CO**A**CTION

Assessing and improving the quality of vitamin data in food composition databases

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The EuroFIR (European Food Information Resource; www.eurofir.org) project has developed the first comprehensive pan-European Food Data Platform, using state-of-the-art database linking. Data from 25 countries are available online (www.eurofir.org) and include vitamin contents of an extensive range of over 27,000 foods. The datasets have been compiled based on a technical standard developed within the project and this standardisation of data allows effective management, updating, extending, and comparability of data across Europe. Most datasets have traditionally been published in forms that do not easily allow publication of additional information, but EuroFIR datasets are supported by extensive additional documentation of individual values that allow users to trace original references and laboratory reports and evaluate the quality of values according to their intended use.

Methods

The Project Committee – Food Composition Data was officially accepted by the CEN (European Committee for Standardization) in 2008 and a draft standard is currently being reviewed and finalised by members of the CEN/387 committee. Data quality has always been considered to be a key feature of food composition data at both the international and the regional level (1) and the standard is based on EuroFIR initiatives that build on previous international collaborations (2, 3). The standard includes a harmonised description of data in areas including food description, component identification, value description, sample description, analytical method, and reference. The level of detail that can be documented is very comprehensive and documentation properties are split into mandatory properties that are required to build the core set of documented data needed to properly identify and describe food composition data and optional properties that provide additional information.

A quality management framework for EuroFIR compilers is being developed based on the principles of ISO9001 and the main objective is to reduce artificial differences when calculating and comparing nutrient intake based on different food composition datasets (4). The quality framework includes a system for quality evaluation of data from analytical reports and scientific literature and has been developed based on evaluation of food description, component identification, sampling (number and type of samples), sample handling, analytical method, and analytical performance.

Results and discussion

Food composition data is searchable via an online facility (eSearch) that includes documentation of the source reference and other meta-data. Many references, including laboratory reports, are available through the CiteXplore citation database, allowing further investigation of values. Vitamins included in EuroFIR e-search are the A, D, E, K, B group (thiamin, riboflavin, niacin, niacin equivalents, pantothenic acid, biotin, folate, B6, B12) and vitamin C. Data for additional vitamin components is available through individual datasets.

Documentation related to food description (including cooking procedures, processing treatments, fortification practice, preservation methods, cultivar, etc.), sampling (geographic origin, retail location, season, etc.), sample handling, and analytical method are particularly important for vitamins and allow assessment of the relative strengths and weaknesses of data so that data can be used with more confidence. Changes in methods and/or terminology may occur over the time period that a database is compiled and consequently the terminology used does not always correspond to the specific vitamin entity or to user requirements. Clarity of component description has been improved with the recent harmonisation of EuroFIR component identifiers and INFOODS tagnames, resulting in preferred terms that clearly

identify vitamins and vitamers e.g. 'folate, total' and 'folic acid (synthetic)' and 'folate (food)'. Calculated values related to vitamin activity, for example, total vitamin A as retinol equivalents from retinol and carotenoid activities or total vitamin E as alpha-tocopherol equivalents from E vitamer activities are documented so that compounds included and activity factors used to calculate values are clear.

The accessibility of data from different datasets provides valuable additional information on the range of values likely to be found in foods and provides access to data for foods that may be more common to specific geographic areas. The availability of documentation on vitamin contents in foods in European databases will provide the user with greater confidence in the quality of the data and its use for food and nutritional research in the future.

Conclusions

The CEN food composition standard and the EuroFIR quality framework will improve the quality and comparability of data and will be particularly important with respect to vitamin content, which can be highly variable and dependent on sampling and analytical methods. The improved access to European datasets and documented data will allow users to assess the strengths and weaknesses of data relative to their intended use.

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