Part D. Chapter 10: Food Group and Subgroup Analyses

Introduction

Food pattern modeling (FPM) is a methodology used to illustrate how changes to the amounts or types of foods and beverages in a dietary pattern might affect meeting nutrient needs. This method is also used to develop quantitative dietary patterns that reflect health-promoting food intakes identified in systematic reviews and meet energy and nutrient needs. The use of FPM methodology affords the opportunity to explore changes to the quantities or proportions of food groups and subgroups within USDA Dietary Patterns, while also assessing the energy and nutrient-level implications of these changes. Historically, the food groups and subgroups have been comprised of foods and beverages that share a similar nutrient profile. Through an iterative process, the collective work of prior Committees has used these food groups and subgroups to generate the 3 current USDA Dietary Patterns: Healthy U.S.-Style Dietary Pattern (referred to as HUSS throughout this chapter), Healthy Vegetarian Pattern (referred to as H-VEG throughout this chapter), and Healthy Mediterranean-Style Dietary Pattern (referred to as H-MED throughout this chapter).[1] The USDA Dietary Patterns have 12 calorie levels in 200 kilocalorie increments to meet Dietary Reference Intakes for energy and nutrients, and other nutritional goals for age-sex groups across the lifespan, with few exceptions.[1]

This chapter presents the series of questions that were addressed using FPM to explore hypothetical changes to each of the food groups and subgroups, as well as a question exploring an estimate of calories available for other uses. The chapter explores the implications on nutrient adequacy given proposed shifts in the quantities of food groups and subgroups, mostly tested within the 2020 HUSS, to determine if modifications or flexibilities should be made to the existing patterns, or if new dietary pattern variations should be developed. See **Box D.10.1** for information about how the Committee operationalized these terms (including “nutrient adequacy,” which is explained in the box as “Established Nutritional Goals”).

Box D.10.1: Key Terms

Established Nutritional Goals: The established nutritional goals (hereafter referred to in this chapter as "goals") for food pattern modeling analyses are defined as the Estimated Energy Requirement (EER) for energy,[2] less than 10 percent of energy from saturated fat, less than 10 percent of energy from added sugars,[3] lower than the Chronic Disease Risk Reduction intakes (CDRR) for sodium,[4] and 90 percent of the Recommended Dietary Allowance (RDA), or Adequate Intake (AI) when an RDA is not established.[4-6]

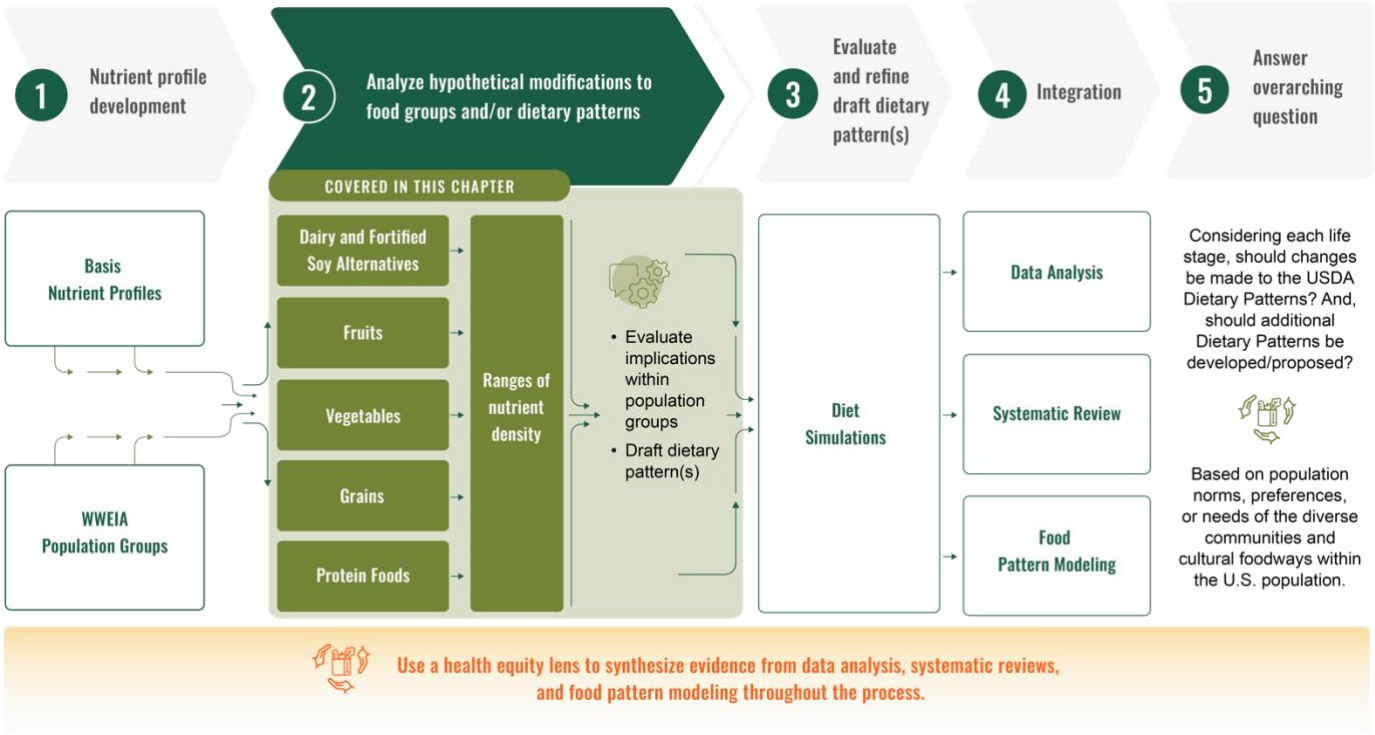
Dietary Pattern Modifications: The Committee operationalized the term 'Modifications' (e.g., modified 2020 HUSS) as any proposed change to the food group or subgroup quantities provided in the 3 patterns included in the *2020-2025 Dietary Guidelines for Americans*.

Dietary Pattern Flexibilities: The Committee operationalized the term 'Flexibilities' (e.g., Protein Foods flexibilities) as narrative advice around options for meeting nutrient needs outside of quantitative pattern recommendations.

Dietary Pattern Variations: The Committee operationalized the term 'Variation' as the creation of a new dietary pattern.

Building on the foundation laid by prior Dietary Guidelines Advisory Committees, the *Dietary Guidelines for Americans* has promoted consumption of a variety of nutrient-dense foods and beverages from food groups and subgroups to meet nutrient needs of the U.S. population. FPM offers the ability to introduce quantitative evidence-based modifications to fine-tune the current USDA Dietary Patterns (i.e., HUSS, H-VEG, H-MED), and to evaluate the implications of such modifications on the nutrient adequacy within energy limits relative to the nutritional requirements for each age-sex group or life stage. The FPM analyses were informed by and complementary to systematic review evidence and current population consumption estimates from data analyses. Protocols were developed to test the nutritional implications of modifications to the 2020 HUSS and 2020 H-VEG that meet nutrient recommendations through the selection of nutrient-dense foods and beverages with limited amounts of added sugars, saturated fat, and sodium as described in **Part D. Chapter 9: Nutrient Profile Development**. As noted by previous Committees, nutrient shortfalls in the existing patterns are noted in cases where natural sources of the nutrient are limited (e.g., vitamin D or E) or when the Dietary Reference Intake value is high compared to energy needs (e.g., iron and folate during pregnancy).[1] Therefore, the implications of reduction or removal of specific food groups or subgroups were presented in the context of the amount of these nutrients in the pattern falling further below the goal. **Figure D.10.1** shows how the analyses described in Chapter 9 form the foundation for the analyses presented in this Chapter and how they contribute to the total body of FPM work completed by the Committee.

FIGURE D.10.1
2025 FOOD PATTERN MODELING PROCESS



Beyond estimating the nutrient contribution of varying quantities of food groups and subgroups, FPM was 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. Starting in 2005, prior USDA Dietary Patterns included a small amount of calories remaining for other uses, though the terminology and definitions for such calories have varied slightly in these editions.[3,7-9] FPM was used to calculate the energy from the pattern of food groups and subgroups, which provided about 85 percent of the total energy intended from the calorie level. The estimated energy that remained (i.e., total energy minus energy from food groups and subgroups) was designated for other uses. This Committee carried out additional FPM analyses to assess the viability of presenting an estimate of calories that represents those available after meeting the quantities of the food groups and subgroups of the dietary pattern with nutrient-dense foods and beverages.

The FPM analyses were used to answer questions exploring modifications or flexibilities in the proportions of the food groups and subgroups in the 2020 HUSS, as well as presentation of calories for other uses. The collective results were then integrated in considering a final pattern with recommended modifications and flexibilities. The final dietary pattern(s) are presented in **Part E. Chapter 1: Overarching Advice to the Departments.**

List of Questions

1. What are the implications for nutrient intakes when modifying the Dairy and Fortified Soy Alternatives food 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?[10]
2. What are the implications for nutrient intakes when modifying the Fruits food group quantities within the Healthy U.S.-Style Dietary Pattern?[11]
3. What are the implications for nutrient intakes when modifying the Vegetables food group and subgroup quantities within the Healthy U.S.-Style Dietary Pattern?[12]
4. What are the implications for nutrient intakes when modifying the quantities of the Grains group within the Healthy U.S.-Style Dietary Pattern? What are the implications for nutrient intakes when specific individual staple grains are emphasized; or when the Grains group is replaced with other staple carbohydrate foods (i.e., Starchy Vegetables; Beans, Peas, and Lentils; starchy Red and Orange vegetables)?[13]
5. What are the implications for nutrient intakes when modifying the Protein Foods group and subgroup quantities within the Healthy U.S.-Style Dietary Pattern or Healthy Vegetarian Dietary Pattern? What are the implications for nutrient intakes when proportions of animal-based Protein Foods subgroups are reduced and proportions of plant-based Protein Foods subgroups are increased?[14]
6. 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?[15]

Methodology

FPM methodology is briefly described in **Part C. Methodology** and detailed methods are provided in the FPM reports. Two of the FPM reports describe exploratory analyses that the Committee conducted to examine removal of animal products as well as restriction of carbohydrate-containing foods. See **Box D.10.2** for more information about these analyses.

Box D.10.2: Exploratory Analyses

The Committee explored special considerations around removal of animal products as well as restriction of carbohydrate-containing foods. Considerable public interest was present around both topics and the Committee conducted exploratory analyses to assess the nutritional implications of these dietary modifications. These analyses included:

- Can nutrient goals be met when animal sources of foods and beverages are removed from the Healthy Vegetarian Dietary Pattern for ages 2 years and older?
- Can nutrient goals be met when carbohydrate-containing foods and beverages are reduced in the Healthy U.S-Style Dietary Pattern for ages 2 years and older?

The FPM analyses that examined the nutritional implications of the hypothetical removal of animal products was conducted by starting with the 2020 H-VEG for ages 2 years and older. This pattern is a lacto-ovo vegetarian dietary pattern that was developed to meet nutritional goals without meat, poultry, and seafood. In the analyses by this Committee, animal sources of foods and beverages contributing to the Dairy and Fortified Soy Alternatives and Protein Foods groups and subgroups were removed from the 2020 H-VEG. Although these analyses broadly address a vegan eating style, the Committee was constrained by insufficient data on the appropriate substitution of foods and beverages that would replace those excluded as part of the analyses and the variability of how a vegan dietary pattern can be operationalized. In other FPM analyses, national consumption data were used to determine trends in food group and subgroup intakes; however, nationally representative data do not exist specifically for people following a vegan dietary pattern to determine the replacement with the same rigor as used for other FPM analyses. The marketplace of products that are not from animal sources is rapidly evolving and is not fully reflected in the food composition data. Further, replacement foods and beverages must be modeled to bridge nutrient gaps that emerge and not be based solely on replacement of calories in the pattern(s). Therefore, the objectives described in this protocol do *not* include analyses that specify the amounts of food groups or subgroup quantities to achieve the energy target or develop a new dietary pattern.

Evaluation of the restriction of carbohydrate-containing foods was completed with a similar process, starting with 2020 HUSS. Similar concerns existed in that a lack of scientific evidence exists to establish the target carbohydrate level and specific foods sources to exclude, as well as lack of consensus to inform the substitution of foods that would replace the foods and beverages excluded to limit carbohydrate intakes. The marketplace is also rapidly evolving to include more foods that have reduced carbohydrate content, which presents challenges in estimating patterns using FPM when food composition data may not reflect the full spectrum of such products. Thus, removal occurred at the food group level to examine potential nutritional gaps, but the Committee did not make subjective decisions about the foods and beverages that might be retained to meet the RDA for carbohydrate.

Results from these analyses may be used to discuss the degree to which nutritional goals might be met after the removal of food groups and subgroups that contribute animal source foods and beverages or carbohydrates, and to help inform future directions, such as nutritional composition priorities for replacement foods.

All analyses and a summary of results can be found in the following FPM Reports:

- Removing Animal-Source Foods FPM Report: https://www.dietaryguidelines.gov/2025-advisory-committee-report/food-pattern-modeling
- Reducing Carbohydrate-Containing Foods FPM Report: https://www.dietaryguidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Review of the Science

This section presents the 6 questions that the Committee addressed in examining modifications to individual food groups or subgroups and their respective implications for the nutrient content and ability of the 2020 HUSS to meet nutritional goals. For the first 5 questions, the Committee provides an overview of the food group being examined, the types of foods or beverages that count towards each food group, which should be consumed in forms with the least amounts of added sugars, saturated fat, and/or sodium (**Box D.10.3**, **Box D.10.4**, **Box D.10.5**, **Box D.10.6**, **Box D.10.7**), a table of the percentage of total nutrient contributions from that food group to the 2020 HUSS (**Table D.10.1**, **Table D.10.3**, **Table D.10.4**, **Table D.10.5**, **Table D.10.6**), and synthesis statements and a summary of the evidence. For the 6th question, which is about potential accommodation in USDA Dietary Patterns of quantities of foods and beverages lower in nutrient density, synthesis statements and a summary of the evidence are presented. The FPM analyses that examined modifications to the individual food groups and subgroups were carried out individually. Upon examining the evidence of each analysis, the Committee developed synthesis statements that outline any proposed modifications or flexibilities to be pursued with additional analyses in the synthesis phase. In the synthesis phase, proposed modifications were examined concurrently to inform a proposed modified 2020 HUSS.

Question 1: What are the implications for nutrient intakes when modifying the Dairy and Fortified Soy Alternatives food group quantities within the Healthy U.S.-Style Dietary Pattern? What are the implications for nutrient intakes when dairy food and beverages sources are replaced with non-dairy alternatives?

Approach to Answering Question: Food Pattern Modeling

Introduction to the Dairy and Fortified Soy Alternatives Food Group

Box D.10.3: Dairy and Fortified Soy Alternatives

What is included? The Dairy and Fortified Soy Alternatives Food Group in the 2020 USDA Dietary Patterns includes all fluid, dry, or evaporated milk, including lactose-free and lactose-reduced products and fortified soy beverages (soy milk), buttermilk, yogurt, kefir, frozen yogurt, dairy desserts, and cheese. The *Dietary Guidelines, 2020-2025* notes that most choices should be fat-free or low-fat and nutrient-dense such as those prepared without added sugars, saturated fat, and/or sodium. Cream, sour cream, and cream cheese are not included due to their low calcium content.

How much? The 2020 USDA Dietary Patterns recommend 1½ to 2 cup equivalents (cup eq) of Dairy and Fortified Soy Alternatives each day for young children ages 12 through 23 months and 2 to 3 cup eq of Dairy and Fortified Soy Alternatives each day for individuals ages 2 years and older.

What counts? The Food Pattern Equivalents Database (FPED) converts all foods and beverages in the Food and Nutrient Database for Dietary Studies (FNDDS) into USDA Dietary Pattern components. FPED shows that 1 cup eq of Dairy and Fortified Soy Alternatives equates to approximately 1 cup of milk or fortified soymilk, 1 cup of yogurt or fortified soy yogurt, and 1½ to 2 ounces of cheese.

Table D.10.1 shows that the Dairy and Fortified Soy Alternatives Food Group contributes 60-80 percent of the total calcium in the 2020 HUSS across all age groups starting at 12 months of age. The food group also contributes >70 percent of the total vitamin D for young children ages 12 through 23 months and >50 percent for those ages 2 years and older. Dairy and Fortified Soy Alternatives also contribute 15 percent or more to the total nutrient content in the 2020 HUSS for more than 1 dozen additional nutrients across most calorie levels.

TABLE D.10.1
PERCENTAGE OF TOTAL NUTRIENT CONTRIBUTION FROM THE DAIRY AND FORTIFIED SOY ALTERNATIVES FOOD GROUP IN THE 2020 HEALTHY U.S.-STYLE (HUSS) DIETARY PATTERN AS A RANGE OF ESTIMATES ACROSS CALORIE LEVELS FOR AGES 12 THROUGH 23 MONTHS AND 2 YEARS AND OLDER

Nutrient	Range of contribution (%) in HUSS for ages 12 through 23 months	Range of contribution (%) in HUSS for ages 2 years and older
Energy (kcal)	28-31*	8-17*
Carbohydrate (g)	13-17	6-13
Fiber (g)	<1	≤3
Protein (g)	39-43*	23-41*
Fat (g)	38-44*	3-6
Saturated Fatty Acids (g)	66-71*	8-18*
Linoleic acid (18:2) (g)	5-7	≤1
Linolenic acid (18:3) (g)	7-10	≤1
Vitamin A (mcg RAE)	38-43*	23-39*
Vitamin C (mg)	<1	<1
Vitamin D (IU)	73-76*	55-74*
Vitamin E (mg AT)	6-7	≤1
Vitamin K (mcg)	≤3	≤1
Thiamin (mg)	19-22*	10-21*
Riboflavin (mg)	52-55*	30-50*
Niacin (mg)	≤4	4-9
Vitamin B6 (mg)	17-18*	10-19*
Folate (mcg DFE)	6-7	≤5
Vitamin B12 (mcg)	57-63*	41-61*
Choline (mg)	28-30*	17-32*
Calcium (mg)	77-80*	60-78*
Copper (mg)	≤5	6-12
Iron (mg)	≤2	≤2
Magnesium (mg)	24-25*	14-27*
Phosphorus (mg)	54-55*	30-50*
Potassium (mg)	27-30*	15-28*
Sodium (mg)	48-51*	25-43*
Zinc (mg)	36-39*	21-39*

AT = alpha-tocopherol, DFE = dietary folate equivalents, g = grams, IU = international units, kcal = calories, mcg = micrograms, mg = milligrams, RAE = retinol activity equivalents

*Dairy and Fortified Soy Alternatives Food Group contributes more than 15 percent of the total amount of these nutrients in the 2020 HUSS for at least half of the calorie levels.

Synthesis Statements and Summary of the Evidence

Synthesis Statement 1 of 2

Potential Modification to the HUSS for Ages 2 and Older

FPM results provide support for exploring a modification that reduces Dairy and Fortified Soy Alternatives in the overall synthesis that integrates the food groups in a healthy dietary pattern.

Supporting Evidence and Considerations for Synthesis Statement 1

Reduction Analyses

Reductions in Dairy and Fortified Soy Alternatives by 0.5 to 1.0 cup eq can be made for most of the age, sex, and/or life stage groups before introducing new nutrient implications (i.e., other than those nutrients for which the 2020 HUSS is already below goals). For females ages 9 through 18 years and males ages 9 through 13 years, Dairy and Fortified Soy Alternatives cannot be reduced without calcium falling below goals. Therefore, any modification that reduces Dairy and Fortified Soy Alternatives in the overall synthesis may not be feasible for these 2 age-sex groups without a commensurate increase in calcium from another food group or subgroup for these 2 age-sex groups.

The FPM results did not support exploring a reduction in Dairy and Fortifies Soy Alternatives greater than 0.5 to 1.0 cup eq because multiple nutrients then fell below goals as indicated in the reduction analyses (not including complete removal). These include calcium (all groups), vitamin A (females ages 51 through 70 years; males ages 31 years and older; and all pregnancy groups), riboflavin (males ages 51 years and older; all pregnancy groups; and lactation groups ages 31 years and older), magnesium (females ages 14 years and older; males ages 31 through 50 years; pregnancy ages 19 years and older), potassium (children ages 2 through 8 years and males ages 51 years and older), phosphorus (females ages 9 through 13 years), and zinc (males ages 51 years and older and all pregnancy groups). Any reduction in quantities of Dairy and Fortified Soy Alternatives results in the amount of vitamin D in the pattern—which is already below the goal in the 2020 HUSS—falling further below the goal.

Considerations for Examining a Modification

Each of the 3 existing USDA Dietary Patterns have consistent age-specific recommendations for quantities of Dairy and Fortified Soy Alternatives such that regardless of energy needs, the recommended quantity for children ages 2 through 3 years is 2 cup eq, for children ages 4 through 8 years is 2.5 cup eq, and for children ages 9 through 18 years is 3 cup eq. In contrast, the current HUSS and H-VEG has 3 cup eq of Dairy and Fortified Soy Alternatives for adults older than age 18 years, whereas the H-MED has 2.5 cup eq for adults older than age 18 years. Therefore, for adults, but not children, there is precedent in the USDA Dietary Patterns for a modification that reduces Dairy and Fortified Soy Alternatives by 0.5 cup eq without introducing new nutrient implications and provides a flexibility for dietary patterns presented in **Part E. Chapter 1: Overarching Advice to the Departments**. Nonetheless, when exploring an age- and/or life stage-specific modification to reduce Dairy and Fortified Soy Alternatives during the synthesis phase, a reduction may not be feasible for adolescents who are in peak bone acquisition without a commensurate increase in calcium and other bone-building nutrients from other food groups or subgroups.

Synthesis Statement 2 of 2

Potential Flexibility to the HUSS for Ages 2 Years and Older

FPM results provide support for exploring a flexibility in which fortified plant-based milk alternatives are substituted for the Dairy and Fortified Soy Alternatives food group.

Supporting Evidence and Considerations for Synthesis Statement 2

Comparison of Milk Products

To address the question of fortified plant-based milk alternatives, the Committee focused on a comparison of fat-free milk as well as a nutrient-dense version of fortified soy milk which is already part of the Dairy and Fortified Soy Alternatives Food Group; and almond and oat milk alternatives which are not currently in the established food group. This decision was based on the availability of food composition data in the 2017-2018 FNDDS[16] and in the USDA Foundation Foods Database within USDA's FoodData Central,[17] and on the popularity of these products at the time of the analyses. The Committee acknowledges that the data presented in **Table D.10.2** reflect limited existing food composition data for products that are part of a rapidly evolving market and may not reflect all products currently available. The Committee also discussed the possibility of creating an aggregate nutrient profile for plant-based milk, yogurt, and cheese, but ultimately decided against this approach due to the lack of consumption pattern data and food composition data for these plant-based versions.

Considerations for Examining a Flexibility

A flexibility in which fortified plant-based milk alternatives are substituted for the Dairy and Fortified Soy Alternatives Food Group in the 2020 HUSS was proposed for consideration in recognition of this rapidly emerging market. Fortification plays a considerable role in determining the comparability of plant-based milk alternatives for replacement of cow's milk in the HUSS. Dairy and Fortified Soy Alternatives Food Group is a significant contributor of calcium and vitamin D to the 2020 HUSS. The plant-based milk alternatives have similar or higher quantities of calcium and vitamin D compared to an equivalent amount of fat-free milk, which support consideration for examining this flexibility. However, considerable variation exists in the broader nutrient composition of different types of plant-based milks. Nutrient composition is influenced by plant source (e.g., oat vs. soy vs. almond) and/or by differences in product fortification, which influences the degree to which a plant-based milk alternative may offer more or less of a nutrient compared to cow's milk. Further complicating the comparison is variation in fortification levels across formulations of products from the same manufacturer and from different manufacturers. Therefore, the direct substitution of plant-based milk alternatives for cow's milk within the patterns may introduce unintended consequences for meeting other nutrient recommendations and may vary by product selected. This is especially a concern in children where nutrients such as protein, phosphorus, and magnesium are critical for bone mineral development.[18] Therefore, the Committee emphasized that any proposal for a flexibility that considered plant-based milks as part of a healthy dietary pattern requires meaningful guidance on how to select plant-based milks, which are not nutritionally equivalent to cow's milk and exhibit variability in nutrient content across products. Further, a flexibility would require meaningful guidance on integration with other food groups to identify where to otherwise obtain nutrients found in cow's milk or soy milk.

TABLE D.10.2
COMPARISON OF NUTRIENT PROFILES OF THE DAIRY AND FORTIFIED SOY ALTERNATIVES FOOD GROUP, AND SINGLE FOOD CODES FOR FAT-FREE MILK, UNSWEETENED ALMOND MILK, OAT MILK (FOUNDATION FOODS), AND LIGHT SOY MILK (FNDDS 2017-2018)

Nutrient	Fat-free milk[a] (cup eq)	Almond milk[b] (cup eq)	Oat milk[c] (cup eq)	Soy milk, light[d] (cup eq)
Energy (kcal)	82.9	36.6	117.9	73.2
Carbohydrate (g)	11.9	3.2	12.4	8.6
Fiber (g)	0.0	0.5	0.0	0.7
Protein (g)	8.4	1.0	1.9	5.8
Fat (g)	0.2	2.3	6.7	1.9
Saturated Fatty Acids (g)	0.1	0.2	N/A[e]	0.0
Linoleic acid (18:2) (g)	0.0	0.6	N/A[e]	0.9
Linolenic acid (18:3) (g)	0.0	0.0	N/A[e]	0.1
Vitamin A (mcg RAE)	156.1	219.5	206.7	148.8
Vitamin C (mg)	0.0	0.0	N/A[e]	0.0
Vitamin D (IU)	107.3	97.6	165.9	117.1
Vitamin E (mg AT)	0.0	6.9	N/A[e]	0.1
Vitamin K (mcg)	0.0	0.0	1.0	3.9
Thiamin (mg)	0.1	0.0	0.1	0.1
Riboflavin (mg)	0.3	0.0	0.7	0.5
Niacin (mg)	0.3	0.2	0.2	0.5
Vitamin B6 (mg)	0.1	0.0	0.0	0.0
Folate (mcg DFE)	4.9	2.4	N/A[e]	22.0
Vitamin B12 (mcg)	1.4	0.0	1.2	2.4
Choline (mg)	44.4	7.6	N/A[e]	30.0
Calcium (mg)	322.0	448.8	362.2	300.0
Copper (mg)	0.0	0.0	0.1	0.2
Iron (mg)	0.0	0.7	0.6	1.0
Magnesium (mg)	29.3	14.6	14.4	36.6
Phosphorus (mg)	261.0	22.0	217.5	212.2
Potassium (mg)	407.3	163.4	362.0	285.4
Sodium (mg)	100.0	175.6	102.4	117.1
Zinc (mg)	1.1	0.1	0.2	0.6

AT = alpha-tocopherol, DFE = dietary folate equivalents, FNDDS = Food and Nutrient Database for Dietary Studies, g = grams, IU = international units, kcal = calories, mcg = micrograms, mg = milligrams, RAE = retinol activity equivalents

[a]FNDDS 2017-2018 code 11113000

[b]FNDDS 2017-2018 code 11350020

[c]FDC ID 2257046

[d]FNDDS 2017-2018 code 11320100

[e]Data on nutrients marked N/A are not available from the Foundation Foods database.

All analyses and a summary of results by age, sex, and life stage can be found in the:
Dairy and Fortified Soy Alternatives FPM Report at:
https://www.DietaryGuidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Question 2: What are the implications for nutrient intakes when modifying the Fruits food group quantities within the Healthy U.S.-Style Dietary Pattern?

Approach to Answering Question: Food Pattern Modeling

Introduction to the Fruits Food Group

Box D.10.4: Fruits

What is included? The Fruits Food Group in the 2020 USDA Dietary Patterns includes all fresh, frozen, canned, and dried fruits and 100% fruit juices; for example: apples, Asian pears, bananas, berries, citrus fruit, cherries, dates, figs, grapes, guava, jackfruit, lychee, mangoes, melons, nectarines, papaya, peaches, pears, persimmons, pineapple, plums, pomegranates, raisins, rhubarb, sapote, and soursop. The *2020-2025 Dietary Guidelines* notes that most choices should be nutrient-dense such as those prepared without added sugars, saturated fat such as butter, and/or sodium.

How much? The 2020 USDA Dietary Patterns recommend ½ to 1 cup equivalent (cup eq) of Fruits each day for young children ages 12 through 23 months and 1 to 3 cup eq of Fruits each day for individuals ages 2 years and older. The *Dietary Guidelines for Americans, 2020-2025* recommend that at least half of Total Fruit should be Whole Fruit.

What counts? The FPED converts all foods and beverages in FNDDS into USDA Dietary Pattern components. FPED shows that 1 cup eq of Fruits equates to approximately 1 cup of raw or cooked fruit, 1 cup of fruit juice, and ½ cup of dried fruit.

Table D.10.3 shows that the Fruits Food Group contributes 44-57 percent of the total vitamin C in the 2020 HUSS across all age groups, starting at 12 months of age. The Fruits Food Group also contributes 15 percent of the total carbohydrates, total fiber, and total potassium in the 2020 HUSS for most calorie levels.

TABLE D.10.3
PERCENTAGE OF TOTAL NUTRIENT CONTRIBUTION FROM THE FRUITS FOOD GROUP IN THE 2020 HEALTHY U.S.-STYLE (HUSS) DIETARY PATTERN AS A RANGE OF ESTIMATES ACROSS CALORIE LEVELS FOR AGES 12 THROUGH 23 MONTHS AND 2 YEARS AND OLDER

Nutrient	Range of contribution (%) in HUSS for ages 12 through 23 months	Range of contribution (%) in HUSS for ages 2 years and older
Energy (kcal)	7-11	9-12
Carbohydrate (g)	18-25*	17-23*
Fiber (g)	15-21*	14-21*
Protein (g)	≤2	≤2
Fat (g)	≤1	≤1
Saturated Fatty Acids (g)	≤1	≤1
Linoleic acid (18:2) (g)	≤1	≤1
Linolenic acid (18:3) (g)	≤4	≤3
Vitamin A (mcg RAE)	≤4	≤5
Vitamin C (mg)	48-57*	44-57*
Vitamin D (IU)	<1	<1
Vitamin E (mg AT)	5-9	6-8
Vitamin K (mcg)	3-6	3-6
Thiamin (mg)	7-10	6-9
Riboflavin (mg)	4-7	5-8
Niacin (mg)	4-6	≤5
Vitamin B6 (mg)	10-16	11-15
Folate (mcg DFE)	6-10	6-9
Vitamin B12 (mcg)	<1	<1
Choline (mg)	3-6	5-6
Calcium (mg)	≤3	≤4
Copper (mg)	10-15	10-14
Iron (mg)	4-6	4-6
Magnesium (mg)	7-11	8-11
Phosphorus (mg)	≤3	≤3
Potassium (mg)	13-18*	14-18*
Sodium (mg)	≤1	≤1
Zinc (mg)	≤2	≤3

AT = alpha-tocopherol, DFE = dietary folate equivalents, g = grams, IU = international units, kcal = calories, mcg = micrograms, mg = milligrams, RAE = retinol activity equivalents

*The Fruits Food Group contributes more than 15 percent of the total amount these nutrients in the 2020 HUSS pattern for at least half of the calorie levels.

Synthesis Statements and Summary of the Evidence

Synthesis Statement 1 of 1

No Potential Modifications to the HUSS

FPM results support not reducing existing quantities of Fruits in the overall synthesis that integrates the food groups in a healthy dietary pattern.

Supporting Evidence and Considerations for Synthesis Statement 1

Reduction Analyses

In scenarios that incrementally reduced the Fruits Food Group from the 2020 HUSS recommendations, negative nutrient implications were evident with a 0.25 to 0.5 cup eq reduction for children ages 2 through 8 years; 0.5 cup eq reduction for females ages 14 years and older and males ages 9 through 13 years; 1 cup eq reduction of Fruits for males ages 31 years and older; complete removal for all pregnancy groups; and 1.5 cup eq reduction for lactating individuals. In these scenarios, the changes reduced the content of vitamin C, fiber, potassium, and magnesium in the pattern to levels below goals. Note that fortified orange or apple juice were not used in FPM analyses.

Considerations for No Proposed Modifications

In summary, these analyses confirm that reduction in Fruits would have negative nutrient implications, so the Committee did not recommend any overall reduction in Fruits in the modified 2020 HUSS (**Box D.10.8**).

The 2020 HUSS does not include quantitative recommendations for whole fruit and 100% fruit juice although narrative guidance recommends that at least half of total fruit consumption should be from whole fruits. Item clusters for 100% fruit juices and nectars comprise approximately 26 percent of the nutrient profile for Fruits used in FPM analyses reflecting proportional consumption in the U.S. population. In analyses that investigated different proportions of whole fruits and 100% fruit juice, the results showed little to no difference in meeting nutritional goals. In scenarios that modified the proportion to include 50 to 100 percent whole fruits and 0 to 50 percent fruit juice, results showed fiber in the pattern increased with increasing proportions of whole fruit. However, there were no negative nutrient implications when 50 percent of Fruits were modeled as 100% fruit juice. Therefore, the Committee did not recommend a modification to existing guidance on proportions of whole fruit.

All analyses and a summary of results by age, sex, and life stage can be found in the:
Fruits FPM Report at:
https://www.DietaryGuidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Question 3: What are the implications for nutrient intakes when modifying the Vegetables food group and subgroup quantities within the Healthy U.S.-Style Dietary Pattern?

Approach to Answering Question: Food Pattern Modeling

Introduction to the Vegetables Food Group

Box D.10.5: Vegetables

What is included? The Vegetables Food Group in the 2020 USDA Dietary Patterns includes 5 subgroups: Dark-Green Vegetables; Red and Orange Vegetables; Beans, Peas, and Lentils; Starchy Vegetables; and Other Vegetables. The *2020-2025 Dietary Guidelines* notes that most choices should be nutrient-dense such as those prepared without added sugars, saturated fat such as butter, and/or sodium.

Dark-Green Vegetables: all fresh, frozen, and canned dark-green leafy vegetables and broccoli, cooked or raw; for example: amaranth leaves, bok choy, broccoli, chamnamul, chard, collards, kale, mustard greens, poke greens, romaine lettuce, spinach, taro leaves, turnip greens, and watercress.

Red and Orange Vegetables: all fresh, frozen, and canned red and orange vegetables or juice, cooked or raw; for example: calabaza, carrots, red and orange bell peppers, sweet potatoes, tomatoes, 100% tomato juice, and winter squash.

Beans, Peas, and Lentils: all cooked from dry or canned beans, peas, chickpeas, and lentils; for example: black beans, black-eyed peas, bayo beans, chickpeas (garbanzo beans), edamame, kidney beans, lentils, lima beans, mung beans, pigeon peas, pinto beans, and split peas. Does not include green beans or green peas.

Starchy Vegetables: all fresh, frozen, and canned starchy vegetables; for example: breadfruit, burdock root, cassava, corn, jicama, lotus root, lima beans, plantains, white potatoes, salsify, taro root (dasheen or yautia), water chestnuts, yam, and yucca.

Other Vegetables: all other fresh, frozen, and canned vegetables, cooked or raw; for example: asparagus, avocado, bamboo shoots, beets, bitter melon, Brussels sprouts, cabbage (green, red, napa, savoy), cactus pads (nopales), cauliflower, celery, chayote (mirliton), cucumber, eggplant, green beans, kohlrabi, luffa, mushrooms, okra, onions, radish, rutabaga, seaweed, snow peas, summer squash, tomatillos, and turnips.

How much? The 2020 USDA Dietary Patterns recommend ⅔ to 1 cup equivalents (cup eq) of Total Vegetables each day for young children ages 12 through 23 months and 1 to 4 cup eq of Total Vegetables each day for individuals ages 2 years and older. Weekly recommendations are provided for each Subgroup.

What counts? The FPED converts all foods and beverages in FNDDS into USDA Dietary Pattern components. FPED shows that 1 cup eq of Vegetables equates to approximately 1 cup of raw or cooked vegetables, 1 cup of vegetable juice, 2 cups leafy salad greens, and ½ cup of dried vegetables.

Table D.10.4 shows that the Vegetables Food Group contributes >60 percent of total vitamin K, >40 percent of total vitamin C, approximately 30-40 percent of total fiber, and 31-43 percent of total potassium to the 2020 HUSS across all age groups starting at age 12 months. The Vegetables Food Group also contributes at least 15 percent of the total nutrient content for more than 1 dozen different nutrients in the 2020 HUSS for most calorie levels.

TABLE D.10.4
PERCENTAGE OF TOTAL NUTRIENT CONTRIBUTION FROM THE VEGETABLES FOOD GROUP IN THE 2020 HEALTHY U.S.-STYLE (HUSS) DIETARY PATTERN AS A RANGE OF ESTIMATES ACROSS CALORIE LEVELS FOR AGES 12 THROUGH 23 MONTHS AND 2 YEARS AND OLDER

Nutrient	Range of contribution (%) in HUSS for ages 12 through 23 months	Range of contribution (%) in HUSS for ages 2 years and older
Energy (kcal)	10-12	12-18*
Carbohydrate (g)	17-20*	18-25*
Fiber (g)	29-39*	31-43*
Protein (g)	7-8	7-13
Fat (g)	4-6	7-10
Saturated Fatty Acids (g)	≤3	6-8
Linoleic acid (18:2) (g)	4-8	5-8
Linolenic acid (18:3) (g)	7-10	7-11
Vitamin A (mcg RAE)	28-35*	36-48*
Vitamin C (mg)	40-49*	41-54*
Vitamin D (IU)	<1	<1
Vitamin E (mg AT)	19-24*	20-26*
Vitamin K (mcg)	61-76*	61-74*
Thiamin (mg)	15-18*	14-21*
Riboflavin (mg)	7-8	8-14
Niacin (mg)	11-16*	13-17*
Vitamin B6 (mg)	19-24*	22-30*
Folate (mcg DFE)	21-33*	19-30*
Vitamin B12 (mcg)	<1	<1
Choline (mg)	10-13	13-21*
Calcium (mg)	4-6	5-11
Copper (mg)	25-30*	24-34*
Iron (mg)	15-22*	16-24*
Magnesium (mg)	17-21*	19-28*
Phosphorus (mg)	7-9	10-17*
Potassium (mg)	28-32*	31-43*
Sodium (mg)	6-9	9-13
Zinc (mg)	7-8	8-14

AT = alpha-tocopherol, DFE = dietary folate equivalents, g = grams, IU = international units, kcal = calories, mcg = micrograms, mg = milligrams, RAE = retinol activity equivalents

*The Vegetables Food Group contributes more than 15 percent of the total amount of these nutrients in the 2020 HUSS pattern for at least half of the calorie levels.

Synthesis Statements and Summary of the Evidence

Synthesis Statement 1 of 2

No Potential Modifications to the HUSS

FPM results support not reducing existing quantities of Total Vegetables in the overall synthesis that integrates the food groups in a healthy dietary pattern.

Supporting Evidence and Considerations for Synthesis Statement 1

Reduction Analyses

In scenarios that incrementally reduced Total Vegetables for young children ages 12 through 23 months, the 2020 HUSS pattern fell below or further below the goals at all calorie levels for several nutrients (e.g., carbohydrates, fiber, vitamin K, vitamin E, iron, potassium, and choline). For the lowest calorie level (700 calories), the additional nutrients falling below or further below the goals were vitamin A, thiamin, folate, calcium, copper, and linoleic acid. Linoleic acid also falls below the goal in the 900-calorie level scenario.

For other age-sex groups, Total Vegetables incremental reduction scenarios indicated additional negative nutrient implications for carbohydrates (children ages 2 through 8 years and lactation groups ages 31 through 50 years), vitamin A (children ages 4 through 8 years; females all ages; males all ages; and all pregnancy groups), vitamin C (females ages 31 years and older; all lactation groups; males ages 19 years and older; and pregnancy groups ages 19 years and older), folate (females ages 31 years and older; lactating individuals ages 31 years and older; and males ages 51 years and older), copper (lactating individuals only); iron (females ages 14 through 18 years), magnesium (females ages 14 years and older), vitamin K (all groups ages 4 years and older), potassium (all groups), and fiber (all groups).

Considerations for No Proposed Modifications

In summary, these analyses confirm that reduction in Total Vegetables would have negative nutrient implications, therefore the Committee did not recommend any overall reduction in Total Vegetables in the modified 2020 HUSS (**Box D.10.8**).

Synthesis Statement 2 of 2

Potential Modification to the HUSS Across All Life Stages Starting at 12 Months

FPM results provide support for exploring a modification to the proportions of Vegetables subgroups that increases Beans, Peas, and Lentils and Dark-Green Vegetables in the overall synthesis that integrates food groups in a healthy dietary pattern.

Supporting Evidence and Considerations for Synthesis Statement 2

Equal Proportion Analyses

To achieve a scenario where intakes of each of the Vegetables subgroups are in equal proportion within the Total Vegetables quantity, the cup eq of Beans, Peas, and Lentils and the Dark-Green Vegetables subgroups would need to increase, while the Red and Orange Vegetables, Starchy Vegetables, and Other Vegetables subgroups would need to decrease relative to the 2020 HUSS. In this scenario when

the Vegetables subgroups quantities were equal, positive nutrient implications, including vitamin E, folate, iron, magnesium, and choline were noted. One negative nutrient implication included vitamin A for individuals who are lactating and males ages 51 years and older. These analyses provided initial supporting evidence to consider a modification that increases Beans, Peans and Lentils and Dark-Green Vegetables while keeping existing quantities of Total Vegetables constant.

Total Vegetables from One Subgroup Analyses

All Beans, Peas, and Lentils: Positive and negative nutrient implications were noted when the total quantity of Vegetables recommended in the 2020 HUSS came exclusively from Beans, Peas, and Lentils. Positive implications included improvements in quantities of potassium and carbohydrate for young children ages 12 through 23 months. Choline increased across all age, sex, and life stage groups (ages 1 year and older). Iron improved in young children ages 12 through 23 months and children ages 4 through 8 years, females ages 14 through 50 years, and all pregnancy groups. Vitamin E improved across all groups (ages 1 year and older). Folate in pregnancy groups shifted to meeting nutrient goals. Lastly, magnesium in males ages 51 years and older increased. Negative nutrient implications included vitamin A in most age-sex groups, vitamin C (females ages 31 years and older, lactating individuals, and males ages 19 years and older), and vitamin K (for young children ages 12 through 23 months at the 700-, 800-, and 900-calorie levels, children ages 4 through 8 years, females ages 14 through 70 years, lactating individuals ages 19 through 50 years, males ages 19 years and older, and individuals during pregnancy). Finally, energy was exceeded across most age-sex groups.

All Dark-Green Vegetables: Positive nutrient implications were noted when the total quantities of Vegetables recommended in the 2020 HUSS came exclusively from Dark-Green Vegetables. Vitamin A in individuals who are lactating, folate in individuals during pregnancy, and iron in children ages 4 through 8 shifted from not meeting nutrient goals in the 2020 HUSS pattern to meeting nutrient goals. Improvements in nutrients were observed for magnesium in males ages 51 years and older, iron in females ages 19 through 50 years and in individuals during pregnancy, and vitamin E in most age, sex, and life stage groups; however, these nutrients were still below goals. Negative nutrient implications were noted in carbohydrates for children ages 1 through 8 years and linoleic acid for young children ages 12 through 23 months (700- and 900-calorie levels).

All Starchy, All Other, or All Red and Orange Vegetables: Negative nutrient implications were observed in key nutrients for some age, sex, and life stage groups when all vegetables were exclusively obtained from the Starchy, Other, or Red and Orange Vegetable subgroups. Examples include reductions in folate in calorie levels tested for individuals during pregnancy and reductions in iron for children, females, and pregnancy groups.

Reduction/Removal Subgroup Analyses

Beans, Peas, and Lentils: Negative nutrient implications were noted when quantities of the Beans, Peas, and Lentils subgroup were reduced or removed from the Vegetables Food Group in the 2020 HUSS. Fiber fell below the goals for most age-sex groups. The magnitude of decline of several additional nutrients across life stages was also of concern: the decline in folate and iron in patterns relevant during pregnancy;

iron in children ages 4 through 8 years, and females ages 14 through 50 years; and magnesium in males ages 51 and older and pregnancy ages 14 through 18 years.

Dark-Green Vegetables: Negative nutrient implications were also noted when quantities of the Dark-Green Vegetables subgroup were reduced or removed from the 2020 HUSS. The magnitude of decline of several nutrients across life stages was of concern, such as the decline in folate in patterns relevant during pregnancy; decline in vitamin A in patterns relevant during lactation and in males ages 51 years and older (removal only); decline in iron for children ages 4 through 8, females ages 14 through 50, and individuals during pregnancy; magnesium in males ages 51 years and older and pregnancy groups ages 14 through 18 years; vitamin K in males ages 31 years and older and females ages 51 years and older (removal only).

Starchy, Other, or Red and Orange Vegetables: When Other, Starchy, and Red and Orange Vegetables were incrementally reduced, iron (for children ages 4 through 8, females ages 14 through 50, and individuals during pregnancy), folate (pregnancy groups only), magnesium (males ages 51 years and older and pregnancy groups ages 14 through 18 years), vitamin A (lactating groups only), and choline fell below or further below nutrient goals. For Other Vegetables, potassium fell below goals for children ages 4 through 8 years. For Starchy and Red and Orange Vegetables, potassium fell below goals for children ages 4 through 8 years and males ages 51 years and older. For Starchy Vegetables, fiber fell below goals for several groups when less than ~0.15 cup eq per day was in the pattern. For Red and Orange Vegetables, vitamin A and fiber fell below goals in most groups.

Considerations for Examining a Modification

These scenarios provide evidence of potential nutrient improvements, which supports further analyses to explore a modification to the proportions of Vegetables subgroups that increases Beans, Peas, and Lentils and Dark-Green Vegetables in the overall synthesis that integrates food groups in a healthy dietary pattern.

All analyses and a summary of results by age, sex, and life stage can be found in the:
Vegetables FPM Report at:
https://www.DietaryGuidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Question 4: What are the implications for nutrient intakes when modifying the quantities of the Grains group within the Healthy U.S.-Style Dietary Pattern? What are the implications for nutrient intakes when specific individual staple grains are emphasized; or when the Grains group is replaced with other staple carbohydrate foods (i.e., Starchy Vegetables; Beans, Peas, and Lentils; starchy Red and Orange vegetables)?

Approach to Answering Question: Food Pattern Modeling

Introduction to the Grains Food Group

Box D.10.6: Grains

What is included? The Grains Food Group in the 2020 USDA Dietary Patterns includes 2 subgroups: Whole Grains and Refined Grains. The *2020-2025 Dietary Guidelines* notes that most choices should be nutrient-dense such as those prepared without added sugars, saturated fat such as butter, and/or sodium.

Whole Grains: all whole-grain products and whole grains used as ingredients; for example: amaranth, barley (not pearled), brown rice, buckwheat, bulgur, millet, oats, popcorn, quinoa, dark rye, whole-grain cornmeal, whole-wheat bread, whole-wheat chapati, whole-grain cereals and crackers, and wild rice.

Refined Grains: All refined-grain products and refined grains used as ingredients; for example: white breads, refined-grain cereals and crackers, corn grits, cream of rice, cream of wheat, barley (pearled), masa, pasta, and white rice. Refined grain choices should be enriched.

How much? The 2020 USDA Dietary Patterns recommend 1¾ to 3 ounce equivalents (oz eq) of Grains each day for young children ages 12 through 23 months and 3 to 10½ oz eq of Grains each day for individuals 2 years and older. The *Dietary Guidelines for Americans, 2020-2025* include that at least half of Grains are whole grain.

What counts? The FPED converts all foods and beverages in FNDDS into USDA Dietary Pattern components. FPED shows that 1 oz eq of Grains equates to approximately ½ cup cooked rice, pasta, or cereal; 1 ounce dry pasta or rice, 1 medium (1 ounce) slice bread, tortilla, or flatbread, 1 ounce ready-to-eat cereal (about 1 cup of flaked cereal).

Table D.10.5 shows that the Grains Food Group contributes approximately 50-60 percent of the total folate and total iron, approximately 40-50 percent of the total carbohydrate, total fiber, and total thiamin, and approximately 30-40 percent of the total niacin, total copper, total magnesium, and total zinc to the 2020 HUSS across most age groups starting at age 12 months. The Grains Food Group also contributes at

least 15 percent of the total nutrient content for several additional nutrients in the 2020 HUSS for most calorie levels.

TABLE D.10.5
PERCENTAGE OF TOTAL NUTRIENT CONTRIBUTION FROM THE GRAINS FOOD GROUP IN THE 2020 HEALTHY U.S.-STYLE (HUSS) DIETARY PATTERN AS A RANGE OF ESTIMATES ACROSS CALORIE LEVELS FOR AGES 12 THROUGH 23 MONTHS AND 2 YEARS AND OLDER

Nutrient	Range of contribution (%) in HUSS for ages 12 through 23 months	Range of contribution (%) in HUSS for ages 2 years and older
Energy (kcal)	23-28*	30-37*
Carbohydrate (g)	41-45*	44-51*
Fiber (g)	43-50*	37-44*
Protein (g)	14-19*	17-24*
Fat (g)	9-11	14-18*
Saturated Fatty Acids (g)	5-7	16-21*
Linoleic acid (18:2) (g)	16-21*	15-20*
Linolenic acid (18:3) (g)	7-10	8-11
Vitamin A (mcg RAE)	13-15	12-16*
Vitamin C (mg)	≤3	≤2
Vitamin D (IU)	5-6	7-11
Vitamin E (mg AT)	10-13	9-12
Vitamin K (mcg)	≤5	≤4
Thiamin (mg)	41-48*	45-53*
Riboflavin (mg)	11-16	18-27*
Niacin (mg)	35-43*	34-41*
Vitamin B6 (mg)	20-23*	18-22*
Folate (mcg DFE)	47-58*	55-63*
Vitamin B12 (mcg)	11-14	12-18*
Choline (mg)	8-11	10-13
Calcium (mg)	10-12	12-21*
Copper (mg)	33-38*	28-33*
Iron (mg)	53-63*	56-62*
Magnesium (mg)	33-39*	31-37*
Phosphorus (mg)	17-20*	21-29*
Potassium (mg)	12-13	11-13
Sodium (mg)	19-27*	28-39*
Zinc (mg)	27-33*	29-36*

AT = alpha-tocopherol, DFE = dietary folate equivalents, g = grams, IU = international units, kcal = calories, mcg = micrograms, mg = milligrams, RAE = retinol activity equivalents

*For these nutrients, the Total Grains Food Group contributes more than 15 percent of the total amount of these nutrients in the HUSS pattern for at least half of the calorie levels.

Synthesis Statements and Summary of the Evidence

Synthesis Statement 1 of 3

Potential Modification to the HUSS Across All Life Stages Starting at Age 12 Months

FPM results provide support for exploring a modification that reduces Total Grains in the overall synthesis that integrates the food groups in a healthy dietary pattern.

Supporting Evidence and Considerations for Synthesis Statement 1

Reduction Analyses

Generally, a 1-oz eq reduction in the Total Grains daily recommendation (maintaining 50 percent Whole Grains) for ages 2 years and older does not introduce any additional nutrients falling below the goal. Although most calorie levels in the 2020 HUSS have a level of sodium below the CDRR, a small reduction in Total Grains has positive implications in further reducing sodium. For age-sex groups for whom the 2020 HUSS contributes <90 percent of iron, folate, or magnesium, a small reduction in Total Grains has additional negative implications. For example, iron decreases an additional 5-10 percent for groups including children ages 4 through 8, females ages 14 through 50, and the pregnancy life stage. Folate decreases approximately 8 percent in patterns that apply to the pregnancy life stage.

Reducing Whole Grains has more negative implications than reducing Refined Grains. In incremental reduction analyses for Whole Grains (not including complete removal), nutrients that fell below goals include carbohydrates (children ages 2 through 8 years and lactating individuals ages 31 through 50 years), vitamin A (males ages 51 years and older), folate (females ages 51 years and older), iron (children ages 2 through 3 years; females ages 14 through 18 years and 51 years and older), magnesium (females ages 14 through 18 years and 31 years and older; males ages 14 through 50 years; and pregnancy groups 19 years and older), zinc (individuals who are lactating ages 14 through 18 years; males 51 years and older; individuals during pregnancy 14 through 18 years), and fiber (all groups).

In incremental reduction analyses for Refined Grains (not including complete removal), nutrients that fell below goals in at least 1 age, sex, or life stage group include carbohydrates (for children ages 2 through 8 years), folate (females ages 51 years and older; lactating groups ages 31 years and older), and iron (females ages 14 through 18 years).

Considerations for Examining a Modification

The nutrient profile for Refined Grains and Whole Grains reflects the contribution of several commonly consumed foods, including breads, rice, and pasta that are enriched with iron, folic acid, and B vitamins, as well as ready-to-eat breakfast cereals which are often fortified with iron and other micronutrients. Results suggest that a small reduction in Total Grains has minimal implications for most age-sex groups. The Committee recognizes, however, that larger implications exist for age groups and life stages for whom the contribution of nutrients in enriched and/or fortified grain products is of particular public health importance, especially the peri-conceptional and early pregnancy stages. The synthesis statement was developed with the intent to explore a potential reduction in Total Grains as part of the broader synthesis in which other proposed modifications might ameliorate the negative implications for iron and/or folate.

Synthesis Statement 2 of 3

Potential Flexibility to the HUSS Across Life Stages Starting at Age 12 Months

FPM results provide support for exploring a flexibility that increases Beans, Peas, and Lentils above the proposed quantities in a healthy dietary pattern while simultaneously decreasing Total Grains.

Supporting Evidence and Considerations for Synthesis Statement 2

Decrease Grains and Increase Beans, Peas, and Lentils Analyses

When Refined Grains or Whole Grains are incrementally decreased by 1 oz eq per week and the total quantity of Beans, Peas, and Lentils in the 2020 HUSS is increased by ⅜ cup eq per week, positive implications exist for folate, iron, choline, potassium, and fiber for ages 1 year and older. The positive implications for iron are more notable when Refined Grains (vs. Whole Grains) are substituted with Beans, Peas, and Lentils.

For most age-sex groups, the quantity of folate, iron, potassium, and fiber in the 2020 HUSS is already above goals. Up to half of Total Grains (maintaining a 50 percent Whole Grain ratio) could be replaced with Beans, Peas, and Lentils and would result in primarily positive implications for achieving goals. For example, the goal for choline is not achieved for many age-sex groups in the 2020 HUSS. When at least 25 percent of Total Grains are substituted with Beans, Peas, and Lentils, choline approaches the goal for many but not all age-sex groups.

Considerations for Examining a Flexibility

These scenarios provide evidence to support further analyses to explore a flexibility that increases Beans, Peas, and Lentils above the proposed quantities in a healthy dietary pattern while simultaneously decreasing Total Grains.

Synthesis Statement 3 of 3

Potential Flexibility to the HUSS Across All Life Stages Starting at Age 12 Months

FPM results provide support for exploring a flexibility that increases Starchy Vegetables (including starchy Red and Orange Vegetables) above the proposed quantities in a healthy dietary pattern while simultaneously decreasing Total Grains.

Supporting Evidence and Considerations for Synthesis Statement 3

Decrease Grains and Increase Starchy Vegetables Analyses

In general, decreasing Whole Grains and/or Refined Grains by 1 oz eq per week and increasing Starchy Vegetables, including starchy Red and Orange Vegetables such as sweet potatoes and pumpkin, by 0.5 cup eq per week has limited nutritional implications in the 2020 HUSS.

For those age, sex, and life stages for which the 2020 HUSS falls short of the goal for vitamin A, positive implications are introduced when Whole Grains and/or Refined Grains are decreased by 1 oz eq and starchy Red and Orange vegetables in the 2020 HUSS is increased by 0.5 cup eq. Specifically, a 2 oz eq per week decrease of Whole Grains with a 1 cup eq per week increase in starchy Red and Orange vegetables would be needed to meet the nutrient goals for vitamin A during lactation.

In scenarios where Total Grains are decreased and replaced with Starchy Vegetables and/or starchy Red and Orange vegetables, negative implications are introduced for iron and folate, which are often enriched and/or fortified in Grains foods. These flexibilities would not meet the nutritional goals for iron and folate in calorie levels tested for adolescent females and would exacerbate the issues for individuals during pregnancy. For example, for individuals ages 14 through 18 years who are pregnant, negative nutrient implications for zinc and magnesium were observed when Whole Grains were replaced with any of the vegetable subgroups. In scenarios where Starchy Vegetables replaced Total Grains for this group, magnesium fell below goals. Zinc also fell below goals when Total Grains were replaced with Starchy Vegetables or Starchy Vegetables plus starchy Red and Orange Vegetables. In contrast, when Refined Grains or Total Grains are replaced with starchy Red and Orange Vegetables (including in combination with Starchy Vegetables), magnesium increases in the pattern for males 51 years and older. Of note, fortification of grain products does not typically include zinc and magnesium.

Replacing Whole, Refined, and Total Grains with Starchy Vegetables (only) had negative implications for vitamin A among individuals who are lactating as well as males ages 51 years and older. In contrast, positive nutrient implications are observed across most age-sex groups for choline and sodium in scenarios where Total Grains were replaced with Starchy Vegetables and/or starchy Red and Orange Vegetables; however, these positive nutrient implications were often in tandem with negative nutrient implications in iron and folate.

Considerations for Examining a Flexibility

These scenarios provide evidence to support further analyses to explore a flexibility that increases Starchy Vegetables (including starchy Red and Orange Vegetables) above the proposed quantities in a healthy dietary pattern while simultaneously decreasing Total Grains. Given the implications for age groups and life stages for whom the contribution of nutrients in enriched and/or fortified grain products may be of particular public health importance, the Committee emphasized that any proposal for a flexibility that considered increasing Starchy Vegetables while simultaneously decreasing Total Grains would require meaningful guidance on integration with other food groups to identify where to otherwise obtain these nutrients that are found in Total Grains.

All analyses and a summary of results by age, sex, and life stage can be found in the:
Grains FPM Report at:
https://www.DietaryGuidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Question 5: What are the implications for nutrient intakes when modifying the Protein Foods group and subgroup quantities within the Healthy U.S.-Style Dietary Pattern or Healthy Vegetarian Dietary Pattern? What are the implications for nutrient intakes when proportions of animal-based Protein Foods subgroups are reduced and proportions of plant-based Protein Foods subgroups are increased?

Approach to Answering Question: Food Pattern Modeling

Introduction to the Protein Foods Group

Box D.10.7: Protein Foods

What is included? The Protein Foods group in the 2020 USDA Dietary Patterns includes 4 subgroups: Meats, Poultry, and Eggs; Seafood; Nuts, Seeds, and Soy Products; and Beans, Peas, and Lentils. Beans, Peas, and Lentils can also be included as a Vegetables subgroup. The *2020-2025 Dietary Guidelines* notes that most choices should be nutrient-dense such as those prepared without added sugars, additional saturated fat such as butter, and/or sodium.

Meats, Poultry, Eggs: Meats include beef, goat, lamb, pork, and game meat (e.g., bison, moose, elk, deer). Poultry includes chicken, Cornish hens, duck, game birds (e.g., ostrich, pheasant, and quail), goose, and turkey. Organ meats include chitterlings, giblets, gizzard, liver, sweetbreads, tongue, and tripe. Eggs include chicken eggs and other birds' eggs. Meat and poultry should be lean or low-fat.

Seafood: Seafood examples that are lower in methylmercury include anchovy, black sea bass, catfish, clams, cod, crab, crawfish, flounder, haddock, hake, herring, lobster, mullet, oyster, perch, pollock, salmon, sardine, scallop, shrimp, sole, squid, tilapia, freshwater trout, light tuna, and whiting.

Nuts, Seeds, and Soy Products: Nuts and seeds include all nuts (tree nuts and peanuts), nut butters, seeds (e.g., chia, flax, pumpkin, sesame, and sunflower), and seed butters (e.g., sesame, tahini, and sunflower). Soy includes tofu, tempeh, and products made from soy flour, soy protein isolate, and soy concentrate. Nuts should be unsalted.

Beans, Peas, and Lentils: all cooked from dry or canned beans, peas, chickpeas, and lentils; for example: black beans, black-eyed peas, bayo beans, chickpeas (garbanzo beans), edamame, kidney beans, lentils, lima beans, mung beans, pigeon peas, pinto beans, and split peas. Does not include green beans or green peas.

How much? The 2020 USDA Dietary Patterns recommend 1 to 2 ounce equivalents (oz eq) of Protein Foods per day for young children ages 12 through 23 months and 1 to 8 oz eq of Protein Foods per day for individuals ages 2 years and older. Weekly recommendations are provided for each Subgroup.

What counts? The FPED converts all foods and beverages in FNDDS into USDA Dietary Pattern components. FPED shows that 1 oz eq of Protein Foods equates to approximately 1 ounce lean meats, poultry, or seafood; 1 egg; ¼ cup cooked beans or tofu; 1 tablespoon nut or seed butter; ½ ounce nuts or seeds.

Table D.10.6 shows that the Protein Foods group contributes approximately 40-50 percent of the total choline and approximately 30-40 percent of the total protein, total niacin, and total vitamin B12 to the 2020 HUSS across most age groups starting at age 12 months. The Protein Foods group also contributes at

least 15 percent of the total nutrient content for more than 1 dozen additional nutrients in the 2020 HUSS for most calorie levels. It should be noted that although the Protein Foods group in the 2020 HUSS can include Beans, Peas, and Lentils, the Protein Foods group was not modeled with the inclusion of Beans, Peas, and Lentils. Therefore, the nutrient data shown in **Table D.10.6** do not include the nutritional contribution from Beans, Peas, and Lentils.

TABLE D.10.6
PERCENTAGE OF TOTAL NUTRIENT CONTRIBUTION FROM THE PROTEIN FOODS GROUP IN THE 2020 HEALTHY U.S.-STYLE (HUSS) DIETARY PATTERN AS A RANGE OF ESTIMATES ACROSS CALORIE LEVELS FOR AGES 12 THROUGH 23 MONTHS AND 2 YEARS AND OLDER

Nutrient	Range of contribution (%) in HUSS for ages 12 through 23 months	Range of contribution (%) in HUSS for ages 2 years and older
Energy (kcal)	11-16	12-18*
Carbohydrate (g)	≤2	≤2
Fiber (g)	≤2	≤3
Protein (g)	29-37*	29-42*
Fat (g)	12-16*	16-24*
Saturated Fatty Acids (g)	10-13	20-30*
Linoleic acid (18:2) (g)	9-12	9-13
Linolenic acid (18:3) (g)	4-6	4-7
Vitamin A (mcg RAE)	8-11	6-9
Vitamin C (mg)	<1	<1
Vitamin D (IU)	18-22*	19-34*
Vitamin E (mg AT)	15-19*	14-21*
Vitamin K (mcg)	≤2	≤2
Thiamin (mg)	8-14	8-12
Riboflavin (mg)	17-23*	15-24*
Niacin (mg)	33-47*	33-42*
Vitamin B6 (mg)	22-32*	22-30*
Folate (mcg DFE)	5-7	4-6
Vitamin B12 (mcg)	23-31*	25-40*
Choline (mg)	42-49*	37-48*
Calcium (mg)	≤3	≤5
Copper (mg)	16-23*	16-22*
Iron (mg)	13-19*	13-17*
Magnesium (mg)	10-13	11-15
Phosphorus (mg)	14-19*	16-24*

Nutrient	Range of contribution (%) in HUSS for ages 12 through 23 months	Range of contribution (%) in HUSS for ages 2 years and older
Potassium (mg)	11-17	11-16*
Sodium (mg)	16-23*	17-26*
Zinc (mg)	18-27*	21-31*

AT = alpha-tocopherol, DFE = dietary folate equivalents, g = grams, IU = international units, kcal = calories, mcg = micrograms, mg = milligrams, RAE = retinol activity equivalents

*For these nutrients, the Protein Foods Group contributes more than 15 percent of the total amount of these nutrients in the HUSS pattern for at least half of the calorie levels.

Synthesis Statements and Summary of the Evidence

Synthesis Statement 1 of 3

Potential Modification to the HUSS Ages 2 Years and Older

FPM results provide support for exploring a modification that reduces Total Protein Foods in the overall synthesis that integrates food groups in a healthy dietary pattern.

Supporting Evidence and Considerations for Synthesis Statement 1

Reduction Analyses

The magnitude by which Total Protein Foods or its subgroups can be reduced without additional implications on nutrients falling short of goals depends on the age-sex group. For age, sex, and life stage groups already below goals for vitamin D, vitamin A, magnesium, folate, iron, choline, and vitamin E, when the Protein Foods subgroups were reduced, the quantities for these nutrients also decreased further below goals; for certain age-sex groups, potassium or zinc may also fall below goals.

Generally, a modest reduction in the weekly quantity of Meats, Poultry, and Eggs, with all other subgroups held constant, can occur without negative implications on meeting nutritional goals. For example, the following decreases are the point at which a negative nutrient implication occurs with a reduction in Meats, Poultry, and Eggs: for children ages 4 through 8 years, potassium falls below the goal with a decrease of 5.5 oz eq per week; for females ages 14 through18 years, iron falls below the goal with a decrease of 4 oz eq per week; for females who are lactating, zinc falls below the goal when nearly all Meats, Poultry and Eggs are removed.

When incrementally reducing Beans, Peas, and Lentils (not including complete removal), iron (females ages 14 through 18 years) fell below goals. When incrementally reducing Nuts, Seeds, and Soy (not including complete removal), iron (females ages 14 through 18 years) fell below goals. When incrementally reducing Seafood (not including complete removal), iron (females ages 14 through 18 years) fell below goals.

Considerations for Examining a Modification

With these scenarios, the Committee determined that a modification to decrease Total Protein Foods could be explored. However, when exploring an age- and/or life stage-specific modification to reduce Total Protein Foods during the synthesis phase, a reduction may not be feasible for children ages 4 through 8

years or females ages 1 through 18 years without a commensurate increase in nutrient shortfalls, such as iron, potassium, and zinc, from other food groups or subgroups.

Synthesis Statement 2 of 2

Potential Flexibility to the HUSS Across All Life Stages Starting at Age 12 Months

FPM results provide support for exploring a flexibility that increases Beans, Peas, and Lentils and Nuts, Seeds, and Soy Products, while simultaneously decreasing Meats, Poultry, and Eggs.

Supporting Evidence and Considerations for Synthesis Statement 2

FPM results show positive and negative nutrient implications when Beans, Peas, and Lentils, and Nuts, Seeds, and Soy Products are increased above existing quantities in the 2020 HUSS, and Meats, Poultry and Eggs are reduced. For instance, nutrients that increase include fiber, linoleic acid, vitamin E, folate, calcium, and potassium for young children ages 12 through 23 months, and fiber, vitamin E, folate, and magnesium for individuals 2 years and older. Nutrients that decrease include vitamin D and sodium for young children ages 12 through 23 months and individuals ages 2 years and older. The nutrients that decrease are either already below nutritional goals or newly fall below nutritional goals. It is also noted that this scenario shifts iron from heme to non-heme sources, which will reduce the bioavailability of the iron and potentially increase phytates.

Considerations for Examining a Flexibility

These scenarios provide evidence to support further analyses to explore a flexibility that increases Beans, Peas, and Lentils, and Nuts, Seeds, and Soy Products, while simultaneously decreasing Meats, Poultry, and Eggs. The 2025 Committee prioritized analyses that moved the Beans, Peas, and Lentils subgroup from Vegetables to Protein Foods to examine hypothetical flexibilities of animal vs. plant-based Protein Foods.

Synthesis Statement 3 of 3:

Potential Flexibility to the 2020 H-VEG Across All Life Stages Starting at Age 12 Months

FPM results provide support for exploring a flexibility of the 2020 H-VEG in which Seafood is added.

Supporting Evidence and Considerations for Synthesis Statement 3

Seafood Added to H-VEG Analyses

In scenarios where Seafood is added (8 oz or less per week, depending on the calorie range) to the existing Protein Foods in the 2020 H-VEG, no negative implications are noted for ages 2 years and older. That is, no additional nutrients fall below established goals for this age group. Additionally, vitamin D increases modestly above the amounts in the 2020 H-VEG for all age-sex groups (including patterns relevant to young children ages 12 through 23 months). Although there are no negative nutrient implications for the patterns relevant to individuals ages 2 years and older, negative implications are noted when plant-based protein foods are decreased and replaced with Seafood for young children ages 12 through 23 months, specifically that fiber falls below goals in the patterns relevant for these ages.

Considerations for Examining a Flexibility

These scenarios provide evidence to support further analyses to explore modifications of the Total Protein Foods to the 2020 HUSS and a flexibility of a seafood addition to the H-VEG.

All analyses and a summary of results by age, sex, and life stage can be found in the:
Protein Foods FPM Report at:
https://www.DietaryGuidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Question 6: 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?

Approach to Answering Question: Food Pattern Modeling

Synthesis Statements and Summary of the Evidence

Synthesis Statement 1 of 2

Potential Modification to All Dietary Patterns Across All Life Stages Starting at Age 2 Years

The energy is variable among nutrient-dense representative foods and beverages underlying the nutrient profile calculation for each food group and subgroup. The variability in energy precludes the ability to estimate the quantity of remaining calories per day within the recommended calorie allotments. Therefore, FPM results provide support for exploring a modification that does not include specific quantities of remaining daily calories for other uses in the presentation of the patterns.

Supporting Evidence and Considerations for Synthesis Statement 1

The nutrient profiles of food groups and subgroups used in FPM were calculated using only the nutrient-dense versions of foods and beverages, as described in **Part D. Chapter 9: Nutrient Profile Development**. In addition, desserts, sweets, and milkshakes were excluded from nutrient profile calculations. Thus, the patterns' estimated nutrient profiles and calories do not necessarily convey the variability in these estimates across the possible foods and beverages within a food group or subgroup.

When the nutrient-dense forms of foods and beverages were used, the proposed food group and subgroup quantities in the 2020 HUSS represented an average of ~86 percent of daily energy across calorie levels and age-sex groups. Modeling the nutrient profiles and the proposed quantities of food groups and subgroups in the 2020 HUSS using nutrient-dense foods and beverages contributed, on average, <2 percent of calories as added sugars and ~6 percent of calories from saturated fat. Although these estimates are <100 percent for daily energy, <10 percent of calories from added sugars and <10 percent of calories from saturated fat, the estimates do not reflect the potential range for energy when selecting from all nutrient-dense options within various food or beverage choices.

The nutrient profiles were constructed as the weighted average among diverse foods and beverages within food groups and subgroups, thus the amount of energy of the pattern was higher or lower depending on the foods and beverages being modeled. For example, the nutrient profile for Red and Orange Vegetables estimates that 1 cup eq has 53 calories with a range of 31 calories per cup eq for raw tomatoes

to 180 calories per cup eq for cooked sweet potatoes. Depending on the food consumed, meeting the recommendation for Red and Orange Vegetables could result in more or less energy than the modeled estimate. Thus, the actual calories per day from nutrient-dense foods and beverages may be higher or lower than the average estimates. In summary, a single estimate of remaining calories for other uses does not represent the underlying variability. Therefore, a modification to the Dietary Patterns that does not present quantities of remaining calories per day—previously referred to as "Limit on Calories for Other Uses"—is proposed.

Synthesis Statement 2 of 2

An assessment of the energy contributions of various foods and beverages that are lower in nutrient density demonstrate challenges to meeting nutrient goals while remaining within the daily allotment for calories, added sugars, and saturated fat. Analysis to evaluate the inclusion of lower nutrient-dense foods is not justified.

Supporting Evidence and Considerations for Synthesis Statement 2

Given the findings of Synthesis Statement 1, which concludes that it is not feasible to provide an estimate of daily calories for other uses, the subsequent evaluation of foods and beverages lower in nutrient density for feasible inclusion is not warranted. The nutrient profiles of food groups and subgroups used in FPM analyses are calculated using nutrient-dense forms of foods and beverages and do not include any contribution from desserts, sweets, or milkshakes. For more information on the development of nutrient profiles used in the 2025 FPM process, see **Part D. Chapter 9: Nutrient Profile Development**.

Synthesis of Hypothetical Dietary Pattern Modifications

Each of the 6 questions presented in this chapter examined modifications to individual food groups or subgroups and their respective implications on the nutrient content and ability of the 2020 HUSS to meet nutritional goals. As a first step, these analyses modified quantities in food groups and subgroups while the rest of the pattern remained unchanged. Subsequently, assessment of the concurrent modifications to the 2020 HUSS food groups and subgroup quantities was conducted to determine the summative impact on the nutritional content after proposed changes are implemented. In **Table D.10.7**, each of the proposed modifications to the 2020 HUSS Dietary Pattern are listed. The table identifies proposed modifications with a strikethrough which were identified during synthesis of the individual food group analyses but were not carried forward in cumulative synthesis analyses The resulting modified 2020 HUSS (**Box D.10.8** and **Table D.10.8**) could then be assessed through the diet simulations, which are presented in **Part D. Chapter 11: Diet Simulations**.

The modified 2020 HUSS in **Table D.10.8** was the pattern used in diet simulations to evaluate modifications to food groups and subgroups. Multiple modifications were proposed as part of the analyses for the food groups and subgroups. The final modifications proposed by the Committee were determined through evaluation of the FPM results in conjunction with the evidence from systematic reviews and in consideration of data analysis.

TABLE D.10.7
SUMMARY OF MODIFICATIONS AFTER EVIDENCE SYNTHESIS: PROPOSED MODIFICATIONS TO THE 2020 HUSS DIETARY PATTERN

Proposed Modifications to the 2020 HUSS Dietary Pattern	Ages
• Modify Vegetables subgroups • Increase Beans, Peas, and Lentils • Increase Dark-Green Vegetables • Decrease Starchy Vegetables	2+
• Reduce Total Grains	1+
• Reduce Total Protein Foods	2+
• Reduce Dairy and Fortified Soy Alternatives	2+
• Remove “Limits on Calories for Other Uses” from visual presentation of the pattern(s)	2+*

*The 2020 USDA Dietary Patterns for young children ages 12 through 23 months do not contain “Limits on Calories for Other Uses.”

The proposed modifications with a strikethrough were identified during synthesis of the individual food group analyses but were not carried forward in cumulative synthesis analyses

To examine the impact of changes to the quantities of the food groups and subgroups, the revised nutrient profiles presented in **Part D. Chapter 9: Nutrient Profile Development** were used to evaluate the nutrient implications of modifying the food group quantities in the 2020 HUSS. Outcomes from various scenarios were examined, including cumulative combinations of modifications to examine the impact on meeting nutritional goals across age-sex groups and life stages within calorie limits. These evaluations allowed the Committee to determine the synergistic impact of multiple food group and subgroup changes on the total energy and nutrient content of the modified 2020 HUSS (**Box D.10.8**).

Box D.10.8: The Modified 2020 HUSS

The modified 2020 HUSS was the proposed pattern used by the 2025 Dietary Guidelines Advisory Committee in the synthesis of all FPM analyses discussed in this chapter and in diet simulations discussed in **Part D. Chapter 11: Diet Simulations**. The final pattern(s) that integrated evidence across food pattern modeling, systematic review, and data analysis can be found in **Part E. Chapter 1. Overarching Advice to the Departments.**

Cumulative Effects of Hypothetical Dietary Pattern Modifications, by Food Group

No modifications were proposed that change the quantities of Total Vegetables in the modified 2020 HUSS; however, modifications were proposed to change the proportional quantities of Vegetable subgroups within the Vegetables Food Group, including an increase in the quantity of Dark-Green Vegetables and Beans, Peas, and Lentils, and a reduction in the quantity of Starchy Vegetables. While increasing the proportion of vegetables from Dark-Green Vegetables increased the nutrient content of the HUSS, evidence from the systematic reviews was limited in supporting a modification to the quantity in the HUSS. Therefore, the Committee chose not to propose any modification in Dark-Green Vegetables.

In contrast, compelling evidence was noted in the systematic reviews in which dietary patterns that had higher levels of Beans, Peas, and Lentils (often presented in the literature as “legumes”) were associated with beneficial health outcomes. Similarly, increasing the proportion of the Beans, Peas, and Lentils subgroup in the Vegetables Food Group produced positive gains in potassium, choline, vitamin E, folate, and magnesium. Beans, Peas, and Lentils were increased across calories levels in the modified 2020 HUSS for ages 2 years and older, with a 0.5 cup equivalent per week increase in the 1,000-, 1,200-, 2,600-, and 2,800-calorie levels and a 1.0 cup equivalent per week increase in 1,400- to 2,400-calorie levels. The quantities were increased to a maximum of 3 cup equivalents per week, as this level approaches the 95th percentile of intake in the population.[19]

With no change to the total quantity of the Vegetables Food Group, the increase in Beans, Peas, and Lentils requires a redistribution of the sources of the cup equivalents from the Vegetable Subgroups. When Starchy Vegetables are reduced in proportion to an increase to Beans, Peas, and Lentils, no negative implications on nutrients were introduced and the compensation for energy kept the patterns within energy limits. Of the Vegetable subgroups, Starchy Vegetables makes up among the largest proportions of Total Vegetables and is also (like Beans, Peas, and Lentils) more energy-dense than other Vegetable subgroups. This shift in Vegetable subgroups does not have implications for meeting the goal for potassium. Starchy Vegetables and Beans, Peas, and Lentils contribute potassium to the dietary pattern. Quantities of Starchy Vegetables established in FPM conducted by previous Committees were important for helping the patterns come closer to achieving the DRI for potassium, which at the time was nearly 2-fold higher than in the updated DRI published in 2019. Additionally, conclusion statements from the Committee’s systematic reviews noted higher intakes of fried potatoes to be associated with negative health outcomes (see **Part D. Chapter 2: Dietary Patterns**). The World Cancer Research Fund Third Expert Report on Diet, Nutrition, Physical Activity and Cancer recommends increased intake of vegetables in the form of non-starchy vegetables for cancer prevention.[20] Therefore, the Committee proposed a reduction in Starchy Vegetables equal to the increase in Beans, Peas, and Lentils in the modified 2020 HUSS.

Modifications to Protein Foods Groups and Subgroups were proposed for synthesis in the modified 2020 HUSS. Systematic review evidence consistently indicated that dietary patterns higher in red and processed meats were related to negative health consequences, while higher intakes of fish and seafood were related to beneficial health outcomes (see **Part D. Chapter 2: Dietary Patterns**). Intakes of animal protein foods considered in systematic reviews are within the range of typical intakes in U.S. diets, which may not be nutrient-dense. In contrast, the representative foods in FPM analyses use the most nutrient-dense form with the lowest saturated fat and added sugars content. While examining potential reductions in the Protein Foods Group through reduction in the Meats portion of the Meats, Poultry, and Eggs subgroup, it became evident that reductions at or below the 2,000-calorie level had negative implications on meeting nutritional goals, especially for children and adolescents. This underscores the importance of nutrient density and the challenge of meeting nutritional goals within lower calorie levels (2,000 calories or below). Instead, the 2,200-calorie level emerged as a threshold where modifications could be made without introducing numerous nutrient gaps.

The Committee initially proposed modifications for reductions in the Dairy and Fortified Soy Alternatives Food Group, but ultimately chose not to pursue such reductions due to the negative implications on nutrients for many age-sex groups, especially children and adolescents and older adults for whom nutrient needs related to bone acquisition and retention are higher.[6]

The Committee also initially proposed modifications for reductions in Total Grains. FPM analyses in food group isolation indicated the potential to reduce the quantities of Total Grains in the HUSS, which would free up additional calories without producing negative nutrient implications. A reduction of Total Grains also results in reductions in sodium, which is a nutrient that is overconsumed. When these modifications were tested in concert with the other modifications, however, they were no longer feasible without introducing nutritional gaps. Specifically, the reduction in the Grains Food Group negated many of the gains introduced by increasing quantities of the Beans, Peas, and Lentils subgroup in the HUSS. The Committee recognizes the implications for age groups and life stages for whom the contribution of nutrients in enriched and/or fortified grain products may be of particular public health importance, especially the peri-conceptional and early pregnancy periods, and it was apparent that no other proposed modifications would ameliorate the negative implications for iron and/or folate. Therefore, the Committee chose not to propose modifications to Total Grains.

No modifications to the Fruits Food Group were explored by the Committee. Systematic review evidence supports positive health outcomes related to 100% juice, dietary patterns, and complementary feeding. Those systematic reviews support dietary patterns higher in fruit. Further, data analysis indicates that the population is below recommendations for fruit intake, and FPM analyses did not support making modifications because fruit is the main contributor of vitamin C, fiber, and potassium in the 2020 HUSS Dietary Pattern.

Differences in Nutritional Adequacy from Modifications to the HUSS

The proposed modifications shown in **Table D.10.8** allowed the Committee to further optimize the nutritional adequacy of the HUSS. The work of prior Committees has made incremental improvements to the pattern, which broadly meets the nutritional goals across age-sex groups and life stages, with few exceptions. Therefore, modest changes to the quantities in the pattern are not likely to produce large shifts in nutrition content (as shown in **Table D.10.9**), but when integrating the evidence from systematic reviews and data analysis with FPM results, the modifications of food groups and subgroups had positive impacts on the nutrients provided in the modified 2020 HUSS and aligned with the Committee's review of evidence from systematic reviews.

TABLE D.10.8
THE MODIFIED 2020 HEALTHY U.S.-STYLE DIETARY PATTERN (HUSS)

	Calorie Level											
Food Group or Subgroup	**1,000**	**1,200**	**1,400**	**1,600**	**1,800**	**2,000**	**2,200**	**2,400**	**2,600**	**2,800**	**3,000**	**3,200**
Vegetables (cup eq/day)	1.0	1.5	1.5	2.0	2.5	2.5	3.0	3.0	3.5	3.5	4.0	4.0
Dark-Green Vegetables (cup eq/week)	0.5	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.5	2.5	2.5	2.5
Red and Orange Vegetables (cup eq/week)	2.5	3.0	3.0	4.0	5.5	5.5	6.0	6.0	7.0	7.0	7.5	7.5
Beans, Peas, and Lentils (cup eq/week)	1.0*	1.0*	1.5*	2.0*	2.5*	2.5*	3.0*	3.0*	3.0*	3.0*	3.0	3.0
Starchy Vegetables (cup eq/week)	1.5*	3.0*	2.5*	3.0*	4.0*	4.0*	5.0*	5.0*	6.5*	6.5*	8.0	8.0
Other Vegetables (cup eq/week)	1.5	2.5	2.5	3.5	4.0	4.0	5.0	5.0	5.5	5.5	7.0	7.0
Fruits (cup eq/day)	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0	2.0	2.5	2.5	2.5
Grains (oz eq/day)	3.0	4.0	5.0	5.0	6.0	6.0	7.0	8.0	9.0	10.0	10.0	10.0
Whole Grains (oz eq/day)	1.5	2.0	2.5	3.0	3.0	3.0	3.5	4.0	4.5	5.0	5.0	5.0
Refined Grains (oz eq/day)	1.5	2.0	2.5	2.0	3.0	3.0	3.5	4.0	4.5	5.0	5.0	5.0
Dairy and Fortified Soy Alternatives (cup eq/day)	2.0	2.5	2.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Protein Foods (oz eq/day)	2.0	3.0	4.0	5.0	5.0	5.5	5.5*	6.0*	6.0*	6.5*	6.5*	6.5*
Meats, Poultry, and Eggs (oz eq/week)	10.0	14.0	19.0	23.0	23.0	26.0	24.5*	27.0*	27.0*	29.0*	29.0*	29.0*
Seafood (oz eq/week)	2.0-3.0	4.0	6.0	8.0	8.0	8.0	9.0	10.0	10.0	10.0	10.0	10.0
Nuts, Seeds, and Soy Products (oz eq/week)	2.0	2.0	3.0	4.0	4.0	5.0	5.0	5.0	5.0	6.0	6.0	6.0
Oils (g/day)	15.0	17.0	17.0	22.0	24.0	27.0	29.0	31.0	34.0	36.0	44.0	51.0

*Indicates a change from the 2020 HUSS. Weekly quantities of Beans, Peas, and Lentils increased. Weekly quantities of Starchy Vegetables decreased. Daily quantities of Protein Foods decreased. Weekly quantities of Meats, Poultry, and Eggs decreased.

TABLE D.10.9
DIFFERENCE (PERCENT CHANGE) IN NUTRIENT ADEQUACY OF THE MODIFIED 2020 HUSS COMPARED TO THE 2020 HUSS

Age-Sex Group	Calorie Level	Energy	Energy From Added Sugars	Energy From Total Fat	Energy From Saturated Fat	Sodium CDRR	Protein RDA	Vitamin A RDA	Vitamin D RDA	Vitamin E RDA	Folate RDA	Calcium RDA	Iron RDA	Magnesium RDA	Fiber AI	Potassium AI	Choline AI
Children 2-3	1,200	0	0	0	0	-1	7	0	0	1	10	1	4	5	6	1	1
Children 4-8	1,200	0	0	0	0	-1	5	0	0	1	8	0	3	3	6	1	1
Males 9-13	2,000	0	0	0	0	-1	5	0	0	1	10	1	7	3	7	1	1
Males 14-18	2,600	-1	0	0	0	-3	- 5	-1	0	0	3	0	0	0	3	-2	-2
Males 19-30	2,600	-1	0	0	0	-3	- 5	-1	0	0	3	0	0	0	3	-1	-2
Males 31-50	2,200	-1	0	0	0	-3	-3	-1	0	0	7	1	4	1	6	-1	-1
Males 51+	1,800	0	0	0	0	-1	3	0	0	1	8	1	7	2	8	1	1
Females 9-13	1,800	0	0	0	0	-1	- 5	0	0	1	10	1	7	3	8	1	1
Females 14-18	2,000	0	0	0	0	-1	4	0	0	1	8	1	4	2	7	1	1
Females 19-30	2,000	0	0	0	0	-1	4	0	0	1	8	1	3	3	7	1	1
Females 31-50	1,800	0	0	0	0	-1	4	0	0	1	8	1	3	2	8	1	1
Females 51+	1,600	0	0	0	0	-1	4	0	0	1	8	1	7	2	9	1	1
Pregnancy 14-18	2,000	0	0	0	0	-1	2	0	0	1	5	1	2	2	7	1	1
Pregnancy 19-30	2,000	0	0	0	0	-1	2	0	0	1	5	1	2	2	7	1	1
Pregnancy 31-50	2,000	0	0	0	0	-1	2	0	0	1	5	1	2	2	7	1	1
Lactation 14-18	2,400	-1	0	0	0	-3	-3	-1	0	0	6	0	3	1	6	-1	-1
Lactation 19-30	2,400	-1	0	0	0	-3	-3	-1	0	0	6	1	3	2	6	-1	-1
Lactation 31-50	2,200	-1	0	0	0	-3	-3	-1	0	0	6	1	3	2	6	-1	-1

With the proposed modifications to the 2020 HUSS, improvements toward the DRI goal were noted in the protein, folate, iron, magnesium, and fiber content of the pattern. Even with several nutrients that had a modest decrease in percentage of the DRI, the pattern still met goals. The modifications to the pattern resulted in an increase in folate across all age-sex groups; however, the folate goal is not met by the pattern for individuals who are pregnant. The increased folate needs during this life stage are difficult to achieve, as noted by the 2020 Committee, but the modified 2020 HUSS moves closer to meeting the goal. Finally, the modified 2020 HUSS has a modest reduction in sodium across all age-sex groups.

Removal of "Limits on Calories for Other Uses"

The 2020 HUSS contains a line for "Limits on Calories for Other Uses" within the pattern to represent a quantitative estimate of calories remaining after all other foods in the pattern are consumed in their most nutrient-dense forms, such as lean or low-fat and prepared with minimal added sugars, refined starches, saturated fat, or sodium.[3] Guidance in the *Dietary Guidelines for Americans, 2020-2025* was that these calories can be used for added sugars, saturated fat, and/or alcohol, or to eat more than the recommended amount of food in a food group. The FPM methodology produces a nutrient profile that is based on the foods and beverages within the food group and weighted to represent distribution of reported consumption in What We Eat in America, National Health and Nutrition Examination Survey (WWEIA, NHANES). Therefore, variability exists in the energy and nutrient content of foods and beverages within food groups and subgroups. If foods or beverages with lower or higher calorie content in their nutrient-dense forms are used, the energy from the pattern may be below the estimates from FPM analyses but could also exceed the calorie level for the pattern. Further, the dietary data provided by WWEIA, NHANES provide a reliable point estimate to represent nutrient content of foods and beverages that account for the variability of nutritional content of foods and beverages in the U.S. food supply. Finally, data analysis results indicate that foods and beverages consumed in the United States are not commonly in the most nutrient-dense forms. With the inherent variability in the calories of nutrient-dense foods and beverages and the current dietary intake patterns in the United States, presenting a quantified number of additional calories was not considered prudent and may be misleading in that calories for other uses may not be available.

All analyses and a summary of results by age, sex, and life stage can be found in the:
Synthesis FPM Report at:
https://www.DietaryGuidelines.gov/2025-advisory-committee-report/food-pattern-modeling

Discussion

The Committee identified supporting evidence to explore potential modifications to the 2020 HUSS that simultaneously modify at certain calorie levels: (1) Vegetable subgroups, specifically to increase Beans, Peas, and Lentils and decrease Starchy Vegetables while keeping the quantity of Total Vegetables unchanged; and (2) reduce Total Protein Foods by reducing the Meat portions of Meats, Poultry and Eggs for some calorie levels. Overall, the Committee concluded that there was no scientific justification to recommend modifications for the quantities of other food groups or subgroups in any pattern. The Committee also recommended to not include a quantified number of calories that may be left for other

uses. The scientific evidence also supported exploration of multiple flexibilities within and across food groups, which allowed a rigorous, extensive, evidence-based evaluation using FPM. Overall, the committee decided that with these proposed modifications and/or flexibilities, there was insufficient evidence to support proposal of new dietary patterns.

The collective activities described in this chapter describe a unique opportunity to examine each food group in depth with a "what if" philosophy. As changes are made to the food groups and subgroups within the HUSS, there are nutrient ramifications that need to be evaluated within the context of meeting nutritional goals. Each food group was thoughtfully explored as not to introduce biases withing FPM, through independent analyses (i.e., each food group was explored on its own), to isolate the resulting implications for nutrients in the HUSS and to not introduce biases within FPM activities. The Committee's goal was to build on the current *Dietary Guidelines* to explore what modifications and flexibilities can be introduced within and between food groups to enhance dietary guidance for all individuals. The integration of systematic reviews and FPM through a health equity lens allowed the Committee to explore different combinations of foods within individual food groups and subgroups to maximize capacity of the healthy dietary patterns to address individual differences while optimizing health.

An overarching theme of the questions in this chapter underscores the necessity of dietary variety within and across the food groups to meet nutritional goals. The analyses in this chapter demonstrated the unique but varied contributions that each food group and subgroup across the 2020 and modified 2020 HUSS makes to meeting nutritional goals. This collective contribution to total nutrients across the pattern demonstrates the synergistic effect of dietary variety in meeting nutrient needs, as well as the implications of exclusions of dietary components without thoughtful replacement. Further, some food groups may be primary sources of key nutrients. For example, the Protein Foods group is a primary source of dietary protein in the pattern, and the Dairy and Fortified Soy Alternatives Food Group as well as the Beans, Peas, and Lentils Vegetables Subgroup provide additional dietary protein to the pattern.

When considering individual food groups and subgroups, interesting issues emerged from the analysis phase. The Committee decided that no modifications or flexibilities to the Fruits Food Group in 2020 HUSS were justified based on scientific evidence. In FPM, Fruits are divided into whole fruits and fruit juice. The Committee explored the nutrient implications of changing the narrative guidance regarding the proportion of Total Fruits contributed by whole fruits relative to fruit juice, but based on the data using representative foods, concluded that there was no scientific justification to change the recommended ratios.

Within the Vegetables group, the Committee determined through review of multiple FPM scenarios that increased quantities of Beans, Peas, and Lentils and/or Dark-Green Vegetables had additional nutrient benefits above and beyond the 2020 HUSS. In general, the systematic reviews did not explicitly call out Dark-Green Vegetables as a food subgroup, so the Committee chose not to pursue this proposed modification within the Vegetables group. Beans, Peas, and Lentils are a unique food subgroup in that they can contribute to either Vegetables or Protein Foods and will be referred to in different food groups throughout this report, depending on the context. Furthermore, systematic reviews indicated that dietary patterns emphasizing Beans, Peas, and Lentils (commonly presented as "legumes") as well as Vegetables

are related favorably to health outcomes (see **Part D. Chapter 2: Dietary Patterns**). Accordingly, Beans, Peas, and Lentils were considered in terms of both modifications and flexibilities. The FPM results provided support for exploring flexibilities that increase Beans, Peans, and Lentils above the proposed quantities in a healthy dietary pattern while either simultaneously decreasing Total Grains or reducing Meats, Poultry, and Eggs within the 2020 HUSS. One of the challenges with making these recommendations was understanding how often and in what quantity the flexibilities can be implemented, particularly when considering individual population groups. For example, it was not deemed practical to consume only Beans, Peas, and Lentils in lieu of Total Grains, and indeed, Beans, Peas, and Lentils are often consumed with grains. Similarly, a flexibility that occurs occasionally would have different implications than a modification that recommended a specific amount within a specific time frame. Please see **Part E. Chapter 1: Overarching Advice to the Departments** for the Committee's overarching advice on Beans, Peas, and Lentils**.**

With respect to the Grains Food Group, multiple issues arose. The evidence indicated that in individuals older than age 2 years, an individual can reduce intake of Total Grains from current recommendations in the 2020 HUSS without negative nutritional implications. However, the quantity by which Grains can be reduced without negative nutrient implications varies by age-sex group, making it challenging to provide a single value that would be applicable to every group. The distribution of Total Grains is also a challenge. Refined grains are fortified with nutrients including folate at approximately twice the amount found in whole grains, whereas most whole grain versions of commonly consumed grains are not fortified (e.g., rice, pasta, and other cooked grains).[21-24] An exception is fortified ready-to-eat breakfast cereal which, due to it being a top food category source of whole grain consumption, influences the nutrient profile for Whole Grains used in FPM. The Committee had extensive discussion on this imbalance within the food supply and considered potential approaches to incentivize fortification of whole grains with nutrients such as folate and iron to shift the flexibilities to the modified 2020 HUSS to include more whole grains without compromising nutrient needs primarily achieved through fortification. The methods used in FPM focus on absolute nutrient contents of food groups and subgroups. The Committee discussed variation of bioavailability and bioaccessibility of nutrients which is important when considering the contribution of a food group to nutrient status or health outcomes, e.g., food groups that are sources of nutrients such as iron, which presents in the food supply in forms that vary in bioavailability.

When discussing flexibilities that increased Starchy Vegetables while reducing Total Grains, and acknowledging cultural foodways followed by individual population groups, the Committee considered the Revision to Meal Patterns Consistent with the 2020-2025 Dietary Guidelines for Americans final rule published in the Federal Register which states that "School food authorities and schools that are tribally operated, operated by the Bureau of Indian Education, and that serve primarily American Indian or Alaska Native children, may serve any vegetable, including vegetables such as breadfruit, prairie turnips, plantains, sweet potatoes, and yams, to meet the grains component."[25] This is a concrete example of a flexibility already in place and provided an opportunity to use FPM methods to examine the implications. The Committee expressed concerns that with consistent replacement of Starchy Vegetables for Total Grains over time, iron needs might not be met, specifically if Starchy Vegetables were substituted for iron-

fortified grains. Committee members also expressed concerns and hesitancy with this flexibility due to differences among age-sex groups in achieving nutrient adequacy over the lifespan, as an intent of the *Dietary Guidelines* is to promote young children's learning about a healthy dietary pattern and following such a pattern across the lifespan. The Committee emphasized the need to assess—at a more defined quantitative level—implications for substitutions of food groups and subgroups, as a clearer understanding about what group/subgroup is being displaced due to substitution would provide more confidence in estimation of corresponding nutrient implications.

The Committee had extensive discussion on the evidence that provided support for exploring a modification to reduce the Dairy and Fortified Soy Alternatives Food Group in the overall synthesis that integrates the food groups in a healthy dietary pattern (see **Part D. Chapter 3. Beverages** and **Part D. Chapter 4: Food Sources of Saturated Fat**). It was emphasized that these analyses were conducted related to patterns for individuals ages 2 years and older. The Dairy and Fortified Soy Alternatives Food Group contributes to multiple nutrients that are related to bone health. Although the emphasis has been on calcium and vitamin D, a combination of multiple nutrients (energy, protein, calcium, phosphorous, magnesium, zinc, and vitamin A) is critical for children's bone health. Reducing or removing the Dairy and Fortified Soy Alternatives Food Group reduces levels of certain nutrients, which would need to be accounted for by proposed substitutions/synthesis. Ultimately, the Committee chose not to recommend any reduction in this food group out of concern about the negative impact on bone health.

The Committee evaluated the potential of widely available plant-based milk options as a flexibility for the 2020 HUSS recommendations on low-fat and fat-free milk, or lactose-free and soy milk. The evidence indicated that non-dairy alternative products are fortified with calcium and vitamin D but may not be fortified with other nutrients necessary for bone health. Moreover, the variability in nutrient composition of plant-based milk alternatives creates challenges in assessing the implications of their substitution for foods within the Dairy and Fortified Soy Alternatives group. For example, almond milk is calcium-fortified but low in phosphorus (20:1 ratio of calcium to phosphorus) compared to fat-free milk, which is suboptimal for bone development in young children.[18] In addition, wide variation exists in nutrient composition, including protein, across plant-based milks. While protein is not considered a nutrient of public health concern, protein intake is already low among adolescent females and is a critical nutrient for bone health (see **Part D. Chapter 1: Current Dietary Intakes and Prevalence of Nutrition-Related Chronic Health Conditions**). New forms of plant-based milks are rapidly emerging in this evolving market, and insufficient food composition data are available to compare these new products to dairy beverages. The Committee emphasized that any proposal for a flexibility considering plant-based milks as part of a healthy dietary pattern would require guidance for selecting plant-based milks as they are not equivalent to cow's milk in protein and other nutrients, may contain added sugars, and would require integration with other food groups to otherwise obtain nutrients that are found in dairy milks, but not plant-based milks.

The Committee took a multi-phased approach for understanding if nutritional goals could be achieved when the Protein Foods group and subgroup quantities were hypothetically modified, including with lower quantities of animal-based Protein Foods and greater quantities of plant-based Protein Foods than are currently recommended in the 2020 HUSS or the H-VEG Patterns. The 2020 H-VEG differs from the 2020

HUSS because the former has no meat and poultry, but does include eggs, and soy is separate from nuts and seeds. When discussing Total Protein Foods, the Committee proposed evaluation of the nutrient implications when reducing the amount of Total Protein Foods and Meats, Poultry and Eggs, while simultaneously increasing the amount of Beans, Peas, and Lentils, currently presented as Vegetables in the 2020 HUSS, which provides nutrient benefits as discussed earlier in this chapter. Total Protein Foods is a broad category with a variety of Protein Foods subgroups around which flexibilities can be explored. In exploring flexibilities for this food group, however, evidence did not support consuming all Protein Foods from a single subgroup to meet nutrient needs.

Considering the results from data analysis of the U.S. prevalence of overweight and obesity, meeting nutrient goals within calorie levels is critical, especially among children and adolescents and older adults (see **Part D. Chapter 1: Current Dietary Intakes and Prevalence of Nutrition-Related Chronic Health Conditions**). When evaluating reductions of food groups and subgroups in the patterns, few reductions in quantities within the modified 2020 HUSS were possible without introducing nutritional gaps in modeling the lower calorie levels. This underscores the importance of nutrient density and the challenge of meeting nutritional goals within lower calorie levels (2,000 calories or below). With the Estimated Energy Requirements calculations used to estimate calorie levels, the calorie needs were computed estimating inactive activity levels. Meeting Physical Activity Guidelines would increase energy expenditure and increase energy needs that would increase the chances to meet nutritional goals within less stringent calorie needs given that estimates for remaining energy are higher with sequentially higher calorie levels defined in the modified 2020 HUSS.[26] The 2020 HUSS presents estimates of calories that might remain after food group and subgroup quantities within the HUSS are fulfilled. This presentation is based on the energy estimates of nutrient-dense representative foods and their proportional contributions to nutrient profile calculations. However, these modeled nutrient profiles may not reflect how an individual eats; either the proportional intake of a given individual on a given day or across time. With this practical grounding, and realization that individuals select real foods, not composite profiles of a food group, the actual energy contributions may vary considerably for each food group or subgroup modeled within the HUSS and maximal energy level for each calorie level may easily be reached when fulfilling the food group and subgroup quantities in the HUSS. Therefore, the Committee decided not to portray any calories (i.e., energy) that might be left for other uses, because on a given day, achieving the modified 2020 HUSS may account for all calories.

Next Steps in the 2025 FPM Process

The previous chapter, **Part D. Chapter 9: Nutrient Profile Development**, described how the Committee developed the underlying food group nutrient profiles for all FPM analyses described in this chapter: **Part D. Chapter 10: Food Group and Subgroup Analysis**. As a result of the findings detailed here, the Committee developed a modified 2020 HUSS that continues to meet nutritional goals across life stages and age-sex groups, with few exceptions. The modified 2020 HUSS was then evaluated for potential refinement using diet simulations, which are described in **Part D. Chapter 11: Diet Simulations**.

For more information on the final pattern(s) proposed to the Departments, see **Part E. Chapter 1: Overarching Advice to the Departments**.

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