



What quantities of foods and beverages lower in nutrient density can be accommodated in the USDA Dietary Patterns while meeting nutritional goals within calorie levels?: Food Pattern Modeling Protocol

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Rationale

Food pattern modeling (FPM) is a methodology used to a) illustrate how hypothetical changes to the amounts or types of foods and beverages in a dietary pattern might affect meeting nutrient needs, and b) assist in defining quantitative dietary patterns that reflect the evidence for health-promoting diets synthesized from systematic reviews, while meeting energy and nutrient needs.

The 2020 USDA Dietary Patterns for ages 2 and older include quantitative recommendations for five food groups as well as oils.¹ The patterns were constructed to provide adequate levels of nutrients within calorie limits with choices of foods and beverages higher in nutrient-density within each food group. Nutrient-dense foods and beverages provide vitamins, minerals, and other health-promoting components and have little added sugars, saturated fat, and sodium. Vegetables, fruits, whole grains, seafood, eggs, beans, peas, and lentils, unsalted nuts and seeds, fat-free and low-fat dairy products, and lean meats and poultry—when prepared with no or little added sugars, saturated fat, and sodium—are nutrient-dense foods. Once nutrient needs are met through food group goals, the USDA Dietary Patterns have typically included a small number of remaining calories. These were listed as the ‘limit on calories for other uses’. These were calculated as remaining calories after the foods and beverages selected to achieve food group goals are in their most nutrient dense forms.

The discrepancy between the recommendations to achieve a healthy dietary pattern and actual dietary intakes of the population led the 2020 Dietary Guidelines Advisory Committee to encourage future food pattern modeling analyses that explore the nutrient density of the patterns and the remaining limits on calories for other uses. In the 2020 Dietary Guidelines Advisory Committee report the Committee noted, “...*the food pattern modeling process does not include beverages that are not contributors to the USDA food groups or subgroups, meaning that many of the commonly consumed beverages, such as sweetened beverages and alcoholic beverages, are not included in the patterns presented. Therefore, if individuals choose to include these types of energy-containing beverages in excess of the remaining energy allotted in a pattern on a routine basis, then they would need to account for that energy by reducing intakes of other foods and beverages to ensure energy balance without sacrificing the nutrient adequacy that the Healthy U.S.-Style Pattern provides.*”²

The following food pattern modeling analyses are proposed to examine these remaining calories in consideration of current intake patterns. Analyses will first seek to understand the variation/range of a quantified limit on calories for other uses. They will then focus on examining the quantity and frequency of commonly consumed foods and beverages lower in nutrient density that may fit within the context of a healthy dietary pattern. Understanding how remaining calories might be utilized supports the development of clear recommendations that are practical, relevant, and achievable.

Introduction

To prepare for the development of the *Dietary Guidelines for Americans, 2025-2030*, the U.S. Departments of Health and Human Services (HHS) and Agriculture (USDA) identified a proposed list of scientific questions based on relevance, importance, potential impact to federal programs, and avoiding duplication, which were posted for public comment.^{1,3} The Departments appointed the 2025 Dietary Guidelines Advisory Committee (Committee) in January 2023 to review evidence on the scientific questions. Their review forms the basis of their independent, science-based advice and recommendations to HHS and USDA, which is considered as the Departments develop the next edition of the *Dietary Guidelines*. These questions were refined and prioritized by the Committee for consideration in their review of the evidence.

The Committee will be asked to answer the following question using Food Pattern Modeling (FPM) analyses:

Considering each life stage, should changes be made to the USDA Dietary Patterns (Healthy U.S.-Style, Healthy Mediterranean-Style, and/or Healthy Vegetarian); should additional Dietary Patterns be developed/proposed based on:

- **Findings from systematic reviews, data analysis, and/or FPM analyses; and**
- **Population norms (e.g., starchy vegetables are often consumed interchangeably with grains), preferences (e.g., emphasis on one staple grain versus another), or needs (e.g., lactose intolerance) of the diverse communities and cultural foodways within the U.S. population?**

Changes to Dietary Patterns may include modification to the amounts of food groups/subgroups and/or recategorization of food groups/subgroups, as well as subsequent changes to energy available for other uses, including for added sugars.

As part of that process and to address the overarching FPM question, the following questions for analysis have been identified:

What quantities of foods and beverages lower in nutrient density can be accommodated in the USDA Dietary Patterns while meeting nutritional goals within calorie levels?

The Committee will use FPM analyses to address these questions, with support from USDA's FPM methods team. This protocol will establish the methods to model hypothetical choices made for using any remaining calories after food group goals are achieved.

Historical perspectives

The 2005, 2010, 2015, and 2020 USDA Dietary Patterns included a small amount of remaining calories for other uses, though the terminology and definitions have varied slightly in these editions.^{1,4-6}

The *2005 Dietary Guidelines for Americans* termed these remaining calories 'Discretionary calorie allowance' defined as, "...the remaining amount of calories in each food pattern after selecting the specified number of nutrient-dense forms of foods in each food group. The number of discretionary calories assumes that food items in each food group are selected in nutrient-dense forms (that is, forms that are fat-free or low-fat and that contain no added sugars)."⁶ The 2005 edition provided some additional examples of foods that should always be counted towards discretionary calories, such as:

- *"The fat in low-fat, reduced fat, or whole milk or milk products or cheese and the sugar and fat in chocolate milk, ice cream, pudding, etc.*
- *The fat in higher fat meats (e.g., ground beef with more than 5% fat by weight, poultry with skin, higher fat luncheon meats, sausages)*
- *The sugars added to fruits and fruit juices with added sugars or fruits canned in syrup*
- *The added fat and/or sugars in vegetables prepared with added fats or sugars*
- *The added fats and/or sugars in grain products containing higher levels of fat and/or sugars (e.g., sweetened cereals, higher fat crackers, pies and other pastries, cakes, cookies)."*

The *2010 Dietary Guidelines for Americans* renamed these remaining calories, "Maximum SoFAS <solid fats and added sugars> limit, calories".⁵ Although these remaining calories were renamed, the definition remained

similar to the previous edition: “*the remaining amount of calories in each food pattern after selecting the specified amounts in each food group in nutrient-dense forms (forms that are fat-free or low-fat and with no added sugars).*”

The *2015 Dietary Guidelines for Americans* again renamed these remaining calories, “Limit on Calories for Other Uses”, and provided some additional examples of how these calories could be used (bolded below) and that they should not be used to exceed the limits of less than 10 percent of total calories from added sugars and less than 10 percent from saturated fat: “*All foods are assumed to be in nutrient-dense forms, lean or low-fat and prepared without added fats, sugars, refined starches, or salt. If all food choices to meet food group recommendations are in nutrient-dense forms, a small number of calories remain within the overall calorie limit of the Pattern (i.e., limit on calories for other uses). Calories up to the specified limit can be used for added sugars, added refined starches, solid fats, alcohol, or to eat more than the recommended amount of food in a food group. The overall eating Pattern should not exceed the limits of less than 10 percent of calories from added sugars and less than 10 percent of calories from saturated fats.*”⁴

The *Dietary Guidelines for Americans, 2020-2025* carried forward the terminology and definition from the previous edition.¹ The amount remaining for the ‘Limits on calories for other uses’ continues to depend on two factors: 1) the total calorie level of the pattern, and 2) that all foods and beverages contributing to food group goals are in their most nutrient-dense form (e.g., prepared with minimal or no added sugars and saturated fat).

The recommendations to maximize the nutrient density of the dietary patterns in the *Dietary Guidelines, 2020-2025* were supported by systematic reviews that indicate dietary patterns, which emphasize nutrient-dense foods (e.g., vegetables, fruits, legumes, whole grains) and limit sources of saturated fats and added sugars, tend to be associated with favorable health outcomes.⁷⁻¹¹

Current perspectives

As noted above, the 2020 USDA Dietary Patterns includes a small number of remaining calories for other uses which ranges from ~80 to 580 calories per day, depending on the total calorie level of the pattern. The *Dietary Guidelines, 2020-2025* translates this for consumers in, “*The 85-15 Guide*”, which shows that about 85% of calories per day are needed to meet food group recommendations healthfully, in nutrient-dense forms, while the remaining 15% are available for other uses.¹ As an example, the Healthy U.S.-Style (HUSS) Dietary Pattern at the 2,000-calorie level includes a limit of 240 calories remaining for other uses. These analyses will build on the Nutrient Profile Development - Basis protocol¹² and will address shifts in energy recommendations based on the updated estimated energy requirement.¹³

There are several potential sources of these remaining calories. Remaining calories could come from foods or beverages lower in nutrient density that do not fit into a food group (e.g., sugar sweetened beverages; alcohol; or sweetened coffee or tea). Remaining calories could also be consumed through a greater than recommended quantity of nutrient-dense foods or beverages, however data suggests this is not typical. More than 80 percent of individuals in the U.S. have dietary patterns that are low in Vegetables, Whole Grains, Seafood, Fruit, and Dairy and Fortified Soy Alternatives. Additionally, most individuals exceed limits on saturated fat and added sugars. Data from the 2013-2016 What We Eat in America, National Health and Nutrition Examination Survey (WWEIA, NHANES) showed average intakes of 239 calories/day from saturated fat and 239 calories/day from added sugars.¹ Past analyses have shown when typical choices, rather than nutrient-dense choices, are used to meet food group goals, average energy intakes exceed target calorie levels by 15 to 30% (i.e., 350 to 450 calories).¹⁴ As an example, 90% of individuals in the U.S. did not meet recommendations for the Dairy and Fortified Soy Alternatives food group, and the foods and beverages generally consumed from this group were in forms with higher amounts of saturated fat (e.g., higher fat milk or

yogurt, or cheese as part of mixed dishes such as sandwiches, pizza, and pasta) and added sugars (e.g., flavored milk, ice cream, sweetened yogurts).²

In summary, these analyses are intended to quantify types of foods and beverages lower in nutrient density (e.g., higher fat or sweetened milk, sugar sweetened beverages) in commonly consumed amounts, and the hypothetical frequency (e.g., daily, weekly, monthly) these types of foods and beverages may fit within the context of a healthy dietary pattern that meets nutritional goals. Understanding how remaining calories might be utilized supports the development of clear recommendations for flexibilities in that patterns that are practical, relevant, and achievable.

These analyses will be examined using the proposed dietary patterns proposed by the 2025 Dietary Guidelines Advisory Committee. Therefore, the analyses outlined in this protocol will be conducted after food pattern modeling exercises examining hypothetical modifications to food groups are complete and synthesized. Discussion of the results will include implications for each dietary pattern under consideration and for each life stage: children, adolescents, adults, older adults, and individuals who are pregnant or lactating. As part of the iterative FPM process, findings from these and other analyses may prompt revisions of dietary patterns developed to answer the overarching FPM question. The conclusions drawn by the Committee will inform their recommendations for the 2025 USDA Dietary Patterns in their scientific report to the Secretaries of HHS and USDA.

Methods

This section presents an overview of the methods, or the process, that will be used by the Committee to answer the questions:

What quantities of foods and beverages lower in nutrient density can be accommodated in the USDA Dietary Patterns while meeting nutritional goals within calorie levels?

Develop a protocol

A FPM protocol is the plan for how USDA's FPM methodology will be used to conduct specific FPM analyses. The protocol is established by the Committee before the analysis is conducted. The protocol describes the components of the FPM process, including the analytic framework, analytic plan, analysis synthesis, conclusion development, and future research recommendations. It is developed through Committee discussion of the strengths and limitations for various analysis types and exercises to identify the most appropriate and relevant methods to answer each FPM question. FPM is an iterative process; thus, results from initial analyses may inform refinement of this protocol or subsequent protocols for other research questions.

When reviewing questions or topics addressed by prior Committees, the Committee uses the previous analytic framework, plan, and protocol to inform and refine their current approaches. Any changes to this protocol will be described in **Table 3. Protocol amendments**.

Develop an analytic framework

An analytic framework represents the overall scope of the FPM analyses, including the population, type of analyses, and data sources identified to answer the question. It also includes the definitions of key terms.

Questions:

What quantities of foods and beverages lower in nutrient density can be accommodated in the USDA Dietary Patterns while meeting nutritional goals within calorie levels?

Population:

The nutrient profiles modeled in these FPM analyses are based on dietary intake data among the U.S. population ages 12 months and older. The contribution of complementary foods and beverages consumed by infants less than 12 months will not be included in the calculation of nutrient profiles.

The nutrient profiles examined in these FPM analyses are those that have been applied to each proposed dietary pattern proposed by the 2025 Dietary Guidelines Advisory Committee.

Types of analyses:

The overall FPM methodology used to develop and update the USDA Dietary Patterns includes six steps: **(1)** identifying appropriate energy levels for the patterns; **(2)** identifying nutritional goals for the patterns; **(3)** establishing food groupings and food group amounts; **(4)** determining the amounts of energy and nutrients that would be provided by consuming various foods within each food group or subgroup; and **(5)** evaluating nutrient levels in each pattern against nutritional goals. Finally, **(6)** adjust and re-evaluate the patterns to align with current or potential recommendations.

These analysis questions will focus on step 6 (adjust and re-evaluate the patterns to align with current or potential recommendations). Analyses will use nutrient profiles for the food groups and subgroups updated based on the 2025 Dietary Guidelines Advisory Committee's analyses in answering the question: *“Should foods and beverages with lower nutrient density (i.e., those with added sugars, saturated fat, and sodium) contribute to item clusters, representative foods, and therefore the nutrient profiles for each food group and subgroup used in modeling the USDA Dietary Patterns? View the protocol developed by the 2025 Committee to answer that question.”*¹²

Subsequent analyses will model the remaining calories allocated to quantities of foods and beverages lower in nutrient density and examine the implications for meeting nutritional goals.

FPM analyses planned to answer these questions include:

- Examine the variation/range of a quantified limit on calories for other uses.
- Examine what quantities of typical choices of foods and/or beverages lower in nutrient density could potentially fit within the flexible framework of the proposed patterns while achieving nutritional goals.

Results from these analyses will contribute to the evidence that will be used to answer the overarching FPM question: Considering each life stage, should changes be made to the USDA Dietary Patterns (Healthy U.S.-Style, Healthy Mediterranean-Style, and/or Healthy Vegetarian), and should additional Dietary Patterns be developed/proposed?

This process will include:

- Synthesizing the above analyses, after all other food group and subgroup modification analyses have been synthesized, to determine if changes could be made to proposed dietary patterns of the 2025 Dietary Guidelines Advisory Committee.
- Examining modified or new dietary patterns in comparison to the nutritional goals defined by the DRIs, current *Dietary Guidelines for Americans, 2020-2025* recommendations, potential recommendations of the 2025 Committee, and simulated diet analyses.
- Developing conclusion statements based on all FPM analyses informing the overarching FPM question and in consideration of related systematic review conclusions and data analysis findings.
- Making research recommendations to inform future work on this topic.

Data Sources:

- What We Eat in America, NHANES 2017-2018, individuals 1 years and over, days 1 and 2, weighted to produce nationally representative estimates. Available: ars.usda.gov/nea/bhnrc/fsrg
- FNDDS 2017-2018: U.S. Department of Agriculture, Agricultural Research Service. 2020. *USDA Food and Nutrient Database for Dietary Studies 2017-2018*. Available: ars.usda.gov/nea/bhnrc/fsrg
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Key definitions:

Note: Key definitions in this protocol include existing definitions used by the 2020 Dietary Guidelines Advisory Committee and/or published in the *Dietary Guidelines for Americans, 2020-2025*, such as definitions operationalized in the HUSS Dietary Pattern.^{1,2} The 2025 Dietary Guidelines Advisory Committee will continue

to consider terminology and implications of terms related to health equity and/or communication to the public. Future revisions to existing definitions and new working definitions for 2025 will be noted.

Food Groups and Subgroups in the HUSS Dietary Pattern: USDA's HUSS Dietary Pattern for ages 2 years and older provides amounts of five major food groups and *subgroups* including:

- Fruits
- Vegetables:
 - *Dark-Green; Red and Orange; Beans, Peas, and Lentils^a; Starchy; and Other*
 - ^a. Beans, Peas, and Lentils are typically modeled as Vegetables in the HUSS Dietary Pattern but can also be counted toward the Protein Foods group. For the analyses in this protocol using the HUSS Dietary Pattern, Beans, Peas, and Lentils will only be modeled in the Vegetables food group.
- Dairy and Fortified Soy Alternatives
- Grains:
 - *Whole Grains and Refined Grains*
- Protein Foods:
 - *Meats, Poultry, and Eggs^b; Seafood; Nuts, Seeds, and Soy Products*
 - ^b. For the HUSS Dietary Pattern for ages 12 through 23 months, there are separate subgroups for 1) Meats and Poultry and 2) Eggs.

Oils: Oils are sources of essential fatty acids and include canola, corn, olive, peanut, safflower, soybean, and sunflower oils. Oils also are naturally present in nuts, seeds, seafood, olives, and avocados. The fat in some tropical plants, such as coconut oil, palm kernel oil, and palm oil, are not included in the oils category because they contain a higher percentage of saturated fat than do other oils.

Added sugars: Added sugars are either added during the processing of foods or are packaged as sweeteners (e.g., a bag of table sugar). Added sugars include sugars (free, mono- and disaccharides), sugars from syrups and honey, and sugars from concentrated fruit or vegetable juices that are in excess of what would be expected from the same volume of 100 percent fruit or vegetable juice of the same type.¹⁵ Naturally occurring sugars, such as those in fruit or milk, are not defined as added sugars. Specific examples of added sugars that can be listed as an ingredient include brown sugar, corn sweetener, corn syrup, dextrose, fructose, glucose, high-fructose corn syrup, honey, invert sugar, lactose, malt syrup, maltose, molasses, raw sugar, sucrose, trehalose, and turbinado sugar.

Limits on calories for other uses (as defined in the HUSS Pattern):^{1,2} Foods are assumed to be in nutrient-dense forms, which are lean or low-fat and prepared with minimal added saturated fat, added sugars, refined starches, or sodium. If all food choices to meet food group recommendations are in nutrient-dense forms, a small number of calories remain within the overall limit of the pattern (i.e., limit on calories for other uses). The amount of calories depends on the total calorie level of the pattern and the amounts of food from each food group required to meet nutritional goals. Calories up to the specified limit can be used for added sugars, refined starches, saturated fat, and/or alcohol (for nonpregnant adults of legal drinking age only), or to eat more than the recommended amount of food in a food group.

Item Clusters: Identified groupings of the same or similar foods or beverages that make up each food group and subgroup. Item clusters are used to calculate the weighted average consumption for use in calculating a nutrient profile for each food group and subgroup used in USDA FPM.

Nutrient-Dense Foods and Beverages: Nutrient-dense foods and beverages provide vitamins, minerals, and other health-promoting components while containing no or minimal added sugars, saturated fat, and sodium. Vegetables, fruits, whole grains, seafood, eggs, beans, peas, and lentils, unsalted nuts and seeds, fat-free and

low-fat dairy products, and lean meats and poultry—when prepared with no or little added sugars, saturated fat, and sodium—are nutrient-dense foods.

Nutrient-Dense Representative Foods: For the purpose of USDA’s FPM, each item cluster is assigned a nutrient-dense representative food which are those foods or beverages that represent the forms with the least amounts of added sugars, sodium, and saturated fats. The nutrient composition of the nutrient-dense representative food is used to represent the nutrient composition of the entire item cluster when calculating the nutrient profile for a food group or subgroup.

Nutrient Profiles: The proportional nutrient composition from the item clusters that represent each food group and subgroup from the variety of foods in each food group in their nutrient-dense forms. The nutrient profiles are based on a weighted average of nutrient-dense forms of foods (i.e., a composite of nutrient-dense forms of foods and beverages within a food group or subgroup). The weighted average calculation considers a range of food choices in the United States, but in nutrient-dense forms and results in a food pattern that can be adapted to fit an individual’s preferences.

Develop an analytic plan

Establish energy levels:

Dietary Reference Intakes (DRI) formulas are used to calculate Estimated Energy Requirements (EER) for each age-sex group and for three age groups specific to pregnancy and lactation (14-18 years, 19-30 years and 31-50 years).¹³ (See **Table 1.**) EER is based on sex, age, height, weight, level of physical activity, and life stage and, during pregnancy, gestational weeks. The EERs for pregnancy account for the energy cost of tissue accretion and deposition based on pre-pregnancy BMI category and IOM recommended rates of gestational weight gain. The EERs for lactation account for the energy cost of human milk production and mobilization of postpartum tissue stores for gradual weight loss.¹

Computed weight for a body mass index (BMI) of 22.5 kg/m² for adult males and 21.5 kg/m² for adult females (ages 19+ years) and median height are used to calculate reference energy levels for each age-sex group.¹ The computed weight based on the corresponding BMI is obtained using the following equation.

$$\text{BMI } 22.5 \text{ or } 21.5 \times (\text{median height in m})^2 = \text{computed weight in kg}$$

These BMIs correspond to the 50th percentile (median) for reference weight among 19-year old males and females based on the 2005 DRI for energy and the 2000 CDC Growth Charts.^{16,17} The EER calculations for adults follow the 2020 Committee’s approach to base reference weight on a BMI of 18.5 to <25 kg/m² but are enhanced to incorporate median heights for each age-sex group using updated NHANES data instead of using one median height for all adult males and one median height for all adult females.^{18,19} For children and adolescents ages 2-18 years, median height and the 50th percentile BMI-for-age are obtained using NHANES anthropometric data and the CDC Growth Charts.^{19,20} For young children ages 12 through 23 months, EERs from the DRI report using NHANES median weight and length are used, as these result in similar calorie levels as WHO Growth Chart data.^{13,21} These weight, height/length, and BMI assumptions for estimating energy levels in FPM align with those being used in the Committee’s data analysis work. The use of median height/length also aligns with the DRI for energy report.¹³

A lower energy level (for inactive individuals) rounded to the nearest 200 calorie level and its associated pattern are determined for each age-sex group and used in evaluating the patterns against nutritional goals. (See step 2: **Establish nutritional goals.**) The 2020 USDA Dietary Patterns for ages 12 through 23 months are established to meet the EER for those ages. For ages 2 years and older, the 2020 Dietary Patterns generally are not age- or sex- specific. However, the 2020 Dietary Patterns at 1,000, 1,200, and 1,400 calorie

levels are designed to meet the nutritional needs of children ages 2 through 8 years. Patterns from 1,600 to 3,200 calories are designed to meet the nutritional needs of children 9 years and older and adults. The 1,000 and 1,200 calorie level patterns are not intended for children 9 years and older or adults, and the 1,400-calorie level is not intended for children ages 10 years and older or adults. Individuals may require a calorie level that is higher or lower than the calorie level associated with each population-level age-sex group.

Table 1. Age-sex groups for which nutritional goals are examined in analyses

Children (Male/Female)	Males	Females	Pregnancy (Per 1 st , 2 nd , and 3 rd Trimesters)	Lactation (Per 0-6 and 7-12 months postpartum)
1-3 years				
	4-8 years	4-8 years		
	9-13 years	9-13 years		
	14-18 years	14-18 years	14-18 years	14-18 years
	19-30 years	19-30 years	19-30 years	19-30 years
	31-50 years	31-50 years	31-50 years	31-50 years
	51+ years	51+ years		

Establish nutritional goals:

Specific nutritional goal quantities for a dietary intake pattern are set according to energy intake level and based on the DRI age-sex group(s) for which the pattern is designed. Goals for total energy, fat, protein, carbohydrates, 3 fatty acids, 12 vitamins, 8 minerals, added sugars, and fiber are based on DRI reports released between 1997 and 2023 and on quantitative recommendations in the current *Dietary Guidelines for Americans, 2020-2025* (DGA).^{1,13,22-25} The macronutrients, fatty acids, vitamins, and minerals that are considered nutritional goals for these analyses are specified in **Table 2**. Because the dietary patterns are designed as a framework for achieving a healthy dietary pattern, the goals are the Recommended Dietary Allowance (RDA) amounts for nutrients having an RDA. The Adequate Intake (AI) is used as the nutrient goal when an RDA is not established.

Table 2. Nutritional goals for analyses

Food Component	Specific Nutrients (and Source of Goal ^a)
Energy	Energy (EER)
Macronutrients	Carbohydrate (AMDR/RDA), Protein (AMDR/RDA), Total Fat (AMDR)
Fatty acids	Saturated Fatty Acids (DGA 2020-2025, <10% of total energy), 18:2 Linoleic Acid (AI), 18:3 Linolenic Acid (AI)
Vitamins	Vitamin A (RDA), Vitamin C (RDA), Vitamin D (RDA), Vitamin E (RDA), Vitamin K (AI), Thiamin (RDA), Riboflavin (RDA), Niacin (RDA), Vitamin B6 (RDA), Folate (RDA), Vitamin B12 (RDA), Choline (AI)

Food Component	Specific Nutrients (and Source of Goal ^a)
Minerals	Calcium (RDA), Copper (RDA), Iron (RDA), Magnesium (RDA), Phosphorus (RDA), Potassium (AI), Sodium (CDRR), Zinc (RDA)
Added Sugars	Added Sugars (DGA 2020-2025, <10% of energy)
Fiber	Total Dietary Fiber (AI, 14g/1,000 calories)

^a AI = Adequate Intake, AMDR = Acceptable Macronutrient Distribution Range, CDRR = Chronic Disease Risk Reduction Level, DGA 2020-2025 = *Dietary Guidelines for Americans, 2020-2025*, RDA = Recommended Dietary Allowance

Establish food groupings and amounts:

Food groups and subgroups in the proposed dietary patterns by the 2025 Dietary Guidelines Advisory Committee will be used in these analyses.

Determine the amounts of nutrients that would be obtained by consuming various foods within each group:

The anticipated energy and nutrient content, or nutrient profile of each food group and subgroup will be determined based on the synthesis of results of the planned 2025 analyses to answer the question:

“Should foods and beverages with lower nutrient density (i.e., those with added sugars, saturated fat, and sodium) contribute to item clusters, representative foods, and therefore the nutrient profiles for each food group and subgroup used in modeling the USDA Dietary Patterns?”

The results of those analyses will determine if a “composite” system will be used to determine the nutrient profiles, or if a revised approach will be used which removes foods and beverages lower in nutrient density from contributing to the development of healthy dietary patterns.

For more information on the work planned for this question, view the protocol developed by the 2025 Committee and posted on [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).¹²

Evaluate nutrient level in each pattern against nutritional goals:

Using the revised nutrient profiles that apply to young children less than 2 years and the population 2 years and older, the nutrients provided by amounts recommended in the *Dietary Guidelines for Americans, 2020-2025* from each food group (and oils) are compared to the age, sex, and life stage-specific goals (usually at least 90% of the RDA or AI).

Iteration and re-evaluation of the patterns to align with current or potential recommendations:

The draft Dietary Patterns proposed by the 2025 Dietary Guidelines Advisory Committee will be used to inform recommendations around any remaining calories for other uses. Calories from all food groups, subgroups, and oils, termed “essential calories,” will be summed and the remaining calories up to the calorie limit for the pattern will be used to set limits on calories for other uses. Once proposed limits on calories for other uses are set, the proposed analyses in this protocol will be conducted and include:

Analysis on variation/range of limits on calories for other uses:

- Examine the variation/range of a quantified limit on calories for other uses.

- Objective 1: Determine the remaining calories for each proposed dietary pattern based on nutrient profiles developed for each population subgroup outlined in the FPM protocol on the question, *“What are the differences between nutrient profiles calculated using the dietary intakes of the total U.S. population and populations subgroups?”* For more information on the work planned for this question, view the protocol developed by the 2025 Committee and posted on [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).²⁶

Analyses on nutrient density:

- Examine quantities of typical choices of foods and/or beverages lower in nutrient density and the implications on nutritional goals given the proposed food group quantities. Foods included in these analyses are those that are lower in nutrient density, such as those that are top sources of added sugars and/or saturated fat for children and/or adults.^{1,2}
 - Objective 2: Compare 1 cup equivalent (cup eq) of the nutrient profile for the Dairy and Fortified Soy Alternatives food group to the nutrient profiles for 1 cup eq of the following foods/beverages:
 - Milk, whole
 - Milk, reduced fat
 - Milk, flavored (i.e., calorically sweetened)
 - Yogurt, whole
 - Yogurt, low fat
 - Yogurt, flavored (i.e., calorically sweetened)
 - Objective 3: Examine the implications on nutrient intakes and limits on calories for other uses when all food groups and subgroups goals except those for Dairy and Fortified Soy Alternatives are met using nutrient-dense choices. Quantitative recommendations for the Dairy and Fortified Soy Alternatives food group will be examined using the nutrient profiles for the milks and yogurts higher in fat and/or added sugars outlined in Objective 2a.

Note: Non-dairy alternatives and higher fat cheese will be examined in the analyses outlined in the FPM protocol on the question, *“What are the implications for nutrient intakes when modifying the Dairy and Fortified Soy group quantities within the Healthy U.S.-Style Dietary Pattern? What are the implications for nutrient intakes when Dairy food and beverage sources are replaced with non-Dairy alternatives?”* For more information on the work planned for this question, view the protocol developed by the 2025 Committee and posted on [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).²⁷
 - Objective 4: Examine the implications on nutrient intakes and limits on calories for other uses when all food groups and subgroup goals are met using nutrient-dense choices, and the following foods and/or beverages are consumed in addition to those food groups:
 - Alcohol
 - Sugar Sweetened Beverages (i.e., Soft drinks, Fruit drinks, Sport and Energy Drinks)
 - Coffee and Teas with added sugars/saturated fats
 - Candy and Sugars
 - Objective 5: Examine the implications on nutrient intakes and limits on calories for other uses when all food groups and subgroup goals are met using nutrient-dense choices, and the following foods and/or beverages are consumed in addition to those food groups or as partial contributors to their respective food groups. As an example, a chocolate covered banana would have some of the food contributing to the fruit food group (i.e., banana) with the remaining calories from the chocolate contributing to the limits on calories for other uses.
 - Desserts and Sweet Snacks
 - Breakfast Cereals and Bars, higher added sugars

- Condiments and Sauces

Conduct analyses

The USDA FPM methods team, in collaboration with the Committee, will use the analytic framework and analytic plan as a guide for conducting analyses and preparing tables and reports describing the analytic results for each analysis.

The first level of analysis will be by population with results described for each age-sex groups and life stage (e.g., pregnancy and lactation). Depending on the available data, subsequent analyses may be based on population subgroups, race and/or ethnicity, and/or socioeconomic position.

Synthesize analyses

The Committee will describe, compare, and combine the evidence from all FPM analyses conducted to answer these FPM questions. Synthesis of the analyses will involve summarizing results with particular emphasis on implications for each life stage: children, adolescents, adults, older adults, and individuals who are pregnant or lactating. Implications for each of the existing USDA Dietary Patterns or rationale for new pattern development, including energy levels, will also be included.

The analyses related to each individual protocol, along with the results of simulated diet analyses, related systematic review evidence, and related data analysis findings will be considered together in answering the primary question.

Develop conclusion

The Committee will review and discuss the synthesis of the analyses to develop conclusion statements for each FPM question. Conclusions from this protocol will be used along with conclusions from all other food pattern modeling protocols, the graded conclusions of any related systematic review, and related data analysis findings to collectively inform the Committee’s advice on the development or refinement of healthy dietary patterns.

Recommend future research

The Committee will identify and document research gaps and methodological limitations throughout the FPM process. These gaps and limitations will be used to develop research recommendations that describe the research, data, and methodological advances that are needed to strengthen the process to test and develop healthy dietary patterns. Rationales for the necessity of additional or stronger research may also be provided with the research recommendations.

Protocol amendments

No amendments to the protocol have been made at this time. Any future amendments will be documented below in **Table 3**.

Table 3. Protocol amendments

Date	Protocol change	Description
N/A	N/A	N/A

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The Committee members are involved in: establishing all aspects of the protocol, which presents the plan for how they are planning to examine the scientific evidence, including the development of an analytic framework and analytic plan; synthesizing analysis results; and writing conclusion statements. The analytic framework and plan provide details about the types of analyses that will be conducted, synthesized, and from which conclusions will be drawn to inform subsequent FPM questions and the Committee’s advice on the development or refinement of healthy dietary patterns. The FPM Methods Team, with assistance from Federal Liaisons and Project Leadership, supports the Committee by facilitating, executing, and documenting the work

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