



Report

A structured vocabulary for indexing dietary supplements in databases in the United States

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ARTICLE INFO

Article history:

Received 4 July 2011

Received in revised form 1 October 2011

Accepted 2 October 2011

Available online 14 October 2011

Keywords:

LanguaL

Government

Dietary supplements

Databases

Indexing

Structured vocabulary

Thesaurus

Food analysis

Food composition

ABSTRACT

Food composition databases are critical to assess and plan dietary intakes. Dietary supplement databases are also needed because dietary supplements make significant contributions to total nutrient intakes. However, no uniform system exists for classifying dietary supplement products and indexing their ingredients in such databases. Differing approaches to classifying these products make it difficult to retrieve or link information effectively. A consistent approach to classifying information within food composition databases led to the development of LanguaLTM, a structured vocabulary. LanguaLTM is being adapted as an interface tool for classifying and retrieving product information in dietary supplement databases. This paper outlines proposed changes to the LanguaLTM thesaurus for indexing dietary supplement products and ingredients in databases. The choice of 12 of the original 14 LanguaLTM facets pertinent to dietary supplements, modifications to their scopes, and applications are described. The 12 chosen facets are: product type; product source; part of source; physical state, shape or form; ingredients; preservation method; packing medium; container or wrapping; contact surface; label claims/consumer group/dietary use; geographic places and regions; and adjunct characteristics of dietary supplements.

Published by Elsevier Inc.

1. Introduction

Several dietary supplement databases are available in the United States of America (Dwyer et al., 2008; Saldanha et al., 2010). To use their data efficiently, it is necessary that both conventional food² and dietary supplement databases use consistent descriptive systems for classifying them.

The concept of using a faceted thesaurus to index foods originated at the United States (US) Food and Drug Administration (FDA) in the mid-1970s, because of the need to overcome barriers

in accessing and exchanging information about food products (McCann et al., 1988). Barriers included differences in food names, food descriptive terms, and nutrient names and units. Because of the enormity and the complexity of the data on a global level, much useful data had become isolated in different and incompatible files (Pennington et al., 1995). The LanguaLTM thesaurus was created to answer the need for a consistent cataloguing system.

The term LanguaLTM is derived from the Latin words *lingua* (language or tongue) and *alimentaria* or “food”, so it represents the language for describing food. LanguaLTM is a structured, controlled vocabulary for describing foods, in a systematic organization that simplifies retrieval of information for data analysis. It is based on the principle that items within a database (whether they are dietary supplements or conventional food products) can be described by a combination of uniform terms chosen from “facets” that characterize various mutually exclusive attributes of these products. These facets include food groupings, main ingredient source, physical attributes, other ingredients and processing, packaging and packaging materials, dietary uses, and other miscellaneous characteristics. Within each facet of the thesaurus,

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² Under the Federal Food, Drug and Cosmetic Act and its amendments, food labeling is required for most prepared foods, such as breads, cereals, canned and frozen foods, snacks, desserts, drinks, etc. Nutrition labeling for raw produce (fruits and vegetables) and fish is voluntary. Such products are referred to as “conventional” foods. Dietary supplements are a special category of products that comes under the general umbrella of foods, but which has separate labeling requirements.

Table 1
Proposed LanguaL™ facets for dietary supplements.

Characteristic	Facet letter	Food product descriptor	Dietary supplement descriptor	Information available from DS ^a labels – yes/no/partial
Food group	A	Product type	Product type (as defined by DSHEA) ^b	Yes
Food origin	B	Food source	Product source (major or primary ingredient that characterizes product).	Yes
Physical attributes	C	Part of plant or animal	Part of source (major or primary ingredient)	Yes
	E	Physical state, shape or form	Physical state, shape or form	Yes
	F	Extent of heat treatment	Not relevant to dietary supplements	NA
	G	Cooking method	Not relevant to dietary supplements	NA
Processing	H	Treatment applied	Suggest using “Ingredients” as alternate facet name for dietary supplement databases	Yes
	J	Preservation method	Preservation method	Partial
	K	Packing medium	Packing medium	Partial
Packaging	M	Container or wrapping	Outside package container or wrapping (physical container or package wrapping of dietary supplements)	No
	N	Food contact surface	Dietary supplement contact surface: (material(s) in direct contact with product)	No
Dietary uses	P	Consumer group/dietary use/label claims	Label claims/consumer group/dietary use	Yes
Geographic origin	R	Geographic places and regions	Geographic places & regions (place of manufacture/origin)	Partial
Miscellaneous characteristics	Z	Adjunct characteristics of food	Adjunct characteristics of dietary supplements – (distribution channels)	Partial

^a Dietary Supplements.^b Dietary Supplement Health and Education Act of 1994.

descriptors are arranged in a hierarchical order from broader to narrower terms to facilitate indexing and retrieval (Hendricks, 1992; Pennington and Hendricks, 1992; Pennington and Butrum, 1991). “Scope notes” accompany the thesaurus descriptors to explain precisely when a particular descriptor should be used and to ensure uniform use of the terms by indexers and searchers. The thesaurus also provides additional information for many descriptors: these often refer to specific definitions, such as those in the US Code of Federal Regulations (CFR). Currently the European LanguaL™ Technical Committee administers LanguaL™ and the Danish Food Information hosts and maintains the LanguaL™ website (Eurofoods Working Group, 2000).

This paper outlines the development of a LanguaL™ Dietary Supplement Structured Vocabulary (LanguaL™ DS Thesaurus) for systematically indexing these products. Dietary supplement database compilers and managers can use this structured vocabulary to classify products for information retrieval and facilitate links to other databases. This paper provides modifications to the food product thesaurus, in order to capture the unique features of dietary supplement products and the preliminary schema for the LanguaL™ DS Thesaurus. The preliminary schema was developed by members from the US Federal Dietary Supplement Ingredient Database (DSID) ad hoc Working Group³ in collaboration with and drawing heavily on the work of European experts. Expert opinion was also sought from participants at the post-conference workshop held in conjunction with the 34th National Nutrient Databank Conference in 2010.

Although the classification system described in this paper was developed for use in the US, it can be used in countries where dietary supplements and dietary ingredients are defined in a manner similar to US Dietary Supplement Health and Education Act of 1994 (DSHEA) and it can be adapted to fit regulatory definitions in place in other countries. For example, in some

European countries the terms used to describe dietary supplements are narrower than those provided for in the US. The “extra” terms can be dealt with in the “Scope Notes” that provide them, but clearly state that they are not used in the US classification of dietary supplements.

2. Schema for dietary supplement databases

2.1. Proposed adaptations of the LanguaL™ thesaurus for use in dietary supplement databases

The complete LanguaL™ thesaurus can be viewed and downloaded through the Danish Food Information's website (<http://www.danfood.info/>). This thesaurus provides detailed information about each descriptor and the scope of each facet. Presently foods (other than dietary supplements) can be described using descriptors chosen from 14 facets. Of these, 12 are applicable to dietary supplements. These are: A. product type; B. product source; C. part of source; E. physical state, shape or form; H. ingredients; J. preservation method, K. packing medium, M. container or wrapping; N. contact surface; P. label claims/consumer group/dietary use; R. geographic places and regions; and Z. adjunct characteristics of dietary supplements. Some LanguaL™ food facets were dropped, because of distinctive differences in the manufacturing processes for conventional foods versus dietary supplements. The two food facets that were dropped are F. extent of heat treatment; and G. cooking method (see Table 1).

The titles of some facets also did not seem fitting for dietary supplements, so modifications to the descriptors were proposed. For example, Facet H, Treatment Applied, was provisionally changed to “Ingredients” for the LanguaL™ DS Thesaurus, as under this facet all ingredients, other than the major ingredient source, can be indexed.

The scope and descriptors in each facet were chosen to be consistent with the scope of dietary supplements outlined in the DSHEA (<http://www.gpo.gov/fdsys/pkg/BILLS-103s784enr/pdf/BILLS-103s784enr.pdf>). According to DSHEA, in the US a “dietary supplement” is defined as “a product (other than tobacco) intended

³ The Dietary Supplement Ingredient Database ad hoc Working Group was formed to assist with the development of the Dietary Supplement Ingredient Database (DSID). Information about DSID can be found at the DSID website: <http://ars.usda.gov/Aboutus/docs.htm?docid=6255>.

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