Food Patterns Equivalents Database 2005-06: Methodology and User Guide

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Glossary of Abbreviations

Abbreviation	Full Name
ARS	Agricultural Research Service
BHNRC	Beltsville Human Nutrition Research Center
CDC	Centers for Disease Control and Prevention
CNPP	Center for Nutrition Policy and Promotion
DGA	Dietary Guidelines for Americans
Cup eq.	Cup equivalents
FDA	Food and Drug Administration
FP	Food Patterns
FPE	Food Patterns Equivalents
FPED	Food Patterns Equivalents Database
FPID	Food Patterns Equivalents Ingredients Database
FNDDS	Food and Nutrient Database for Dietary Studies
FSRG	Food Surveys Research Group
HHS	United States Department of Health and Human Services
MPED	MyPyramid Equivalents Database
NCHS	National Center for Health Statistics
NCI	National Cancer Institute
NHANES	National Health and Nutrition Examination Survey
NIH	National Institutes for Health
Oz. eq.	Ounce equivalents
SAS®	Statistical Analysis System
Tsp. eq.	Teaspoon equivalents
USDA	United States Department of Agriculture
WWEIA	What We Eat in America

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Chapter 1

Overview

Background

The latest update of the Dietary Guidelines for Americans (DGA) was in 2010 [1], and the DGA recommendations have been translated into messages and tips for making healthful food choices [2]. The 2010 DGA formed the basis for revisions to the U.S. Department of Agriculture (USDA) Food Patterns (FP). The Food Patterns Equivalents Database (FPED) 2005-06 has been developed based on the USDA Food Pattern definitions used in the 2010 DGA. The Food Patterns provide calorie-based dietary guidance on how much Americans should eat from each of the FP components such as Fruit, Vegetables, Grains, Protein Foods, Dairy, and Oils to have a healthful diet, while simultaneously placing limits on the amounts of added sugars, solid fats, and alcoholic drinks that can be consumed.

The Federal Government, as part of its ongoing nutrition monitoring and surveillance activities conducts the What We Eat in America (WWEIA) survey, which is the dietary intake component of the National Health and Nutrition Examination Survey (NHANES) [3]. The WWEIA, NHANES is a continuous survey and is conducted by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (HHS). The survey uses 24-hour dietary recall method to collect data on the types and amounts of foods and beverages Americans report that they consume. The Food and Nutrient Database for Dietary Studies 3 (FNDDS 3.0) [4] provides nutrient composition of the 7000+ foods and beverages in WWEIA, NHANES [3]. In order to monitor whether Americans meet the recommendations of the DGA 2010, the foods in FNDDS must be first converted to the respective amounts of FP equivalents present in them. The FPED includes the amounts of Fruit, Vegetables, Grains, Protein Foods, Dairy, Oils, Added Sugars, Solid fats, and Alcoholic Drinks present in 100 grams of each of the FNDDS foods.

Why Develop the Food Patterns Equivalents Database?

Single ingredient FNDDS foods such as orange juice, baked potato, cooked rice, baked fish, or skim milk can be directly assigned to Fruit, Vegetables, Grains, Protein Foods, and Dairy components, respectively. However, many of the FNDDS foods such as pizza, sandwich, fruit salad, chocolate milk shake, fried eggs, and casserole are multi-ingredient foods consisting of ingredients that are from more than one FP component. Hence, it is necessary to disaggregate multi-ingredient foods to ingredients that can be assigned to an FP component before computing the amount of FP equivalents present in the food. The Food Patterns Equivalents Database serves this purpose by converting foods that are in the forms reported consumed to appropriate Food Patterns equivalents amounts, thereby

providing means to assess the adherence of American diets to the DGA recommendations.

What is Food Patterns Equivalents Database?

Food Patterns Equivalents Database is the new name for the former MyPyramid Equivalents Database (MPED) [5] developed by USDA, Agricultural Research Service (ARS), Food Surveys Research Group (FSRG). The FPED converts FNDDS foods to the respective number of cup equivalents of Fruit, Vegetables, and Dairy; ounce equivalents of Grains and Protein Foods; number of Alcoholic Drinks; teaspoon equivalents of Added Sugars; and gram equivalents of Solid Fats and Oils. Foods in FNDDS 3.0 are disaggregated to ingredients that can be directly assigned to one of the FP components. Additionally, protein foods are further disaggregated to lean fraction and fat as follows: meat and poultry are disaggregated to lean meat and solid fat fractions; and seafood and nuts to lean and oil fractions. Similarly, dairy foods are further disaggregated to low fat fraction, similar to skim milk, and solid fat fraction.

In addition, the FPED release includes a Food Patterns Equivalents Ingredients Database (FPID) that is similar to FPED for the unique ingredients of FNDDS foods. A few applications of FPID are described in this section.

What is Food Patterns Equivalents Ingredients Database?

The FNDDS SR-Links file includes data on the ingredients and the amounts present in each of the FNDDS foods (includes beverages). A majority of the FNDDS 3.0 foods are multi-ingredient and are composed of various combinations of 2700+ Standard Reference (SR) foods that form the unique ingredients of FNDDS 3.0 foods. A separate database named Food Patterns Equivalents Ingredients Database (FPID) has been developed for these unique ingredients. The FP equivalent amounts of FPID ingredients are then applied to foods in the FNDDS SR-links file to create FPED. Details on FPID and FPED development are described in the later sections.

The methodology for the development of FPED and FPID are essentially the same. The FPED includes the amounts of the 37 FP components per 100 grams of each of the FNDDS foods, and FPID includes the amounts of the 37 FP components per 100 grams of each of the unique ingredients of FNDDS foods.

Uses of Food Patterns Equivalents Ingredients Database

The FPID has the potential for many research, economic, and policy applications. A few of the major applications of FPID are listed below.

- Because FPID is ingredient-based, it can be used to estimate the amount of FP components present in foods in general, where recipes are available. FPID serves as a tool to estimate the amounts of FP components consumed

by participants of dietary studies. Additionally, because FPID is used to create FPED for foods reported in the national dietary surveys, the dietary status of the study populations is comparable to that of the national population.

- FPID in combination with ARS Food Intakes Converted to Retail Commodities Databases (FICRCDs) [6] can be used to estimate the amounts of raw, frozen, or canned fruits and vegetables commodities to be purchased to meet the DGA recommendations. To estimate the amounts of raw fruits and vegetables to be purchased, it is necessary to convert fruits and vegetables from their consumed forms to purchased forms, which include peel, seeds, and other refuse. FICRCDs include conversion factors that convert fruits and vegetable from consumed forms to purchased forms. FICRCDs also include conversion factors to convert cooked grains, legumes, meat, poultry, and fish to their respective uncooked or raw forms. Appendices 8-11 of this document [FPED 2005-06 Methodology and User Guide] include the weights of 1 cup equivalents for many fruits, vegetables, and dairy foods that are ingredients of FNDDS foods.
- The FPID can serve as a resource for estimating the cost of meeting DGA recommendations for fruits and vegetable and other food commodities. By pricing the commodities, the cost (price) of nutritious food choices can be estimated.

The following two examples illustrate the use of FPID cup equivalent weights and FICRCD conversion factors in combination to estimate: (1) the amount of raw broccoli and cantaloupe commodities to be purchased to obtain one cup equivalent of each; (2) the cost (price) of one cup equivalent of raw broccoli and cantaloupe; and (3) the number of cup equivalents of raw broccoli and cantaloupe present in one pound of respective commodities (1 pound = 454 grams).

Raw Broccoli

1 cup equivalent of broccoli (from FPID) = 80 g
Conversion factor for raw broccoli (from FICRCD) = 1.64
i.e., 164 grams of raw broccoli commodity purchased will yield 100 grams of raw, edible portion.

(1) 1 cup equivalent of broccoli, edible portion
= 80 x 1.64 = 131 g of raw broccoli commodity
131 grams raw broccoli commodity = 131 / 454 = 0.29 lb
Or, 0.29 lb of raw broccoli commodity will yield 1 cup equivalent of raw broccoli (edible portion).

(2) Price of 1 lb raw broccoli commodity = $1.70
Price of 0.29 lb raw broccoli commodity = $(1.70 x 0.29)
= $0.49
Price of 1 cup equivalent of raw broccoli is $0.49.

(3) 1 lb raw broccoli commodity = [(454 / 80) / 1.64] cup eq.
= 3.46 = 3.5 cup eq.
i.e., 1 pound of raw broccoli commodity will yield 3.5 cup equivalent of raw broccoli (edible portion).

Cantaloupe

1 cup equivalent of cantaloupe (from FPID) = 170 g
Conversion factor for cantaloupe (from FICRCD) = 1.96 g
i.e., 196 grams of raw cantaloupe commodity purchased will yield 100 grams of raw, edible portion.

(1) 1 cup equivalent of cantaloupe, edible portion
= 1.96 x 170 = 333 g of raw cantaloupe commodity
333 grams of raw cantaloupe commodity = 333 / 454 = 0.73 lb
Or, 0.73 lb of raw cantaloupe commodity will yield 1 cup equivalent of cantaloupe (edible portion).

(2) Price of 1 lb raw cantaloupe commodity = $1.00
Price of 0.73 lb raw cantaloupe commodity = $(1.00 x 0.73)
= $0.73
Price of 1 cup equivalent of raw cantaloupe is $0.73.

(3) 1 lb raw cantaloupe commodity = [(454 / 170) / 1.96] cup eq.
= 1.36 = 1.4 cup eq.
i.e., 1 pound of raw cantaloupe commodity will yield 1.4 cup equivalent of cantaloupe (edible portion).

Similar computations can be made for frozen and canned fruits and vegetables by applying appropriate conversion factors from FICRCD. Canned fruits and vegetables are assumed to contain 65% of gross weight as fruit and vegetables, respectively [6].

FPED in Dietary Analysis

Many multi-ingredient foods such as pizza, soups, sandwiches, and salads are commonly consumed. The energy and nutrients obtained from these foods can be estimated without having to disaggregate these foods to their ingredients. Nutrient adequacy estimations can be done without requiring food disaggregation. However, if data analysis requires an assessment of diets with respect to the DGA recommendations, disaggregation of foods to appropriate FP components can be attained by applying FPED amounts.

Applications of FPED

The FPED has many important applications in Federal nutrition policies and in education programs. It can be used to estimate the mean intakes of FP components and to evaluate whether Americans eat according to the DGA recommendations, by linking FPED with the appropriate WWEIA, NHANES dietary intake data. The FPED data release includes the WWEIA, NHANES day 1 and day 2 dietary data converted to FP components. The FPED (as MPED) data files are also used as a source file for SuperTracker, a dietary assessment tool [7], Healthy Eating Index [8], and USDA Food Plans including the Thrifty Food Plan [9], to name a few. Federal agencies such as the USDA Economic Research Service, Center for Nutrition Policy and Promotion, Food and Nutrition Service, U.S. Department of Health and Human Services [10], National Cancer Institute [11], and the Centers for Disease Control and Prevention use the data to conduct epidemiological studies, surveillance, risk analysis, policy analysis and to develop dietary intervention programs and messages.

FPED can be used in dietary research, if the foods in the study can be directly linked to FNDDS food codes.

What is Included in the Methodology and User Guide?

It describes the methodology including: guiding principles and other decisions made in the development of FPID and FPED FP components, determination of FP equivalents for each component, and algorithms used in the computation of FP equivalents. It also includes descriptions of the data files and databases in FPED 2005-06 release.

Food Patterns Components

Table 1 includes the main FP components in FPED and their units of measurement.

Table 1. Units of Food Patterns Equivalents Database Components

Food Patterns Equivalents Database Main Components	Units of Measurement
Fruits	Cup equivalents
Vegetables	Cup equivalents
Grains	Ounce equivalents
Dairy	Cup equivalents
Protein Foods	Ounce equivalents
Added Sugars	Teaspoon equivalents
Oils	Gram equivalents
Solid Fats	Gram equivalents
Alcoholic Drinks	Number of drinks

Food Patterns Components New to FPED

FPED includes new components that are not in MPED

- Fruit juices have been separated into a separate Fruit Juice component.
- The Red and Orange Vegetables component includes tomatoes and other red and orange colored vegetables.

Additionally, names of some of the components common to FPED and MPED have changed so as to be consistent with DGA 2010. Meat, poultry, fish, eggs, nuts, seeds, and soy products are included in the Protein Foods components. The Fish component in MPED is named Seafood in FPED. The Cured Meat component includes frankfurters, sausages, and luncheon meats that are made from beef, pork, or poultry and replaces M_Frank component of MPED.

Subdivision of Food Patterns Components to Facilitate Data Analysis

In FPED, many of the Food Patterns main components are further subdivided so as to facilitate in-depth data analysis. The Red and Orange Vegetable component is subdivided into Tomatoes and Other Red and Orange Vegetables; the Starchy Vegetable component is subdivided into Potatoes (white potatoes) and Other Starchy Vegetables; the Meat, Poultry, and Seafood component is subdivided into Meat, Poultry, Organ Meat, Cured Meat, Seafood high in *n*-3 fatty acids, and Seafood low in *n*-3 fatty acids.

Because beans and peas (legumes) can be considered as vegetables as well as protein foods, the Beans and Peas component is computed both ways, thereby providing flexibility to users to place Beans and Peas in either of the two components, but not in both simultaneously to avoid double counting. Frankfurters, sausages, and luncheon meat that are made from beef, pork, or poultry are placed in Cured Meat component because of the way they are processed. Organ meat is a separate component in FPED.

Table 2 lists the 37 FP components and includes a brief description of foods included in the components.

Table 2. Food Patterns Equivalents Database Components

FPED component and SAS variable name	Foods and Units
Total Fruit (F_TOTAL)	Total intact fruits (whole or cut) and fruit juices (cup eq.)
Citrus, Melons, and Berries (F_CITMLB)	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)
Other Fruits (F_OTHER)	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
Fruit Juice (F_JUICE)*	Fruit juices, citrus and non-citrus (cup eq.)
Total Vegetables (V_TOTAL)	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)
Dark Green Vegetables (V_DRKGR)	Dark green vegetables (cup eq.)
Total Red and Orange Vegetables (V_REDOR_TOTAL)*	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
Tomatoes (V_REDOR_TOMATO)	Tomatoes and tomato products (cup eq.)
Other Red and Orange Vegetables (V_REDOR_OTHER)	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
Total Starchy Vegetables (V_STARCHY_TOTAL)*	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
Potatoes (V_STARCHY_POTATO)	White potatoes (cup eq.)
Other Starchy Vegetables (V_STARCHY_OTHER)	Other starchy vegetables, excluding white potatoes (cup eq.)
Other Vegetables (V_OTHER)	Other vegetables not in the vegetable components listed above (cup eq.)
Beans and Peas (V_LEGUMES)	Beans and peas (legumes) computed as vegetables (cup eq.)
Total Grains (G_TOTAL)	Total whole and refined grains (oz. eq.)
Whole Grains (G_WHOLE)	Grains defined as whole grains and contain the entire grain kernel — the bran, germ, and endosperm (oz. eq.)
Refined Grains (G_REFINED)	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)
Total Protein Foods (PF_TOTAL)*	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
Total Meat, Poultry, and Seafood (PF_MPS_TOTAL)	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)

Table 2 (cont.). Food Patterns Equivalents Database Components

FPED component and SAS variable name	Foods and Units
Meat (PF_MEAT)	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)
Cured Meat (PF_CUREDMEAT)	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
Organ Meat (PF_ORGAN)	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)
Poultry (PF_POULT)	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)
Seafood High in *n*-3 Fatty Acids (PF_SEAFD_HI)	Seafood (finfish, shellfish, and other seafood) high in *n*-3 fatty acids (oz. eq.)
Seafood Low in *n*-3 Fatty Acids (PF_SEAFD_LOW)	Seafood (finfish, shellfish, and other seafood) low in *n*-3 fatty acids (oz. eq.)
Eggs (PF_EGGS)	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
Soy Products (PF_SOY)	Soy products, excluding calcium fortified soy milk and mature soybeans (oz. eq.)
Nuts and Seeds (PF_NUTSDS)	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)
Beans and Peas (PF_LEGUMES)*	Beans and peas (legumes) computed as protein foods (oz. eq.)
Total Dairy (D_TOTAL)	Total milk, yogurt, cheese, and whey. For some foods, the total dairy values could be higher than the sum of D_MILK, D_YOGURT, and D_CHEESE because the Miscellaneous Dairy component composed of whey is not included in FPED as a separate variable. (cup eq.)
Milk (D_MILK)	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
Yogurt (D_YOGURT)	Yogurt (cup eq.)
Cheese (D_CHEESE)	Cheeses (cup eq.)
Oils (OILS)	Fats naturally present in nuts, seeds, and seafood; unhydrogentated vegetable oils, except palm oil, palm kernel oil, and coconut oils; fat present in avocado and olives above the allowable amount; 50% of fat present in stick and tub margarines and margarine spreads (grams)

Table 2 (cont.). Food Patterns Equivalents Database Components

FPED component and SAS variable name	Foods and Units
Solid Fats (SOLID_FATS)	Fats naturally present in meat, poultry, eggs, and dairy (lard, tallow, and butter); hydrogenated or partially hydrogenated oils; shortening; palm, palm kernel and coconut oils; fats naturally present in coconut meat and cocoa butter; and 50% of fat present in stick and tub margarines and margarine spreads (grams)
Added Sugars (ADD_SUGARS)	Foods defined as added sugars (tsp. eq.)
Alcoholic Drinks (A_DRINKS)	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)

* New variable in FPED and not in MPED 2

Appendix 1 contains a detailed list of foods included in each of the 37 Food Patterns components in FPED. Appendix 2 lists the variables in MPED 2 and FPED, showing the connections between the variables in the two databases.

Foods Not Assigned to Any Food Patterns Components

A few of the FNDDS 3.0 foods are considered as non-FP components because they contain a substantial proportion of ingredients that are not conventional FP components. These non-FP foods include infant formula and a few of the milk- or soy-based beverages that are meal supplements or protein supplements containing extensively processed ingredients such as hydrolyzed whey and soy products which are not FP foods. Other foods that are considered as non-FP components include broth, coconut water, cornstarch, black coffee without added sugars, human milk, leavening agents, lecithin, mustard, orange peel, salt, low-calorie or nonnutritive sweeteners, sugarless gums, soy sauce, tea without additions, vinegar, water, yeast extract, and spices such as celery seeds, cinnamon, cloves, cumin, curry powder, nutmeg, black and white pepper, poppy seeds, and powdered spices.

Files Included in the Release

The release includes:

- Methodology and User Guide;
- The amount of each of the 37 FP components present per 100 grams of each of the FNDDS 3.0 foods (FPED) and their unique ingredients (FPID) in MS Access and SAS;
- The amount of each of the 37 FP components present in individual foods reported by each respondent on day 1 and day 2 of the survey and respondents' demographic information in SAS;

- Total amount of each of the 37 FP components reported by each respondent on day 1 and day 2 of the survey and respondents' demographic information in SAS;
- Four table sets containing estimates of mean intakes of the 37 FP components on day 1, by demographic groups; and
- SAS codes file to create mean intake estimates of FP components on day 1, by demographic groups.

The names of the files including the MS Access and SAS datasets that are released in FPED 2005-06 are listed in Table 3.

Table 3. List of files and datasets included in FPED 2005-06 release

Name of the file	Information contained in the file
fped_0506.pdf	Food Patterns Equivalents Database 2005-06: Methodology and User Guide with appendices on the foods included in each of the 37 FP components and cup weights for fruits, vegetables, and dairy
fpid_0506.mdb	Includes amounts of the 37 FP components present per 100 grams of the 2744 FNDDS 3.0 ingredients, in MS Access
fpid_0506.sas7bdat	Includes amounts of the 37 FP components present per 100 grams of the 2744 FNDDS 3.0 ingredients, in SAS
fped_0506.mdb	Includes amounts of the 37 FP components present per 100 grams of the 7723 FNDDS 3.0 foods, in MS Access
fped_0506.sas7bdat	Includes amounts of the 37 FP components present per 100 grams of the 7723 FNDDS 3.0 foods, in SAS
fped_dr1iff_0506.sas7bdat	Includes amount of each of the 37 FP components present in each of the foods reported by the respondents on day 1 and demographic variables. Total number of observations in the file = 146940. See Appendix 5 for the variables list.
fped_dr2iff_0506.sas7bdat	Includes each of the 37 FP components present in each of the foods reported by the respondents on day 2 and demographic variables. Total number of observations in the file = 132151. See Appendix 5 for the variables list.

Table 3 (cont.). List of files and datasets included in FPED 2005-06 release

Name of the file	Information contained in the file
fped_dr1tot_0506.sas7bdat	Includes total amount of each of the 37 FP components from foods reported by each respondent on day 1 and demographic variables. Total number of observations in the file = 9950. See Appendix 6 for the variables list.
fped_dr2tot_0506.sas7bdat	Includes total amount of each of the 37 FP components from foods reported by respondents on day 2 and demographic variables. Total number of observations in the file = 9950. See Appendix 6 for the variables list.
Table_1_FPED_GEN_0506.pdf	Mean intakes of FP components by age-gender groups; day 1 dietary intake
Table_2_FPED_RAC_0506.pdf	Mean intakes of FP components by race-ethnicity groups; day 1 dietary intake
Table_3_FPED_INC_0506.pdf	Mean intakes of FP components by household income groups (in dollars); day 1 dietary intake
Table_4_FPED_POV_0506.pdf	Mean intakes of FP components by household income groups (as percent of poverty); day 1 dietary intake
MakeTables.sas	SAS codes file that produces mean intakes tables 1- 4 (Appendix 7). While executing MakeTables.sas, day 1 total file, fped_dr1tot_0506.sas7bdat should be in the same folder as MakeTables.sas.

Chapter 2

Food Patterns Equivalents Database Methodology

Overview

The methodology used to develop the MPED has been revised in order to:

- Simplify FPED development
- Apply consistent decisions across similar foods

Major differences between FPED and MPED methodology are:

- Consolidation of the weights of one cup equivalent of fruits such that similar types of fruits will have the same cup weights, with a few exceptions.
- Fruit juices form a separate component and are not included along with intact or whole fruit.
- Consolidation of the weights of one cup equivalent of vegetables such that similar types of vegetables will have the same cup weights, with a few exceptions.
- Definition of ounce equivalents of grains: For grain products such as breads, pancakes, waffles, muffins, and grain-based snacks made of flour, 16 grams of flour is used as the basis for defining one ounce equivalent of grains. Cooked grains such as cooked rice, pasta, and hot breakfast cereals are converted to uncooked form, and one ounce equivalent of grains is defined as 28.35 grams. No change has been made from the MPED definition of one ounce equivalent of grains (28.35 g) for ready-to-eat cereals.
- Inclusion of calcium fortified soy milk in the Dairy Group, as defined in the DGA 2010.
- Computation of added sugars equivalents using the sugar content of foods and ingredients that are defined as added sugars.
- Computation of the number of alcoholic drinks directly from the alcohol (ethanol) content of the beverages. One drink is defined as the amount of alcoholic beverage containing 0.6 fluid ounces or 14 grams of alcohol.
- Yogurt present in frozen yogurt is assigned to the Yogurt component. In MPED, frozen yogurt was assigned to the Milk component.
- Fat free cream cheese is assigned to the Cheese component. In MPED, it was assigned to solid fat.
- The fat present in stick, tub, and spread type of margarines are divided into equal amounts of oils and solid fats. This is a major change from MPED, where stick margarines were assigned to solid fats and tub and spread types containing less than 80 percent fat were assigned to oils.

Guiding Principles

The following guiding principles were used when assigning foods to respective Food Patterns (FP) components:

- **Assigning foods to appropriate FP components independent of the amounts in which they are present**: All ingredients are assigned to an FP component, even if they are present in small amounts in the food. Milk present in coffee, tea, batters, cookies, and cakes; lemon juice used in mayonnaise, cake icing, baked or broiled fish; lime juice present in alcoholic beverages; cheese and oils present as ingredients of sauces; nuts used as garnishes; fruits and nuts present as ingredients in candies, breads, muffins and ready-to-eat cereals are some of the examples where an FP component can be present in small amounts in a food and required consideration in FPED.
- **Rounding to two decimals places:** The amounts of FP components present per 100 grams of each food in FPED were rounded to two decimal places. Any food ingredient that is present in very minuscule amounts will have a value of zero when rounded.
- **Rounding the weights of fruits and vegetables cup equivalents to the nearest zero or five grams**: Weights of one cup equivalent of fruits and vegetables, including cooked beans and peas (legumes), were rounded to the nearest zero or five grams. The reason being because of measurement error we do not have the precision to estimate the cup weight rounded to the nearest gram. For example, a cup weight of 126 grams is rounded to 125 grams (nearest five grams), implying it is between 122.50 to 127.49 grams. However, it should be noted that even these rounded values have measurement errors associated with them. The cup weights of dried fruits and vegetables, potato chips, and vegetable chips are small compared with raw or cooked vegetables and hence were not rounded to the nearest zero or five grams to minimize cup weight errors.
- **Consolidating cup equivalents for similar fruits and vegetables:** The weights of one cup equivalents of fruits and vegetables were consolidated such that similar types of fruits or vegetables will have the same cup weights, with a few exceptions. For example, all types of berries such as raw blackberries, blueberries, cranberries, mulberries, raspberries, and strawberries were assigned 145 grams as the weight of one cup equivalent. Likewise, all types of raw peppers such as banana, hot chili, poblano, serrano, and bell were assigned a weight of 120 grams per one cup equivalent. Cooked beans and peas (legumes) such as cooked black beans, fava beans, lentils, lima beans, mung beans, pinto beans, chickpeas, cowpeas, and white beans were assigned a weight of 175 grams per cup

equivalent. Details on additional decisions made on fruit and vegetables groups are described under Fruit Group and Vegetables Group chapters.

- **Applying 16 gram flour rule:** The grains were categorized into either whole grains or refined grains (non-whole grains) based on whether they contained the entire grain kernel or only certain components of the kernel. In the MPED, the weights of specific sizes of foods such as the weights of one slice of white bread (26 g), half of a hamburger roll (21.5 g), half of an English muffin (25 to 29 g), and small pancakes (40 g) were used as the basis for determining what counts as one ounce equivalent of grains. However, in FPED, the weight of the food that contained 16 grams of flour was used as the basis for defining one ounce equivalent of grains for grain products made of flour. This principle was applied to grain-based foods such as breads, cakes, cookies, corn chips, crackers, muffins, pie crust, pastries, pretzels, quick breads, and all types of rolls (hard, hamburger, hot dog, soft, sweet). The revised methodology offers a standardized way to compute grain equivalents. Cooked grains such as cooked rice, pasta, macaroni, and hot breakfast cereals were first converted to respective amounts of uncooked grains or cereals with one ounce equivalent of grains defined as 28.35 grams. No changes were made to the MPED definition of one ounce equivalent of grains for ready-to-eat cereals, which was 28.35 grams. Details on additional decisions made on grains are described in the Grain Group chapter.
- **Soy milk:** Calcium added (fortified) soy milk was included in the Dairy Group, and soy milk that did not contain added calcium was placed in the Soy Product Group.

Food Patterns Equivalents Ingredients Database and Food Patterns Equivalents Database

The 7000+ foods in the FNDDS-SR Links file were composed of various combinations of 2700+ unique ingredients. A Food Patterns Equivalents Ingredients Database (FPID) was developed first for these unique ingredients. The methodology for the development of FPID and FPED were the same, and they each have 37 FP components per 100 grams of ingredient or food. The FPID was applied to foods in the FNDDS-SR Links file and the FPED was developed.

Major Development Steps

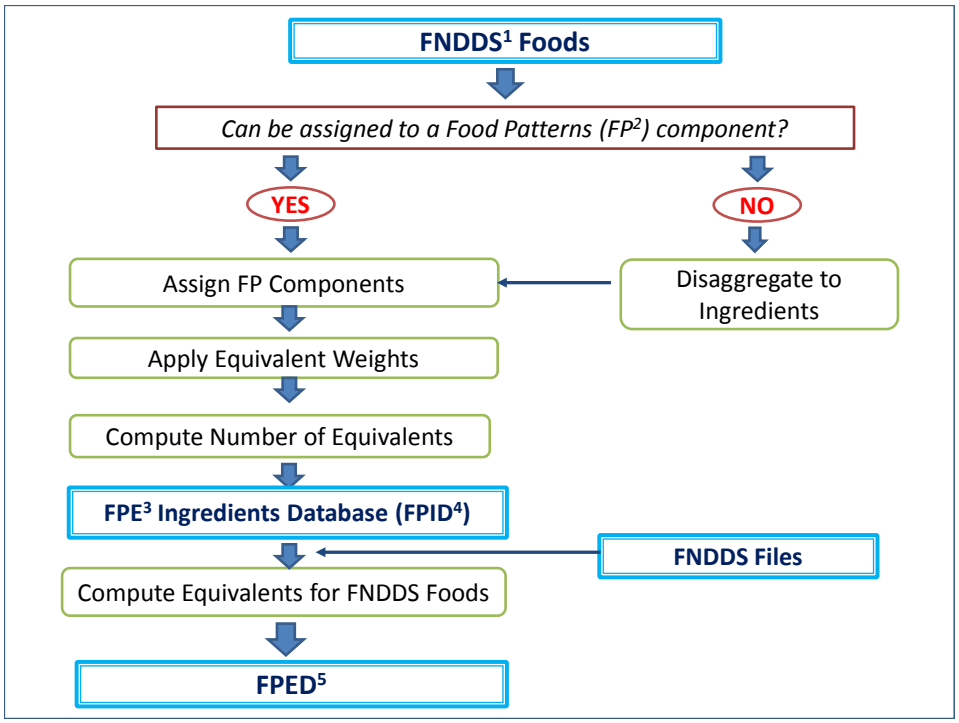
There are four major steps involved in computing Food Patterns equivalents for each FNDDS 3.0 food:

1. Disaggregation of FNDDS 3.0 foods to its ingredients.
2. Assignment of appropriate Food Patterns (FP) components to ingredients.
3. Computation of FP equivalents per 100 grams of ingredient by applying equivalent weights (FPID).

4. Determination of the amounts of each of the 37 FP equivalents present per 100 grams of FNDDS 3.0 foods, by applying FPID values.

Figure 1 illustrates the major steps in the development of FPID and FPED.

Figure 1. Overview of the Process



[1]FNDDS = Food and Nutrient Database for Dietary Studies
[2]FP = Food Patterns
[3]FPE = Food Patterns Equivalents
[4]FPID = Food Patterns Equivalents Ingredients Database
[5]FPED = Food Patterns Equivalents Database

Assignment of FNDDS Foods to Food Patterns Components

Some of the FNDDS foods form their own ingredient, and others have more than one ingredient, as shown below. In Table 4, milk, apple, and carrots form their own ingredient; and honey roasted walnuts and fried eggs have two and three ingredients, respectively.

Table 4. Examples of FNDDS foods and their ingredients

FNDDS food code	Description	SR ingredient code	Ingredient description
11111000	Milk, cow's, fluid, whole	01077	Milk, whole, 3.25% milk fat, with added vitamin D
63101000	Apple, raw	09003	Apples, raw
73101010	Carrots, raw	11124	Carrots, raw
42116100	Walnuts, honey roasted	12155	Walnuts
		19296	Honey
31105000	Eggs, whole, fried	01123	Eggs, whole, raw, fresh
		04610	Margarine, stick
		02047	Table salt

FNDDS foods that can be directly assigned to an FP component are assigned to the appropriate component. Fruits, vegetables, fluid milk, cheese, cooked rice and pasta, broiled meat and fish, butter, cooking oils, and plain peanuts and tree nuts are examples of foods that can be directly assigned to an FP component, without requiring disaggregation into ingredients. Using Table 4 examples, milk, apples, and carrots can be assigned directly to the appropriate FP components. If an FNDDS food can be directly assigned to an FP component, then the number of FP equivalents were computed using appropriate cup, ounce, or gram weights.

Disaggregation of FNDDS Foods into Ingredients

Foods that cannot be directly assigned to an FP component are disaggregated into its ingredients. Most of the FNDDS foods are multi-ingredient foods and cannot be directly assigned to an FP component, without prior disaggregation into their ingredients (e.g., pizza, sandwiches, soups, cakes, cookies, candies, ready-to-eat cereals, rice with vegetables and meat, frozen dinners). In Table 4 examples, honey roasted walnuts and fried eggs cannot be directly assigned to an FP component and need disaggregation into ingredients that can be assigned to an FP component. Table 5 provides a conceptual model for the level of food disaggregation used in FPID and FPED.

Table 5. A Conceptual Model for Food Disaggregation

Survey food description	Recipe for the previous level		
	Level 1 disaggregation	**Level 2 disaggregation**	**Level 3 disaggregation**
Tuna noodle casserole with cream or white sauce [a]	1. Light tuna fish, canned in oil, drained	i. Tuna fish [b] ii. Soybean oil [b] iii. Salt [c]	
	2. Egg noodles, cooked	i. Egg noodles, dry	i. Whole eggs, raw [b] ii. Wheat flour [b]
	3. Fluid milk [b]		
	4. Regular stick margarine, 80% fat [b]		
	5. White all purpose wheat flour [b]		
Tequila Sunrise [a]	1. Tequila [b]		
	2. Orange juice [b]		
	3. Lime juice [b]		
	4. Grenadine	i. High fructose corn syrup [b] ii. Water [c]	
Baked fish [a]	1. Fish [b]		
	2. Butter [b]		
	3. Lemon juice [b]		

[a] Only the major ingredients are listed
[b] Indicates the level at which assignments are made
[c] Ingredient is defined as a non-FP component

Assignment of Ingredients to Food Patterns Components

After disaggregation, each ingredient is either assigned to an appropriate FP component listed in Table 2 or to the "non-FP component" category.

Applying Equivalent Weights and Computing Number of Food Patterns Equivalents

The FP equivalents are computed per 100 grams of ingredients or foods that have an FP component assignment. Table 6 gives examples of FP equivalents computations per 100 grams of ingredient or foods.

Table 6. Application of Equivalent Weights and Computation of Number of Equivalents Present per 100 Grams of Ingredient or Food

Food	Weight of one cup equivalent (g)	Number of equivalents per 100 grams of food
Fluid milk	245	100 / 245 = 0.41
Carrots, raw	125	100 / 125 = 0.80
Berries, raw	145	100 / 145 = 0.69
100% fruit juices	250	100 / 250 = 0.40

Computation of Number of Equivalents in 100 Grams of FNDDS Foods

The amounts of FP equivalents present in each of the ingredients of an FNDDS food are totaled to get the 37 FP component profile per 100 grams of food. FNDDS foods that have only non-FP components will have zero values for all of the FP components in FPED. There are no missing values in FPID and FPED.

The following table provides an overview of computing number of equivalents for 100 grams of sweetened yogurt with strawberries.

Table 7. Number of Equivalents Computation: Sweetened Yogurt with Strawberries

Ingredients[1]	Amount present per 100 grams of food (g)	Weight of one cup equivalent (g)	Food Patterns component assignment	Number of equivalents per 100 grams of food
Yogurt, non-fat	82	245	Yogurt	0.34 cup
Strawberries, frozen	6	150	Citrus, Melons, and Berries	0.04 cup
Sugar	12	4.2	Added Sugar	2.86 tsp.

[1]Only the major FP ingredients are included.

In FPED, 100 grams of sweetened yogurt will have 0.34 cup Yogurt and Total Dairy; 0.04 cup Citrus, Melons, and Berries, and Total Fruit; and 2.86 teaspoons of Added Sugars; and the rest of the FP components will have zero values.

Chapter 3

Fruit Group

This chapter discusses the Fruit Group components and the determination of the amount of Food Patterns equivalents for its components, with examples.

Fruit Group Components

The Fruit Group consists of three components: Citrus, Melons, and Berries; Other Fruits; and Fruit Juice. The first two components include fruits that are consumed as intact fruit or as fruit pieces and exclude fruit juices. The Fruit Juice component includes both citrus and non-citrus fruit juices.

The Citrus, Melons, and Berries component includes blackberries, blueberries, cranberries, currants, dewberries, huckleberries, kiwifruit, loganberries, mulberries, raspberries, and strawberries; melons such as cantaloupe, casaba, honeydew, and watermelon; and citrus fruit such as calamondin, grapefruit, kumquats, lemons, limes, mandarin oranges, oranges, tangerines, and tangelos. The Other Fruit component includes apples, apricots, bananas, cherries, dates, figs, grapes, guava, litchis, mangoes, nectarines, papaya, passion fruit, peaches, pears, pineapple, plums, pomegranates, prunes, raisins, rhubarb, and tamarind. The Fruit Juice component includes juice of citrus, melons, berries and other fruits.

Appendix 1 lists foods in the Fruit Group.

Determination of Cup Equivalent Weights of Fruits and Fruit Juices

One cup of raw, canned, or frozen fruit, or one cup of 100% fruit juice is defined as one cup equivalent of fruit. The weights of one cup equivalent of fruits are consolidated such that similar types of fruits will have the same cup weights, with a few exceptions. The cup weights are rounded to the nearest zero or five grams. The cup weights are based on the most common cup weight for the fruits within the group, as provided in FNDDS 3.0.

Berries: One cup weights of raw (or fresh) berries such as blackberries, blueberries, dewberries, huckleberries, loganberries, mulberries, and strawberries are between 140 and 145 grams, with most of them weighing 145 grams. Therefore, raw/fresh berries are assigned 145 grams per cup. Frozen berries have a higher cup weight, probably due to compacting of fruit during blanching prior to freezing. One cup of frozen, unsweetened berries is given a weight of 150 grams; and frozen, sweetened berries are given 165 grams cup weight because of added sugars.

Melons: Casaba, cantaloupe, and honeydew melons weigh about 170 grams per cup, and therefore 170 grams is chosen as one cup weight for all types of melons. An exception is watermelon with a cup weight of 150 grams.

Citrus fruit: One cup weight of all raw commercial varieties of oranges is 180 grams, Florida oranges 185 grams, and tangerines and mandarins 195 grams. A cup weight of 185 grams is chosen for these fruits. Lemon, lime, and grapefruits have a higher cup weight, and are assigned the cup weight of lemon, which is 210 grams.

Other fruits: For most of the fruits categorized as other fruits, weights were adjusted close to the cup weights used in FNDDS 3.0 and rounded to the nearest zero or five grams such as apples 110 grams, banana 150 grams, papaya 140 grams, peaches 154 grams rounded to 155 grams, and nectarines 143 grams rounded to 145 grams.

Fruit juices, nectars and fruit juice drinks: Single strength fruit juices and fruit juice drinks are assigned a cup weight of 250 grams; frozen juice concentrates 70 grams; and fruit nectars 250 grams. Fruit nectars and fruit juice drinks contain added sugars in addition to fruit juice or pulp. Only a few fruit nectars have label information as to the amount of fruit contained in them which ranged from 25 to 45 percent. Due to a lack of detailed information as to the percentage of fruit pulp or juice present in fruit nectars, it was decided that all types of fruit nectars contained 40 percent of fruit juice or pulp. Fruit juice drinks were assumed to contain 15 percent fruit juice. Consequently, 100 grams of nectars and fruit juice drinks contain 0.16 and 0.06 cup equivalents of fruit juice, respectively. In addition, the added sugars present in nectars and fruit juice drinks are computed, after subtracting sugars naturally present in the Fruit Juice components.

Examples:

1. Mango nectar

One cup weight of mango pulp	= 250 g
Number of cup equivalents per 100 grams	= 100/250 = 0.4 cup eq.
Number of cup equivalents in FPED (40% fruit juice assumed)	= (0.4 x 0.4) cup eq. = 0.16 cup eq.

2. Fruit juice drink, low calorie

One cup weight of fruit juice drink	= 250 g
Number of cup equivalents per 100 grams	= 100/250 = 0.4 cup eq.
Number of cup equivalents in FPED (15% fruit juice assumed)	= (0.4 x 0.15) cup eq. = 0.06 cup eq.

Frozen fruit juice concentrates: The determination of one cup weight for frozen fruit concentrate is described below.

Example: Frozen orange juice concentrate

One cup weight of orange juice frozen concentrate	= 284 g
Frozen orange juice concentrate is made to single-strength by adding 3 parts water to 1 part juice concentrate.	
Dilution factor to bring frozen concentrate to single strength juice	= 4
Weight of frozen orange juice concentrate to produce 1 cup single strength juice	= 284 / 4 = 71
Rounded weight	= 70 g

Canned fruit: The weights of one cup equivalent of canned fruits are as follows: in water pack or juice pack 245 grams, in light syrup 250 grams, and in heavy syrup 255 grams. Fruit canned in 100% fruit juice, water, light or heavy syrups were assumed to contain 65 percent fruit and 35 percent liquid medium. Fruits canned in fruit juice contain 65 percent fruit and 35 percent juice. The juice in juice packs is assigned to Fruit Juices and the fruit to the respective Fruit component. In addition, the added sugars in the syrup are computed, after subtracting the naturally present sugars in fruits.

Example: Canned pineapple in light syrup

One cup weight of canned pineapples in light syrup	= 250 g
Number of cup equivalents per 100 grams	= 100/250 = 0.4 cup eq.
Number of cup equivalents in FPED (65% fruit assumed)	= (0.4 x 0.65) cup eq. = 0.26 cup eq.

Dried Fruit: The weight of ½ cup of dried fruit is defined as one cup equivalent.

Multi-ingredient Foods Containing Fruit

Fruit present in multi-ingredient foods such as fruit salads, cakes, ice cream, and other desserts; fruit juices present in cocktails, fruit nectars, and fruit juice drinks are assigned to the appropriate Fruit component. Ingredients other than fruit or fruit juice are assigned to the respective FP components.

Table 8 summarizes one cup equivalent weights of selected Fruit Group foods. Appendix 8 includes an extensive list of one cup equivalent weights for fruits and fruit juices.

Table 8. Fruit Group: Summary of Selected Cup Equivalent Weights

Fruit type	Weight of one cup equivalent (g)	Additional information
All types of berries, raw	145	
All types of berries, frozen, unsweetened	150	
All types of berries, frozen, sweetened	165	
Citrus fruit, oranges	185	
All melon types (except, watermelon), raw	170	Watermelon 150 grams/cup
All other fruits, raw	varied	Mostly FNDDS 3.0 weights, rounded to nearest 0 or 5 grams
Fruit juice (100%)	250	
Fruit juice concentrate, frozen	70	
Canned fruit in juice pack	245	65% fruit assumed, 35% juice
Canned fruit in water pack	245	65% fruit assumed
Canned fruit in light syrup	250	65% fruit assumed; added sugars computed
Canned fruit in heavy pack	255	65% fruit assumed; added sugars computed
Canned fruit water or juice pack, drained	190	
Canned fruit syrup pack, drained	200	
Applesauce	245	
Fruit nectar	250	40% fruit juice assumed; added sugars computed
Fruit juice drinks	250	15% fruit juice assumed; added sugars computed
Dried fruit	45-90	FNDDS 3.0 weights, rounded
Dried fruit, cooked or stewed	250	

Chapter 4

Vegetables Group

This section discusses the Vegetable Group components and the determination of the amount of Food Patterns equivalents for its components, with examples. Olives, avocados, and plantains are used as vegetables in meals, and hence are included in the Vegetable Group in the USDA Food Patterns.

Vegetables Group Components

The Vegetables Group consists of five components: Dark Green, Red and Orange, Starchy, Other, and Beans and Peas (Legumes). The Beans and Peas can also be treated as Protein Foods. Vegetables juices were included under the respective vegetables; FPED does not have a separate vegetable juice component.

The Dark Green Vegetables component includes arugula, basil, beet greens, bitter melon leaves, broccoli, Chinese cabbage (pak-choi), chrysanthemum garland, chard, cilantro, collards, cress, dandelion greens, kale, lambsquarters, lettuce (Boston, butterhead, cos, romaine, green leaf, and red leaf), mustard cabbage, mustard greens, parsley, poke greens, recaito (Puerto Rican little coriander), spinach, turnip greens, and watercress.

The Red and Orange Vegetables component includes calabaza (Spanish pumpkin), carrots, red chili peppers, red or orange bell peppers, pimento (pimiento), pumpkin, squash (most winter types), sweet potatoes, and tomatoes.

The Starchy Vegetables component includes breadfruit, burdock, cassava (yuca blanca), corn, lima beans, immature peas (e.g., cowpeas, blackeye peas, green peas, pigeon peas), jicama or yam beans, plantain, poi, white potatoes, salsify, tapioca, taro, water chestnuts, and yam.

The Other Vegetables component includes artichoke, asparagus, avocado, bamboo shoots, beans (green, string), bean sprouts, beets, bitter melon (bitter gourd, balsam pear), broccoflower, Brussels sprouts, cabbage (green, red, savoy), cactus (nopales), cauliflower, celeriac, celery, chayote or christophine, chives, cucumber, eggplant, fennel bulb, garlic, ginger root, kohlrabi, leeks, lettuce (iceberg and others not included under dark green category), luffa (Chinese okra), mushrooms, okra, olives, onions, peppers (chili and bell types that are not red or orange in color), radicchio, sprouted beans (e.g. sprouted mung beans), radish, rutabaga, squash (summer), snow peas, tomatillos, turnips, and winter melons.

The Beans and Peas (Legumes) component includes all mature beans and peas (legumes) such as black beans, black-eyed peas, brown beans, bayo beans, carob, chickpeas (garbanzo beans), fava beans, kidney beans, lentils, lima beans, mung beans, navy beans, pink beans, pinto beans, split peas, white beans, and soybeans.

Soy flour, soy isolate, and soy concentrate are not included in Beans and Peas, but are assigned to Protein Foods (variable name: M_Soy).

Appendix 1 lists foods in the Vegetables Group.

Determination of Cup Equivalent Weights of Vegetables and Vegetable Juices

One cup of raw, canned, frozen, or cooked vegetable, two cups of raw, leafy vegetables, one cup of cooked beans and peas (legumes), or one cup of 100% vegetable juice are defined as one cup equivalent of vegetables. The cup weights chosen are close to the FNDDS 3.0 weights, with a few exceptions. The weights of one cup equivalent of vegetables are rounded to the nearest zero or five grams. Variations in the cup weights exist among some of the vegetables in the dark green, red and orange, starchy, or other vegetables categories; and the cup weights are consolidated as much as possible.

- Sliced, diced, or chopped raw vegetables are given the same cup weight because FNDDS food code descriptions do not specify the types of cuts. Most often, the cup weights were the average weights of different cuts. For example, raw carrots are assigned 125 grams cup weight, which is an average of one cup of sliced (122 g) and chopped (128 g) carrots; bell peppers are assigned 120 grams cup weight, which is an average of one cup sliced (92 g) and chopped (149 g); and one cup of broccoli was assigned 80 grams, which is an average of broccoli flowerets (71 g) and chopped broccoli (88 g).
- In general, raw vegetables have lower cup weights than their cooked counterparts. Examples include carrots, raw 125 grams, cooked 145 grams; cucumber, raw 120 grams, cooked 180 grams; eggplant, raw 80 grams, cooked 95 grams; bell peppers, raw 120 grams, cooked 135 grams; and mushrooms, raw 70 grams, cooked 155 grams. This highlights the fact that a person eating cooked vegetables will have to eat greater amounts to get the same number of cup equivalents as a person eating raw or uncooked vegetables.
- Most often, the same cup weights are used regardless of whether a cooked vegetable is prepared from raw (fresh), frozen, or canned form of vegetables, with a few exceptions. Vegetables for which the same cup weights are assigned regardless of the form include artichoke, asparagus, beets, Brussels sprouts, cabbage, carrots, corn, onions, peas, peppers, pumpkin, summer squash, sweet potatoes, and turnips. Where FNDDS 3.0 cup weights of canned or frozen vegetables are quite different from the respective vegetables cooked from fresh or NS as to form, two sets of cup weight are used, as described below.
    - Dark green, leafy vegetables such as collards, greens, kale, mustard greens, spinach, and turnip greens have the same cup weights when prepared from fresh (raw) and different set of cup weights if prepared from frozen or canned forms.

    - Other vegetables such as okra and string beans and starchy vegetables such as immature lima beans prepared from fresh or NS as to forms are assigned the same cup weights and that prepared from frozen or canned have a different set of cup weights.

  An explanation for the observed higher weights of canned and frozen vegetables in FNDDS 3.0 could be due to the compacting of leafy vegetables and some of the other non-leafy vegetables during blanching.
- The FNDDS 3.0 weights for one cup of cooked beans and peas (legumes) range from 170 to 191 grams, with an exception of mung beans which weigh 200 grams per cup. Most of the cup weights for beans are between 172-177 grams. A cup weight of beans not specified as to type of beans is 175 grams. For this reason, cooked beans and peas (legumes) are assigned 175 grams cup weight. The average value of the conversion factors that are used in the USDA's Food Intakes Converted to Retail Commodities Database, 2003-08 [6], to convert cooked legumes to uncooked legumes is 0.33. And so, one cup of uncooked legumes is assigned as 60 grams weight (175 x 0.33 = 58, then rounded to 60).
- The assigned weights of one cup of potatoes and potato products are: boiled potatoes and canned potatoes, drained, 155 grams; baked or roasted potatoes, 120 grams; and potato chips, 57 grams (2 oz.).
- The weight of ½ cup of dried vegetables is defined as one cup equivalent of vegetables.
- One cup of raw tomatoes is assigned 170 grams; tomato paste and puree, 120 grams; tomato sauce and tomato juice, 245 grams; and dried tomatoes, 25 grams.

Table 9 summarizes one cup equivalent of vegetables discussed above and a few additional vegetables. Appendix 9 includes an extensive list of one cup equivalent weights for vegetables.

Table 9. Vegetables Group: Summary of Selected Cup Equivalent Weights

Vegetables	Weight of one cup equivalent (g)
Artichoke, raw	150
Artichoke, cooked from raw, frozen, or canned	175
Asparagus, raw	135
Asparagus, cooked from raw, frozen, or canned	180
Avocados, raw	145
Bean sprouts, raw	105
Bean sprouts, cooked from raw, or canned	125
Beets, raw	135
Beets, cooked from raw, frozen, or canned	170
Bitter melon, cooked	125
Broccoflower, raw	110
Broccoflower, cooked	125
Broccoli, raw	80
Broccoli, cooked from raw, frozen, or NS[1] as to form	155
Brussels sprouts, raw	90
Brussels sprouts, cooked from raw, frozen, or NS[1] as to form	155
Cabbage, (green, red, or savoy), raw	90
Cabbage, (green, red, or savoy), cooked	150
Cabbage, Chinese (pak-choi), raw	140
Cabbage, Chinese (pe-tsai), raw	150
Carrots, raw	125
Carrots, cooked from raw, frozen, or canned	145
Cauliflower, raw	110
Cauliflower, cooked from raw, frozen, or NS[1] as to form	125
Cauliflower, cooked from canned	180
Celery, raw	120
Celery, cooked	150
Collards, raw	70
Collards, cooked from fresh or NS[1] as to form	130
Collards, cooked from frozen or canned	165
Corn, raw	150
Corn, cooked from raw, frozen, or canned	165
Cucumber, raw	120
Cucumber, cooked	180
Eggplant, raw	80
Eggplant, cooked	95

[1]NS = Not Specified

Table 9 (cont.). Vegetables Group: Summary of Selected Cup Equivalent Weights

Vegetables	Weight of one cup equivalent (g)
Kale, cooked from fresh or NS[1] as to form	130
Kale, cooked from frozen or canned	165
Beans and peas or legumes, uncooked	60
Beans and peas or legumes, cooked	175
Lima beans, raw, immature	155
Lima beans immature, cooked from fresh or NS[1] as to form	170
Mushrooms, raw	70
Mushrooms, cooked from raw, frozen, or canned	155
Mustard greens, cooked from fresh	140
Mustard greens, cooked from canned, frozen, or NS[1] as to form	150
Okra, raw	115
Okra, cooked from fresh	160
Okra, cooked from frozen or canned	170
Onions, raw	160
Onions, cooked from raw, frozen, or NS[1] as to form	210
Peppers: bell, chili and all types, raw	120
Peppers: bell, chili and all types, cooked from raw, frozen, or NS[1] as to form	135
Potatoes, baked	120
Potatoes, boiled or canned and drained	155
Potato chips, snack-type	57 (2 oz.)
Pumpkin, raw	115
Pumpkin, cooked from raw, frozen, or canned	245
Spinach, raw	70
Spinach, cooked from fresh or NS[1] as to form	150
Spinach, cooked from frozen or canned	170
Squash, summer, raw	115
Squash, summer, cooked from raw, frozen, or canned	180
Squash, winter type, raw	115
Squash, winter type, cooked or baked	205
Squash, winter type, mashed	245
String beans, raw	110
String beans, cooked from fresh or NS[1] as to form	125
String beans, cooked from frozen or canned	135
Sweet potatoes, boiled or baked	200
Sweet potato chips	57 (2 oz.)

[1]NS = Not Specified

Table 9 (cont.). Vegetables Group: Summary of Selected Cup Equivalent Weights

Vegetables	Weight of one cup equivalent (g)
Tomatoes, raw	170
Tomatoes, dried	25
Tomato paste	120
Tomato puree	120
Tomato sauce	245
Turnips, raw	130
Turnips, cooked from raw, frozen, or canned	155
Turnip greens, cooked from fresh	145
Turnip greens, cooked from canned, frozen, or NS[1] as to form	160
Juices: 100% vegetable juices, all types	245

[1]NS = Not Specified

Naturally Occurring Fats in Olives and Avocado

Among vegetables, olives and avocado have naturally occurring fat in much higher amounts than the rest of the other vegetables in FPED. Next to olives and avocado, fresh sweet corn has the highest amount of naturally occurring fat. The amount of naturally occurring fat in fresh sweet corn was defined as the allowable fat in raw vegetables. Fresh corn contains 1.5 grams of naturally occurring fat per 100 grams which equals 2.25 grams per cup equivalent. The fats naturally occurring in olives and avocado in amounts greater than 1.5 grams per 100 grams are assigned to the Oils component (CNPP, personal communication, February 8, 2013).

Addition of Fats or Sugars to Vegetables

Fats added to vegetables during cooking or at the table (e.g., butter or sour cream added to baked potato) are appropriately assigned to either Oils or Solid Fats. Sugars added to relishes and pickles are assigned to Added Sugars.

Data Analysis Guidance: White Potatoes and Tomatoes

White potatoes and tomatoes are consumed in large amounts and researchers are interested in estimating their consumption. Hence these two vegetables have their own individual component assignments to aid data analysis. FPED variables v_starchy_potato includes potatoes only; v_starchy_other includes all starchy vegetables, except potatoes; and v_starchy_total is the sum of the previous two variables. Similarly, v_redor_tomato includes tomatoes and tomato products;

v_redor_other includes all other red and orange vegetables, except tomatoes; and v_redor_total is the sum of the previous two variables.

Data Analysis Guidance: Beans and Peas

The Beans and Peas (Legumes) can be considered either in the Vegetables or Protein Foods, but not in both components simultaneously. For convenience, FPED has both component forms: Vegetables (v_legumes) and Proteins Foods (pf_legumes). When considered as Vegetables, beans and peas are computed in cup equivalents. When considered as Protein Foods, they are computed in ounce equivalents. One cup equivalent of beans and peas equals four ounce equivalents of protein foods.

Example:

1 cup equivalent of lentils computed as Vegetables = 4 ounce equivalents of lentils as Protein Foods.

Multi-ingredient Foods Containing Vegetables

Vegetables present in multi-ingredient foods such as soups, salads, pizza, sandwiches, and vegetable dishes are assigned to the appropriate Vegetable component.

Chapter 5

Grains Group

This section discusses the Grains Group components and the determination of the amount of Food Patterns equivalents for its components, with examples.

Grains Group Components

The Grains Group consists of two components: Whole Grains and Refined Grains (non-whole grains). Whole Grains include amaranth, barley (not pearled), brown rice, buckwheat, bulgur, millets, oats, popcorn, quinoa, dark rye, triticale, whole-grain cornmeal, whole-grain wheat flour, whole-grain cracked wheat, wild rice, and grain-based products made with 100% whole grains or their flours. Refined Grains (non-whole grains) include grains that are degermed or polished and their flours or meal, cornmeal, masa, corn grits, bran of all cereals, cream of rice, cream of wheat, cracked wheat, malted barley or malted flours, pearled barley, rye (light and medium), wheat gluten, and white rice.

Appendix 1 lists foods in the Grains Group.

Determination of Ounce Equivalents of Grains

The method of computing grains equivalents is one of the major changes that took place in the development of FPED. The Choosemyplate.gov Website lists consumer-friendly examples of what counts as one ounce grain equivalent [2]. These examples are based on common portion sizes such as one slice of bread, one-half cup of cooked rice, and one cup of ready-to-eat cereal, instead of the actual amount of grains present in these foods. Using common portion sizes to compute grain equivalents poses a challenge because standard rules cannot be applied across all foods, whereas using the actual amounts of grains present in a food to determine grain equivalents offers a systematic approach to creating FPED.

Two different definitions of what counts as one ounce grain equivalent are used in FPED:

- For grain products such as breads, bagels, biscuits, muffins, cakes, cookies, pancakes, and waffles made with flour, each 16 grams of flour present in a food was used as the basis for defining one ounce grain equivalent, the rationale being that one standard slice of bread has been defined as equal to one ounce grain equivalent will contain 16 grams of flour.
- For intact grains or grain products such as cream of wheat, barley, bulgur, millets, oats, pasta, rice, rye, quinoa, and ready-to-eat cereals, 28.35 grams of grains was defined as equal to one ounce grain equivalent.

To evaluate this approach, bagels, biscuits, breads, muffins, grain snacks, baked grain products, pancakes, pasta, rice, and ready-to-eat cereals in FNDDS 4.1 for

WWEIA, NHANES 2007-08 were selected. The grain equivalents were computed by two methods: (1) using the definitions based on the common portion sizes of the foods, and (2) using FPED definitions described above and the actual amounts of the grains present in foods [12]. The differences in the amounts of grain equivalents computed by the two methods were not appreciable; and the national mean intakes of grain equivalents estimated were the same. Using the amounts of grains present in grain-based foods offers a standardized method for the computation of grain equivalents.

Table 10 summarizes foods grouped based on the definition of one ounce of grain equivalents.

Table 10. Amounts of Grains in One Ounce Equivalent

Grain amounts in one ounce equivalents	Foods	
16 grams flour	Bagels Biscuits Breads and rolls Cakes Cookies Crackers Danishes Doughnuts	Grain based snacks (e.g., pretzels, tortilla chips, corn chips) Gravies and sauces Muffins and quick breads Pancakes and waffles Pies Tortillas
28.35 grams grain	Barley Buckwheat Bulgur Couscous Hot cereals (e.g., cream of wheat/rice, farina, grits, oatmeal)	Millets Pasta Popcorn Quinoa Ready-to-eat cereals Rice

Multi-ingredient Foods Containing Grains

Grains present in multi-ingredient foods such as breads, rice and vegetable dishes, macaroni and cheese, and noodle soups are assigned to Whole or Refined Grains components, as appropriate.

Chapter 6

Dairy Group

This section discusses the Dairy Group components and the determination of the amount of Food Patterns equivalents for its components, with examples.

Dairy Group Components

The Dairy Group consists of four components: Milk, Yogurt, Cheese, and Miscellaneous Dairy, which is predominantly whey. The Milk component includes all types of fluid milk, buttermilk, dry milk, and evaporated milk, with different levels of fat. Soy milk with added calcium is included in the Milk component. Soy milk without calcium fortification is assigned to Soy Products. The Yogurt component includes plain yogurt, flavored yogurt, fruit yogurt, and frozen yogurt, containing different levels of fat. The Cheese component includes all types of cheeses such as natural cheese, soft cheese, processed cheese, and cheese food. Examples of cheeses include brie, camembert, cheddar, cottage cheese, colby, edam, feta, fontina, gouda, gruyere, limburger, Mexican cheeses (queso anejo, queso asadero, queso chihuahua), monterey, mozzarella, muenster, parmesan, provolone, ricotta, and Swiss. The Miscellaneous Dairy component includes whey. Because its national mean intake is minuscule, the Miscellaneous Dairy component is not a standalone FPED variable, and it is included under the Total Dairy component. The Dairy Group does not include dairy fats such as butter, cream, and cream cheese, which are assigned to Solid Fats component. Appendix 1 lists foods in the Dairy Group.

Solid Fats Naturally Present in Dairy foods

Milk fat is classified as solid fat. The fats naturally present in milk, yogurt, and cheese in excess of 1.5 grams per cup equivalent, which is same as the amount of fat present in fat-free milk, is assigned to the Solid Fats component.

Determination of Cup Weights of Dairy Group

One cup equivalents of selected foods in the Dairy Group are listed in Table 11.

Table 11. Dairy Group: Summary of Selected Cup Equivalent Weights

Dairy	Weight of 1 cup equivalent
Fluid milk, all fat types, plain or flavored	245 g
Buttermilk	245 g
Dry milk, reconstituted	245 g
Soy milk, calcium fortified	245 g
Evaporated milk	125 g
Dry milk	25 g
Yogurt, all fat types, plain or flavored, without fruit	245 g
Yogurt, frozen, sweetened with low-calorie sweetener	245 g
Cheese, natural	1 to 2 oz.
Cheese, natural, soft	4.5 oz.
Cheese, processed	1.5 to 2 oz.

Other Considerations

Flavored milk: Flavored milks are assigned as 100 percent milk. In addition, added sugars are computed, if they are present.

Yogurt with fruit or nuts: Fruit yogurts are assumed to contain six percent fruit, and three percent nuts, if nuts are present. In addition, added sugars are computed, if they are present.

Cheeses: In general, cup equivalents for various cheeses are set using several categories, based on the type of cheese and approximate calcium content in comparison to the calcium in one cup of milk. For cream cheeses, only the fat-free form of cream cheese is assigned to the Cheese component (CNPP, personal communication, December 17, 2012). Regular and low fat cream cheeses are not assigned to the Cheese component due to their low calcium content; only the fat present in these two cheeses are assigned to the Solid Fats component, as in the case for all types of cheese. Also, one cup equivalent of cottage cheese is defined as the amount containing 302 milligrams of calcium, the amount present in a cup of milk.

Multi-ingredient Foods Containing Dairy Components

The milk present in multi-ingredient foods such as half and half and ice cream are assigned to the Milk component; yogurt present in frozen yogurt is assigned to the Yogurt component; and cheese present in sandwiches, salads, and pizza are assigned to the Cheese component.

Chapter 7

Protein Foods

This section discusses the Protein Foods components and the determination of the amount of Food Patterns equivalents for its components, with examples.

Protein Foods Components

The Protein Foods Group consists of Meat, Poultry, Seafood, Eggs, Nuts and Seeds, Soy Products (other than calcium added soy milk and mature soybean), and Beans and Peas (or Legumes). The Meat and Poultry components were further subdivided into: Meat (pf_meat); Poultry (pf_poultry); Organ Meat (pf_organ); and Cured Meat (pf_curedmeat) to facilitate detailed data analysis. The Seafood component is divided into: Seafood that are high in *n*-3 fatty acids (pf_seafd_hi) and Seafood that are low in *n*-3 fatty acids (pf_seafd_lo).

The Meat component includes beef, goat, lamb, pork (includes fresh or uncured ham), game meat (e.g. bear, bison, moose, opossum, rabbit, raccoon, squirrel, venison), and veal. The Poultry component includes chicken, Cornish hens, dove, duck, game birds (e.g. ostrich, pheasant, quail), goose, and turkey. The Cured Meat component includes cured or smoked meat products such as frankfurters, sausages, and luncheons meats, cured meat made from beef, chicken, ham, pork, and turkey. The Organ Meat component includes brain, chitterlings, giblets, gizzard, heart, kidney, liver, stomach, sweetbreads, thymus, tongue, and tripe.

The following FDA definitions [13] are used for classification of cured meat. The three basic categories of cured meat and poultry, as defined by FDA are listed in Table 12.

Table 12. FDA Cured Meat and Poultry Categories

FDA cured meat and poultry categories	Foods included within the category
Uncomminuted smoked products	Include bacon, beef jerky, hams, pork shoulders, turkey breasts, turkey drumsticks.
Sausages (including cured sausages)	Include both finely ground and coarsely ground products. • Finely ground sausages include bologna, frankfurters, luncheon meats and loaves, sandwich spreads, and viennas. • Coarsely ground sausages include chorizos, kielbasa, pepperoni, salami, and summer sausages. Cured sausages may be categorized as (1) raw, cured; (2) cooked, smoked; (3) cooked, unsmoked; and (4) dry, semidry, or fermented.
Uncomminuted, unsmoked processed products	Include corned beef, pastrami, pig's feet, and corned tongues. This category of products may be sold either as raw ready-to-cook or ready-to-eat.

Computation of *n*-3 fatty Acids Cutoff per 100 Grams of Seafood

The only *n*-3 fatty acids of interest are the long chain fatty acids, EPA and DHA. The Seafood component is further subdivided into: (1) high in *n*-3 fatty acids and (2) low in *n*-3 fatty acids. Cooked seafood containing 500 mg or more of *n*-3 fatty acids (EPA and DHA) per three ounces was assigned as seafood high in *n*-3 fatty acids [14]. This translates to 588 milligrams per 100 grams of cooked fish as shown below.

3 oz. = 3 x 28.35 g = 85.05 g

85 g of cooked high *n*-3 seafood should contain at least 500 mg of *n*-3

100 g of cooked high *n*-3 seafood should contain at least (500 / 85) x 100
= 588 mg *n*-3 fatty acids

To estimate the cutoff amount of *n*-3 fatty acids in raw fish, a cooking yield of 77 percent is applied [15]. The amount of 452 milligrams of *n*-3 fatty acids per 100 grams of raw seafood is used to categorize seafood to one of the two *n*-3 groups. The computation is described below.

Computation of raw seafood *n*-3 cutoff amount:

130 g raw fish will yield 100 g cooked fish (77% yield)
Cutoff *n*-3 fatty acid amount = 588 mg per 100 g cooked or 130 g raw
Cutoff *n*-3 fatty acid amount = (588 / 130) x 100
= 452 mg

Examples of seafood that are high in *n*-3 fatty acids include anchovy, herring, mackerel, salmon, sardine, shark, trout, and bluefin and albacore tuna. Seafood low in *n*-3 fatty acids include catfish, clams, cod, crabs, crayfish, croaker, eel, flounder, haddock, lobster, mussels, octopus, oyster, perch, pollock, scallop, shrimp, snapper, tilapia, tuna (other than bluefin and albacore) and turtle. Canned tuna fish was divided between the two seafood components: 25% high in *n*-3 and 75% low in *n*-3 [14]. Appendix 1 lists seafood in the two *n*-3 components.

The Eggs component includes chicken eggs and other birds' eggs and their components such as egg yolk, egg white, liquid egg, dried eggs, and egg substitutes containing egg whites. The Soy Products component includes all soy products except calcium added (fortified) soy milk and mature soybean cooked as vegetables. The Soy Products component includes soy flour, soy protein isolate, soy concentrate, tofu, and soy milk that is not calcium fortified. The Beans and Peas (Legumes) component includes all mature beans and peas (legumes) such as black beans, black-eyed peas, brown beans, bayo beans, carob, chickpeas (garbanzo beans), fava beans, kidney beans, lentils, lima beans, mung beans, navy beans, pink beans, pinto beans, soy beans, and white beans.

Appendix 1 lists foods in the Protein Foods Group. The definitions of one ounce equivalent of protein foods are in Table 13.

Table 13. Definitions of One Ounce Equivalent of Protein Foods

Protein Foods components	Definition of one ounce equivalent
Lean meat/poultry	28.35 grams of cooked, lean portion of meat/poultry containing no more than 2.63 grams of solid fats naturally present, per ounce equivalent
Lean seafood	28.35 grams of cooked, lean portion of seafood containing no more than 2.63 grams of fats naturally present as oils, per ounce equivalent
Eggs	50 grams, raw or cooked
Nuts and seeds	½ ounce or (28.35 / 2) grams
Nut butters	16 grams (1 tablespoon)
Legumes	4 x the number of cup equivalents of legumes as vegetables (i.e., ¼ cup of cooked legumes as vegetables equals 1 ounce equivalent of legumes as protein foods. 1 cup equivalent of cooked legumes = 175 grams in FPED)
Soy flour, isolate or concentrate	½ ounce or (28.35 / 2) grams
Soy, tofu	¼ cup or (250 / 4) grams
Soy nuts	28.35 grams

Solid Fats and Oils Naturally Present in Protein Foods

The fats naturally present in seafood, nuts, seeds, and legumes are defined as oils and fats present in meat, poultry, and eggs are defined as solid fats. The USDA Food Patterns allows 2.63 grams of fat or oils per ounce of lean meat and other protein foods. Any solid fats or oils that are naturally present above the allowable amounts are included under the Solid Fats or Oils components of the respective protein foods.

The method for calculating ounce equivalents for meat, poultry, and seafood disaggregates solid fats or oils while the method for eggs and nuts does not. The following section describes computation of these components.

Determination of Ounce Equivalents of Lean Meat in Cooked Meat, Poultry, and Seafood

By definition, one ounce of cooked lean meat, poultry, or seafood can have no more than 2.63 grams of allowable fat per 28.35 grams of lean meat. Or, 100 grams of cooked lean meat, poultry, or seafood will contain 100 / 28.35 or 3.53 ounces of lean meat with a maximum of (3.53 x 2.63) grams or 9.28 grams of allowable fat.

Non-fat portion = (100 - 9.28) g = 90.72 g

Or, 90.72 grams of non-fat meat, poultry, or seafood can contain up to 9.28 grams of allowable fat or oils.

Or, Food Patterns allowable solid fat per ounce equivalent = 2.63 g
Non-fat meat portion per 28.35 grams (1 ounce) lean meat = 28.35 - 2.63
= 25.72 g

The following is derived from the above information:

(1) Any cooked meat, poultry, or seafood that has 9.28 percent or less total fat will **not** have either solid fats or oils above the allowable limits.
(2) Any cooked meat, poultry, or seafood that has 9.28 percent or less total fat will have **3.53** ounce equivalents of lean protein per 100 grams.

Examples:
The computation of Protein Food equivalents and Solid Fats or Oils components can be done in several ways. Two methods are described below and the user may choose the one that is convenient to them because both computational methods give the same result. The examples in this chapter use method 2.

Cooked sausage (example 1) and broiled beef steak (example 2) are examples from MPED 2 Documentation and User Guide, pp 36-37 [5]. These foods are included to show that either of the two methods will provide the same result as MPED 2.

1. Cooked sausage - Method 1

Cooked sausage contains 31.16 percent total fat. Because this amount is greater than 9.28, the cooked sausage will contain solid fats above the allowable limit.

Non-fat meat portion present in 100 grams sausage = 100 - 31.16
= 68.84 g
Allowable solid fat for 68.84 grams non-fat meat portion = (9.28 / 90.72) x 68.84
= 7.04 g
Solid fat above the allowable limit = % total fat - allowable fat
= 31.16 - 7.04
= 24.12 g
Number of ounce equivalents of meat = (100 – % total fat above the limit) / 28.35
= (100 - 24.12) / 28.35
= 75.88 / 28.35
= 2.677 = 2.68

Cooked sausage - Method 2

Non-fat meat portion present in 100 grams sausage	= 100 - 31.16 = 68.84 g
Number of ounce equivalents of meat	= 68.84 / 25.72 = **2.677 = 2.68**
Allowable solid fat	= 2.63 x 2.68 = 7.048 g = 7.05 g
Solid fat present above the allowable limit	= 31.16 - 7.05 = 24.11 g

2. **Broiled beef steak (by method 2)**

Broiled beef steak has 15 percent total fat. Because this amount is greater than 9.28, the broiled beef steak will contain solid fats above the allowable limit.

Non-fat meat portion present in 100 grams broiled beef steak	= 100 - 15 = 85 g
Number of ounce equivalents of meat	= 85 / 25.72 = **3.30**
Allowable solid fat	= 2.63 x 3.30 = 8.68 g
Solid fat present above the allowable limit	= 15 - 8.68 = 6.32 g

3. Luncheon Meat, not further specified (by method 2)

Luncheon meat, NFS contains 32.16 percent total fat. Because this amount is greater than 9.28, the luncheon meat will contain solid fats above the allowable limit (FNDDS food code 25230110)

Non-fat meat portion present in 100 grams luncheon meat	= 100 - 32.16 = 67.84 g
Number of ounce equivalents of meat	= 67.84 / 25.72 = 2.64
Allowable solid fat	= 2.63 x 2.64 = 6.94 g
Solid fat present above the allowable limit	= 32.16 - 6.94 = 25.22 g

4. Baked salmon without added fat (by method 2)

If no other ingredient is present in the baked salmon, the computation is as follows (FNDDS food code 26137110, the amount of added salt is disregarded in the computation):

Baked salmon without added fat has 4.3 percent total fat
Because 4.3 percent fat is lower than the allowable oil level of 9.28 grams, the baked salmon **will not** contain any oils above the allowable limit.

Number of ounce equivalents of seafood	= 100 / 28.35 = 3.53

5. Herring, baked without added fat (by method 2)

Baked herring contains 11.14 percent total fat. Because this amount is greater than 9.28 grams, the baked herring will contain oils above the allowable limit.

Non-fat, lean portion present in 100 grams	= 100 - 11.14 = 88.86 g
Number of ounce equivalents of seafood	= 88.86 / 25.72 = 3.45
Allowable oils	= 2.63 x 3.45 = 9.07 g
Oils present above the allowable limit	= 11.14 - 9.07 = 2.07 g

In FNDDS, some of the baked or broiled fish have added lemon juice. These food codes will have fruit juice equivalents and a slightly lower amount of protein foods ounce equivalents than that are in the above examples.

Differences between FPID and FPED in the Calculation of Meat, Poultry, and Seafood Ounce Equivalents

In FPID, raw meat and poultry are assumed to have 75 percent cooking yield and the raw seafood is assumed to have 77 percent cooking yield. Cooked meat, poultry, and seafood ingredients are assumed to have 100 percent cooking yield (no moisture or fat loss during cooking). However, in FNDDS, some of the meat, poultry, and seafood, whether raw or cooked, may have varying levels of cooking yields and some may additionally have lost fat during cooking. Because of the differences in cooking yields, the FPID FP equivalents are not used for the computation of meat, poultry, and seafood in FPED. In FPED, meat, poultry, and seafood equivalents are computed using FNDDS fat loss and/or moisture loss information. Cooking yield was computed using fat and/or moisture loss data.

The following example show the computations used in FPID and FPED.

FPID: Determination of Ounce Equivalents of Lean Meat in Raw Meat, Poultry, and Seafood as an Ingredient: No Fat Loss Is Assumed in Cooking

In the computation, no fat loss during cooking was assumed, if no fat loss was indicated in the recipe.

Examples:

1. **Raw pork**

Raw pork contains 14.8 percent total fat. In the computation 75 percent cooking yield and no fat loss during cooking is used.

After cooking, 100 grams of raw pork will yield 75 grams of cooked pork containing 14.8 grams of total fat.

Non-fat, lean portion present in 75 grams	= 75 - 14.8 = 60.20 g
Number of ounce equivalents of meat	= 60.20 / 25.72 = 2.34
Allowable solid fats	= 2.63 x 2.34 = 6.15 g
Solid fats present above the allowable limit	= 14.8 - 6.15 = 8.65 g

2. **Raw mackerel**

Raw mackerel contains 13.9 percent total fat. In the computation, 77 percent cooking yield and no fat loss during cooking was used.

Non-fat, lean portion present in 77 grams of mackerel	= 77 - 13.9 = 63.1 g
Number of ounce equivalents of seafood	= 63.1 / 25.72 = 2.45
Allowable oils	= 2.63 x 2.45 = 6.44 g
Oils present above the allowable limit	= 13.9 - 6.44 = 7.46 g

FPED: Determination of Ounce Equivalents of Lean Meat in Raw Meat, Poultry, and Seafood as an Ingredient: Where Moisture and/or Fat Loss Are Assumed

FNDDS fat loss and/or moisture loss information as shown in the examples below. The cooking yield less than 100 percent is a result of moisture loss, fat loss, or both.

% cooking yield= 100 – % moisture lost -% fat lost

The moisture lost from the meat and poultry ingredients are computed as follows:

- Calculate moisture present in each ingredient
- Add the moisture from each ingredient to get the total moisture of the food
- Calculate the proportion of moisture from each ingredient to the total moisture of the food
- Allocate moisture loss to each ingredient in the proportion computed in the above step

The fat loss is allocated to the specific type of fat in the fat type variable in the FNDDS. Generally, the fat is lost from the meat or poultry ingredient.

Example:

Chicken breast fried, skin not eaten

FNDDS food code 24124100

The purpose of this example is to demonstrate the calculation of ounce equivalents of lean poultry and solid fats from the chicken. Based on the fat type information, fat is lost from the poultry only and not from the vegetable shortening present as an ingredient. All of the fat from vegetable shortening will count toward solid fat.

Moisture loss in cooking = 31% Fat loss in cooking = 4.2% Cooking yield = 64.8%

Ingredients needed to make 100 grams of fried chicken (no skin eaten) (amount rounded to one decimal place):

Chicken breast, raw	= 151.7 g
Vegetable shortening	= 1.5 g
Salt	= 1.1 g
Total ingredient weight	= 154.3 g
Moisture loss during cooking	= 154.3 x (31 / 100) = 47.8 g
Fat loss is during cooking	= 154.3 x (4.2 / 100) = 6.5 g

100% of fat and moisture loss are from chicken breast and not from the other two ingredients.

Amount of cooked chicken breast (after fat and moisture losses)

= (151.7 - 47.8 - 6.5) g

= 97.4 g

Amount of fat present in 152 grams of raw chicken = 14 g

Amount of fat present in chicken breast after fat loss = 14 - 6.5 = 7.5 g

Amount of fat present in 97.4 grams cooked chicken breast = 7.5 g

The amount of 7.5 grams of fat present in 97.4 grams of poultry is within the allowable amount.

Number of ounces equivalents poultry = 97.4 / 28.35
= 3.43

The food has 1.5 grams added vegetable shortening, which is assigned to the Solid Fats component.

Determination of Ounce Equivalents and Solid Fats Present in Eggs

Computation of the lean portion of eggs is parallel to that of meat, poultry, and seafood, except in eggs, the excess fat (solid fats) is not subtracted before calculating the ounce equivalents. The total fat content of eggs is included in calculating the ounce equivalents.

One ounce equivalent of eggs is defined as 50 grams and can have no more than 2.63 grams of allowable solid fat. The methodology for computing ounce equivalents is described below:

(1) The number of ounce equivalents is computed first, without subtracting the solid fats naturally present in eggs.
(2) Allowable solid fat is computed for the number of ounce equivalents computed in step 1.
(3) The amount of solid fat present above the allowable limit is computed by subtracting the allowable fat from the total fat.

Example:

1. Boiled eggs

100 grams of boiled eggs contain 10.6 percent total fat.

Number of ounce equivalents of eggs per 100 grams (M_EGGS)	= 100 / 50 = **2**
Allowable fat per 2 ounces of eggs	= 2.63 x 2
	= 5.26 g
Solid fat present above the allowable limit	= 10.6 - 5.26
	= 5.34 g
Solid fat present per ounce equivalents of eggs	= 5.34 / 2
	= 2.67 g

Determination of Ounce Equivalents and Oils Present in Nuts

Computation of lean portion of nuts is parallel to that of meat, poultry, and seafood, except in nuts, the excess fat (oils) is not subtracted before calculating the ounce equivalents. All fat present in nuts are included in calculating the ounce equivalents. The oil present above the allowable limit is calculated using the number of ounce equivalents.

One ounce equivalent of nuts is defined as ½ ounce or 14.175 grams. The fats naturally present in nuts are defined as oils. The methodology for computing ounce equivalents is described below:

(1) The number of ounce equivalents is computed first, without subtracting the oils naturally present in nuts.
(2) Allowable oil is computed for the number of ounce equivalents computed in the above step.
(3) The amount of oils above the allowable limit is computed by subtracting the allowable fat from the total fat.

The oil present above the allowable limit is calculated using the number of ounce equivalents. As a result, the amount of oil present in one ounce equivalent of nuts will vary, as shown in the following examples.

Examples:

1. Dry roasted almonds

Dry roasted almonds contain 52.8 percent total fat.

Number of ounce equivalents of nuts per 100 grams	= 100 / 14.175
	= 7.05
Allowable oils in 7.05 ounce equivalents	= 2.63 x 7.05

	= 18.5 g
Oils present above the allowable limit	= 52.8 - 18.5
	= 34.3 g

100 grams of roasted almonds contain 7.05 ounce equivalents, and each ounce equivalent of roasted almonds will contain 7.49 grams (52.8 / 7.05) of fat, of which 4.86 grams (7.49 - 2.63) is also assigned to Oils component.

2. Macadamia nuts

Macadamia nuts contain 76.1 percent total fat.

Number of ounce equivalents of nuts per 100 grams	= 100 / 14.175
	= 7.05
Allowable oils in 7.05 ounce equivalents	= 2.63 x 7.05
	= 18.5 g
Oils present above the allowable limit	= 76.1 - 18.5
	= 57.6 g

Each ounce equivalent of macadamia nuts will contain 10.8 grams of fat (76.1 / 7.05), of which 8.17 grams (10.8 - 2.63) is also assigned to Oils component.

Table 14 includes examples of the amount of oils present in one ounce equivalent of selected nuts.

Table 14. Amount of Oils Present in One Ounce Equivalent of Selected Nuts

Name	**Fat content per 100 grams of nuts (g)** **A**	**No. of ounce equivalents per 100 grams nuts**	**Amount of oils present per ounce equivalent of nuts (g)** **A / 7.05**
Almonds	55.1	7.05	7.8
Mixed nuts	51.4	7.05	7.3
Peanuts	49.6	7.05	7.0
Pecans	71.9	7.05	10.2
Pistachio	45.9	7.05	6.5
Walnuts	65.2	7.05	9.2

Multi-ingredient Foods Containing Protein Foods

Proteins foods present in multi-ingredient foods such as sandwiches and subs; rice and meat or chicken dishes; soups; pizza; hotdogs; and frozen dinners are assigned to the appropriate Protein Foods components.

Chapter 8

Added Sugars

Added sugars are defined as sugars that are added to foods as an ingredient during preparation, processing, or at the table. Added sugars do not include naturally occurring sugars such as lactose present in milk and fructose present in fruits. Examples of added sugars include brown sugar, cane sugar, confectioners' sugar, granulated sugar, dextrose, white sugar, corn syrup and corn syrup solids, molasses, honey, and all types of syrups such as maple syrup, table syrups, and pancake syrup. Appendix 1 lists added sugars included in FPED.

Determination of Teaspoon Equivalents of Added Sugars

One teaspoon equivalent of added sugars is computed using the sugar content of foods defined as added sugars. One teaspoon equivalent of added sugars is defined as 4.2 grams of sugars, the amount present in one teaspoon of granulated sugar.

Computation of Added Sugars

Examples:

1. **Granulated sugar**

The sugar content of 100 grams of granulated sugar	= 98.8 g
Number of teaspoon equivalents in 100 grams granulated sugar	= 98.8 / 4.2
	= 23.5

2. **Maple syrup**

The sugar content of 100 grams of maple syrup	= 60.4 g
Number of teaspoon equivalents in 100 grams maple syrup	= 60.4 / 4.2
	= 14.4

3. **Presweetened herbal tea**

The sugar content of 100 grams of presweetened herbal tea	= 5 g
Number of teaspoon equivalents in 100 grams of herbal tea	= 5 / 4.2
	= 1.2

Multi-ingredient Foods Containing Added Sugars

Ingredients that are added sugars present in multi-ingredient foods such as cakes, cookies, milk shakes, and ice cream are assigned to the Added Sugars component.

Chapter 9

Oils

Oils include unhydrogenated vegetable oils (except palm oil, palm kernel oil, and coconut oil) and fats naturally present in nuts, seeds, avocado, olives, and seafood. Unhydrogenated vegetable oils present in all types of margarines (stick, tub, spread, etc.) are assigned to oils. Appendix 1 lists oils included in FPED.

Margarine

In MPED, tub margarines and margarine-like spreads were assigned to the Oils component and stick margarines were assigned to the Solid Fats component. We examined the food labels of these margarines. Almost all of the margarines, whether stick, tub, or spread have unhydrogenated vegetable oils as the first ingredient; partially hydrogenated oils and/or palm oil as the next ingredient(s); and water. As per the guiding principles used in developing FPED, the unhydrogenated vegetable oils present in margarines are assigned to Oils component; and the partially hydrogenated oils, palm oil, and palm kernel oils present in margarines are assigned to Solid Fats. We were unable to obtain data on the proportion of unhydrogenated vegetable oils and oils that are defined as solid fats in margarines. For this reason, the fat present in margarine was divided equally between Oils and Solid Fats. That is, margarine with a fat content of 80 grams per 100 grams is assigned 40 grams each to Oils and Solid Fats.

Avocado and Olives

The fats naturally present in avocado and olives above 2.25 grams per cup equivalent are assigned to the Oils component. This amount translates to 1.5 grams per 100 grams of allowable fat. In MPED, all of the fats naturally present in avocado and olives were considered as allowable fat and not assigned to the Oils component.

Fats Naturally Present in Seafood, Nuts and Seeds

The gram equivalents of oils present in seafood and nuts and seeds are computed after subtracting 2.63 grams of allowable fat per ounce equivalents of protein foods from the total fat. Details on the computation of oils present in seafood and nuts and seeds are explained in the Protein Foods Section (Chapter 7).

Determination of Number of Equivalents of Oils

One gram of oil is defined as one equivalent. The following examples describe the computation of oil equivalents in 100 grams of food.

Examples:

1. **Vegetable oils**
   Vegetable oils such as almond, canola, corn, peanut, sunflower, and soybean containing 100 grams of fat per 100 grams
   Gram equivalents of oils in 100 grams of vegetable oil = 100

2. **Margarine, tub**
   Tub margarine containing 60 grams of fat per 100 grams
   Gram equivalents of Oils in 100 grams of tub margarine = 60 / 2 = 30
   Gram equivalents of Solid Fats in 100 grams of tub margarine = 60 / 2 = 30

Multi-ingredient Foods Containing Oils

Oils present in multi-ingredient foods such as fried vegetables, fried rice, fish dishes, ready-to-eat cereals that contain nuts, mayonnaise, and salad dressings are assigned to the Oils component.

Chapter 10

Solid Fats

Solid fats include fats naturally present in dairy products such as milk, cheese, butter, cream, cream cheese, and sour cream; fats naturally present in meat, poultry, and eggs; lard; hydrogenated or partially hydrogenated fats and shortenings; cocoa butter; coconut oil; and palm oil. The fats present in stick and tub margarines and margarine spreads was divided equally between Oils and Solid Fats. Appendix 1 lists solid fats included in FPED.

Determination of Number of Equivalents of Solid Fats

One gram of fat is defined as one equivalent. The following examples describe the computation of solid fats equivalents in 100 grams of food.

Examples:

1. **Coconut oil or palm oil**
   Vegetable oils such as coconut and palm oil containing 100 grams of fat per 100 grams
   Gram equivalents of solid fats per 100 grams of coconut or palm oil = 100

2. **Coconut meat, raw**
   Raw coconut meat containing 33.5 grams of fat per 100 grams
   Gram equivalents of solid fats per 100 grams of raw, coconut meat = 33.5

3. **Butter**
   Butter containing 81.1 grams of fat per 100 grams
   Gram equivalents of solid fats per 100 grams of butter = 81.1

4. **Stick margarine**
   Stick margarine containing 80 grams of fat per 100 grams
   Gram equivalents of Oils in 100 grams of tub margarine = 80 / 2
   = 40
   Gram equivalents of Solid Fats in 100 grams of tub margarine = 80 / 2
   = 40

Solid Fats Naturally Present in Dairy, Meat, Poultry, and Eggs

The gram equivalents of solid fats present in meat, poultry, and eggs are computed after subtracting 2.63 grams of allowable fat per ounce equivalents of these protein foods from the total fat. The amount of allowable fat in the Dairy component is 1.5 grams per cup equivalent. Details on the computation of solid fats present in meat, poultry, and eggs are explained in the Dairy and Protein Foods sections.

Multi-ingredient Foods Containing Solid Fats

Solid fats present in multi-ingredient foods such as cakes, cookies, pies, pizza, meat dishes, and ice cream are assigned to the Solid Fats component.

Chapter 11

Alcoholic Drinks

Alcoholic Drinks include all types of beers; all types of wines; distilled spirits such as brandy, gin, rum, vodka, and whiskey; and cordials and liqueurs. Appendix 1 lists alcoholic drinks included in FPED.

Determination of Number of Drinks

In general, 12 fluid ounces of beer, 5 fluid ounces of wine, or 1.5 fluid ounces of 80-proof distilled spirit is considered as one drink and contains about 14 grams of ethanol. Based on this, in FPED, one drink was defined as the amount of alcoholic beverage containing 0.6 fluid ounce or 14 grams of ethanol.

FNDDS foods that had alcoholic beverages used in cooking are considered not having any residual ethanol and therefore, do not contain alcoholic drinks equivalents. If alcoholic beverages are added to a food after cooking, credit is given for alcoholic drinks equivalents (e.g., no-bake rum ball cookie, zabaglione). The following examples describe the computation of the number of alcoholic drinks in 100 grams of beverages.

Examples:

1. **Dessert Wine**
   Dessert wine containing 15.3 grams of ethanol per 100 grams
   Number of alcoholic drinks per 100 grams = 15.3 / 14 = **1.09**

2. **Martini**
   Martini containing 32.2 grams of ethanol per 100 grams
   Number of alcoholic drinks per 100 grams = 32.2 / 14 = **2.3**

3. **Whiskey**
   Whiskey containing 36 grams of ethanol per 100 grams
   Number of alcoholic drinks per 100 grams = 36 / 14 = **2.57**

4. **Crème de menthe**
   Crème de menthe containing 29.8 grams of ethanol per 100 grams
   Number of alcoholic drinks per 100 grams = 29.8 / 14 = **2.13**

5. **No-bake rum ball cookie**
   No-bake rum ball cookie containing 3.6 grams of ethanol per 100 grams
   Number of alcoholic drinks per 100 grams = 3.5 / 14 = **0.25**

6. **Zabaglione**
   Zabaglione containing 7.7 grams of ethanol per 100 grams
   Number of alcoholic drinks per 100 grams = 7.7 / 14 = **0.55**

Multi-ingredient Foods Containing Alcohol (Ethanol)

Alcohol (ethanol) present in beverages such as cocktails and alcoholic beverages that are added to multi-ingredient foods after cooking are assigned to the Alcoholic Drinks component.

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Appendix 1: List of Foods Included in the Food Patterns Components, Units, and FPED/FPID Variable Names in Parenthesis

Fruit Components (cup eq.)	Foods
Total Fruit (F_TOTAL)	Includes the sum of all foods in the Fruit components listed below:
Citrus, Melons, and Berries (F_CITMLB)	Blackberries Blueberries Boysenberries Calamondin Cantaloupe Casaba Cranberries Dewberries Grapefruit Honeydew Huckleberries Juneberries Kiwi fruit Kumquats Lemons Limes Loganberries Mandarins Mulberries Oranges Raspberries Strawberries Tangelos Tangerines Watermelon Youngberries
Other Fruits (F_OTHER)	Apples Apricots Bananas Cherries Currants Dates Figs Grapes Guava Lychees Mangoes Nectarines Papayas Passion fruits Peaches Pears Persimmons Pineapple Plums (Ciruelas) Pomegranates Prunes Raisins Rhubarb Soursop (Guanabana) Starfruit (Carambola) Tamarind
Fruit Juice (F_JUICE)	Citrus and non-citrus fruit juices

Vegetables Components (cup eq.)	Foods
Total Vegetables (V_TOTAL)	Includes the sum of all foods in the Vegetables components listed below except Beans and Peas (Legumes):
Dark Green Vegetables (V_DRKGR)	Arugula Basil Beet greens Bitter melon leaves Broccoli Chinese Cabbage (Pak-choi) Chrysanthemum garland Chard Chicory leaves Cilantro (Coriander) Collards Cress Dandelion greens Endive Escarole Greens Horseradish leaves Kale Lambsquarters Leaves of grapes, pumpkin, squash, sweet potato, swamp cabbage, taro, and thistle Lettuce (Boston, butterhead, green or red leaf, cos or romaine) Mustard cabbage Mustard greens Parsley Poke greens Spinach Turnip greens Watercress
Total Red and Orange Vegetables (V_REDOR _TOTAL)	Includes the sum of all foods in the Tomatoes and Other Red and Orange Vegetables components listed below:
Tomatoes (V_REDOR _TOMATO)	Tomatoes (canned, cooked, raw, stewed) Tomatoes, dried Tomato juice Tomato paste Tomato puree Tomato sauce

Vegetables Components (cont.) (cup eq.)	Foods
Other Red and Orange Vegetables (V_REDOR _OTHER)	Calabaza (Spanish pumpkin) Carrots Carrot juice Red colored bell, and nonbell peppers Pimiento Pumpkin Squash (most winter varieties) Sweet potatoes
Total Starchy Vegetables (V_STARCHY _TOTAL)	Includes the sum of all foods in the Potatoes and Other Starchy Vegetables components listed below:
Potatoes (V_STARCHY _POTATO)	White potatoes White potato flour White potato flakes
Other Starchy Vegetables (V_STARCHY _OTHER)	Breadfruit Burdock Cassava (Yuca blanca) Corn, sweet (raw) Dasheen Green bananas Hominy Jicama (Yam beans) Lima beans, immature Lotus root Parsnips Immature peas (e.g., immature cowpeas, blackeye peas, green peas, pigeon peas) Plantains Salsify Tannier Tapioca Taro Water chestnuts Yams

Vegetables Components (cont.) (cup eq.)	Foods
Other Vegetables (V_OTHER)	Alfalfa sprouts Artichoke Asparagus Avocado Bamboo shoots Beans (green, yellow, snap, string) Bean sprouts Beets Bitter melon (bitter gourd, balsam pear) Broccoflower Brussels sprouts Cabbage Cactus (Nopales) Capers Cauliflower Celeriac Celery Chayote (Christophine) Chinese cabbage (pei-tsai) Chinese okra (Luffa) Chives Cucumber Eggplant Fennel bulb Flowers, edible Garlic Ginger root Horseradish pods Jute Kohlrabi Leeks Lettuce (varieties not in dark green category) Mushrooms Okra Olives Onions Palm hearts Peas, podded Peppers, bell and nonbell peppers (not red or orange in color) Pokeberry shoots Radicchio Radish Rutabaga Scallions Seaweed Snow peas Sprouted beans (e.g. mung, soybean) Squash (green, sequin, spaghetti, yellow, zucchini, most summer varieties) Tomatillos Tomatoes, green Turnips Winter melon (Wax gourd)

Vegetables Components (cont.) (cup eq.)	Foods
Beans and Peas (Legumes) (V_LEGUMES)	Includes all mature beans and peas (legumes) such as: Black beans Blackeye peas Brown beans Bayo beans Calico beans Carob Chickpeas (Garbanzo beans) Cowpeas Fava beans Kidney beans Lentils Mature lima beans Mung beans Navy beans Pink beans Pinto beans Red Mexican beans Soybeans (mature) Split peas White beans

Grains Components (oz. eq.)	Foods
Total Grains (G_TOTAL)	Includes the sum of all foods in the Grains components listed below:
Whole Grains (G_WHOLE)	Amaranth Barley, whole Barley flour (whole barley) Barley meal Brown rice Brown rice flour Buckwheat groats Bulgur Corn, whole grain Corn meal or flour (whole grain) Millett Oats Oat flour Oatmeal Popcorn Quinoa Rye, whole grain Rye flour (dark) Triticale Wheat Whole wheat flour Wild rice
Refined Grains (G_REFINED)	Barley, pearled Barley, pearled, flour Barley malt flour Bran (all grains) Corn flour or meal, degermed Corn grits Cream of wheat Couscous Farina Masa Oat flour, debranned Rice (milled, not whole grain) Rice, milled, flour Rye flour (light and medium) Semolina Wheat flour (milled, not whole grain) Wheat germ

Protein Foods Components (oz. eq.)	Foods
Total Protein Foods (PF_ TOTAL)	Includes the sum of all foods in the Protein Foods components listed below except Beans and Peas:
Total Meat, Poultry, and Seafood (PF_MPS_TOTAL)	Includes the sum of all foods in the Meat, Cured Meat, Organ Meat, Poultry, Seafood High in *n*-3, and Seafood Low in *n*-3 components listed below:
Meat (PF_MEAT)	Armadillo Bacon (not cured) Bear Beaver Beef Bison Caribou Game meat (other) Goat Ground hog Ham (not cured) Lamb Moose Opossum Oxtail Pork Rabbit Raccoon Squirrel Veal Venison Wild pig

Protein Foods Components (cont.) (oz. eq.)	Foods
Cured Meat (PF_CUREDMEAT)	Bacon Beef sausage Beef luncheon meat Blood sausage Bockwurst Bologna Bratwurst Braunschweiger Capicola Cervelat Chicken sticks Chicken luncheon meat Chicken or turkey loaf Chorizo Cold cut deli meat Corned beef Chipped beef Dutch brand loaf Frankfurters Ham (cured, smoked, deli, deviled, loaf, luncheon meat, minced) Head cheese Honey loaf Hotdogs Italian sausage Jerky (all meats) Kielbasa Knockwurst Liverwurst Meat spreads Meat sticks Mettwurst Mortadella Pastrami Pepperoni Pepper loaf Polish sausage Pork luncheon meat Pork sausage Potted meats Salami Sandwich loaf Souse Thuringer Turkey luncheon meat Turkey sausage Turkey, smoked Turkey sticks Veal loaf Vienna sausage
Organ Meat (PF_ORGAN)	Brain Chitterlings Giblets Gizzard Heart Kidney Liver Stomach Sweetbreads Thymus Tongue Tripe

Protein Foods Components (cont.) (oz. eq.)	Foods	
Poultry (PF_POULT)	Chicken Cornish game hen Dove Duck Goose	Ostrich Pheasant Quail Turkey
Seafood High in *n*-3 Fatty Acids (PF_SEAFD_HI)	Anchovy Barracuda Caviar (roe) Cisco Herring Mackerel Pompano Ray Salmon Sardine	Sea bass Shad Shark Squid Swordfish Trout Tuna (albacore and bluefin) Whitefish
Seafood Low in *n*-3 Fatty Acids (PF_SEAFD_LOW)	Abalone Carp Catfish Clams Cod Crab Crayfish Croaker Eel Flounder Frog legs Haddock Halibut Lobster Mullet Mussels Ocean perch Octopus	Oyster Perch Pike Pollock Porgy Scallop Scup Shrimp Snail Snapper Sole Sturgeon Tilapia Tuna (except albacore and bluefin) Turtle Whiting

Protein Foods Components (cont.) (oz. eq.)	Foods	
Eggs (PF_EGGS)	Eggs, whole (chicken, duck, goose, quail, and other birds)	Egg white Egg yolk Egg substitute Egg, dried
Soy Products (PF_SOY)	Miso Natto Soybean curd or tofu Soybean flour Soybean meal	Soybean protein isolate and concentrate Soy milk (not calcium fortified) Soy nuts
Nuts and Seeds (PF_NUTSDS)	Almonds Almond butter Almond paste Brazil nuts Cashew Cashew butter Chestnuts Flax seeds Hazelnuts Macadamia nuts Peanuts Peanut butter	Peanut flour Pecans Pine nuts Pistachios Pumpkin seeds Squash seeds Sesame butter (tahini) Sesame seeds Sesame paste Sunflower seeds Walnuts
Beans and Peas (Legumes) (PF_LEGUMES)	See under Vegetables, Beans and Peas component for the list of foods	

Dairy Components (cup eq.)	Foods
Total Dairy (D_TOTAL)	Includes the sum of all foods in the Dairy components listed below, plus the following: Whey
Milk (D_MILK)	Includes fluid milk and calcium added soy milk of all fat-types such as: Buttermilk Evaporated milk Filled milk Milk, dry Milk, evaporated Milk, fluid Goat milk, fluid Soy milk, calcium added
Yogurt (D_YOGURT)	Includes yogurt of all fat-types and yogurt present in flavored and frozen yogurt

Dairy Components (cont.) (cup eq.)	Foods
Cheese (D_CHEESE)	Includes natural and processed cheeses of all fat-types such as: American cheese Blue cheese Brick cheese Brie cheese Camembert cheese Cheddar cheese Colby cheese Colby Jack cheese Cottage cheese Cream cheese, fat free Edam cheese Feta cheese Fontina cheese Goat cheese Gouda cheese Gruyere cheese Limburger cheese Mexican blend Monterey cheese Mozzarella cheese Muenster cheese Parmesan cheese Pasteurized cheese Port de salut cheese Provolone cheese Ricotta cheese Romano cheese Roquefort Swiss cheese Queso anejo Queso asadero Queso chihuahua Queso del pais, blanco Queso fresco

Oils Component (grams)	Foods
Oils (OILS)	Includes fats naturally present in seafood, nuts, and seeds and the following: Almond oil Canola oil Corn oil Cottonseed oil Fish oil Flaxseed oil Olive oil Peanut oil Rapeseed oil Safflower oil Sesame oil Spreads Soybean oil Sunflower oil Vegetable oil Walnut oil Wheat germ oil

Added Sugars Component (tsp. eq.)	Foods
Added Sugars (ADD_SUGARS)	Brown Sugar Cane syrup Corn Syrups Corn syrup solids Dextrose Fructose Fruit syrups Honey Maple syrup Molasses Pancake syrups Raw sugar Sorghum syrups White sugar

Solid Fats Component (grams)	Foods
Solid Fats (SOLID_FATS)	Includes fats naturally present in milk products, meat, poultry, eggs and the following: Butter Cocoa butter Cocoa fat Coconut cream Coconut oil Cream Cream substitute Cream Cheese, regular and low-fat Ghee Hydrogenated oils Lard Palm oil Tallow Shortening (animal and vegetable) Sour cream

Alcoholic Drinks Component (no. of drinks)	Foods
Alcoholic Drinks (A_DRINKS)	Includes: Beer Wine Distilled spirits Alcohol (ethanol) present in cocktails and other alcoholic beverages Alcohol (ethanol) added to foods after cooking

Appendix 2: Connecting MPED 2.0 and FPED Variables

MPED 2.0 Variables	FPED Variables	Foods in FPED Variables (units)
F_TOTAL	F_TOTAL	Total intact fruits (whole or cut) and fruit juices (cup eq.)
F_CITMLB[1]	F_CITMLB	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)
F_OTHER[1]	F_OTHER	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
--	F_JUICE[2]	Fruit juices, citrus and non-citrus (cup eq.)
V_TOTAL	V_TOTAL	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)
V_DRKGR	V_DRKGR	Dark green vegetables (cup eq.)
--	V_REDOR_TOTAL[2]	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
V_TOMATO	V_REDOR_TOMATO	Tomatoes and tomato products (cup eq.)
V_ORANGE	V_REDOR_OTHER	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
--	V_STARCHY_TOTAL[2]	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
V_POTATO	V_STARCHY_POTATO	White potatoes (cup eq.)
V_STARCY	V_STARCHY_OTHER	Other starchy vegetables, excluding white potatoes (cup eq.)
V_OTHER	V_OTHER	Other vegetables not in the vegetable components listed above (cup eq.)
LEGUMES	V_LEGUMES	Beans and peas (legumes) computed as vegetables (cup eq.)
G_TOTAL	G_TOTAL	Total whole and refined grains (oz. eq.)
G_WHL	G_WHOLE	Grains defined as whole grains and contain the entire grain kernel — the bran, germ, and endosperm (oz. eq.)
G_NWHL	G_REFINED	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)
--	PF_TOTAL[2]	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
M_MPF	PF_MPS_TOTAL	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)
M_MEAT[3]	PF_MEAT	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)
M_FRANK[3]	PF_CUREDMEAT	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
M_ORGAN	PF_ORGAN	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)
M_POULT	PF_POULT	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)

MPED 2.0 Variables	FPED Variables	Foods in FPED Variables (units)
M_FISH_HI	PF_SEAFD_HI	Seafood (finfish, shellfish, and other seafood) high in *n*-3 fatty acids (oz. eq.)
M_FISH_LO	PF_SEAFD_LOW	Seafood (finfish, shellfish, and other seafood) low in *n*-3 fatty acids (oz. eq.)
M_EGG	PF_EGGS	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
M_SOY[4]	PF_SOY	Soy products, excluding calcium fortified soy milk and mature soybeans (oz. eq.)
M_NUTSD	PF_NUTSDS	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)
--	PF_LEGUMES[2]	Beans and Peas (legumes) computed as protein foods (oz. eq.)
D_TOTAL	D_TOTAL	Total milk, yogurt, cheese, and whey. For some foods, the total dairy values could be higher than the sum of D_MILK, D_YOGURT, and D_CHEESE because miscellaneous dairy component composed of whey is not included in FPED as a separate variable. (cup eq.)
D_MILK[4]	D_MILK	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
D_YOGURT	D_YOGURT	Yogurt (cup eq.)
D_CHEESE	D_CHEESE	Cheeses (cup eq.)
DISCFAT_OIL	OILS	Fats naturally present in nuts, seeds, and seafood; unhydrogentated vegetable oils, except palm oil, palm kernel oil, and coconut oils; fat present in avocado and olives above the allowable amount; 50% of fat present in stick and tub margarines and margarine spreads (grams)
DISCFAT_SOL	SOLID_FATS	Fats naturally present in meat, poultry, eggs, and dairy (lard, tallow, and butter); hydrogenated or partially hydrogenated oils; shortening; palm, palm kernel and coconut oils; fat naturally present in coconut meat and cocoa butter; and 50% of fat present in stick and tub margarines and margarine spreads (grams)
ADD_SUG	ADD_SUGARS	Foods defined as added sugars (tsp. eq.)
A_BEV	A_DRINKS	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)

[1] Fruit juices were included in the individual fruit subgroups in MPED 2.0
[2] New variables, not in MPED 2.0
[3] Cured or smoked ham and turkey were included in the M_MEAT subgroup in MPED 2.0
[4] Soy milk was included in the M_SOY subgroup in MPED 2.0

Appendix 3: Food Patterns Equivalents Ingredients Database (FPID) Variables

FPID Variables	Description (units)
CODE	Food code
DESCRIPTION	Food description
F_TOTAL	Total intact fruits (whole or cut) and fruit juices (cup eq.)
F_CITMLB	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)
F_OTHER	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
F_JUICE	Fruit juices, citrus and non-citrus (cup eq.)
V_TOTAL	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)
V_DRKGR	Dark green vegetables (cup eq.)
V_REDOR_TOTAL	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
V_REDOR_TOMATO	Tomatoes and tomato products (cup eq.)
V_REDOR_OTHER	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
V_STARCHY_TOTAL	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
V_STARCHY_POTATO	White potatoes (cup eq.)
V_STARCHY_OTHER	Other starchy vegetables, excluding white potatoes (cup eq.)
V_OTHER	Other vegetables not in the vegetable components listed above (cup eq.)
V_LEGUMES	Beans and peas (legumes) computed as vegetables (cup eq.)
G_TOTAL	Total whole and refined grains (oz. eq.)
G_WHOLE	Grains defined as whole grains and contain the entire grain kernel — the bran, germ, and endosperm (oz. eq.)
G_REFINED	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)
PF_TOTAL	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
PF_MPS_TOTAL	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)
PF_MEAT	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)
PF_CUREDMEAT	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
PF_ORGAN	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)
PF_POULT	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)

FPID Variables	Description (units)
PF_SEAFD_HI	Seafood (finfish, shellfish, and other seafood) high in *n*-3 fatty acids (oz. eq.)
PF_SEAFD_LOW	Seafood (finfish, shellfish, and other seafood) low in *n*-3 fatty acids (oz. eq.)
PF_EGGS	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
PF_SOY	Soy products, excluding calcium fortified soy milk and mature soybeans (oz. eq.)
PF_NUTSDS	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)
PF_LEGUMES	Beans and Peas (legumes) computed as protein foods (oz. eq.)
D_TOTAL	Total milk, yogurt, cheese, and whey. For some foods, the total dairy values could be higher than the sum of D_MILK, D_YOGURT, and D_CHEESE because miscellaneous dairy component composed of whey is not included in FPED as a separate variable. (cup eq.)
D_MILK	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
D_YOGURT	Yogurt (cup eq.)
D_CHEESE	Cheeses (cup eq.)
OILS	Fats naturally present in nuts, seeds, and seafood; unhydrogentated vegetable oils, except palm oil, palm kernel oil, and coconut oils; fat present in avocado and olives above the allowable amount; 50% of fat present in stick and tub margarines and margarine spreads (grams)
SOLID_FATS	Fats naturally present in meat, poultry, eggs, and dairy (lard, tallow, and butter); hydrogenated or partially hydrogenated oils; shortening; palm, palm kernel and coconut oils; fat naturally present in coconut meat and cocoa butter; and 50% of fat present in stick and tub margarines and margarine spreads (grams)
ADD_SUGARS	Foods defined as added sugars (tsp. eq.)
A_DRINKS	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)

Appendix 4: Food Patterns Equivalents Database (FPED) Variables

FPED Variables	Description (units)
FOODCODE	Food code
MODCODE	Modification code
DESCRIPTION	Food description
F_TOTAL	Total intact fruits (whole or cut) and fruit juices (cup eq.)
F_CITMLB	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)
F_OTHER	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
F_JUICE	Fruit juices, citrus and non-citrus (cup eq.)
V_TOTAL	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)
V_DRKGR	Dark green vegetables (cup eq.)
V_REDOR_TOTAL	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
V_REDOR_TOMATO	Tomatoes and tomato products (cup eq.)
V_REDOR_OTHER	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
V_STARCHY_TOTAL	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
V_STARCHY_POTATO	White potatoes (cup eq.)
V_STARCHY_OTHER	Other starchy vegetables, excluding white potatoes (cup eq.)
V_OTHER	Other vegetables not in the vegetable components listed above (cup eq.)
V_LEGUMES	Beans and peas (legumes) computed as vegetables (cup eq.)
G_TOTAL	Total whole and refined grains (oz. eq.)
G_WHOLE	Grains defined as whole grains and contain the entire grain kernel — the bran, germ, and endosperm (oz. eq.)
G_REFINED	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)
PF_TOTAL	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
PF_MPS_TOTAL	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)
PF_MEAT	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)
PF_CUREDMEAT	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
PF_ORGAN	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)

FPED Variables	Description (units)
PF_POULT	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)
PF_SEAFD_HI	Seafood (finfish, shellfish, and other seafood) high in *n*-3 fatty acids (oz. eq.)
PF_SEAFD_LOW	Seafood (finfish, shellfish, and other seafood) low in *n*-3 fatty acids (oz. eq.)
PF_EGGS	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
PF_SOY	Soy products, excluding calcium fortified soy milk and mature soybeans (oz. eq.)
PF_NUTSDS	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)
PF_LEGUMES	Beans and Peas (legumes) computed as protein foods (oz. eq.)
D_TOTAL	Total milk, yogurt, cheese, and whey. For some foods, the total dairy values could be higher than the sum of D_MILK, D_YOGURT, and D_CHEESE because miscellaneous dairy component composed of whey is not included in FPED as a separate variable. (cup eq.)
D_MILK	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
D_YOGURT	Yogurt (cup eq.)
D_CHEESE	Cheeses (cup eq.)
OILS	Fats naturally present in nuts, seeds, and seafood; unhydrogentated vegetable oils, except palm oil, palm kernel oil, and coconut oils; fat present in avocado and olives above the allowable amount; 50% of fat present in stick and tub margarines and margarine spreads (grams)
SOLID_FATS	Fats naturally present in meat, poultry, eggs, and dairy (lard, tallow, and butter); hydrogenated or partially hydrogenated oils; shortening; palm, palm kernel and coconut oils; fat naturally present in coconut meat and cocoa butter; and 50% of fat present in stick and tub margarines and margarine spreads (grams)
ADD_SUGARS	Foods defined as added sugars (tsp. eq.)
A_DRINKS	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)

Appendix 5: Food Patterns Equivalents Intakes Files per Food per Individual for Day 1 and Day 2: Number of Observations and Variables

Day 1 fped_dr1iff_0506.sas7bdat	**Day 2 fped_dr2iff_0506.sas7bdat**	**Description (units)**
146940	132151	Number of observations
SEQN	SEQN	Respondent sequence number
RIAGENDR	RIAGENDR	Gender
RIDAGEYR	RIDAGEYR	Age at screening adjudicated - Recode
RIDRETH1	RIDRETH1	Race/Ethnicity – Recode
INDFMINC	INDFMINC	Annual family income
INDFMPIR	INDFMPIR	Ratio of family income to poverty
SDMVPSU	SDMVPSU	Masked variance pseudo-PSU
SDMVSTRA	SDMVSTRA	Masked variance pseudo-stratum
WTDRD1	WTDRD1	Dietary day one sample weight
WTDR2D	WTDR2D	Dietary two-day sample weight
DR1DRSTZ	DR2DRSTZ	Dietary recall status
DRABF	DRABF	Breast-fed infant (either day)
DRDINT	DRDINT	Number of days of intake
DR1TNUMF	DR2TNUMF	Number of foods reported
DR1ILINE	DR2ILINE	Food/Individual component number
DR1IFDCD	DR2IFDCD	USDA food code
DR1MC	DR2MC	Modification code
DR1IGRMS	DR2IGRMS	Grams
DESCRIPTION	DESCRIPTION	Food description
DR1I_F_TOTAL	DR2I_F_TOTAL	Total intact fruits (whole or cut) and fruit juices (cup eq.)
DR1I_F_CITMLB	DR2I_F_CITMLB	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)

Day 1 fped_dr1iff_0506.sas7bdat	Day 2 fped_dr2iff_0506.sas7bdat	Description (units)
DR1I_F_OTHER	DR2I_F_OTHER	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
DR1I_F_JUICE	DR2I_F_JUICE	Fruit juices, citrus and non-citrus (cup eq.)
DR1I_V_TOTAL	DR2I_V_TOTAL	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)
DR1I_V_DRKGR	DR2I_V_DRKGR	Dark green vegetables (cup eq.)
DR1I_V_REDOR_TOTAL	DR2I_V_REDOR_TOTAL	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
DR1I_V_REDOR_TOMATO	DR2I_V_REDOR_TOMATO	Tomatoes and tomato products (cup eq.)
DR1I_V_REDOR_OTHER	DR2I_V_REDOR_OTHER	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
DR1I_V_STARCHY_TOTAL	DR2I_V_STARCHY_TOTAL	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
DR1I_V_STARCHY_POTATO	DR2I_V_STARCHY_POTATO	White potatoes (cup eq.)
DR1I_V_STARCHY_OTHER	DR2I_V_STARCHY_OTHER	Other starchy vegetables, excluding white potatoes (cup eq.)
DR1I_V_OTHER	DR2I_V_OTHER	Other vegetables not in the vegetable components listed above (cup eq.)
DR1I_V_LEGUMES	DR2I_V_LEGUMES	Beans and peas (legumes) computed as vegetables (cup eq.)
DR1I_G_TOTAL	DR2I_G_TOTAL	Total whole and refined grains (oz. eq.)
DR1I_G_WHOLE	DR2I_G_WHOLE	Grains defined as whole grains and contain the entire grain kernel — the bran, germ, and endosperm (oz. eq.)
DR1I_G_REFINED	DR2I_G_REFINED	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)
DR1I_PF_TOTAL	DR2I_PF_TOTAL	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
DR1I_PF_MPS_TOTAL	DR2I_PF_MPS_TOTAL	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)
DR1I_PF_MEAT	DR2I_PF_MEAT	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)

Day 1 fped_dr1iff_0506.sas7bdat	Day 2 fped_dr2iff_0506.sas7bdat	Description (units)
DR1I_PF_CUREDMEAT	DR2I_PF_ CUREDMEAT	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
DR1I_PF_ORGAN	DR2I_PF_ORGAN	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)
DR1I_PF_POULT	DR2I_PF_POULT	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)
DR1I_PF_SEAFD_HI	DR2I_PF_SEAFD_HI	Seafood (finfish, shellfish, and other seafood) high in *n*-3 fatty acids (oz. eq.)
DR1I_PF_SEAFD_LOW	DR2I_PF_SEAFD_LOW	Seafood (finfish, shellfish, and other seafood) low in *n*-3 fatty acids (oz. eq.)
DR1I_PF_EGGS	DR2I_PF_EGGS	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
DR1I_PF_SOY	DR2I_PF_SOY	Soy products, excluding calcium fortified soy milk and mature soybeans (oz. eq.)
DR1I_PF_NUTSDS	DR2I_PF_NUTSDS	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)
DR1I_PF_LEGUMES	DR2I_PF_LEGUMES	Beans and Peas (legumes) computed as protein foods (oz. eq.)
DR1I_D_TOTAL	DR2I_D_TOTAL	Total milk, yogurt, cheese, and whey. For some foods, the total dairy values could be higher than the sum of D_MILK, D_YOGURT, and D_CHEESE because miscellaneous dairy component composed of whey is not included in FPED as a separate variable. (cup eq.)
DR1I_D_MILK	DR2I_D_MILK	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
DR1I_D_YOGURT	DR2I_D_YOGURT	Yogurt (cup eq.)
DR1I_D_CHEESE	DR2I_D_CHEESE	Cheeses (cup eq.)
DR1I_OILS	DR2I_OILS	Fats naturally present in nuts, seeds, and seafood; unhydrogentated vegetable oils, except palm oil, palm kernel oil, and coconut oils; fat present in avocado and olives above the allowable amount; 50% of fat present in stick and tub margarines and margarine spreads (grams)

Day 1 fped_dr1iff_0506.sas7bdat	Day 2 fped_dr2iff_0506.sas7bdat	Description (units)
DR1I_SOLID_FATS	DR2I_SOLID_FATS	Fats naturally present in meat, poultry, eggs, and dairy (lard, tallow, and butter); hydrogenated or partially hydrogenated oils; shortening; palm, palm kernel and coconut oils; fat naturally present in coconut meat and cocoa butter; and 50% of fat present in stick and tub margarines and margarine spreads (grams)
DR1I_ADD_SUGARS	DR2I_ADD_SUGARS	Foods defined as added sugars (tsp. eq.)
DR1I_A_DRINKS	DR2I_A_DRINKS	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)

Appendix 6: Total Food Patterns Equivalents Intakes Files per Individual for Day 1 and Day 2: Number of Observations and Variables

Day 1 **fped_dr1tot_0506.sas7bdat**	**Day 2** **fped_dr2tot_0506.sas7bdat**	**Description (units)**
9950	9950	Number of observations
SEQN	SEQN	Respondent sequence number
RIAGENDR	RIAGENDR	Gender
RIDAGEYR	RIDAGEYR	Age at screening adjudicated - Recode
RIDRETH1	RIDRETH1	Race/Ethnicity – Recode
INDFMINC	INDFMINC	Annual family income
INDFMPIR	INDFMPIR	Ratio of family income to poverty
SDMVPSU	SDMVPSU	Masked variance pseudo-PSU
SDMVSTRA	SDMVSTRA	Masked variance pseudo-stratum
WTDRD1	WTDRD1	Dietary day one sample weight
WTDR2D	WTDR2D	Dietary two-day sample weight
DR1DRSTZ	DR2DRSTZ	Dietary recall status
DRABF	DRABF	Breast-fed infant (either day)
DRDINT	DRDINT	Number of days of intake
DR1TNUMF	DR2TNUMF	Number of foods reported
DR1T_F_TOTAL	DR2T_F_TOTAL	Total intact fruits (whole or cut) and fruit juices (cup eq.)
DR1T_F_CITMLB	DR2T_F_CITMLB	Intact fruits (whole or cut) of citrus, melons, and berries (cup eq.)
DR1T_F_OTHER	DR2T_F_OTHER	Intact fruits (whole or cut); excluding citrus, melons, and berries (cup eq.)
DR1T_F_JUICE	DR2T_F_JUICE	Fruit juices, citrus and non-citrus (cup eq.)
DR1T_V_TOTAL	DR2T_V_TOTAL	Total dark green, red and orange, starchy, and other vegetables; excludes legumes (cup eq.)

Day 1 fped_dr1tot_0506.sas7bdat	Day 2 fped_dr2tot_0506.sas7bdat	Description (units)
DR1T_V_DRKGR	DR2T_V_DRKGR	Dark green vegetables (cup eq.)
DR1T_V_REDOR_TOTAL	DR2T_V_REDOR_TOTAL	Total red and orange vegetables (tomatoes and tomato products + other red and orange vegetables) (cup eq.)
DR1T_V_REDOR_TOMATO	DR2T_V_REDOR_TOMATO	Tomatoes and tomato products (cup eq.)
DR1T_V_REDOR_OTHER	DR2T_V_REDOR_OTHER	Other red and orange vegetables, excluding tomatoes and tomato products (cup eq.)
DR1T_V_STARCHY_TOTAL	DR2T_V_STARCHY_TOTAL	Total starchy vegetables (white potatoes + other starchy vegetables) (cup eq.)
DR1T_V_STARCHY_POTATO	DR2T_V_STARCHY_POTATO	White potatoes (cup eq.)
DR1T_V_STARCHY_OTHER	DR2T_V_STARCHY_OTHER	Other starchy vegetables, excluding white potatoes (cup eq.)
DR1T_V_OTHER	DR2T_V_OTHER	Other vegetables not in the vegetable components listed above (cup eq.)
DR1T_V_LEGUMES	DR2T_V_LEGUMES	Beans and peas (legumes) computed as vegetables (cup eq.)
DR1T_G_TOTAL	DR2T_G_TOTAL	Total whole and refined grains (oz. eq.)
DR1T_G_WHOLE	DR2T_G_WHOLE	Grains defined as whole grains and contain the entire grain kernel — the bran, germ, and endosperm (oz. eq.)
DR1T_G_REFINED	DR2T_G_REFINED	Refined grains that do not contain all of the components of the entire grain kernel (oz. eq.)
DR1T_PF_TOTAL	DR2T_PF_TOTAL	Total meat, poultry, organ meat, cured meat, seafood, eggs, soy, and nuts and seeds; excludes legumes (oz. eq.)
DR1T_PF_MPS_TOTAL	DR2T_PF_MPS_TOTAL	Total of meat, poultry, seafood, organ meat, and cured meat (oz. eq.)
DR1T_PF_MEAT	DR2T_PF_MEAT	Beef, veal, pork, lamb, and game meat; excludes organ meat and cured meat (oz. eq.)
DR1T_PF_ CUREDMEAT	DR2T_PF_ CUREDMEAT	Frankfurters, sausages, corned beef, and luncheon meat that are made from beef, pork, or poultry (oz. eq.)
DR1T_PF_ORGAN	DR2T_PF_ORGAN	Organ meat from beef, veal, pork, lamb, game, and poultry (oz. eq.)

Day 1 fped_dr1tot_0506.sas7bdat	Day 2 fped_dr2tot_0506.sas7bdat	Description (units)
DR1T_PF_POULT	DR2T_PF_POULT	Chicken, turkey, Cornish hens, duck, goose, quail, and pheasant (game birds); excludes organ meat and cured meat (oz. eq.)
DR1T_PF_SEAFD_HI	DR2T_PF_SEAFD_HI	Seafood (finfish, shellfish, and other seafood) high in *n*-3 fatty acids (oz. eq.)
DR1T_PF_SEAFD_LOW	DR2T_PF_SEAFD_LOW	Seafood (finfish, shellfish, and other seafood) low in *n*-3 fatty acids (oz. eq.)
DR1T_PF_EGGS	DR2T_PF_EGGS	Eggs (chicken, duck, goose, quail) and egg substitutes (oz. eq.)
DR1T_PF_SOY	DR2T_PF_SOY	Soy products, excluding calcium fortified soy milk and mature soybeans (oz. eq.)
DR1T_PF_NUTSDS	DR2T_PF_NUTSDS	Peanuts, tree nuts, and seeds; excludes coconut (oz. eq.)
DR1T_PF_LEGUMES	DR2T_PF_LEGUMES	Beans and Peas (legumes) computed as protein foods (oz. eq.)
DR1T_D_TOTAL	DR2T_D_TOTAL	Total milk, yogurt, cheese, and whey. For some foods, the total dairy values could be higher than the sum of D_MILK, D_YOGURT, and D_CHEESE because miscellaneous dairy component composed of whey is not included in FPED as a separate variable. (cup eq.)
DR1T_D_MILK	DR2T_D_MILK	Fluid milk, buttermilk, evaporated milk, dry milk, and calcium fortified soy milk (cup eq.)
DR1T_D_YOGURT	DR2T_D_YOGURT	Yogurt (cup eq.)
DR1T_D_CHEESE	DR2T_D_CHEESE	Cheeses (cup eq.)
DR1T_OILS	DR2T_OILS	Fats naturally present in nuts, seeds, and seafood; unhydrogentated vegetable oils, except palm oil, palm kernel oil, and coconut oils; fat present in avocado and olives above the allowable amount; 50% of fat present in stick and tub margarines and margarine spreads (grams)

Day 1 fped_dr1tot_0506.sas7bdat	Day 2 fped_dr2tot_0506.sas7bdat	Description (units)
DR1T_SOLID_FATS	DR2T_SOLID_FATS	Fats naturally present in meat, poultry, eggs, and dairy (lard, tallow, and butter); hydrogenated or partially hydrogenated oils; shortening; palm, palm kernel and coconut oils; fat naturally present in coconut meat and cocoa butter; and 50% of fat present in stick and tub margarines and margarine spreads (grams)
DR1T_ADD_SUGARS	DR2T_ADD_SUGARS	Foods defined as added sugars (tsp. eq.)
DR1T_A_DRINKS	DR2T_A_DRINKS	Alcoholic beverages and alcohol (ethanol) added to foods after cooking (no. of drinks)

Appendix 7: SAS Program for Calculating Mean Intakes of Food Patterns Equivalents for the Thirty-Seven Components

```
/*************************************************************************************;
SAS Program:    MakeTables.sas

Purpose:    Sample SAS program to estimate mean intakes of USDA 2005-2006 Food
            Patterns Equivalents and create tables

Data In:    ...\Output\FPED_DR1TOT_0506.sas7bdat

Output:     ...\Output\Table1.pdf       by Gender and Age
            ...\Output\Table2.pdf       by Race/Ethnicity and Age
            ...\Output\Table3.pdf       by Family Income (in Dollars) and Age
            ...\Output\Table4.pdf       by Family Income (% Poverty) and Age

*************************************************************************************/



*******************************************************************;
*                                                                 ;
*  MakeTables.sas                                                 ;
*                                                                 ;
*  This SAS® program estimates mean intakes, consumed per         ;
*  individual in the United States of USDA 2005-2006 Food         ;
*  Patterns Equivalents and creates the following tables          ;
*  in the same directory as this program:                         ;
*                                                                 ;
*       Table1.pdf      by Gender and Age                         ;
*       Table2.pdf      by Race/Ethnicity and Age                 ;
*       Table3.pdf      by Family Income (in Dollars) and Age     ;
*       Table4.pdf      by Family Income (% Poverty) and Age      ;
*                                                                 ;
*  The required input data set, FPED_DR1TOT_0506.sas7bdat,        ;
*  is assumed to exist in the same directory as this program.     ;
*  If not, be sure to modify the libname statement appropriately. ;
*                                                                 ;
*******************************************************************;

options nocenter nodate number orientation=landscape ls=155 ps=48  missing = ' ';

* Create macro var, iPath, with directory of this program.;
%let iPath=%sysfunc(tranwrd(%sysget(SAS_EXECFILEPATH),\%sysget(SAS_EXECFILENAME),));

* Libname of folder where FPED_DR1TOT_0506 resides.;
libname Input "&iPath.";


*******************************************************************;
*                                                                 ;
*  Make data1 with stub variables for the groups.                 ;
*  Day 1, 2 year and over, exclude breast-fed, reliable intakes.  ;
*                                                                 ;
*******************************************************************;
data data1;
```

```
set Input.FPED_DR1TOT_0506 (where = ((RIDAGEYR >= 2) and
                           (DRABF ne 1) and DR1DRSTZ = 1));

all = 1;
sex = RIAGENDR;

if       2 <= RIDAGEYR <= 5     then ag1 = 1;
else if  6 <= RIDAGEYR <= 11    then ag1 = 2;
else if 12 <= RIDAGEYR <= 19    then ag1 = 3;
else if 20 <= RIDAGEYR <= 29    then ag1 = 4;
else if 30 <= RIDAGEYR <= 39    then ag1 = 5;
else if 40 <= RIDAGEYR <= 49    then ag1 = 6;
else if 50 <= RIDAGEYR <= 59    then ag1 = 7;
else if 60 <= RIDAGEYR <= 69    then ag1 = 8;
else if RIDAGEYR >= 70          then ag1 = 9;

if       2 <= RIDAGEYR <= 5     then ag2 = 1;
else if  6 <= RIDAGEYR <= 11    then ag2 = 2;
else if 12 <= RIDAGEYR <= 19    then ag2 = 3;
else if RIDAGEYR >= 20          then ag2 = 10;

if      RIDRETH1 = 1            then rac = 3;   * Mex American  ;
else if RIDRETH1 = 2            then rac = 4;   * Other Hispanic;
else if RIDRETH1 = 3            then rac = 1;   * Non-Hisp White;
else if RIDRETH1 = 4            then rac = 2;   * Non-Hisp Black;
else if RIDRETH1 = 5            then rac = 5;   * Other Race    ;

if      RIDRETH1 in(1 2)        then his = 1;   * Hispanic      ;
else                                 his = 2;   * Non-Hispanic  ;

if      INDFMIN2 in(1:5 13)     then inc = 1;   * Under $20k    ;
else if INDFMIN2 in(6:10)       then inc = 2;   * $20 - $75k    ;
else if INDFMIN2 in(14 15)      then inc = 3;   * $75k and Over ;
else                                 inc = 4;   * Other         ;

if      0 <= INDFMPIR <= 1.3    then pov = 1;   * Under 131% pov;
else if 1.3 < INDFMPIR <= 1.85  then pov = 2;   * 131-185% pov  ;
else if INDFMPIR > 1.85         then pov = 3;   * Over 185% pov ;
else                                 pov = 4;   * Other         ;

* Apply shortened labels, these will appear in table headings.;
label DR1T_G_TOTAL          = "Total Grain";
label DR1T_G_WHOLE          = "Whole Grains";
label DR1T_G_REFINED        = "Refined Grains";
label DR1T_V_TOTAL          = "Total Vegetables";
label DR1T_V_DRKGR          = "Dark Green";
label DR1T_V_REDOR_OTHER    = "Other Red Orange";
label DR1T_V_STARCHY_TOTAL  = "Total Starchy";
label DR1T_V_STARCHY_POTATO = "Potatoes";
label DR1T_V_STARCHY_OTHER  = "Other Starchy";
label DR1T_V_REDOR_TOTAL    = "Total Red and Orange";
label DR1T_V_REDOR_TOMATO   = "Tomatoes";
label DR1T_V_OTHER          = "Other";
label DR1T_F_TOTAL          = "Total Fruit";
label DR1T_F_CITMLB         = "Citrus, Melons and Berries";
label DR1T_F_OTHER          = "Other Fruit";
label DR1T_F_JUICE          = "Fruit Juice";
```

```
    label DR1T_D_TOTAL          = "Total Dairy";
    label DR1T_D_MILK           = "Fluid Milk";
    label DR1T_D_YOGURT         = "Yogurt";
    label DR1T_D_CHEESE         = "Cheese";
    label DR1T_PF_TOTAL         = "Total Protein";
    label DR1T_PF_MPS_TOTAL     = "Total Meat, Poultry, and Seafood";
    label DR1T_PF_MEAT          = "Meat";
    label DR1T_PF_ORGAN         = "Organ";
    label DR1T_PF_CUREDMEAT     = "Cured Meats";
    label DR1T_PF_POULT         = "Poultry";
    label DR1T_PF_SEAFD_HI      = "Seafood High n-3";
    label DR1T_PF_SEAFD_LOW     = "Seafood Low n-3";
    label DR1T_PF_EGGS          = "Eggs";
    label DR1T_PF_SOY           = "Soybean Products";
    label DR1T_PF_NUTSDS        = "Nuts and Seeds";
    label DR1T_V_LEGUMES        = "Legumes as Vegetable";
    label DR1T_PF_LEGUMES       = "Legumes as Protein";
    label DR1T_OILS             = "Oils";
    label DR1T_SOLID_FATS       = "Solid Fats";
    label DR1T_ADD_SUGARS       = "Added Sugar";
    label DR1T_A_DRINKS         = "Alcoholic Drinks";
run;


*******************************************************************;
*                                                                 ;
*  Create formats for the group variables.                        ;
*                                                                 ;
*******************************************************************;
proc format;
    value agef
        1   = " 2 -  5............."
        2   = " 6 - 11............."
        3   = "12 - 19............."
        4   = "20 - 29............."
        5   = "30 - 39............."
        6   = "40 - 49............."
        7   = "50 - 59............."
        8   = "60 - 69............."
        9   = "    70 and over......"
        10  = "       20 and over..."
        11  = "        2 and over...";

    value sexf
        1   = "Males:"
        2   = "Females:"
        3   = "Males and females:";

    value racf
        1   = "Non-Hispanic White:"
        2   = "Non-Hispanic Black:"
        3   = "Mexican American:"
        4   = "All Hispanic:";

    value incf
        1   = "$0 - $24,999:"
        2   = "$25,000 - $74,999:"
```

```
        3   = "$75,000 and higher:"
        4   = "All Individuals:";

    value povf
        1   = "Under 131% poverty:"
        2   = "131-185% poverty:"
        3   = "Over 185% poverty:"
        4   = "All Individuals:";
run;


*********************************************************************;
*                                                                   ;
*  Generate weighted means and SE.                                  ;
*                                                                   ;
*********************************************************************;
ods listing close;
ods noresults;
proc sort data=data1;
    by SDMVSTRA SDMVPSU;
* By Gender and Age.;
proc surveymeans nobs mean stderr data = data1;
    stratum SDMVSTRA;
    cluster SDMVPSU;
    weight WTDRD1;
    domain  all sex*ag1 sex*ag2;
    var DR1T_F_CITMLB--DR1T_A_DRINKS;
    ods output domain = data2_sex;
* By Race/Ethnicity and Age.;
proc surveymeans nobs mean stderr data = data1;
    stratum SDMVSTRA;
    cluster SDMVPSU;
    weight WTDRD1;
    domain rac his ag2*rac ag2*his;
    var DR1T_F_CITMLB--DR1T_A_DRINKS;
    ods output domain = data2_rac;
* By Family Income (in Dollars) and Age.;
proc surveymeans nobs mean stderr data = data1;
    stratum SDMVSTRA;
    cluster SDMVPSU;
    weight WTDRD1;
    domain all inc all*ag2 inc*ag2;;
    var DR1T_F_CITMLB--DR1T_A_DRINKS;
    ods output domain = data2_inc;
* By Family Income (% Poverty) and Age.;
proc surveymeans nobs mean stderr data = data1;
    stratum SDMVSTRA;
    cluster SDMVPSU;
    weight WTDRD1;
    domain all pov all*ag2 pov*ag2;;
    var DR1T_F_CITMLB--DR1T_A_DRINKS;
    ods output domain = data2_pov;
run;
ods listing;
```

```
*****************************************************************;
*                                                               ;
*  Combine data sets, assign statistical flag, round, and add   ;
*  table, age, and group variables.                             ;
*                                                               ;
*****************************************************************;
data data3;
    set data2_sex (in=insex)
        data2_rac (in=inrac)
        data2_inc (in=ininc)
        data2_pov (in=inpov);

    * Assign statistical flag based on cv, sample size, and vif.;
    vif = 2.16; * Variance inflation factor for 2 year and older.;
    if (mean > 0) then cv = stderr / mean * 100;
    if  (cv >= 30) or
        (n < (30 * vif)) then statflag = '*';

    * Round values. ;
    cstat = put(mean, 8.2);
    cse = put(stderr, 8.3);

    * Indicate if value greated than zero too small to print. ;
    if (round(mean, 0.01) eq 0) and (mean > 0) then cstat = "#";
    if (round(stderr, 0.001) eq 0) and (stderr > 0) then cse = "#";

    * Don't show statflag if too small to print. ;
    if cstat = "#" then statflag = "";
    cse = compress("("||cse||")");
    * Don't show cse if cstat too small to print. ;
    if cstat = "#" then cse = "";

    * Replace zero with #. ;
    if compress(cstat) = "0" then do;
        cstat = "#";
        cse = "";
        statflag = "";
    end;

    * Make table, age, and group variables. ;
    if insex=1 then do;
        table = "sex";
        if ag1 in(1:9)  then age = ag1;
        if ag2 in(10)   then age = ag2;
        if all in(1) then do;
            sex = 3;                    * All individuals          ;
            age = 11;                   * 2 and over               ;
        end;
        group = put(sex, sexf.);
    end;

    if inrac=1 then do;
        table = "rac";
        if rac in(4 5)  then rac = .;
        if his in(1)    then rac = 4;   * All Hispanic             ;
        if ag2 in(.)    then age = 11;  * 2 and over               ;
        if ag2 in(1:10) then age = ag2;
```

```
        group = put(rac, racf.);
    end;

    if ininc=1 then do;
        table = "inc";
        if inc in(4)    then inc = .;
        if all in(1)    then inc = 4;   * All individuals          ;
        if ag2 in(.)    then age = 11;  * 2 and over               ;
        if ag2 in(1:10) then age = ag2;
        group = put(inc, incf.);
    end;

    if inpov=1 then do;
        table = "pov";
        if pov in(4 5)  then pov = .;
        if all in(1)    then pov = 4;   * All individuals          ;
        if ag2 in(.)    then age = 11;  * 2 and over               ;
        if ag2 in(1:10) then age = ag2;
        group = put(pov, povf.);
    end;

    agegroup = put(age, agef.);
    if group ^="" and age in(1:11) then output;
    keep varname varlabel cstat cse statflag n mean stderr cv;
    keep sex rac inc pov table age group agegroup;
run;


*****************************************************************;
*                                                               ;
*  Create data set, vars, with varnames and varorder.           ;
*  Permits printing vars in the correct order.                  ;
*                                                               ;
*****************************************************************;
proc transpose data=data1(keep=DR1T_F_CITMLB--DR1T_A_DRINKS obs=0)
    out=vars (keep=_name_ rename=(_name_=varname));
data vars;
    set vars;
    varorder=_n_;
proc sort data=data3;
    by varname;
proc sort data=vars;
    by varname;
data data3;
    merge data3 vars;
    by varname;
proc sort data=data3;
    by table sex rac inc pov age varorder;
run;


*****************************************************************;
*                                                               ;
*  Create and run macro program to make tables.                 ;
*                                                               ;
*****************************************************************;
%macro makeTables();
```

```
ods escapechar = '~';
ods listing close;

%do i = 1 %to 4;    * Loop through tables.;
%if &i. = 1 %then %do;
    %let grp = sex;
    %let grpTxt = Gender*and age (years);
    %let grpBy = by Gender and Age;
%end;
%if &i. = 2 %then %do;
    %let grp = rac;
    %let grpTxt = Race/ethnicity*and age (years);
    %let grpBy = by Race/Ethnicity and Age;
%end;
%if &i. = 3 %then %do;
    %let grp = inc;
    %let grpTxt = Family income*in dollars*and age (years);
    %let grpBy = by Family Income (in Dollars) and Age;
%end;
%if &i. = 4 %then %do;
    %let grp = pov;
    %let grpTxt = Family income as*% of Federal poverty*threshold ;
    %let grpTxt = &grpTxt.and age*and age (years);
    %let grpBy = by Family Income (as % of Federal Poverty Threshold) and Age;
%end;

ods pdf file = "&iPath.\Table&i..pdf" style = journal notoc;

* Macro var with style, column, defines, and computes for all reports.;
%let allReports = %str(
    style(header)=[font=('Times') height=0.80in fontsize=10pt fontstyle=roman]
    style(column)=[font=('Times') height=0.18in fontsize=10pt fontstyle=roman];
    column &grp. ("&grpTxt." age) ("n" n) varlabel, (cstat statflag cse);
    define &grp.    /group  "" noprint id order=data;
    define age      /group  "" style=[width=1.30in just=r] id order=data;
    define n        /group  "" style=[width=0.40in just=r];
    define varlabel /across "" order=data;
    define cstat    /group  "" style=[width=0.40in just=r rightmargin=-0.10in];
    define statflag /group  "" style=[width=0.02in just=r rightmargin=-0.07in];
    define cse      /group  "" style=[width=0.45in just=l fontsize=9pt];
    compute before &grp.;
        line "~S={just=l vjust=b fontweight=bold font=('Times') "
             "height=0.25in fontsize=11pt}" &grp. &grp.f.;
    endcomp;
    compute after &grp.;
        line "~S={height=0.10in}";
    endcomp;
    format age agef. &grp. &grp.f.;);

%let footnote1 = "() Standard Error";
%let footnote2 = "* Indicates an estimate with a relative standard error greater than 30%.";
%let footnote3 = "# Indicates a non-zero value that is too small to report.";
%let footnote4a = "Total Dairy includes fluid milk, cheese, yogurt, and miscellaneous dairy (not
in table). "
                  "Fluid Milk includes calcium fortified soy milk.";
%let footnote4b = "Legumes are not included in Total Protein Foods or Total Vegetables. "
```

```
                 "Legumes as Protein Foods are calculated as 4x Legumes as Vegetable.";
%let footnote4c = "Total Vegetables does not include Legumes.";
%let footnote6 = "DATA SOURCES: ~mWhat We Eat in America, NHANES 2005-2006, "
                "individuals 2 years and over (excluding breast-fed children), "
                "day 1 dietary intake data, weighted.~-2n"
                "Food Patterns Equivalent Database (FPED) 2005-2006.";
%let titleEnd = Consumed per Individual,~-2nEstimated from Dietary Intake;
%let titleEnd = &titleEnd. Data, &grpBy., in the United States, 2005-2006);

title;
footnote;
footnote1 &footnote1.;
footnote2 &footnote2.;
footnote3 &footnote3.;
footnote4 &footnote4a.;
footnote6 &footnote6.;

title1 "Dairy: ~mMean Cup Equivalents, &titleEnd.";
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_D_TOTAL"  "DR1T_D_MILK"
            "DR1T_D_CHEESE" "DR1T_D_YOGURT");
run;

footnote4;
footnote6 &footnote6.;
title1 "Fruit: ~mMean Cup Equivalents, &titleEnd.";
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_F_TOTAL"          "DR1T_F_CITMLB"
            "DR1T_F_OTHER"          "DR1T_F_JUICE");
run;

title1 "Grains: ~mMean Ounce Equivalents &titleEnd.";
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_G_TOTAL"          "DR1T_G_WHOLE"
            "DR1T_G_REFINED");
run;

title1 "Protein Foods: ~mMean Ounce Equivalents, &titleEnd.";
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_PF_TOTAL"         "DR1T_PF_MPS_TOTAL"
            "DR1T_PF_MEAT"          "DR1T_PF_POULT"
            "DR1T_PF_CUREDMEAT"     "DR1T_PF_SEAFD_LOW"
            "DR1T_PF_SEAFD_HI"      "DR1T_PF_ORGAN");
run;

title1 "Protein Foods: ~mMean Ounce Equivalents, &titleEnd.";
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_PF_EGGS"          "DR1T_PF_NUTSDS"
            "DR1T_PF_SOY");
run;

title1 "Legumes: ~mMean Cup Equivalents (as vegetable) and Ounce "
```

```
       "Equivalents (as protein), &titleEnd.";
footnote4 &footnote4b.;
footnote6 &footnote6.;
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_PF_LEGUMES"       "DR1T_V_LEGUMES");
run;

title1 "Vegetables: ~mMean Cup Equivalents &titleEnd.";
footnote4 &footnote4c.;
footnote6 &footnote6.;
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_V_TOTAL"          "DR1T_V_DRKGR"
            "DR1T_V_REDOR_OTHER"    "DR1T_V_STARCHY_TOTAL"
            "DR1T_V_STARCHY_POTATO" "DR1T_V_STARCHY_OTHER"
            "DR1T_V_REDOR_TOTAL"    "DR1T_V_REDOR_TOMATO"
            "DR1T_V_OTHER");
run;
footnote4 ;
footnote6 &footnote6.;
title1 "Oils and Other Components: ~mMean Grams of Oils and Solid Fats; "
       "Teaspoon Equivalents of Added Sugars;~-2nand Number of Alcoholic "
       "Drinks, &titleEnd.";
proc report nowindows missing split ="*" data=data3 &allReports.;
    where table = "&grp." and varname
        in( "DR1T_OILS"         "DR1T_SOLID_FATS"
            "DR1T_ADD_SUGARS"   "DR1T_A_DRINKS");
run;

ods _all_ close;
%end; * End of table loop.;
ods listing;
%mend makeTables;

%makeTables();
```

Appendix 8: Fruit Cup Equivalent Weights

Food Description	Weight of One Cup Equivalent (g)
100% Fruit juice	250
100% Fruit juice blend	250
100% Fruit juice concentrate	70
Apples, baked	110
Apples, dried	45
Apples, raw	110
Applesauce	245
Apricots, dried	65
Apricots, raw	165
Banana flakes, dehydrated	50
Bananas, boiled	150
Bananas, raw	150
Blackberries, frozen	150
Blackberries, raw	145
Blueberries, frozen	150
Blueberries, raw	145
Boysenberries, frozen	150
Boysenberries, raw	145
Calamondin, raw	185
Cantaloupe, melon, frozen	170
Cantaloupe, melon, raw	170
Carambolas (starfruit), raw	140
Cassaba melon, raw	170

Food Description	Weight of One Cup Equivalent (g)
Cherries, sour, raw	155
Cherries, sweet, raw	155
Cranberries, raw	145
Currants, dried	75
Currants, raw	110
Dates	75
Dewberries, raw	145
Figs, dried	75
Figs, raw	255
Fruit juice drink	250
Fruit nectar	250
Fruit, all types, canned, in heavy syrup, solids and liquids	255
Fruit, all types, canned, in light syrup, solids and liquids	250
Fruit, all types, canned, in syrup, drained	200
Fruit, all types, canned, juice pack, solids and liquids	245
Fruit, all types, canned, water pack, drained	190
Fruit, all types, canned, water pack, solids and liquids	245
Fruit, all types, dried, cooked	250
Grapefruit, raw	210
Grapes, American type, slip skin, raw	90
Grapes, European type, adherent skin, raw	150
Guava, raw	165
Honeydew melon, frozen	170
Honeydew melon, raw	170
Huckleberries, raw	145

Food Description	Weight of One Cup Equivalent (g)
Juneberries, raw	145
Kiwifruit, raw	175
Kumquats, raw	185
Lemons, raw	210
Limes, raw	210
Litchis, dried	45
Litchis, raw	190
Loganberries, frozen	150
Loganberries, raw	145
Mangoes, raw	165
Mulberries, raw	145
Nectarines, raw	145
Oranges, raw	185
Papayas, dried	70
Papayas, raw	140
Passion fruit, raw	235
Peaches, dried	80
Peaches, frozen	150
Peaches, raw	155
Pears, dried	90
Pears, raw	165
Persimmon, raw	165
Pineapple, dried	70
Pineapple, raw	165
Plums, raw	165

Food Description	Weight of One Cup Equivalent (g)
Plums, rock salt, dried	60
Pomegranate, raw	155
Prunes, dried	85
Raisins	75
Raspberries, frozen	150
Raspberries, raw	145
Rhubarb, raw	120
Strawberries, frozen	150
Strawberries, raw	145
Tamarind, raw	120
Tangelos, raw	185
Tangerines, raw	185
Watermelon, raw	150
Youngberries, raw	145

Endnotes:

1. Fruit juice drinks are presumed to contain 15% fruit juice.
2. Fruit nectars are presumed to contain 40% fruit juice.
3. Fruits canned in syrup or water are presumed to be 65% fruit. Fruits canned in juice are presumed to be 65% fruit and 35% juice.

Appendix 9: Vegetable Cup Equivalent Weights

Food Description	Weight of One Cup Equivalent (g)
100% Vegetable juice, all types	245
Alfalfa sprouts or sprouted seeds, raw	35
Artichokes, cooked, from raw, frozen, or canned (drained)	175
Artichokes, raw	150
Arugula, raw	40
Asparagus, cooked, from raw, frozen, or canned (drained)	180
Asparagus, raw	135
Avocados, raw	145
Bamboo shoots, cooked	150
Bamboo shoots, raw	150
Basil, fresh	40
Bean sprouts, cooked, from raw or canned (drained)	125
Bean sprouts, raw	105
Beet greens, cooked	145
Beet greens, raw	75
Beets, cooked, from raw, frozen, or canned (drained)	170
Beets, raw	135
Bitter melon leaves, cooked	125
Bitter melon, cooked	125
Breadfruit, cooked	250
Breadfruit, raw	220
Broccoflower, cooked	125
Broccoflower, raw	110

Food Description	Weight of One Cup Equivalent (g)
Broccoli, cooked, from raw or frozen	155
Broccoli, raw	80
Brussels sprouts, cooked, from raw or frozen	155
Brussels sprouts, raw	90
Burdock root, cooked	125
Burdock root, raw	120
Cabbage, (green, red, or savoy), cooked	150
Cabbage, (green, red, or savoy), raw	90
Cabbage, Chinese, cooked	170
Cabbage, mustard, cooked	155
Cabbage, mustard, raw	130
Cabbage, pak-choi, raw	140
Cabbage, pe-tsai, raw	150
Cabbage, pickled, Japanese style	150
Cactus (Nopales), cooked	150
Cactus (Nopales), raw	150
Calabaza (Spanish pumpkin), cooked	165
Capers, cooked	135
Carrot juice	245
Carrots, cooked, from raw, frozen, or canned (drained)	145
Carrots, dried	35
Carrots, raw or frozen	125
Cassava (yuca blanca), cooked	130
Cassava (yuca blanca), raw	130
Cauliflower, cooked, from canned (drained)	180

Food Description	Weight of One Cup Equivalent (g)
Cauliflower, cooked, from raw or frozen	125
Cauliflower, frozen	110
Cauliflower, raw	110
Celeriac, cooked	155
Celeriac, raw	150
Celery juice	245
Celery, cooked	150
Celery, raw	120
Chard, cooked	150
Chard, raw	70
Chayote (Christophine), cooked	160
Chayote (Christophine), raw	130
Chicory greens, raw	60
Chives, dehydrated	10
Chives, raw	50
Chrysanthemum garland, cooked	100
Cilantro or coriander, raw	30
Collards, cooked, from frozen or canned (drained)	165
Collards, cooked, from raw	130
Collards, raw	70
Corn, cooked, from raw, frozen, or canned (drained)	165
Corn, raw or frozen	150
Cress, cooked, from raw or canned (drained)	135
Cress, raw	100
Cucumbers, cooked	180

Food Description	Weight of One Cup Equivalent (g)
Cucumbers, pickled	155
Cucumbers, raw	120
Dandelion greens, cooked	110
Dandelion greens, raw	110
Dasheen, cooked	140
Eggplant, cooked	95
Eggplant, pickled	135
Eggplant, raw	80
Endive, raw	100
Escarole, cooked	130
Escarole, raw	100
Fennel bulb, cooked	85
Fennel bulb, raw	85
Garlic, cooked	135
Garlic, raw	135
Ginger root, raw	95
Grape leaves, raw	30
Greens, cooked, from frozen or canned (drained)	160
Greens, cooked, from raw	145
Hominy, canned or cooked	165
Horseradish tree, leafy tips, cooked	40
Horseradish, pods, raw	100
Jicama, raw	130
Jute, potherb, cooked	145
Kale, cooked, from frozen or canned (drained)	165

Food Description	Weight of One Cup Equivalent (g)
Kale, cooked, from raw	130
Kohlrabi, cooked	165
Kohlrabi, raw	135
Lambsquarter, cooked	180
Leeks, cooked	170
Leeks, raw	90
Lettuce, Boston, raw	110
Lettuce, butterhead, raw	110
Lettuce, cooked	110
Lettuce, cos or romaine, raw	95
Lettuce, green leaf, raw	70
Lettuce, raw	110
Lima beans, immature, cooked, from raw, frozen, or canned (drained)	170
Lima beans, immature, raw or frozen	155
Lotus root, cooked	120
Mung beans, sprouted, cooked	125
Mung beans, sprouted, raw	105
Mushrooms, cooked, from raw, frozen, or canned (drained)	155
Mushrooms, dehydrated	20
Mushrooms, raw	70
Mustard greens, cooked, from frozen or canned (drained)	150
Mustard greens, cooked, from raw	140
Mustard greens, raw	110
Okra, cooked, from frozen or canned (drained)	170
Okra, cooked, from raw	160

Food Description	Weight of One Cup Equivalent (g)
Okra, frozen	115
Okra, raw	115
Olives	135
Onions, dehydrated	30
Onions, frozen	160
Onions, mature, cooked or sauteed, from raw or frozen	210
Onions, pearl, cooked, from raw, frozen, or canned (drained)	185
Onions, raw	160
Onions, young green (spring or scallion), cooked	220
Onions, young green (spring or scallion), raw	100
Palm hearts, cooked	145
Palm hearts, raw	145
Parsley, cooked	120
Parsley, raw	120
Parsnips, cooked	155
Peas, cow, field, or blackeye (immature), cooked, from raw, frozen, or canned (drained)	170
Peas, green (immature), cooked, from raw, frozen, or canned (drained)	160
Peas, green, dehydrated	35
Peas, green, frozen	145
Peas, green, raw	145
Peppers, bell and nonbell, canned (drained)	135
Peppers, bell and nonbell, cooked, from raw, frozen, or canned (drained)	135
Peppers, bell and nonbell, frozen, unprepared	125
Peppers, bell and nonbell, raw	120
Pigeon peas, immature seeds, cooked	150

Food Description	Weight of One Cup Equivalent (g)
Pigeon peas, immature seeds, raw	145
Pimiento	190
Plantain chips	57
Plantain or green bananas, cooked	150
Plantain or green bananas, raw	150
Poke greens, cooked	155
Pokeberry shoots, cooked	165
Potato chips	57
Potatoes, boiled	155
Potatoes, dry, powder	30
Potatoes, raw	150
Potatoes, roasted or baked	120
Pumpkin leaves, cooked	65
Pumpkin, cooked, from raw, frozen, or canned (drained)	245
Pumpkin, raw	115
Radicchio, raw	80
Radish, cooked	145
Radish, raw	125
Rutabaga, cooked	170
Rutabaga, raw	140
Salsify, cooked	135
Sauerkraut	140
Seaweed, raw	80
Snow peas, cooked, from raw or frozen	160
Snow peas, raw	100

Food Description	Weight of One Cup Equivalent (g)
Spinach, cooked, from frozen or canned (drained)	170
Spinach, cooked, from raw	150
Spinach, frozen, chopped or leaf	155
Spinach, raw	70
Sprouts, not further specified	55
Squash, spaghetti, cooked	155
Squash, summer, cooked, from raw, frozen, or canned (drained)	180
Squash, summer, raw	115
Squash, winter type, baked or cooked	205
Squash, winter type, mashed	245
Squash, winter type, raw	115
String (snap) beans, cooked, from frozen or canned (drained)	135
String (snap) beans, cooked, from raw	125
String (snap) beans, raw	110
Sweet potato chips	57
Sweet potato leaves, cooked	65
Sweet potatoes, canned (drained)	200
Sweet potatoes, cooked, baked or boiled	200
Sweet potatoes, raw	130
Tannier, cooked	190
Tapioca, pearl, dry	75
Taro chips	57
Taro leaves, cooked	145
Taro leaves, raw	60
Taro, cooked	130

Food Description	Weight of One Cup Equivalent (g)
Taro, raw	105
Thistle leaves, cooked	145
Tomatillos, raw	130
Tomato and vegetable juice or cocktail	245
Tomato juice	245
Tomato paste	120
Tomato puree	120
Tomato sauce	245
Tomatoes, canned, packed in tomato juice	245
Tomatoes, cooked	240
Tomatoes, dried	25
Tomatoes, raw	170
Turnip greens, cooked, from frozen or canned (drained)	160
Turnip greens, cooked, from raw	145
Turnips, cooked, from raw, frozen, or canned (drained)	155
Turnips, raw	130
Water chestnuts, cooked	160
Water chestnuts, raw	125
Watercress, cooked,	135
Watercress, raw	70
Winter melon (wax gourd), cooked	175

Appendix 10: Dairy Cup Equivalent Weights

Food Description	Weight of One Cup Equivalent
Milk	
Buttermilk, fluid, all fat types	245 g
Milk, dry, all fat types, not reconstituted	25 g
Milk, dry, all fat types, reconstituted	245 g
Milk, evaporated, all fat types	125 g
Milk, fluid, all fat types, plain or flavored	245 g
Soy milk, with added calcium	245 g
Yogurt	
Yogurt, all fat types, plain or flavored	245 g
Cheese	
Cheese food, pasteurized process, American, without di sodium phosphate	2 oz
Cheese food, pasteurized process, Swiss	1.5 oz
Cheese product, pasteurized process, American, reduced fat, fortified with vitamin	2 oz
Cheese product, pasteurized process, cheddar or American, reduced fat	2 oz
Cheese spread, pasteurized process, American, without di sodium phosphate	2 oz
Cheese, blue	2 oz
Cheese, brick	1.5 oz
Cheese, brie	6 oz
Cheese, camembert	3 oz
Cheese, cheddar	1.5 oz

Food Description	Weight of One Cup Equivalent
Cheese, colby	1.5 oz
Cheese, cottage	variable
Cheese, cream, fat free	3 oz
Cheese, edam	1.5 oz
Cheese, feta	2 oz
Cheese, fontina	2 oz
Cheese, goat, hard type	1 oz
Cheese, goat, semisoft type	3.5 oz
Cheese, goat, soft type	7.5 oz
Cheese, gouda	1.5 oz
Cheese, gruyere	1 oz
Cheese, limburger	2 oz
Cheese, low fat, cheddar or colby	3 oz
Cheese, low-sodium, cheddar or colby	1.5 oz
Cheese, Mexican, blend, reduced fat	1 oz
Cheese, Mexican, queso anejo	1.5 oz
Cheese, Mexican, queso asadero	1.5 oz
Cheese, Mexican, queso chihuahua	1.5 oz
Cheese, monterey	1.5 oz
Cheese, monterey, low fat	1.5 oz
Cheese, mozzarella, low sodium	1.5 oz
Cheese, mozzarella, nonfat	1 oz
Cheese, mozzarella, part skim milk	1.5 oz
Cheese, mozzarella, part skim milk, low moisture	1.5 oz
Cheese, mozzarella, whole milk	2 oz

Food Description	Weight of One Cup Equivalent
Cheese, mozzarella, whole milk, low moisture	2 oz
Cheese, muenster	1.5 oz
Cheese, muenster, low fat	2 oz
Cheese, parmesan, dry grated, reduced fat	1 oz
Cheese, parmesan, grated	1 oz
Cheese, parmesan, hard	1 oz
Cheese, parmesan, low sodium	1 oz
Cheese, pasteurized process, American, low fat	1.5 oz
Cheese, pasteurized process, American, with di sodium phosphate	2 oz
Cheese, pasteurized process, American, without di sodium phosphate	2 oz
Cheese, pasteurized process, cheddar or American, fat-free	1.5 oz
Cheese, pasteurized process, Swiss, low fat	1.5 oz
Cheese, pasteurized process, Swiss, with di sodium phosphate	1.5 oz
Cheese, port de salut	1.5 oz
Cheese, provolone	1.5 oz
Cheese, provolone, reduced fat	1.5 oz
Cheese, queso fresco	3.5 oz
Cheese, ricotta, part skim milk	4.5 oz
Cheese, ricotta, whole milk	5 oz
Cheese, romano	1 oz
Cheese, Swiss	1.5 oz
Cheese, Swiss, low fat	1 oz
Cheese, Swiss, low sodium	1 oz
Parmesan cheese topping, fat free	1.5 oz

Appendix 11: Beans and Peas (Legumes) Cup Equivalent Weights

Food Description	Weight of One Cup Equivalent (g)
Bayo beans, cooked	175
Bayo beans, uncooked	60
Beans, not further specified, cooked	175
Beans, not further specified, uncooked	60
Black beans, cooked	175
Black beans, uncooked	60
Brown beans, cooked	175
Brown beans, uncooked	60
Calico beans, cooked	175
Calico beans, uncooked	60
Carob flour or powder	60
Chickpeas (garbanzo beans, bengal gram), canned, drained	175
Chickpeas (garbanzo beans, bengal gram), cooked	175
Chickpeas (garbanzo beans, bengal gram), uncooked	60
Cowpeas, common (blackeyed, crowder, and southern peas), cooked	175
Cowpeas, common (blackeyed, crowder, and southern peas), uncooked	60
Fava beans (broad beans), cooked	175
Fava beans (broad beans), uncooked	60
Kidney beans, canned, drained	175
Kidney beans, cooked	175
Kidney beans, uncooked	60
Lentils, cooked	175
Lentils, uncooked	60

Food Description	Weight of One Cup Equivalent (g)
Lima beans (mature), cooked	175
Lima beans (mature), uncooked	60
Mung beans, cooked	175
Mung beans, uncooked	60
Navy beans, canned, drained	175
Navy beans, cooked	175
Navy beans, uncooked	60
Pink beans, cooked	175
Pink beans, uncooked	60
Pinto beans, cooked	175
Pinto beans, uncooked	60
Split peas, cooked	175
Split peas, uncooked	60
White beans, cooked	175
White beans, uncooked	60

Endnote:

The weight of one cup equivalent for all other uncooked beans and peas is 60g, and all other cooked beans and peas is 175g.