from four online FCDBs – USA, Canada, Australia, and New Zealand – were downloaded and transformed according to EuroFIR specifications for presenting data and metadata. Despite their different levels of documentation, the data in these 4 FCDBs can be compared and interchanged using the standardized EuroFIR eSearch platform with little loss of information. This demonstrates the benefits of using standardized systems for linking and describing food composition data.

Selection and peer-review under responsibility of National Nutrient Databank Conference Steering Committee

Keywords: Food composition databases; Data documentation; EuroFIR; eSearch

1. Background & Objective

1.1. Published food composition databases

Food composition databases (FCDBs) include information pertaining to the identification of foods and their nutrient composition, although they may present data in different formats and with different levels of documentation. FCDB presentations typically cover a wide range of technical solutions and layouts, according to their intended use, national traditions, and available finances. In general, data are presented in different formats and include different levels of documentation. As a result, users need to review the background information, most often placed in external documents. The different formats make it difficult for users to compare values between data sets or import data using a standard procedure.

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1.2. EuroFIR solution

In order to standardize food composition work in Europe, EuroFIR (European Food Information Resource) [1] created a draft common standard, whereby national and specialized FCDBs can present data and metadata in a uniform way. This standard for common description of foods and their compositional values in published food composition databases subsequently became the basis for the establishment of a common CEN (Comité Européen de Normalisation /European Committee for Standardization) Standard on food data [2]. The EuroFIR draft standard includes common description of foods, using the LanguaL thesaurus [3], and common documentation of values, using EuroFIR thesauri and ISO (International Organization for Standardization) codes for languages and countries.

EuroFIR thesauri [4] consist of eight controlled vocabularies for the description of the compositional value of a component in a given food. The thesauri follow international standards on monolingual and multilingual thesauri [5], which secure international development and use of the thesauri. There are EuroFIR thesauri for Acquisition Types, Components, Value Types, Units, Matrix Units, Method Types, Method Indicators, and Reference Types. The EuroFIR Component thesaurus contains cross-references to ChEBI [6], CAS registry numbers [7], INFOODS tagnames [8], and legal definitions.

EuroFIR also designed a common XML template for data transfer (The EuroFIR Food Data Transfer Package) to connect databases to web services for data interchange. The EuroFIR eSearch facility [9] is an innovative interface, which can be accessed online and allows its users to simultaneously search more than 25 national and specialized FCDBs. Users have access to a wide range of European and international data, linking foods and nutrients through harmonized data description and associated component value information. The search facilities include options to search on a food name or food description (or both), as well as the powerful and unique ability to compare the component values between foods in the linked FCDBs. Outputs can be downloaded as spreadsheets allowing the user to manage the data as required. The FCDBs linked with EuroFIR use standardized food description (LanguaL) and standardized component and value description through the use of thesauri (standard vocabularies) to achieve a fully standardized approach linking between data in the various FCDBs.

1.3. Objective

The objective of this paper is to analyze four major online English-language FCDBs – from USA, Canada, Australia and New Zealand - from the point of view of advanced users (e.g. foreign FCDB compilers):

- The USDA National Nutrient Database for Standard Reference (SR) [10] is the major source of food composition data in the United States. Release 24 (SR24) contains data on 7,906 food items and up to 146 food components. It is published with a users' manual as an online searchable database and provides downloadable electronic database files.
- The Canadian Nutrient File (CNF) 2010 [11] is a computerized bilingual database that reports up to 150 nutrients in over 5,807 foods. Many of the data in the CNF have been derived from USDA SR22, with modification for Canadian conditions, e.g. regulatory standards and levels of fortification, along with addition of Canadian only foods or Canadian commodity data, as well as some brand name foods.
- The Australia NUTTAB 2010 [12] is a reference database that contains food composition data for 2,668 foods and includes nutrient data for up to 245 nutrients. NUTTAB 2010 is published as an online searchable database and as electronic database files. Additional, separate data files are provided for indigenous foods, vitamin D, amino acids, and *trans* fatty acids.
- The New Zealand FOODfiles 2010 [13] is the major source of food composition data in New Zealand. The unabridged version contains information for up to 354 components in 2,705 foods. The data files and users' manual can be downloaded from the New Zealand website.