2017-2018 Food and Nutrient Database for Dietary Studies

Documentation

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You may also consider including the following sentence in your manuscript: USDA's Food and Nutrient Database for Dietary Studies 2017-2018 was used to code dietary intake data and calculate nutrient intakes.

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INTRODUCTION

What is FNDDS?

The USDA Food and Nutrient Database for Dietary Studies (FNDDS) converts foods and beverages consumed in What We Eat in America (WWEIA), National Health and Nutrition Examination Survey (NHANES) into gram amounts and determines their nutrient values. ***Appendix A*** lists abbreviations used in this documentation. The FNDDS 2017-2018 is the ninth version released.

How can FNDDS be used?

Because the FNDDS generates the nutrient intake data files for WWEIA, NHANES, researchers do not need to use the FNDDS to estimate the nutrient intake for the survey respondents. FNDDS is made available for researchers to review the nutrient profiles for specific foods and beverages that were consumed in the WWEIA, NHANES in the corresponding survey years as well as their associated portions and recipe calculations. Such detailed information makes it possible to conduct enhanced analysis of dietary intakes. Additionally, FNDDS can be applied in other dietary research studies to determine the amounts of nutrients/food components in food and beverages.

What We Eat in America, NHANES

The NHANES is a nationally representative, cross-sectional survey designed to monitor the health and nutritional status of the civilian, noninstitutionalized U.S. population and is conducted by the Centers for Disease Control and Prevention's National Center for Health Statistics. NHANES is a continuous survey with data releases every two years. Each 2-year cycle includes about 9,000 participants from sampled counties across the country.

The Food Surveys Research Group of the Beltsville Human Nutrition Research Center of USDA's Agricultural Service has lead responsibility for the survey's dietary data collection methodology and maintenance of the databases used to code and process data. Trained interviewers using the 5-step USDA Automated Multiple-Pass Method (AMPM) collect dietary intakes. The AMPM includes an extensive compilation of standardized food-specific questions and possible response options. Routing of questions is based on previous responses. An initial 24- hour recall (day 1) is collected in-person at a NHANES Mobile Examination Center; a second recall (day 2) is collected by telephone 3-10 days later. The AMPM was validated in a large study and shown to be an effective method for accurately assessing group energy (Moshfegh et al, 2008) and sodium intake of adults (Rhodes et al, 2013).

The AMPM is revised for each 2-year collection of WWEIA to reflect the changing food supply and to address research needs from the data user community. The FNDDS is also modified to reflect AMPM revisions as well as changes in consumption patterns and availability of nutrient values. A new version is released to accompany each 2-year release of WWEIA, NHANES (Bodner-Montville et al). This version (FNDDS 2017-2018) was used to process WWEIA, NHANES 2017-2018 and reflects the food supply during this period. It is not recommended to use a version of FNDDS other than the database associated with the given survey cycle.

See ***Appendix B*** for each version of FNDDS and its corresponding survey 2-year cycle of WWEIA, NHANES. Also, provided is the number of food codes added and discontinued for each FNDDS version as well as the total number of additional descriptions and nutrients/components in each.

Database Structure and Download

A brief overview of FNDDS 2017-2018 is provided in ***Appendix C***; the nutrients and food components are listed in ***Appendix D***.

FNDDS 2017-2018 is organized into 12 Access® tables or datasets linked by primary and secondary data items forming a relational database. As illustrated in ***Appendix E. 2017-2018 FNDDS File Relationships***, the primary link is the food code; secondary links are subcode, portion code, nutrient code, ingredient code and derivation code.

The complete FNDDS 2017-2018 consists of the 12 data tables or datasets plus an additional table/dataset - *FNDDSRecCount* - that identifies the number of records in each table. Listed below are the full name and abbreviated name for each of the tables/datasets, separated into three components - Food Descriptions, Food Portions and Weights, and Nutrients.

Full Name	***Abbreviated Name***
Food Descriptions Component	
Main Food Descriptions	*MainFoodDesc*
Additional Food Descriptions	*AddFoodDesc*
Food Portions and Weights Component	
Food Weights	*FoodWeights*
Food Portion Descriptions	*FoodPortionDesc*
Subcode Descriptions	*SubcodeDesc*
Food Code-Subcode Links	*FoodSubcodeLinks*
Nutrients Component	
FNDDS Nutrient Values	*FNDDSNutVal*
Nutrient Descriptions	*NutDesc*
Moisture Adjustment	*MoistAdjust*
FNDDS Ingredients	*FNDDSIngred*
Ingredient Nutrient Values	*IngredNutVal*
Derivation Descriptions	*DerivDesc*

Field name and description for every variable in FNDDS 2017-2018 are provided in ***Appendix F. Contents of Datasets***.

The complete FNDDS 2017-2018 is available for download at www.ars.usda.gov/nea/bhnrc/fsrg in both Access® and SAS®.

Selected variables provide quick viewing and searching as five Excel® files:

Foods and Beverages
Portions and Weights
FNDDS Ingredients
Ingredient Nutrient Values
FNDDS Nutrient Values

Appendix G. FNDDS At A Glance provides a list of variables plus descriptions contained in each of the five Excel® spreadsheets. Each file contains an additional tab listing variables and descriptions. Although the Excel® files contain only selected variables, data, by variable, are the same in all database formats.

The next sections describe some of the aspects of the three components: Food Descriptions, Food Portions and Weights, and Nutrients.

FOOD DESCRIPTIONS COMPONENT

The FNDDS 2017-2018 contains 7,083 food and beverage items (6,286 foods/792 beverages). ***Appendix B*** provides a summary of the number of food codes added and discontinued for each version of FNDDS.

Food Code

An 8-digit number – food code – uniquely identifies each food or beverage item in FNDDS. Food code numbers are generally assigned according to a classification scheme that associates the first digit with one of nine major food commodity groups: Milk and Milk Products; Meat, Poultry, Fish, and Mixtures; Eggs; Dry Beans, Peas, Other Legumes, Nuts, and Seeds; Grain Products; Fruits; Vegetables; Fat, Oils, and Salad Dressings; Sugars, Sweets, Beverages. The first two digits of the 8-digit code, as illustrated in ***Appendix H,*** identify subgroups that are more specific.

If a food or beverage as described in FNDDS is determined to have changed dramatically or no longer available, the food code may be discontinued. Discontinued food codes are removed from the current FNDDS and the 8-digit numbers are not recycled. It is important to note that although a code number was discontinued, the food or beverage associated with that food code may still be available; however, it is now associated with one or more different food codes. Beginning with the FNDDS 2011-2012, a resource file details every discontinued food, rationale for discontinuation, and if appropriate, a link to a new FNDDS code (Adler et al, 2016). *Discontinued Food Codes between FNDDS 2015-2016 and FNDDS 2017- 2018* are available on the FSRG website www.ars.usda.gov/nea/bhnrc/fsrg.

Main Description

The main food description is the primary complete description identified by a unique 8-digit food code and may include form, preparation method, and source of item. Main food descriptions may be modified over time; however, if the food or beverage is determined to have changed dramatically or no longer available, the food code may be discontinued.

The main descriptions are usually generic in nature; however, some codes include a brand name, often in parentheses. This designates that a respondent reported the brand name product; however, the nutrient profile may match a generic food/beverage or a composite of several similar products because the full nutrient profile of the individual brand name product was not available. Main descriptions that contain a brand name include most ready-to-eat cereals and infant formulas; as well as popular candies, chips, crackers, energy drinks, nutrition bars and powders, and selected burgers from two fast food chains.

Additional Food Description

The FNDDS 2017-2018 contains 12,953 additional food descriptions located in *AddFoodDesc*. Additional food descriptions, associated with a specific main food description, share the same nutrient values and portion weights as the main food description. More than one additional description may be associated with a food code; not all food codes have additional descriptions.

Many additional food descriptions are brand names; others represent similar forms of the main food description. The additional food descriptions provide information that is particularly useful when coding dietary intakes from respondents in WWEIA, NHANES based on responses elicited from questions asked during the 24-hour recall.

 *New for FNDDS 2017-2018* – updated food codes

Specific categories of foods/beverages completely updated in AMPM and FNDDS 2017-2018 include the following: fruit; vegetables; beans and beans and rice; eggs; curry; ice cream and ice pops; pudding and gelatins; biscuits and doughnuts; butter, margarine, and oils; syrups and condiments. In addition, updates to the AMPM collection process resulted in new codes for select foods previously collected by its components and coded as a combination. This includes the following: chicken filet sandwiches, fish sandwiches, and burgers.

 *New for FNDDS 2017-2018* – codes for use with sandwiches and vegetables

New food codes to collect vegetables/bacon on sandwiches, and sauces/meats in vegetables were added to FNDDS. The new 'for use' codes all have 899 as the first 3-digits.

Nine codes were added to FNDDS to capture the following ingredients for use on a sandwich or burger: avocado, cucumber, lettuce, mushrooms, onions, pepper, spinach, tomatoes, and bacon. These new codes will allow researchers to more readily determine the contribution of sandwiches to vegetable intake in WWEIA.

In addition, nine codes were added to capture the following for use with cooked vegetables: bacon, ham, beef, chicken, cream sauce, cheese sauce, gravy, soy-based sauce, and tomato sauce. This reduces the necessity of creating multiple codes for each vegetable variety in order to capture products cooked with meat or cooked with a sauce.

NFS, NS

When a survey respondent In NHANES is unable to answer all questions about a food/beverage or if detailed questions are not asked, a food code is selected that contains the term NS (not specified) or NFS (not further specified) in its main or additional description. Nutrient values and portion weight data for the NFS or NS food codes are based on food consumption data from WWEIA, internal data on the frequency of reports, food production and supply statistics, and food industry publications.

Sources used to determine proportions and subsequent nutrient profiles for *11100000 Milk, NFS, 82101000 Vegetable oil, NFS*, as well as other top reported NFS codes were reviewed and revised as necessary to reflect data current during the corresponding 2-year survey cycle. For example, data on food availability and products from the USDA, Economic Research Service helped determine the proportions of different fat-content milks (USDA, ERS, Food Availability) and various types of vegetable oils (USDA, ERS, Oil Crops Yearbook).

What We Eat in America Food Category Number and Description

Beginning with FNDDS 2015-2016, the WWEIA Food Category number and description are included for each FNDDS food code. Both the WWEIA Food Category 4-digit number and description are included as variables in four of the At A Glance Excel® spreadsheets to support search capabilities.

The WWEIA Food Categories provide an application to analyze foods and beverages as consumed in the American diet (Rhodes et al, 2017). The focus of this classification system is grouping similar foods and beverages together based on how items are typically consumed and on their nutrient content. Each FNDDS food code is assigned to only one of the WWEIA Food Categories.

Appendix I. WWEIA Food Categories: Code and Description lists the 167 individual food categories combined into 15 main groups: Milk and Dairy; Protein Foods; Mixed Dishes; Grains; Snacks and Sweets; Fruit; Vegetables; Beverages; Alcoholic Beverages; Water; Fats and Oils; Condiments and Sauces; Sugars; Baby Foods and Formulas; and Other. Within the main groups are subgroups (Milk, Flavored Milk. Dairy Drinks and Substitutes, Cheese, and Yogurt) characterized by similar food-related properties. Designed to be flexible, the WWEIA Food Categories can easily be combined into a variety of larger groupings.

New for FNDDS 2017-2018 –additional WWEIA Food Categories

Changes made to the WWEIA Food Categories reflect updates to fruit, vegetables, and beans in AMPM and FNDDS 2017-2018. New WWEIA Food Categories were added for strawberries, blueberries, pears, pineapple, and mango/papaya. Other new WWEIA Food Categories include broccoli, spinach, other dark green vegetables, cabbage, fried vegetables, coleslaw and vegetables on a sandwich. In addition, a new subgroup – Mixed Dishes – Bean/Vegetable-based was created that contains two new categories for bean, pea, legume dishes and vegetable dishes. In the process of expanding the WWEIA Food Categories, a few categories were deleted.

A new version of the WWEIA Food Categories is produced for each 2-year cycle of WWEIA, NHANES and FNDDS, and released on the FSRG website. More detailed information about the WWEIA Food Categories is located at www.ars.usda.gov/nea/bhnrc/fsrg. Included are:

- Table of Changes in WWEIA Food Categories between survey cycles.
- *WWEIA Food Categories* – for each food category, provides 4-digit category number and name, number of times reported in WWEIA, and number of FNDDS codes in category
- *FNDDS codes linked to WWEIA Food Categories* – for each FNDDS code, provides the number of times reported on day 1 and day 2 of the 2017-2018 survey. This resource provides a quick access to examine unweighted frequency counts for each FNDDS food code and by food category.

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FOOD PORTIONS AND WEIGHTS COMPONENT

During the 24-hour recall, respondents in WWEIA, NHANES estimate the amount of food and beverages consumed using 3-dimensional models on day 1 and a Food Model Booklet on day 2. Respondents can also report food specific amounts such as a medium apple, 2 slices of bread, can of soda. Either way, the amounts of foods and beverages reported need to be converted into a gram weight amount. FNDDS 2017-2018 contains approximately 33,000 weights for portions of foods and beverages. The wide variety of portion weights in the FNDDS makes it easier to code the extensive assortment of amounts that are reported in WWEIA, NHANES and other dietary studies.

Portion Code and Portion Description

For each food code in FNDDS, there is a set of portion codes (*FoodWeights*) and portion descriptions (*FoodPortionDesc*). A portion code is a unique 5-digit number that identifies a portion description or unit of measure, e.g. slice, piece, snack size, medium, teaspoon, cup. The same portion description and code are used for many different foods/beverages. Each food and beverage item in FNDDS contains multiple portion codes and portion descriptions.

Portion Weight

The weight of a food/beverage item for the portion indicated by a portion code is available in *FoodWeights*. All weights are in grams of edible portion as consumed. Weights are estimations to represent a group of foods and beverages and may not account for all sizes available for a specific product. A single FNDDS food code often includes several products; therefore, portion gram weights reflect a generic food/beverage or a composite of several similar products. Among comparable types of foods and beverages, portion weights were streamlined for consistency. Portion weights in FNDDS, developed for estimating food and nutrient intakes of respondents in WWEIA, NHANES, may not be applicable for calculating density or weight per volume for any specific liquid.

Subcode and Subcode Description

Two categories of foods – candy and snack cakes – may have a unique 7-digit subcode (*FoodWeights* and *FoodSubcodeLinks*) and subcode description (*SubcodeDesc*) that has unique portion weights. A subcode is associated with a specific food code and main description and shares the same nutrient profile. Food code-subcode links document the association between food codes and subcodes. A food code for a candy or snack cake may be linked to multiple subcodes, and a subcode may be linked to multiple food codes. *FoodSubcodeLinks* contains only the FNDDS food codes that have subcodes associated with them.

FNDDS 2017-2018 will be the last release to contain these two tables/datasets. Subcodes will be discontinued in future releases of FNDDS.

Unknown Amounts

The FNDDS contains a portion code 90000 - Quantity Not Specified (QNS) for every food/beverage item in FNDDS. When a respondent is unable to estimate the amount they consumed, this portion code is selected.

QNS values may reflect the most frequently consumed or most likely portion measure or they may reflect consumption patterns estimated from WWEIA data for a category of foods or beverages. Therefore, for any individual food code, the QNS measure may not represent the amount reported by most respondents. Database users should not assume that QNS values accurately represent the average amount of a food or beverage consumed.

NUTRIENTS COMPONENT

The six tables in the Nutrients Component of FNDDS 2017-2018 provide not only the nutrient profile for each food code, they also specify details on the development of each nutrient profile as well as the source for each individual nutrient value used to generate FNDDS food codes. Every FNDDS food code contains a complete nutrient data set for energy and 64 nutrient/food components. The nutrient values may reflect an average value for a generic representation of the food or beverage item.

Source of Nutrient Values

New for FNDDS 2017-2018 – USDA FoodData Central

For FNDDS 2017-2018, the source for most nutrient values is the new USDA FoodData Central (FDC) integrated data system launched in April 2019 (USDA, ARS, 2019). Managed by the Agricultural Research Service's Beltsville Human Nutrition Research Center (BHNRC) and hosted by the National Agricultural Library, FDC is available at www.fdc.nal.usda.gov.

Containing all of USDA's major sources of food and nutrient data, FDC includes five distinct data types that provide information on food and nutrient profiles. Because of the uniqueness of each data type, not all provide data on every nutrient.

FDC contains three well-established data types.

- **Standard Reference (SR) Legacy** provides nutrient values derived from analyses, calculations, and published literature. Released in April 2018, it is the final release of this data type and will not be updated. Older versions of SR are now available at BHNRC's new Methods and Application of Food Composition Laboratory website: www.ars.usda.gov/nea/bhnrc/mafcl.

- **USDA Global Branded Food Products Database (Branded Foods)** are data from a public-private partnership that provides nutrient values that appear on the product label of branded and private label foods.

- **Food and Nutrient Database for Dietary Studies** is also part of FDC. After release, the most current version is placed on FDC.

FDC includes two new data types.

- **Foundation Foods** includes values for nutrients and other food components as well as extensive underlying metadata. These metadata include the number of samples, sampling location, date of collection, analytical approaches used, and if appropriate, agricultural information such as genotype and production practices. The goal of Foundation foods will be to, over time, expand the number of basic foods and ingredients and their underlying data.

- **Experimental Foods** contains foods produced, acquired or studied under unique conditions, such as alternative management systems, experimental genotypes, or research/analytical protocols. Experimental Foods data are currently available through links to relevant agricultural research data sources.

The six tables or datasets explained in the Nutrients Component section include:

FNDDSNutVal
NutDesc
MoistAdjust
FNDDSIngred
IngredNutVal
DerivDesc

FNDDS Nutrient Values and Nutrient Descriptions

Nutrient values per 100 grams of edible portion for energy and 64 nutrients/food components for each FNDDS food/beverage item by nutrient code are in *FNDDSNutVal*.

The nutrient code is the same unique 3-digit identifier code for a nutrient historically used in SR. The nutrient description for each 3-digit nutrient code is in *NutDesc*.

New for FNDDS 2017-2018 – ***Appendix K. Nutrient Codes in FNDDS and FoodData Central***

Since the numerical codes designating a nutrient differ between FNDDS and FDC, ***Appendix K*** provides a crosswalk. For each nutrient/food component in FNDDS, both the 3-digit Nutrient Code in FNDDS and SR as well as the 4-digit FDC Nutrient ID are listed.

This table, *NutrDesc*, also contains the measurement unit (g, mg, or µg) and the number of decimal places to which a nutrient value is rounded for energy and each of the 64 nutrient/food components. The number of decimal places follows conventions in SR Legacy and does not reflect the accuracy of the value. Also included in *NutrDesc* is Tagname, the INFOODS unique abbreviation for a food component (Food and Agriculture Organization).

FNDDS Ingredients

Information provided in *MoistAdjust* and *FNDDSIngred* generate the nutrient profiles for foods and beverages in FNDDS 2017-2018 as provided in *FNDDSNutVal*.

Data for about 2,300 items in FDC were used to determine the values for the 7,083 food and beverage items in FNDDS 2017-2018. Approximately one-third of codes in FNDDS are a direct match to a single FDC code and therefore have only one **ingredient code**.

The FNDDS ingredient codes can be identified by number of digits.

- FDC code (4 or 5-digit NDB No)
- FNDDS code (8-digit)
- FSRG generated code based on another FDC code (6-digit).

The **Ingredient description** may be an FDC description, FNDDS main description, or a generated description based on another FDC code. *FNDDSIngred* also provides the amount, measure and portion code used to calculate ingredient weights(s).

Eight codes generated to reflect reduced sodium products were developed for FNDDS 2015-2016. These codes are 6-digits with '9' as the initial digit. Except for sodium, the nutrient profiles are identical to the FDC code (identified by digits 2-6) and FDC description (following REDUCED SODIUM). The amount of sodium in each FDC code was decreased by 25% for each REDUCED SODIUM product to reflect the nutrient content claim for products labeled as reduced sodium.

907971	REDUCED SODIUM: Bologna, meat and poultry
907057	REDUCED SODIUM: Pepperoni, beef and pork, sliced
907072	REDUCED SODIUM: Salami, dry or hard, pork, beef
907028	REDUCED SODIUM: Ham, sliced, pre-packaged, deli meat (96%fat free, water added)
907961	REDUCED SODIUM: Chicken breast, deli, rotisserie seasoned, sliced, prepackaged
907081	REDUCED SODIUM: Turkey breast, sliced, prepackaged
907043	REDUCED SODIUM: Roast beef, deli style, prepackaged, sliced
912695	REDUCED SODIUM: Nuts, almond butter, plain

Also developed for FNDDS 2015-2016 was a single-nutrient code. Containing only vitamin D, this ingredient code was created to allow assumed fortification of vitamin D to regular yogurt FNDDS codes as well as a baby food yogurt code. For FNDDS 2015-2016, the recipe calculations assumed all regular (not Greek) yogurt contained 1.2-µg vit D/100g.

999328	Vitamin D as ingredient

Single-nutrient ingredient codes are 6-digits; 999 followed by the nutrient code. Vitamin D is currently the only single-nutrient code in FNDDS.

The nutrient profiles of the majority of foods and beverages in FNDDS 2017-2018 were generated using a recipe calculation process utilizing two or more 'ingredients'. The **ingredient codes** can be FDC codes, FNDDS codes or a combination of both. In general, a recipe calculation approach generated nutrient profiles for home-prepared dishes, as well as cooked meats, eggs, grains, and vegetables that consider salt and/or fat used in preparation. When no appropriate composition data from FDC for processed or restaurant foods were available, recipe calculations generated nutrient profiles for those foods as well.

Each ingredient code, plus the amount, used to create a nutrient profile for a food or beverage in FNDDS is in the table/dataset *FNDDSIngred*. The ingredient codes used to generate nutrient profiles for each FNDDS food code are easily viewed in the Excel® spreadsheet **At A Glance: FNDDS Ingredients**. The 'recipes' are not cookbook-style recipes, but rather calculated nutrient values based on ingredient proportions.

A recipe calculation does not usually reflect a specific recipe for an item; but rather selects ingredients and amounts to estimate a nutrient profile that may represent several variants of a particular food or beverage. A variety of sources was utilized to determine ingredients and their amounts: food label data from USDA Global Branded Food Products Database and company websites, product preparation instructions, label ingredients, and cookbooks and recipe websites.

Recipe calculations were also the most common technique used to generate nutrient data for the 1000+ FNDDS food codes updated for 2017-2018. General protocols were developed to standardize and streamline the ingredients for comparable codes within a type or category of related foods/beverages.

It is important to remember:

- *Recipe calculations are developed to represent multiple variants of a basic dish.*
- *Since ingredients are selected to yield a nutrient profile for a food/beverage code, the FDC codes selected do not necessarily represent an exact item in a product.*
- *Recipe ingredients do not generally include items that contribute minimally to the nutrient content of the food or beverage.*
- *FNDDS food codes consider salt and fat used in preparation and may be included as an ingredient.*

Vegetables and Eggs

For FNDDS 2017-2018, generally all recipes for cooked vegetables, and fried/scrambled eggs or omelet codes were updated and the amount of sodium in the recipe was reduced by half. The updated recipe calculations take into consideration that cooked vegetables and eggs/omelets may be prepared without adding any salt by some individuals and prepared with added salt by other individuals.

New for FNDDS 2017-2018 – ingredient codes for use only in recipe calculations

The recipe approach was also used to create nutrient profiles for a group of ingredient foods that were used in subsequent recipe calculations. FNDDS 2017-2018 contains 25 codes; all have 9999 as the first four digits. These food codes are not used to code dietary intakes in WWEIA. The 9999 codes are only used as an ingredient in recipe calculations to standardize and streamline the development of nutrient profiles. Selected codes include the following:

99991400	Cheese as ingredient in sandwiches
99992230	Breakfast meat as ingredient in omelet
99995000	Breading or batter as ingredient in food
99995130	Wheat bread as ingredient in sandwiches
99995135	Wheat bun as ingredient in sandwiches
99997220	Broccoli, cooked, as ingredient
99997310	Carrots, cooked, as ingredient
99997800	Dark green vegetables as ingredient in omelet
99997802	Tomatoes as ingredient in omelet
99997804	Other vegetables as ingredient in omelet
99997810	Vegetables as ingredient in curry

The individual ingredients of some of the 9999 codes were selected based on frequency of reports in WWEIA. For example, *Wheat bread as an ingredient in sandwiches* is based on frequency of reports of bread other than white bread for use in sandwiches.

Retention Codes and Moisture Adjustment

In addition to selecting the appropriate ingredients and proportions for each recipe calculation, retention factors and moisture adjustments are applied in order to calculate FNDDS nutrient values (Powers and Hoover, 1989).

Retention codes

Nutrient losses that occur because of cooking are accounted for in many recipe calculations using the *USDA Table of Nutrient Factors, Release 6* (USDA, ARS, NDL 2007). The table has retention factors for 16 vitamins, 8 minerals, and alcohol for types of foods; each retention factor is the percent of the specific nutrient that remains in the food after preparation. Retention factors are provided for different food groups with a range of cooking and preparation methods. Each food group/cooking method (retention description) has a unique 4-digit retention code.

When a retention factor is utilized for an ingredient code, the 4-digit retention code is listed in *FNDDSIngred.* During the recipe calculation the retention factor (percentages of nutrient retained) was applied at the ingredient-level to create the final nutrient profile.

Moisture adjustment

The moisture change accounts for how much water a food will lose or gain during cooking. The loss or gain of water during cooking can have a substantial effect on the nutrient content when expressed on a per 100-gram basis. Provided in *MoistAdjust*, moisture change is expressed as a percentage of the total weight of the food/beverage item and was applied at the recipe-level to create the final nutrient profile.

Selection of a moisture loss to represent a cooked product is informed using *USDA's Food Yields Summarized by Different Stages of Preparation* (USDA, ARS, 1975) as well as other limited sources. For some recipes, moisture adjustments were performed until the moisture value in the recipe food was close to the moisture value of a similar analyzed food where available.

Any increase or decrease in fat during cooking is incorporated into the ingredients; therefore, recipe calculations do not include any fat change - gain or fat loss during cooking. This process began with FNDDS 2015-2016.

 *New for FNDDS 2017-2018* – resources added to FSRG website

Links to both the *USDA Table of Nutrient Retention Factors* and *Food Yields Summarized by Different Stages of Preparation* are available for quick reference as resources on FSRG website along with FNDDS databases and documentation.

Ingredient Nutrient Values

The development of FNDDS 2017-2018 began with an evaluation of the integrity and currency of underlying values for the ingredient codes from FDC that form the basis of nutrient profiles for each FNDDS food/beverage. This evaluation resulted in the removal of SR Legacy codes used in earlier versions of FNDDS and the addition of new Foundation Foods. Some nutrient values for FDC codes were modified or corrected for inclusion in FNDDS and therefore differ from the value in FDC.

To enhance the transparency of developing nutrient profiles in FNDDS, expanded characterization of both the source used for the nutrient values, and the year of their determination were added to *IngredNutVal* beginning with the FNDDS 2015-2016 and expanded for FNDDS 2017-2018.

The dataset *IngredNutVal* contains only the ingredient codes from FDC and does not contain FNDDS codes used as ingredients. Included in *IngredNutVal* are the NDB number (Ingredient code) and corresponding description (Ingredient description). Also provided, for each ingredient code are the following:

- Nutrient value for energy and 64 nutrients– amount per 100g edible portion
- Nutrient value source
- Derivation code
- SR AddMod Year or Foundation year acquired

New for FNDDS 2017-2018 – **Appendix L. Nutrient Value Sources**

The variable – nutrient value source - provides the FDC database or additional source that is the basis for each individual nutrient value. See ***Appendix L***. for the 13 sources that are the basis for each nutrient value in FNDDS 2017-2018.

Most nutrient values for ingredient codes in FNDDS 2017-2018 utilized the value obtained directly from FDC as downloaded on October 31, 2019 which included data types - SR Legacy and Foundation Foods. These nutrient values will also have a new FNDDS variable - FDC ID. In FDC, a unique code or FDC_ID number identifies samples for each food contained in each of the data types. Currently, an FDC_ID number is assigned randomly when new or updated versions of foods are published in FDC.

Nutrient values for some ingredient codes used in FNDDS were modified and therefore differ from the value in FDC. At least one nutrient value was modified for about 70 of the FDC codes downloaded. The source for the modified nutrient value is provided.

For a few ingredient codes, a source other than SR Legacy or Foundation was the basis for either all, or for only select nutrients. The specific source for each nutrient is listed.

New for FNDDS 2017-2018 – Foundation Foods

Foundation Foods is the source for 45 ingredient codes in FNDDS 2017-2018. Calculations and assumptions when using Foundation Foods values for FNDDS are detailed below.

All nutrient values in Foundation Foods are based on analyses conducted under USDA National Food and Nutrient Analysis Program or provided by other USDA units or external organizations. New Foundation Foods, as opposed to those pulled from SR, will not have all nutrients but will be targeting important nutrients in that food. In order to provide values for energy and the 64 nutrients in FNDDS, assumptions were made. Examples include:

- Values were assumed to be zero for the following: added vitamin B12, added vitamin E, and folic acid.
- Values for both food folate and folate (DFE) were assumed from the value for total folate - the only folate component provided in Foundation Foods.
- For vitamin A components, certain values were assumed to be zero, reflecting zero or minimal (<100 µg) SR Legacy values.
- For some individual fatty acids, calculated sums of cis- and trans-fatty acids from Foundation Foods were used to be consistent with FNDDS.
- Foundation Foods provided values for Sugars, Total NLEA (nutrient code 269.4). This value was used for the FNDDS nutrient Sugars, total (nutrient code 269).

Nutrient values in Foundation Foods are rounded to scientifically appropriate significant figures and may differ from the number of digits that FNDDS reports for a nutrient. After making any necessary calculations, the nutrient values were rounded to be consistent with FDC rounding methods for Foundation Foods. Values were rounded to at most 3 significant digits using the "half-even" algorithm -- for values ending in a 5, the value is rounded to the nearest even number (e.g. 3.215 rounds up to 3.22, and 3.225 rounds down to 3.22).

The FNDDS dataset *IngredNutVal* contains additional variables to provide details important in assessing the currency for each nutrient value downloaded from FDC. The variables differ based on which FDC data type is used. If the source is SR Legacy, **SR AddMod year** is provided which indicates the year a nutrient value was added or last modified as defined by SR. Although SR provides a month and year, only the year is listed in FNDDS. If SR ADDMod year is blank for an ingredient with nutrient value source as SR Legacy, the data were missing.

If the source is Foundation, **FDC-FF Min year acquired** is listed which is defined in FDC as the minimum purchase year.

Derivation Description

If the nutrient value source is SR Legacy or Foundation, a derivation code provides information about how a value was calculated or imputed as defined in FDC. ***Appendix J*** is a list of FDC derivation codes and descriptions that provide specific information on how the value was determined. This information is available in a new table/dataset added in FNDDS 2015-2016 and expanded for FNDDS 2017-2018.

Some SR derivation codes reference 'source codes' in the description. ***Appendix J*** includes a listing of the referenced source code and accompanying description. The source codes (indicating the type of data) and descriptions are as defined by FDC.

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Appendix A. List of Abbreviations

AMPM	USDA Automated Multiple-Pass Method
ARS	Agricultural Research Service
BHNRC	Beltsville Human Nutrition Research Center
FDC	FoodData Central
FDC ID	Unique permanent identifier of a food in FoodData Central
FNDDS	Food and Nutrient Database for Dietary Studies
FSRG	Food Surveys Research Group
MAFCL	Methods and Application of Food Composition Laboratory
NDB No.	Nutrient Databank number
NHANES	National Health and Nutrition Examination Survey
NS	not specified
NFS	not further specified
QNS	quantity not specified
SAS®	Statistical Analysis System
SR	USDA National Nutrient Database for Standard Reference
USDA	United States Department of Agriculture
WWEIA	What We Eat in America

Appendix B. Number of Food/Beverages by Food and Nutrient Database for Dietary Studies Version

FNDDS version by NHANES survey years	FNDDS 1 *(2001-02)*	FNDDS 2 *(2003-04)*	FNDDS 3 *(2005-06)*	FNDDS 4.1 *(2007-08)*	FNDDS 5 *(2009-10)*	FNDDS 2011-12	FNDDS 2013-14	FNDDS 2015-16	**FNDDS 2017-18**
Food codes	6,974	6,940	6,921	7,174	7,253	7,618	8,536	8,690	**7,083**
added	*n/a*	*70*	*115*	*283*	*99*	*1,156*	*1,197*	*978*	***209***
discontinued	*n/a*	*104*	*134*	*30*	*20*	*791*	*279*	*824*	***1,816***
Additional descriptions	6,585	6,600	6,801	7,255	7,437	9,791	12,128	14,449	**12,953**
Nutrients/components	61	63*	64*	65*	65	65	65	65	**65**

*Nutrients added by year:

2007-2008: Vitamin D (D2+D3) (µg)
2005-2006: Total Choline (mg)
2003-2004: Added Vitamin E (mg) and Added Vitamin B12 (µg)

Appendix C. FNDDS 2017-2018 Factsheet

Food and Nutrient Database for Dietary Studies 2017-2018

The USDA Food and Nutrient Database for Dietary Studies 2017-2018 (FNDDS) converts food and beverages consumed in What We Eat In America, National Health and Nutrition Examination Survey into gram amounts and determines their nutrient values.

The complete FNDDS 2017-2018 consists of 12 datasets (Access® and SAS®). Select variables available in quick view/search format (Excel®). All available for download at www.ars.usda.gov/nea/bhnrc/fsrg.

Food Descriptions Component

Main Food Descriptions
Primary descriptions for 7,083 foods/beverages *(6,286 foods/797 beverages)*
Unique 8-digit code assigned to each main food description

Additional Food Descriptions
Descriptions for 12,953 additional foods/beverages associated with a specific main food/beverage

Food Portions and Weights Component

Food Weights
Weights (g) for 32,614 portions

Food Portion Descriptions
Descriptions for unit measure of foods/beverages

Subcode Descriptions
Candy and snack cakes with unique portion weights

Food Code-Subcode Links
Associations between main food codes and subcodes

Nutrients Component

FNDDS Nutrient Values
Nutrient values for food energy and 64 nutrients/food components **(other side of page)** for each food/beverage

Nutrient Descriptions
Descriptions and measurement units for nutrients

Moisture Adjustment
Factors used during calculation of nutrient values for foods/beverages

FNDDS Ingredients
Information used in calculating FNDDS nutrient values per 100 g

Ingredient Nutrient Values
Sources of nutrient values - USDA FDC *(accessed 10/2019)* or other sources

Derivation Descriptions
Descriptions for derivation codes defined by USDA FDC *(accessed 10/2019)*

Appendix D. FNDDS 2017-2018 Nutrients and Food Components (unit)

Food energy (kcal)
Protein (g)
Carbohydrate (g)
Fat, total (g)
Alcohol (g)

Sugars, total (g)
Dietary fiber, total (g)
Water (g)

Saturated fatty acids, total (g)
Monounsaturated fatty acids, total (g)
Polyunsaturated fatty acids, total (g)
Cholesterol (mg)

Individual fatty acids:
Saturated fatty acids:
4:0 Butyric acid (g)
6:0 Caproic acid (g)
8:0 Caprylic acid (g)
10:0 Capric acid (g)
12:0 Lauric acid (g)
14:0 Myristic acid (g)
16:0 Palmitic acid (g)
18:0 Stearic acid (g)

Monounsaturated fatty acids:
16:1 Palmitoleic acid (g)
18:1 Oleic acid (g)
20:1 Gadoleic acid (g)
22:1 Erucic/citoleic acid (g)

Polyunsaturated fatty acids:
18:2 Linoleic acid (g)
18:3 Linolenic acid (g)
18:4 Parinaric acid (g)
20:4 Arachidonic acid (g)
20:5 n-3 Eicosapentaenoic acid (EPA) (g)
22:5 n-3 Docosapentaenoic acid (DPA) (g)
22:6 n-3 Docosahexaenoic acid (DHA) (g)

Vitamin A as retinol activity equivalents (µg)
Retinol (µg)

Carotenoids:
Carotene, alpha (µg)
Carotene, beta (µg)
Cryptoxanthin, beta (µg)
Lycopene (µg)
Lutein + zeaxanthin (µg)

Vitamin E as alpha-tocopherol (mg)
*Added vitamin E (mg) *(added 2003-04)*
Vitamin D (D2 + D3) (µg) *(added 2007-08)*
Vitamin K as phylloquinone (µg)
Vitamin C (mg)
Thiamin (mg)
Riboflavin (mg)
Niacin (mg)
Vitamin B-6 (mg)

Folate, total (µg)
Folate (DFE) (µg)
Folic acid (µg)
Food folate (µg)

Vitamin B12 (µg)
**Added vitamin B12 (µg) *(added 2003-04)*
Choline, total (mg) *(added 2005-06)*

Calcium (mg)
Iron (mg)
Magnesium (mg)
Phosphorus (mg)
Potassium (mg)
Sodium (mg)
Zinc (mg)
Copper (mg)
Selenium (µg)

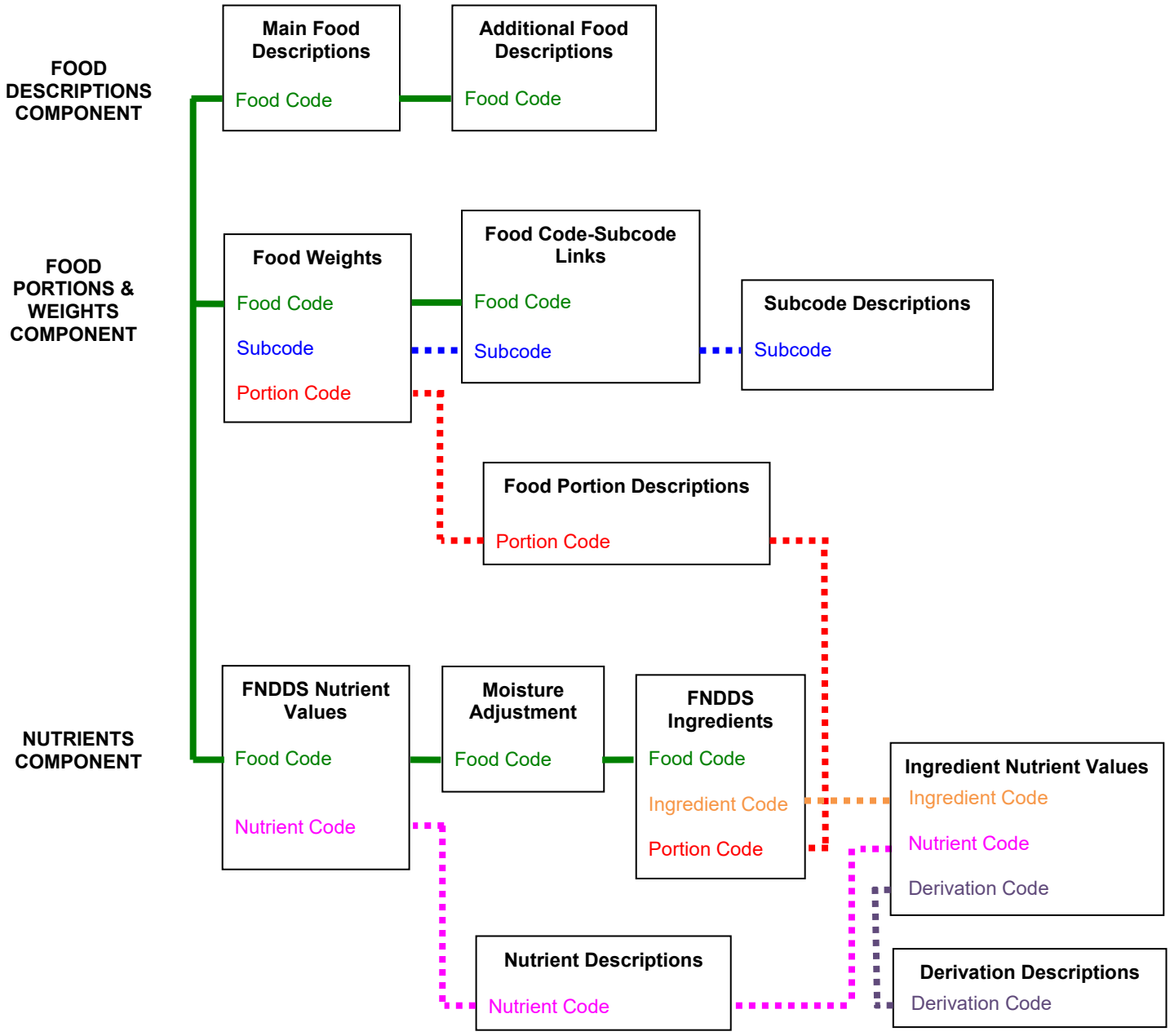
Caffeine (mg)
Theobromine (mg)

*Represents a synthetic subcomponent of vitamin E and is included in the vitamin E value.
**Represents a fortified subcomponent of vitamin B12 and is included in the vitamin B12 value.

Appendix E. FNDDS 2017-2018 File Relationships

The USDA Food and Nutrient Database for Dietary Studies (FNDDS) converts food and beverages consumed in What We Eat In America (WWEIA), National Health and Nutrition Examination Survey into gram amounts and determines their nutrient values.

The complete FNDDS 2017-2018 consists of 12 datasets linked by primary and secondary data items forming a relational database. The primary link is the food code, indicated with a solid line. Secondary links are subcode, portion code, nutrient code, ingredient code, and SR derivation code indicated with dotted lines.



Appendix F. FNDDS 2017-2018 Content of Datasets

2017-2018 Food and Nutrient Database for Dietary Studies

Content of Datasets

The USDA Food and Nutrient Database for Dietary Studies (FNDDS) converts food and beverages consumed in What We Eat In America (WWEIA), National Health and Nutrition Examination Survey into gram amounts and determines their nutrient values.

The complete FNDDS 2017-2018 consists of 12 datasets (Access® and SAS®). Select variables in quick view and search format also available in Excel®. All available for download at www.ars.usda.gov/nea/bhnrc/fsrg.

Food Descriptions Component

Main Food Descriptions (MainFoodDesc)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Main food description	A 200	Primary description for a food code
WWEIA Category number	N 4	Unique 4-digit identification number
WWEIA Category description	A 80	Description for a WWEIA category

Additional Food Descriptions (AddFoodDesc)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Seq num	N 2	Number for ordering additional food descriptions
Additional food description	A 80	Description(s) associated with a food code/main description

Food Portions and Weights Component

Food Weights (FoodWeights)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Subcode‡	N 7	Unique 7-digit identification number
Seq num	N 2	Number for ordering portion descriptions
Portion code‡	N 5	Unique 5-digit identification number
Portion weight	N 8.3	Edible portion in grams (g)

Food Portion Descriptions (FoodPortionDesc)

Field Name	Field Type	Description
Portion code‡	N 5	Unique 5-digit identification number
Portion description	A 120	Unit of measure

Subcode Descriptions (SubcodeDesc)

Field Name	Field Type	Description
Subcode‡	N 7	Unique 7-digit identification number
Subcode description	A 80	Candy or snack cake with unique portion weights

Food Code-Subcode Links (FoodSubcodeLinks)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Subcode‡	N 7	Unique 7-digit identification number

Appendix F. FNDDS 2017-2018 Content of Datasets (continued)

Nutrients Component

FNDDS Nutrient Values (FNDDSNutVal)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Nutrient code‡	N 5	3-digit identification number
Nutrient value	N 10.x	Amount per 100 g edible portion for energy and 64 nutrients

Nutrient Descriptions (NutDesc)

Field Name	Field Type	Description
Nutrient code‡	N 5	3-digit identification number
Nutrient description	A 45	Description of nutrient or food component
Tagname	A 15	INFOODS international food component identifier
Unit	A 10	Measurement unit for nutrient value
Decimals	N 1	Number of decimal places

Moisture Adjustment (MoistAdjust)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Moisture change	N 5.1	Percentage moisture change of total weight

FNDDS Ingredients (FNDDSIngred)

Field Name	Field Type	Description
Food code‡	N 8	Unique 8-digit identification number
Seq num	N 2	Number for ordering ingredient codes
Ingredient code‡	N 8	NDB number or FNDDS food code
Ingredient description	A 240	Description of NDB number or FNDDS food code
Amount	N 11.3	Number of measures of ingredient code
Measure	A 3	Unit of measure to quantify amount of ingredient code
Portion code‡	N 5	Unique 5-digit identification number
Retention code	N 4	Retention factor identification code
Ingredient weight	N 11.3	Edible portion in grams (g)

Ingredient Nutrient Values (IngredNutVal)

Field Name	Field Type	Description
Ingredient code‡	N 8	Identifies only NDB number
Ingredient description	A 200	Description of NDB number
Nutrient code‡	N 5	3-digit identification number
Nutrient value	N 10.x	Amount per 100 g edible portion for energy and 64 nutrients
Nutrient value source	A 80	FDC or other source for nutrient value
FDC ID	N 6	Identifier of food in FDC
Derivation code‡	A 4	Derivation code as defined by FDC
SR AddMod year	N 4	Year value added or last modified as defined by SR
Foundation year acquired	N 4	Initial year acquired as defined by FDC

Derivation Descriptions (DerivDesc)

Field Name	Field Type	Description
Derivation code‡	A 4	Derivation code as defined by FDC
Derivation description	A 120	Description of derivation code

‡ linking field across files
Note: Start/end dates included on all datasets (except NutDesc and DerivDesc) indicate time period corresponding to WWEIA data.

Appendix G. FNDDS 2017-2018 At A Glance

The USDA Food and Nutrient Database for Dietary Studies (FNDDS) converts food and beverages consumed in What We Eat In America (WWEIA), National Health and Nutrition Examination Survey into gram amounts and determines their nutrient values.

At A Glance provides select variables in quick view/search format (Excel®) from the FNDDS 12 datasets (Access® and SAS®). All available for download at www.ars.usda.gov/nea/bhnrc/fsrg.

	Variable	Description
Food and Beverages	Food code	Unique 8-digit identification number
	Main food description	Primary description for a food code
	Additional food description	Description(s) associated with a food code/main description
	WWEIA Category number	Unique 4-digit identification number
	WWEIA Category description	Description for a WWEIA category

Portions and Weights	
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
Subcode	Unique 7-digit identification number
Subcode description	Candy or snack cake with unique portion weights
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category
Seq num	Number for ordering portion descriptions
Portion description	Unit of measure
Portion weight	Edible portion in grams (g)

FNDDS Ingredients	
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category
Seq num	Number for ordering ingredient codes
Ingredient code	NDB number or FNDDS food code
Ingredient description	Description of NDB number or FNDDS food code
Ingredient weight	Edible portion in grams (g)
Retention code	Retention factor identification code
Moisture change	Percentage moisture change of total weight

Ingredient Nutrient Values	
Ingredient code	Identifies only NDB number
Ingredient description	Description of NDB number
Nutrient code	3-digit identification number
Nutrient description	Description of nutrient or food component
Nutrient value	Amount per 100 g edible portion for energy and 64 nutrients
Nutrient value source	FDC or other source for nutrient value
FDC ID	Identifier of food in FDC
Derivation code	Derivation descriptor as defined by FDC
SR AddMod year	Year value added or last modified as defined by SR
Foundation year acquired	Initial year acquired as defined by FDC

FNDDS Nutrient Values	
Food code	Unique 8-digit identification number
Main food description	Primary description for a food code
WWEIA Category number	Unique 4-digit identification number
WWEIA Category description	Description for a WWEIA category
Value for each nutrient	Amount per 100 g edible portion for energy and 64 nutrients

FDC = FoodData Central (accessed 10/2019).

Appendix H. FNDDS 2017-2018 Food Code: Grouping by First 2 Digits

1 Milk and Milk Products	*11 Milks, milk drinks, yogurts, infant formulas* *12 Creams and cream substitutes* *13 Milk desserts and sauces* *14 Cheeses*
2 Meat, Poultry, Fish, and Mixtures	*20 Meat* *21 Beef* *22 Pork* *23 Lamb, veal, game* *24 Poultry* *25 Organ meats, frankfurters, sausages, lunchmeats* *26 Fish, shellfish* *27 Meat, poultry, fish mixtures* *28 Frozen meals, soups, gravies*
3 Eggs	*31 Eggs* *32 Egg mixtures* *33 Egg substitutes*
4 Dry Beans, Peas, Other Legumes, Nuts, and Seeds	*41 Legumes* *42 Nuts, nut butters, nut mixtures* *43 Seeds and seed mixtures* *44 Carob products*
5 Grain Products	*50 Flour and dry mixes* *51 Yeast breads, rolls* *52 Quick breads* *53 Cakes, cookies, pies, pastries, bars* *54 Crackers, snack products* *55 Pancakes, waffles, French toast, other grain products* *56 Pastas, rice, cooked cereals* *57 Cereals, not cooked* *58 Grain mixtures, frozen meals, soups* *59 Meat substitutes*
6 Fruits	*61 Citrus fruits, juices* *62 Dried fruits* *63 Other fruits* *64 Fruit juices and nectars excluding citrus* *67 Fruits and juices baby food*
7 Vegetables	*71 White potatoes, starchy vegetables* *72 Dark-green vegetables* *73 Orange vegetables* *74 Tomatoes, tomato mixtures* *75 Other vegetables* *76 Vegetables and mixtures mostly vegetables baby food* *77 Vegetables with meat, poultry, fish* *78 Mixtures mostly vegetables without meat, poultry, fish*
8 Fats, Oils, and Salad Dressings	*81 Fats* *82 Oils* *83 Salad dressings* *89 'For use' with a sandwich or vegetable*
9 Sugars, Sweets, and Beverages	*91 Sugars, sweets* *92 Nonalcoholic beverages* *93 Alcoholic beverages* *94 Noncarbonated water* *95 Formulated nutrition beverages, energy drinks, sports drink* *99 Used as an ingredient, not for coding*

Appendix I. WWEIA Food Categories: *Code, Description, Number of FNDDS Codes/Category*

MILK AND DAIRY	Code	Description	
Milk	1002	Milk, whole	9
	1004	Milk, reduced fat	6
	1006	Milk, lowfat	7
	1008	Milk, nonfat	7
Flavored Milk	1202	Flavored milk, whole	12
	1204	Flavored milk, reduced fat	22
	1206	Flavored milk, lowfat	15
	1208	Flavored milk, nonfat	17
Dairy Drinks and Substitutes	1402	Milk shakes and other dairy drinks	13
	1404	Milk substitutes	27
Cheese	1602	Cheese	57
	1604	Cottage/ricotta cheese	16
Yogurt	1820	Yogurt, regular	17
	1822	Yogurt, Greek	14

PROTEIN FOODS			
Meats	2002	Beef, excludes ground	76
	2004	Ground beef	5
	2006	Pork	83
	2008	Lamb, goat, game	45
	2010	Liver and organ meats	15
Poultry	2202	Chicken, whole pieces	161
	2204	Chicken patties, nuggets and tenders	15
	2206	Turkey, duck, other poultry	48
Seafood	2402	Fish	340
	2404	Shellfish	94
Eggs	2502	Eggs and omelets	151
Cured Meats/Poultry	2602	Cold cuts and cured meats	67
	2604	Bacon	13
	2606	Frankfurters	12
	2608	Sausages	27
Plant-based Protein Foods	2802	Beans, peas, legumes	74
	2804	Nuts and seeds	78
	2806	Processed soy products	21

Appendix I. WWEIA Food Categories: *Code, Description, Number of FNDDS Codes/Category (continued)*

MIXED DISHES	Code	Description	
Mixed Dishes – Meat, Poultry, Seafood	3002	Meat mixed dishes	299
	3004	Poultry mixed dishes	145
	3006	Seafood mixed dishes	120
Mixed Dishes – Bean/Vegetable-based	3102	Bean, pea, legume dishes	24
	3104	Vegetable dishes	36
Mixed Dishes – Grain-based	3202	Rice mixed dishes	136
	3204	Pasta mixed dishes, excludes macaroni & cheese	182
	3206	Macaroni and cheese	17
	3208	Turnovers and other grain-based items	50
Mixed Dishes – Asian	3402	Fried rice and lo/chow mein	45
	3404	Stir-fry and soy-based sauce mixtures	70
	3406	Egg rolls, dumplings, sushi	25
Mixed Dishes – Mexican	3502	Burritos and tacos	53
	3504	Nachos	7
	3506	Other Mexican mixed dishes	61
Mixed Dishes – Pizza	3602	Pizza	91
Mixed Dishes – Sandwiches (single code)	3702	Burgers	63
	3703	Frankfurter sandwiches	97
	3704	Chicken/turkey sandwiches	32
	3706	Egg/breakfast sandwiches	46
	3708	Other sandwiches	60
	3720	Cheese sandwiches	50
	3722	Peanut butter and jelly sandwiches	28
	3730	Seafood sandwiches	20
Mixed Dishes - Soups	3802	Soups	228

GRAINS			
Cooked Grains	4002	Rice	30
	4004	Pasta, noodles, cooked grains	25
Breads, Rolls, Tortillas	4202	Yeast breads	122
	4204	Rolls and buns	39
	4206	Bagels and English muffins	30
	4208	Tortillas	7
Quick Breads and Bread Products	4402	Biscuits, muffins, quick breads	51
	4404	Pancakes, waffles, French toast	75
Ready-to-Eat Cereals	4602	Ready-to-eat cereal, higher sugar (>21.2 g/100g)	86
	4604	Ready-to-eat cereal, lower sugar (=<21.2g/100g)	48
Cooked Cereals	4802	Oatmeal	44
	4804	Grits and other cooked cereals	67

SNACKS AND SWEETS			
Savory Snacks	5002	Potato chips	30
	5004	Tortilla, corn, other chips	33
	5006	Popcorn	33
	5008	Pretzels/snack mix	45
Crackers	5202	Crackers, excludes saltines	57
	5204	Saltine crackers	5
Snack/Meal Bars	5402	Cereal bars	33
	5404	Nutrition bars	13
Sweet Bakery Products	5502	Cakes and pies	186
	5504	Cookies and brownies	107
	5506	Doughnuts, sweet rolls, pastries	70
Candy	5702	Candy containing chocolate	69
	5704	Candy not containing chocolate	65
Other Desserts	5802	Ice cream and frozen dairy desserts	61
	5804	Pudding	27
	5806	Gelatins, ices, sorbets	17

Appendix I. WWEIA Food Categories: *Code, Description, Number of FNDDS Codes/Category (continued)*

FRUIT	Code	Description	
Fruits	6002	Apples	7
	6004	Bananas	2
	6006	Grapes	1
	6008	Peaches and nectarines	6
	6009	Strawberries	3
	6011	Blueberries and other berries	10
	6012	Citrus fruits	11
	6014	Melons	4
	6016	Dried fruits	19
	6018	Other fruits and fruit salads	41
	6020	Pears	5
	6022	Pineapple	5
	6024	Mango and papaya	5

VEGETABLES			
Vegetables, excluding Potatoes	6402	Tomatoes	6
	6404	Carrots	20
	6406	Other red and orange vegetables	34
	6407	Broccoli	15
	6409	Spinach	15
	6410	Lettuce and lettuce salads	14
	6411	Other dark green vegetables	65
	6412	String beans	20
	6413	Cabbage	11
	6414	Onions	8
	6416	Corn	20
	6418	Other starchy vegetables	46
	6420	Other vegetables and combinations	160
	6430	Fried vegetables	30
	6432	Coleslaw, non-lettuce salads	24
	6489	Vegetables on a sandwich	8
White Potatoes	6802	White potatoes, baked or boiled	48
	6804	French fries and other fried white potatoes	44
	6806	Mashed potatoes and white potato mixtures	57

Appendix I. WWEIA Food Categories: *Code, Description, Number of FNDDS Codes/Category (continued)*

BEVERAGES	Code	Description	
100% Juice	7002	Citrus juice	13
	7004	Apple juice	3
	7006	Other fruit juice	21
	7008	Vegetable juice	9
Diet Beverages	7102	Diet soft drinks	13
	7104	Diet sport and energy drinks	12
	7106	Other diet drinks	6
Sweetened Beverages	7202	Soft drinks	14
	7204	Fruit drinks	55
	7206	Sport and energy drinks	19
	7208	Nutritional beverages	16
	7220	Smoothies and grain drinks	25
Coffee and Tea	7302	Coffee	113
	7304	Tea	42
ALCOHOLIC BEVERAGES			
Alcoholic Beverages	7502	Beer	9
	7504	Wine	12
	7506	Liquor and cocktails	78
WATER			
Plain Water	7702	Tap water	1
	7704	Bottled water	1
Flavored or Enhanced Water	7802	Flavored or carbonated water	5
	7804	Enhanced or fortified water	5
FATS AND OILS			
Fats and Oils	8002	Butter and animal fats	14
	8004	Margarine	12
	8006	Cream cheese, sour cream, whipped cream	14
	8008	Cream and cream substitutes	19
	8010	Mayonnaise	10
	8012	Salad dressings and vegetable oils	51
CONDIMENTS AND SAUCES			
Condiments and Sauces	8402	Tomato-based condiments	12
	8404	Soy-based condiments	10
	8406	Mustard and other condiments	29
	8408	Olives, pickles, pickled vegetables	30
	8410	Pasta sauces, tomato-based	11
	8412	Dips, gravies, other sauces	61
SUGARS			
Sugars	8802	Sugars and honey	8
	8804	Sugar substitutes	10
	8806	Jams, syrups, toppings	37

Appendix I. WWEIA Food Categories: *Code, Description, Number of FNDDS Codes/Category (continued)*

BABY FOODS AND FORMULAS	Code	Description	
Baby Foods	9002	Baby food: cereals	20
	9004	Baby food: fruit	52
	9006	Baby food: vegetables	31
	9008	Baby food: meat and dinners	61
	9010	Baby food: yogurt	12
	9012	Baby food: snacks and sweets	35
Baby Beverages	9202	Baby juice	17
	9204	Baby water	1
Infant Formulas	9402	Formula, ready-to-feed	57
	9404	Formula, prepared from powder	82
	9406	Formula, prepared from concentrate	34
Human Milk	9602	Human milk	1

OTHER			
Other	9802	Protein and nutritional powders	18
	9999	Not included in a food category	74

Appendix J. FDC Derivation Codes and Descriptions

Code	Description
A	*Analytical data*
AI	*Analytical data; from the literature or government; incomplete documentation*
AR	*Analytical data; derived by linear regression*
AS	*Summed*
BD	*Based on same food; Drained solids from solids and liquids or vice versa (canned fruits and vegetables)*
BFAN	*Based on another form of the food or similar food; Concentration adjustment; Ash; Retention factors not used*
BFCN	*Based on another form of the food or similar food; Concentration adjustment; Carbohydrate; Retention factors not used*
BFFN	*Based on another form of the food or similar food; Concentration adjustment; Fat; Retention factors not used*
BFFY	*Based on another form of the food or similar food; Concentration adjustment; Fat; Retention factors used*
BFNN	*Based on another form of the food or similar food; Concentration adjustment; Non-fat solids; Retention factors not used*
BFNY	*Based on another form of the food or similar food; Concentration adjustment; Non-fat solids; Retentions factors used*
BFPN	*Based on another form of the food or similar food; Concentration adjustment; Protein; Retention factors not used*
BFPY	*Based on another form of the food or similar food; Concentration adjustment; Protein; Retention factors used*
BFSN	*Based on another form of the food or similar food; Concentration adjustment; Solids; Retention factors not used*
BFSY	*Based on another form of the food or similar food; Concentration adjustment; Solids; Retention factors used*
BFYN	*Based on another form of the food or similar food; Concentration adjustment; Yield; Retention factors not used*
BFYY	*Based on another form of the food or similar food; Concentration adjustment; Yield; Retention factors used*
BFZN	*Based on another form of the food or similar food; Concentration adjustment; No adjustment; Retention factors not used*
BFZY	*Based on another form of the food or similar food; Concentration adjustment; No adjustment; Retention factors used*
BNA	*Based on another form of the same food or similar food: constituents normalized to total; vitamin A*
CAAN	*Calculated from different food; From average values for food category; Ash; Retention factors not used*
CAFN	*Calculated from different food; From average values for food category; Fat; Retention factors not used*
CASN	*Calculated from different food; From average values for food category; Solids; Retention factors not used*
CAZN	*Calculated from different food; From average values for food category; No adjustment; Retention factors not used*
DA	*Concentration adjustment using factor; derived from analytical data*
DI	*Concentration adjustment using factor; derived from imputed data*
FLA	*Estimated formulation based on ingredient list; Linear program used to estimate ingredients; Analytical data*
FLC	*Estimated formulation based on ingredient list; Linear program used to estimate ingredients; Claim on label/serving*
FLM	*Estimated formulation based on ingredient list; Linear program used to estimate ingredients; Manuf. Calc. data/100*
JA	*Aggregated data involving combinations of data with only source codes* 1 and 12 and/or 13*
JO	*Aggregated data involving combinations of data with different source codes* when at least one code is not 1, 6, 12, or 13*
LC	*Label claim (back calculated from label by NDL staff; Calculated from label claim/serving (g or %RDI)*
MA	*Manufacturer supplied(industry or trade association); Analytical data, incomplete documentation*
MC	*Manufacturer supplied; Calculated by manufacturer or unknown if analytical or calculated*
ML	*Manufacturer supplied; Value upon which manufacturer based label claim for fortified/enriched nutrient*

Appendix J. FDC Derivation Codes and Descriptions *(continued)*

Code	Description
NC	*Calculated*
NP	*Nutrient that is based on other nutrient/s; calculated by difference or summed (with or without activity factors) Ex. Proximate component other than CHO by difference. Vitamin A calculated from components when one of the component values is not source code 1 or 7*
NR	*Nutrient that is based on other nutrient/s; value used directly, ex. Nut.#204 from Nut.#298*
O	*Other procedure used from imputing*
PAE	*Based on physical composition; Derived from analytical data; Estimated physical composition*
PAK	*Based on physical composition; Derived from analytical data; Known physical composition*
PIE	*Based on physical composition; Derived from imputed data; Estimated physical composition*
PIK	*Based on physical composition; Derived from imputed data; Known physical composition*
RA	*Recipe; Approximate ingredient proportions (ex. combination of several recipes)*
RC	*Recipe; Cookbook*
RF	*Recipe; Formulary of standard products (formulary or standards of identity)*
RK	*Recipe; Known formulation (dissection data or proprietary formulation)*
RKA	*Recipe; Known formulation; No adjustments applied, combination of source codes* 1, 12, and/or 6*
RKI	*Recipe; Known formulation; No adjustments applied, combination of source codes* which includes codes other than 1,12,or 6*
RP	*Recipe; Per package directions (ex. refrigerated dough, toast, cake mix)*
RPA	*Recipe; Per package directions; No adjustments applied, combination of source codes* 1, 12, and/or 6.*
RPI	*Recipe; Per package directions; No adjustments applied, combination of source codes which includes codes* other than 1,12,or 6*
S	*Product standard, such as enrichment level specified in CFR or AMS commodity standard*
T	*Taken from another source--other tables of food composition*
Z	*Assumed zero (Insignificant amount or not naturally occurring in a food, such as fiber in meat)*

Source: U.S. Department of Agriculture, Agricultural Research Service. (2019). FoodData Central. Available from: www.fdc.nal.usda.gov. Accessed 2020 June 1.

*Source code descriptions:
1 - analytical or derived from analytical
6 - aggregated data involving combinations of source codes 1 & 12
7 - assumed zero
12 - manufacturer's analytical, partial documentation
13 - analytical data from the literature, partial documentation

Appendix K. Nutrient Codes in FNDDS and FoodData Central

Nutrient Code	Nutrient Description	FDC Nutrient ID	Nutrient Code	Nutrient Description	FDC Nutrient ID
203	Protein	1003	601	Cholesterol	1253
204	Total Fat	1004	606	Fatty acids, total saturated	1258
205	Carbohydrate	1005	607	4:0 (Butyric acid)	1259
208	Energy	1008	608	6:0 (Caproic acid)	1260
221	Alcohol	1018	609	8:0 (Caprylic acid)	1261
255	Water	1051	610	10:0 (Capric acid)	1262
262	Caffeine	1057	611	12:0 (Lauric acid)	1263
263	Theobromine	1058	612	14:0 (Myristic acid)	1264
269	Sugars, total	2000	613	16:0 (Palmitic acid)	1265
291	Fiber, total dietary	1079	614	18:0 (Stearic acid)	1266
301	Calcium	1087	617	18:1 (Oleic acid)	1268
303	Iron	1089	618	18:2 (Linoleic acid)	1269
304	Magnesium	1090	619	18:3 (Linolenic acid)	1270
305	Phosphorus	1091	620	20:4 (Arachidonic acid)	1271
306	Potassium	1092	621	22:6 n-3 (Docosahexaenoic acid - DHA)	1272
307	Sodium	1093	626	16:1 (Palmitoleic acid)	1275
309	Zinc	1095	627	18:4 (Parinaric acid)	1276
312	Copper	1098	628	20:1 (Gadoleic acid)	1277
317	Selenium	1103	629	20:5 n-3 (Eicosapentaenoic acid - EPA)	1278
319	Retinol	1105	630	22:1 (Erucic/citoleic acid)	1279
320	Vitamin A, RAE	1106	631	22:5 n-3 (Docosapentaenoic acid - DPA)	1280
321	Carotene, beta	1107	645	Fatty acids, total monounsaturated	1292
322	Carotene, alpha	1108	646	Fatty acids, total polyunsaturated	1293
323	Vitamin E (alpha-tocopherol)	1109			
328	Vitamin D (D2 + D3)	1114			
334	Cryptoxanthin, beta	1120			
337	Lycopene	1122			
338	Lutein + zeaxanthin	1123			
401	Vitamin C	1162			
404	Thiamin	1165			
405	Riboflavin	1166			
406	Niacin	1167			
415	Vitamin B6	1175			
417	Folate, total	1177			
418	Vitamin B12	1178			
421	Choline, total	1180			
430	Vitamin K (phylloquinone)	1185			
431	Folic acid	1186			
432	Folate, food	1187			
435	Folate, DFE	1190			
573	Vitamin E, added	1242			
578	Vitamin B12, added	1246			

Appendix L. FNDDS 2017-2018 Nutrient Value Sources

Nutrient Value Source	Description
Assumed zero	Based on related nutrient value of same product or similar product
Foundation	FoodData Central Foundation Food *downloaded October 2019*[1]
Foundation fdc_id xxxxx	Based on specific subsample value for Foundation Food NDB number
Informed by additional sources	Based on nutrient values in FoodData Central USDA Global Branded Food Products Database[1], company websites or similar products
Informed by FDC Foundation and SR Legacy	Based on nutrient values of FoodData Central Foundation Food and/or SR Legacy NDB number
Nutrient as ingredient	Ingredient code 999328 for vitamin D
SR Legacy	FoodData Central SR Legacy *downloaded October 2019*[1]
SR Legacy code xxxxx	Imputed nutrient value from other SR Legacy NDB number
SR Legacy code xxxxx footnote	Reflects seafood product not treated with sodium
SR Legacy / Foundation code xxxxx	Imputed nutrient value from SR Legacy / Foundation NDB number listed
SR 26	Nutrient value of SR NDB number in SR 26 (USDA, ARS, NDL, 2013) *downloaded October 2015*
SR 28	SR 28 database *downloaded October 2017*[2]
SR 28 *downloaded October 2015*	Nutrient value of SR NDB number in SR 28 *downloaded October 2015*

[1] Link to FDC download April 2019 on FSRG website www.ars.usda.gov/nea/bhnrc/fsrg
[2] Link to SR28 download October 2017 on FSRG website www.ars.usda.gov/nea/bhnrc/fsrg