

Prototype Food and Nutrient Database for Dietary Studies:

Branded Foods Database for Public Health

Proof of Concept

DOCUMENTATION

U.S. Department of Agriculture
Agricultural Research Service
Beltsville Human Nutrition Research Center
Food Surveys Research Group
10300 Baltimore Avenue
BARC-West, Building 005, Room 102
Beltsville, Maryland 20705-2350
www.ars.usda.gov/nea/bhnrc/fsrg

Suggested Citation

U.S. Department of Agriculture, Agricultural Research Service. 2015. *Prototype Food and Nutrient Database for Dietary Studies: Branded Foods Database for Public Health, Proof of Concept*. Food Surveys Research Group Home Page, www.ars.usda.gov/nea/bhnrc/fsrg

Disclaimers

The use of trade, firm, or corporation names in this publication is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by the U.S. Department of Agriculture or the Agricultural Research Service of any product or service to the exclusion of others that may be suitable.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, DC 20250-9410 or call (800) 795-3272 (voice), or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Issued January 2015

Prototype FNDDS: Branded Foods Database for Public Health, Proof of Concept

A public-private partnership was established to augment the USDA's food composition data with nutrition label data for branded food products utilizing GS1 standards (www.gs1.org). The partnership is composed of:

- International Life Sciences Institute (ILSI) North America (www.ilsi.northamerica.org)
- Agricultural Technology Innovation Partnership (ATIP) Foundation (www.atipfoundation.com)
- Agricultural Research Service (ARS), USDA

A proof of concept for a selection of food products was initiated to test the acquisition and transfer of data into USDA public access databases. The proof of concept data have been incorporated into a prototype Food and Nutrient Database for Dietary Studies (FNDDS). The purpose of this prototype is to exhibit the approach for incorporation of the Branded Foods Database into FNDDS and is not intended for use at this time in the What We Eat in America, NHANES survey.

Prototype Variables

Data provided by GS1 (highlighted in blue throughout the document) have been added as new variables or incorporated into existing variables in the FNDDS database directly or with modification.

New variables:

- Global Trade Identification Number (GTIN): unique product identifier for each item
- Brand name
- Manufacturer
- Preparation state
- Ingredients

Existing variables in which GS1 data added directly:

- Main food description is Product long name.
- Start date is Item availability date (also appears in Food Weights and Nutrient Values files).
- End date is Discontinue date (also appears in Food Weights and Nutrient Values files).

Existing variables in which GS1 data added with modification:

- Prototype FNDDS code: unique eight-digit code assigned to each item. The first digit (1-9) represents a main FNDDS food group provided below. The second digit is assigned '9' for every item, and the remaining 6 digits are sequential numbers.

- 1-Milk and Milk Products
- 2-Meat, Poultry, Fish, and Mixtures
- 3-Eggs
- 4-Dry Beans, Peas, Other Legumes, Nuts, and Seeds
- 5-Grain Products
- 6-Fruits
- 7-Vegetables
- 8- Fats, Oils, and Salad Dressings
- 9-Sugars, Sweets, and Beverages

- Portion code and description: FNDDS portion that matches the common household measure or unit in Household serving size
- Portion weight: calculation by adjusting Serving size (grams) for the amount in Household serving size

Nutrient Values

FNDDS includes values for energy and 64 other nutrients on a 100 gram basis. In order to incorporate the nutrient data from GS1, select conversions and imputations were required.

- **Nutrient conversions:**
 - Nutrients provided as an amount per serving were converted to per 100 grams.
 - Nutrients provided as a %RDI per serving were first converted to an amount per serving and then converted to per 100 grams.
- **Nutrient imputations:** nutrients values not provided for the item, or not provided in a form able to be incorporated into FNDDS (e.g. Vitamin A and E in IU), were assigned based on closest food description from FNDDS 2011-2012 (1) or the National Nutrient Database for Standard Reference 26 (SR26) (2).

Please note: Nutrient values not provided by GS1 and imputed from the closest match are being used for this prototype to provide the complete profile of energy and 64 nutrients. Plans are for nutrient values not provided by GS1 to be provided by the USDA, Nutrient Data Laboratory enhanced formulation program when available.

- **Nutrient source:** new variable that identifies the source of each nutrient
 - GS1-Amount
 - GS1-RDI
 - FNDDS 2011-2012
 - SR26
- **Nutrient source code:** new variable that identifies the FNDDS 2011-2012 or the SR26 NDB number used to assign missing nutrient values

Prototype FNDDS Availability: FSRG website www.ars.usda.gov/nea/bhnrc/fsrg

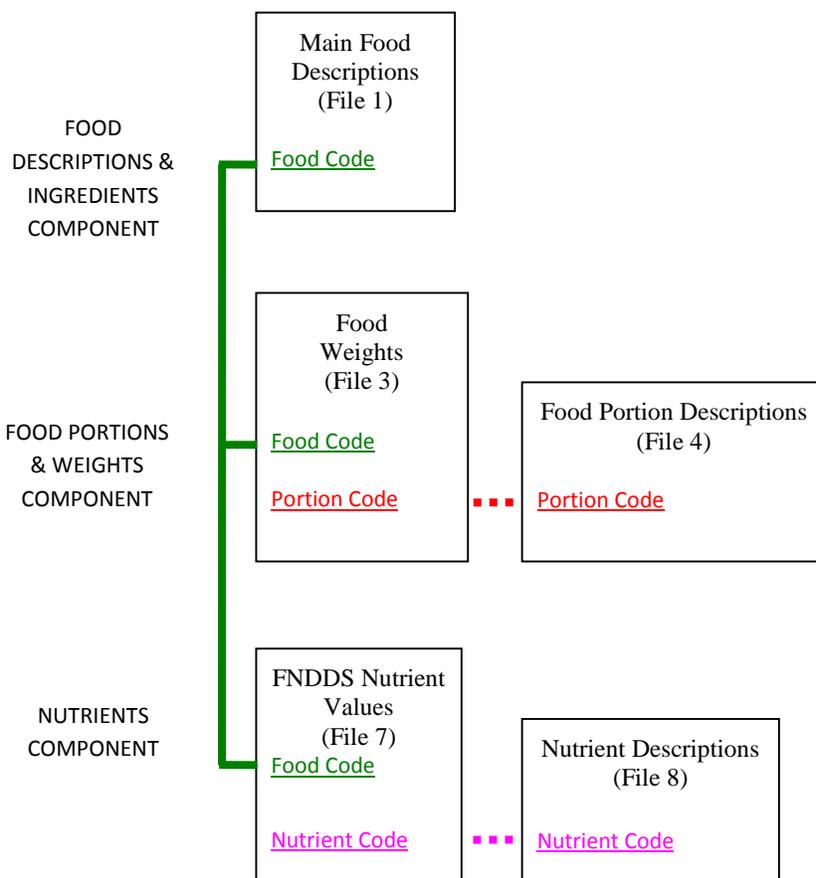
- Prototype ***What's In the Foods You Eat Search Tool***. A search program that allows a user to easily find information on the nutrient content of the foods by searching on product description/name, brand, or manufacturer.
- Download as a Microsoft Access® database. Also available are GS1 data as Microsoft Excel® spreadsheets.

Database Format

The database is available as a Microsoft Access® database and includes 5 separate but linked data files. They are numbered the same as they appear in FNDDS.

As shown in Figure 1, food code is the primary link between the database components and is indicated with a solid line. Secondary links between files are indicated with a dotted line and include portion code in the Food Portions & Weights component, and nutrient code in the Nutrients component. Together the files form a normalized, relational database system where data redundancy is minimized.

Figure 1. USDA Food and Nutrient Database for Dietary Studies (FNDDS) Branded Food Products Database – files and interrelationships



The following table lists the full names of the database files, along with the abbreviated file/table name.

Table 1. Full and Abbreviated File/Table Names

File Number	Full File Name	Abbreviated File Name
1	Main Food Descriptions	MainFoodDesc
3	Food Weights	FoodWeights
4	Food Portion Descriptions	FoodPortionDesc
7	FNDDS Nutrient Values	FNDDSNutVal
8	Nutrient Descriptions	NutDesc

Data File Formats and Contents

When this documentation is viewed online or printed in color, the linking variables that connect information from one file to another appear in color.

Key to Tables

This key (Table 2) defines abbreviations and symbols used in Tables 3 to 7, which outline the format of each database file.

Table 2. Key to abbreviations and symbols used in Tables 3 to 7

Abbreviation or symbol	Meaning	Additional information
N #.#	Numeric field	Number (shown here as #) following variable type indicates variable length; number after decimal point indicates number of decimal places.
A #	Alphanumeric field	Number (shown here as #) following variable type indicates variable length
D (MM/DD/YYYY)	Date field	Indicates a start or end date.
*	Indexed field (holds values by which the file is ordered)	Indexes are identified in this document to show the order of records. Indexed variables are useful in relational databases.
‡	Linking field	Used to indicate links within the database. Linking field names are also highlighted in color in the tables. Linking fields are useful in relational databases.

Food Descriptions & Ingredients Component

The food descriptions and ingredients component consists of one file, the Main Food Descriptions file. As shown in Figure 1, the food code links the file to others in the database. Table 3 provides details for the specific variable names, types, and descriptions.

Table 3. Format of Main Food Descriptions file†

Field Name	Field Type	FNDDS Description	Prototype Description
Food code‡	N 8*	A unique 8-digit number assigned to a particular main food description.	A unique 8-digit number assigned to each proof of concept item.
GTIN	A 14		A unique 8 to 14-digit product number.
Start date	D (MM/DD/YYYY)	Indicates the time period corresponding to the WWEIA data for which the record was used.	Indicates the Item availability date .
End date	D (MM/DD/YYYY)	Indicates the time period corresponding to the WWEIA data for which the record was used.	Indicates the Discontinue date . Field is blank if no date provided.
Main food description	A 178	A complete description for a food/beverage, often including preparation method (e.g., boiled) and original form of the food/beverage (e.g., from frozen); usually generic in nature.	Indicates the Product long name .
Brand Name	A 70		Indicates the Brand name .
Manufacturer	A 35		Indicates the Manufacturer .
Preparation state	A 20		Indicates the Preparation state .
Ingredients	Memo		Provides all items in the Ingredient list .

†See Table 2 for an explanation of the abbreviations and symbols used in this table.

Food Portions and Weights Component

For each food/beverage in the database there is a portion description and associated weight for this portion. The Food Portions and Weights Component consists of two files:

- Food Weights
- Food Portion Descriptions

As shown in Figure 1, the food code links the Food Weights file to other files and the portion code links the Food Weights and Food Portion Descriptions files. Tables 4 and 5 provide details for the specific variable names, types, and descriptions.

Food Weights

The Food Weights file includes the weights (in grams) for different portions of a particular item.

Table 4. Format of Food Weights file†

Field Name	Field Type	FNDDS Description	Prototype Description
Food code ‡	N 8*	A unique 8-digit number assigned to a particular main food description.	A unique 8-digit number assigned to each proof of concept item.
Portion code ‡	N 5*	A unique 5-digit number assigned to a particular portion description.	Portion code which matches the Household serving size.
Start date	D (MM/DD/YYYY)*	Indicates the time period corresponding to the WWEIA data for which the record was used.	Indicates the Item availability date.
End date	D (MM/DD/YYYY)	Indicates the time period corresponding to the WWEIA data for which the record was used.	Indicates the Discontinue date. Field is blank if no date provided.
Portion weight	N 8.3	Weight of food/beverage item for the portion indicated by portion code; all weights are in grams.	Serving size gram weight adjusted for the Household serving size.

†See Table 2 for an explanation of the abbreviations and symbols used in this table.

Food Portion Descriptions

The Food Portions Descriptions file contains common food portion descriptions that are used in coding portion sizes. Each portion description is identified by a unique 5-digit portion code. The same portion code and portion description can be used for many different foods/beverages.

Table 5. Format of Food Portion Descriptions file†

Field Name	Field Type	FNDDS Description
Portion code ‡	N 5*	A unique 5-digit number assigned to a particular portion description.
Portion description	A 120	A description of an amount of food/beverage in terms that facilitate coding of portions

†See Table 2 for an explanation of the abbreviations and symbols used in this table.

Nutrients Component

There are two files in the Nutrients Component:

- FNDDS Nutrient Values
- Nutrient Descriptions

As shown in Figure 1, the food code links the FNDDS Nutrient Values file to other files and the nutrient code links the FNDDS Nutrient Values and Nutrient Descriptions files. Tables 6 and 7 provide details for the specific variable names, types, and descriptions.

FNDDS Nutrient Values

The FNDDS Nutrient Values file provides a complete nutrient profile (energy and 64 nutrients) for each food/beverage code.

Table 6. Format of FNDDS Nutrient Values file†

Field Name	Field Type	FNDDS Description	Prototype Description
Food code ‡	N 8*	A unique 8-digit number assigned to a particular main food description.	A unique 8-digit number assigned to each proof of concept item.
Nutrient code ‡	N 5*	Identifies a nutrient.	
Start date	D (MM/DD/YYYY)*	Indicates the time period corresponding to the WWEIA data for which the record was used.	Indicates the Item availability date.
End date	D (MM/DD/YYYY)	Indicates the time period corresponding to the WWEIA data for which the record was used.	Indicates the Discontinue date. Field is blank if no date provided.
Nutrient value	N 10.x	Amount of nutrient in 100 grams of the food/beverage; number of decimal places varies by nutrient, following conventions in SR.	Nutrient amount or % RDI per serving converted to per 100 grams of the food/beverages.
Nutrient source	A 20		Identifies the source of a nutrient value.

Field Name	Field Type	FNDDS Description	Prototype Description
Nutrient source code	N 8		Identifies the FNDDS or SR code used as a source.

†See Table 2 for an explanation of the abbreviations and symbols used in this table.

Nutrient Descriptions

The Nutrient Descriptions file contains the names (nutrient descriptions) and codes for nutrients included in the FNDDS Nutrient Values file. The nutrient codes, nutrient descriptions, units of expression, and number of decimal places to which values are expressed are consistent with similar fields in SR. Table 7 provides details for the specific variable names, types, and descriptions.

Table 7. Format of Nutrient Descriptions file†

Field Name	Field Type	FNDDS Description
Nutrient code‡	N 5*	Identifies a nutrient.
Nutrient description	A 45	A description of a nutrient or food component.
Tagname	A 15	The nutrient or food component name or “tag” assigned by INFOODS, the International Network of Food Data Systems, for international interchange of nutrient data (3).
Unit	A 10	The measurement unit in which values for the nutrient are expressed.
Decimals	N 1	The number of decimal places to which the nutrient value is expressed; varies by nutrient, following conventions in SR.

†See Table 2 for an explanation of the abbreviations and symbols used in this table.

References

1. U.S. Department of Agriculture, Agricultural Research Service. 2014. *USDA Food and Nutrient Database for Dietary Studies 2011-2012*. Food Surveys Research Group Home Page, www.ars.usda.gov/nea/bhnrc/fsrg. Accessed 2015 Jan 16.
2. U.S. Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. 2013. *USDA National Nutrient Database for Standard Reference, Release 26*. Nutrient Data Laboratory Home Page, www.ars.usda.gov/nea/bhnrc/ndl. Accessed 2015 Jan 16.
3. Food and Agriculture Organization. International Network of Food Data Systems (INFOODS), *Tagnames for Food Components*. Available from: www.fao.org/infoods/infoods/standards-guidelines/food-component-identifiers-tagnames/en/. Accessed 2015 Jan 16.