

**2025 DIETARY GUIDELINES ADVISORY COMMITTEE
MEETING 5**

Convened by the
U.S. Department of Health and Human Services (HHS)
U.S. Department of Agriculture (USDA)

May 29-30, 2024

Dietary Guidelines Advisory Committee Members present:

- Dr. Sarah Booth (Chair)
- Dr. Angela Odoms-Young (Vice Chair)
- Dr. Steven Abrams
- Dr. Cheryl Anderson
- Dr. Aline Andres
- Dr. Carol Byrd-Bredbenner
- Dr. Andrea Deierlein
- Dr. Heather Eicher-Miller
- Dr. Teresa Fung
- Dr. Christopher Gardner
- Dr. Edward Giovannucci
- Dr. Deanna Hoelscher
- Dr. Valarie Blue Bird Jernigan
- Dr. Jennifer Orlet Fisher
- Dr. Cristina Palacios
- Dr. Hollie Raynor
- Dr. Fatima Cody Stanford
- Dr. Sameera Talegawkar
- Dr. Chris Taylor
- Dr. Deirdre Tobias

Also present:¹

- Ms. Janet de Jesus, Designated Federal Officer, Office of Disease Prevention and Health Promotion, Office of the Assistant Secretary for Health, HHS
- Dr. Eve Stoody, Director, Nutrition Guidance and Analysis Division, Center for Nutrition Policy and Promotion, Food and Nutrition Service, USDA

Venue

The Dietary Guidelines Advisory Committee met in the conference center of the Tower Building, which houses the HHS Office of Disease Prevention and Health Promotion, at 1101 Wootton Parkway, Rockville, MD. The meeting was open to the public via live video webcast.

¹ The individuals listed here facilitated or presented some of the meeting agenda items and are listed in the order of appearance on the agenda. Additional attendees included HHS and USDA staff members and contractors who are supporting development of the *Dietary Guidelines for Americans, 2025-2030*.

The following is a summary of Meeting 5. For additional details, refer to the [agenda](#), videocast recording for [Day 1](#) (May 29) and [Day 2](#) (May 30), and the [Meeting 5](#) page of [DietaryGuidelines.gov](#).

DAY 1 – May 29, 2024

WELCOME

The fifth meeting of the 2025 Dietary Guidelines Advisory Committee (Committee) was convened virtually at 1:00 PM on Wednesday, May 29, 2024.

Ms. Janet de Jesus, Designated Federal Officer for the Dietary Guidelines Advisory Committee and a Nutrition Advisor in the HHS Office of Disease Prevention and Health Promotion, introduced herself, welcomed attendees to the meeting, and shared that all 20 Committee members were present.

She shared that the Committee's report is expected to be delivered in the Fall of 2024 and expressed appreciation for the public's engagement in the process. She reviewed opportunities for public engagement: providing public comments to the Committee via [regulations.gov](#), [attending Committee meetings virtually](#), [signing up](#) for email updates, and visiting [DietaryGuidelines.gov](#). She encouraged members of the media to direct media requests to odphpinfo@hhs.gov.

VICE CHAIR REMARKS

Dr. Angela Odoms-Young (Vice Chair) outlined the agendas for Day 1 (May 29) and Day 2 (May 30) of the meeting. She highlighted that each subcommittee or working group will present progress made since Meeting 4 for Committee discussion. Progress updates include the development of new protocols, revisions to previously presented protocols, decisions to deprioritize protocols, and presentation of draft conclusion and synthesis statements for scientific questions reviewed to date.

Dr. Odoms-Young thanked the public for their robust engagement in the process to develop the *Dietary Guidelines*, noting that the Committee has received [4,250 written public comments](#) and that 296 continuing professional education certifications have been granted to registered dietitians who viewed the Committee's public meetings.

Lastly, she provided an update on the peer review process for the Committee's systematic reviews, which is being coordinated by the NIH *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD). Each of the Committee's systematic reviews will undergo peer review after they have been presented to and deliberated by the full Committee during a public meeting. Peer reviewers are external to the *Dietary Guidelines* process and have expertise specific to the questions being reviewed. All reviewers have a doctorate degree, including MDs, and an academic appointment at a U.S. college or university.

HEALTH EQUITY UPDATE

Dr. Sameera Talegawkar (Working Group Chair) presented the Health Equity Working Group's (HEWG) progress since Meeting 4. She acknowledged the HEWG members and support staff and reviewed the Committee's commitment to review all scientific questions with a health equity lens to ensure that the next edition of the *Dietary Guidelines* is relevant to people with diverse racial, ethnic, socioeconomic, and cultural backgrounds.

Dr. Talegawkar shared that the HEWG has continued to support the Committee in incorporating health equity concepts into the three approaches it is using to review evidence, including its consideration of public comments. The HEWG has also continued work on a health equity-focused chapter for the Committee’s scientific report.

Dr. Talegawkar next presented a draft visual illustrating how the Committee has applied a health equity lens—considering factors such as socioeconomic position, race, ethnicity, and culture—to its approaches to review the evidence, examine relationships between diet and health throughout the lifespan, discuss and synthesize findings to develop draft dietary patterns and recommendations, use diet simulations to test proposed representative dietary patterns, and develop and deliver advice to federal agencies in a scientific report.

During a brief discussion about the draft visual, Committee members commented that the “feedback loops” between the HEWG and SCs had been highly informative and that the value this has added to the Committee’s work was not apparent in the visual; that the visual could better capture those frequent HEWG-SC consultations by adding an additional step of synthesis and deliberation prior to the development of the scientific report; that it would be helpful to represent the continuous attention given to culturally tailored interventions as the Committee reviewed the evidence; and that images of people used in the visual should include representation of individuals who are hearing and/or vision-impaired and who do not have limbs or full use of their limbs. Dr. Talegawkar mentioned that an additional visual elaborates on the Committee’s efforts to apply a health equity lens to its work and that elements of that visual could potentially be incorporated into the visual under discussion.

The HEWG’s next steps are to continue to consider health equity throughout all steps of the data analysis, systematic review, and food pattern modeling work, and to continue developing health equity content for the Committee’s scientific report. The HEWG invites public comments related to health equity, specifically comments that incorporate lived and diverse experiences.

STRATEGIES FOR INDIVIDUALS AND FAMILIES RELATED TO DIET QUALITY AND WEIGHT MANAGEMENT

Dr. Cristina Palacios (Subcommittee 4 [SC4] Chair) shared SC4’s progress since Meeting 4, including submitting two systematic reviews (for which draft conclusion statements were presented at Meeting 4) for peer review, developing draft conclusion statements for two additional systematic reviews, and continued work on a fifth systematic review as well as on an evidence scan.

Dr. Palacios shared a summary table indicating where conclusion statements were either developed or not drawn for three life stages (children and adolescents; adults and older adults; and pregnancy and postpartum) examined for the question, “What is the relationship between frequency of meals and/or snacking and growth, body composition, and risk of obesity?” She then reviewed SC4’s analytic framework for the question, highlighting that only trials and prospective cohort studies were included and that the SC did not assess the quality of the foods consumed nor their nutrient composition, but rather whether the behavior of interest (e.g., breakfast consumption) was performed.

Dr. Palacios then shared a summary of conclusions drawn for the three life stages examined for the systematic review. Based on the included articles, the evidence was segmented into four categories: breakfast consumption or skipping, snacking, number of eating occasions per day, and meal frequency. In five cases, grades were not assignable. Dr. Palacios briefly presented the rationale for those decisions, which, for most cases, was a lack of available evidence to answer the question—for example, only four articles addressed populations during pregnancy and postpartum—and in one case, high variability in

exposures. Next, SC4 members Dr. Deanna Hoelscher and Dr. Hollie Raynor elaborated on the draft conclusion statements (and their respective bodies of evidence examined) that Dr. Palacios summarized.

Dr. Hoelscher presented conclusion statements for the evidence examining breakfast consumption and growth, body composition, and risk of obesity across life stages.

- For children and adolescents, **moderate** evidence suggests that regular breakfast consumption may be associated with favorable outcomes related to growth, body composition, and/or lower risk of obesity. SC4 recognized that difficulty in designing and funding RCTs exists due to ethical concerns with restricting consumption of or access to breakfast for this age group.
- For adults and older adults, **limited** evidence suggests that breakfast skipping is not associated with favorable outcomes related to body weight and composition and risk of obesity.

Dr. Hollie Raynor presented the conclusion statements that were synthesized for snacking and growth, body composition, and risk of obesity across life stages.

- For childhood, **limited** evidence suggests that frequency of daily snacking may not be associated with outcomes related to growth, body composition, and/or risk of obesity.
- For adults, **limited** evidence suggests that overall snacking may not be associated with outcomes related to body composition and risk of obesity. Also in adults, however, limited evidence suggests that after dinner/evening snacking may be associated with less favorable outcomes related to body composition and risk of obesity. Dr. Raynor reminded the Committee that although it is possible that the difference in timing of snacking may be driven by a difference in quality of snacks being consumed at this time compared to other times throughout the day, but that nutrient quality of the snacks was not able to be assessed during this synthesis because it was not reported in the included articles.
- For older adults, **a conclusion statement cannot be drawn** because of a lack of available evidence to answer the question.

Dr. Raynor presented the conclusion statements that were synthesized for number of eating occasions and growth, body composition, and risk of obesity across life stages.

- For childhood, **limited** evidence suggests that higher number of eating occasions per day may be associated with favorable outcomes related to growth, body composition, and/or lower risk of obesity.
- For adults, **moderate** evidence suggests that number of eating occasions per day is not associated with outcomes related to change in body composition and weight.
- For older adults, **a conclusion statement cannot be drawn** because of a lack of available evidence to answer the question.

Dr. Raynor presented the conclusion statements for meal frequency and risk of obesity in children and adolescents.

- For children and adolescents, **limited** evidence suggests that meal frequency/skipping may not be associated with outcomes related to risk of overweight or obesity.
- For adults and older adults, **a conclusion statement cannot be drawn** about the relationship between lunch or dinner frequency and outcomes related to body composition and risk of obesity due to the body of evidence having severe limitations related to directness and generalizability (i.e., high variability in the exposures).

Next, Dr. Raynor transitioned to review the analytic framework and present the draft conclusion statements for the systematic review on portion size and growth, body composition, and risk of obesity. For all life stages examined, a **conclusion statement cannot be drawn**.

- For children and adolescents as well as pregnancy and postpartum, not enough evidence was available to answer the question.
- For adults and older adults, inconsistency existed in the interventions, comparators, and outcomes. All articles in that body of evidence were weight loss trials.

SC4's next steps are to continue work on its remaining systematic review (portion size and energy intake) and evidence scan (culturally tailored dietary interventions and diet-related psychosocial factors, dietary intake, diet quality, and health outcomes).

Discussion following the SC4 presentation highlighted that cross-sectional studies from this evidence base were excluded because they did not meet the protocol's inclusion criteria, and that after the remaining studies were segmented into the four categories (breakfast consumption or skipping, snacking, number of eating occasions per day, and meal frequency) and those categories were segmented across life stages, relatively few studies remained. The conclusion statements that were drawn were carefully worded to reflect the evidence base included in each analysis. Even so, some evidence was inconsistent as to how an eating pattern was defined (i.e., investigator-defined or participant-defined), e.g., in some studies if a participant reported that they skipped breakfast, it meant whatever the participant defined as breakfast. It was also noted that trends towards consuming "mini-meals" as a strategy to promote glucose stabilization may have affected reported prevalence of snacking because respondents may characterize mini-meals as a snack. The Committee discussed variation across life stages in the prevalence of the behaviors examined, such as breakfast skipping and snacking. They also wondered about the proportion of energy and dietary intake contributed by snacking, and how it might vary across life stages. Such data were not assessed, but one of the SC4 members commented that they would be helpful to examine and incorporate into the scientific report.

FOOD PATTERN MODELING

Dr. Chris Taylor (Subcommittee 3 [SC3] Co-Chair) reminded attendees that the Committee's single, overarching scientific question for food pattern modeling (FPM) is to evaluate the possibility of modifying or building flexibilities into USDA Dietary Patterns in future editions of the *Dietary Guidelines* to account for diverse foodways, dietary preferences, and needs of U.S. population groups. He summarized SC3's progress in FPM since Meeting 4, which includes examining results from 7 of the 10 FPM protocols that have been posted to [DietaryGuidelines.gov](https://www.dietaryguidelines.gov); drafting the final FPM protocol—removing carbohydrate-containing foods (previously referred to as the low carbohydrate protocol)—which will be posted to [DietaryGuidelines.gov](https://www.dietaryguidelines.gov) in the next month; and discussing a proposed revision to a protocol previously posted to [DietaryGuidelines.gov](https://www.dietaryguidelines.gov)—the vegan protocol, which has a new draft name, "removing animal-based foods." Dr. Taylor noted that the full collection of results for the objectives across the 11 protocols will be publicly available in a dedicated FPM report, its supporting data files, and the Committee's report.

Dr. Taylor shared results from the two protocols used to inform nutrient profile development. A nutrient profile is the weighted average of nutrients in the foods/beverages of a food group based on proportional consumption in the population. One protocol is the basis (based on total population intakes) and WVEIA population groups (based on intakes of various population groups). The goal of these two protocols is to determine if nutrient profiles are different when calculated based on the intakes of various population subgroups.

- As part of the basis protocol, SC3 chose to exclude some foods lower in nutrient density—those categorized as desserts, sweet snacks, and milkshakes/dairy desserts—as contributors to the weighted average of nutrients in a nutrient profile. Thus, a revised nutrient profile that excludes some foods and beverages lower in nutrient density is being used in subsequent food pattern modeling analyses.
- For the WWEIA population groups protocol, nutrient profiles were calculated based on the proportional intakes of population groups stratified by race, Hispanic origin, and income (as defined in publicly available WWEIA datasets). Differences in the proportions of fluid milks, yogurt, and cheese in nutrient profiles were observed among population groups, with corresponding differences in amounts of nutrients consumed from those foods. Differences in the proportion of Refined Grains and Whole Grains in nutrient profiles were also observed among population groups. Although differences in nutrient profiles were generally small, the SC considered it important to consider variations in dietary intake and the resulting implications for meeting nutritional goals. Therefore, proposed dietary patterns will be examined against nutritional goals using the population-level (basis) nutrient profile and against the individually calculated profiles for population groups stratified by race, Hispanic origin, and income.

During the discussion following the first section of FPM content, Dr. Taylor answered Committee member questions. He confirmed that all FPM analyses for population groups (by race, Hispanic origin, and income) will be conducted by age/sex groups; explained that diet simulations will be an innovative way to explore dietary patterns for population groups not fully represented in NHANES; and explained that SC3 examined a basis nutrient profile that included desserts, sweet snacks, and milkshakes/dairy desserts and also a basis nutrient profile that excluded those items, which he said changed the nutrient profile incrementally.

Dr. Taylor next presented a series of FPM results that assessed the percentage of a selected nutrient that a given food group contributes to the intake goal (Recommended Dietary Allowance or Adequate Intake) for that nutrient. These percentages vary by age/sex group, but in all cases, removing a food group from the Healthy U.S.-Style (HUSS) dietary pattern creates gaps in meeting certain nutrient goals for at least some age-sex and/or life stage groups. For example, Vegetables (when consumed in the amounts recommended in the HUSS dietary pattern for ages 2+ across calorie levels 1,000-3,200 kcal) contribute >15% of the intake goal for several nutrients to the HUSS dietary pattern. The percentage of vitamin A that Vegetables contribute to the RDA for vitamin A varies by age-sex and life stage groups. When Vegetables are removed from the HUSS dietary pattern, vitamin A intake falls well below the RDA for all age-sex and life stage groups. Dr. Taylor showed similar exercises for Fruits and vitamin C, Grains and iron, Dairy and Fortified Soy Alternatives and calcium, and Protein Foods and choline.

Dr. Taylor emphasized the volume of FPM analyses conducted by SC3, estimating that more than 350,000 data points had been analyzed to date. He highlighted that although time does not permit every result for each objective, scenario, and age-sex group to be presented during the public meeting, all results will be made publicly available. He also noted that SC3 has not yet synthesized the FPM results presented during the meeting, nor had it considered FPM evidence together with systematic review and data analysis evidence. These steps are forthcoming and will help the Committee examine all potential modifications (changes to food group/subgroup quantities in the pattern) to the HUSS pattern as well as all potential flexibilities (options for meeting nutrient needs outside of quantitative pattern recommendations) to the existing dietary patterns. Ultimately, the Committee will finalize recommended dietary patterns and flexibilities to those patterns.

During discussion following the second section of FPM content, Committee members pointed out that systematic reviews of dietary patterns could help inform FPM considerations of dietary pattern modifications and flexibilities; clarified that nutrient needs are based on the latest DRIs although newer data could potentially indicate changes in intake needs for certain nutrients and age-sex groups; and asked if situations exist where excess intake of a nutrient is present and what the result is when a food group is removed, to which Dr. Taylor responded that such cases would be addressed during the synthesis phase of SC3's work.

Dr. Taylor transitioned into a third section of FPM content: results from analyses that examined implications for nutrient intakes when modifying individual food groups quantities within the HUSS. He noted that while food group analyses were conducted in isolation within the pattern, SC3's synthesis will examine the impacts of "pulling multiple levers," i.e., modifying quantities of multiple food groups simultaneously.

In summary, Dr. Taylor stated that FPM results do not indicate modifications, flexibilities, or dietary pattern variations for quantities of Fruits in any pattern or quantities of Vegetables in any pattern. However, results do support exploring (in synthesis plans):

- Potential modifications to the HUSS dietary pattern that simultaneously (for ages 1+) modify Vegetable subgroups (increase Bean, Peas, Lentils; increase Dark-green Vegetables), reduce total Grains, reduce total Protein Foods, and (for ages 2+) reduce and Fortified Soy Alternatives.
- Explore potential flexibilities to the HUSS or Healthy Vegetarian (H-VEG) dietary patterns that:
 - Explores further increases to Beans, Peas, and Lentils and reductions to Total Grains within HUSS
 - Explores further increases to Starchy Vegetables (including Starchy Red and Orange) and reductions to Total Grains within HUSS
 - Explores further increases to Beans, Peas, and Lentils and Nuts, Seeds, and Soy and reductions to Meats, Poultry, and Eggs within HUSS
 - Explores adding Seafood as a flexibility to H-VEG
 - Explores the substitution of fortified plant-based milk alternatives for the Dairy and Fortified Soy Food Group

During the discussion following the third section of FPM content, Committee members wondered what was driving some of the increases or decreases in certain nutrients when tradeoffs were made to increase the intake of a food group while decreasing the intake of another food group and vice versa. For example, why does sodium intake increase for some age-sex groups when intakes of Beans, Peas, Lentils and Nuts, Seeds, Soy Products are increased and intakes of Meat, Poultry, and Eggs are decreased? SC3 is able to explore the drivers and magnitude of such changes, which can further inform the planning of dietary interventions. It was noted that it is difficult to achieve recommended intakes of vitamin D from diet alone, and that nutrient needs can vary widely by age-sex and life stage groups. Dr. Taylor also noted that SC3 explored the possibility of developing recommendations for intake of Fruits subgroups (similar in concept to Vegetables subgroups), but ultimately, the nutrients included in FPM showed variability across fruit types and there was not an intuitive categorization of fruit types that might be tested. Moreover, although fruits vary in phytonutrient content, DRIs for phytonutrients do not exist. Therefore, SC3 did not include phytonutrient values in its review but did discuss the potential to develop recommendations for intake of Fruits subgroups as a potential future direction.

Dr. Deirdre Tobias (SC3 member) presented SC3's work to draft a protocol to answer the question, "Can nutrient goals be met when carbohydrate-containing foods and beverages are reduced in the Healthy

U.S.-Style (HUSS) Dietary Pattern for ages 2 years and older?” She reviewed the draft protocol’s key definitions, analytic plan, and rationale for the approach. Dr. Tobias emphasized that the results of the analyses—unlike other FPM protocols—will **not** be used to change or modify existing dietary patterns, nor will they be used to create new patterns.

Dr. Sameera Talegawkar (SC3 member) presented revisions to SC3’s protocol, “removing animal-based foods,” previously termed the vegan protocol. She explained that the name change reflected a desire to convey a wider umbrella to this specific dietary approach. Two of the protocol’s original objectives will be removed and the remaining two will be retained. Dr. Talegawkar highlighted that these analyses—unlike other FPM protocols—will **not** be used to change or modify existing dietary patterns, nor will they be used to create new patterns.

Discussion following the final section of FPM content clarified that the results of protocols presented by Drs. Tobias and Talegawkar will highlight the nutrient implications of removing certain food groups/subgroups from the diet, which will inform guidance for choosing substitutions for the removed foods. Such guidance will also consider health equity as well as the results of systematic reviews and data analysis.

ADJOURN

Janet de Jesus applauded the Committee, thanked the staff, and adjourned Day 1 of Meeting 5 at 5:06 PM ET.

DAY 2 – May 30, 2024

WELCOME

Day 2 of the 2025 Dietary Guidelines Advisory Committee (“Committee”) Meeting 5 was convened at 8:30 AM on Thursday, May 30, 2024, at the Tower Oaks conference center of the Tower Building in Rockville, MD, the location of the HHS Office of Disease Prevention and Health Promotion.

Ms. Janet de Jesus, Designated Federal Officer for the Committee and a Nutrition Advisor in the HHS Office of Disease Prevention and Health Promotion, welcomed attendees to the meeting and outlined the day’s agenda.

RELATED PROJECTS UPDATE

Dr. Eve Stoody, Director, Nutrition Guidance and Analysis Division, Center for Nutrition Policy and Promotion, Food and Nutrition Service, USDA, shared updates on four federal government activities that are underway to address topics related to the *Dietary Guidelines*. The four efforts include: Addressing Alcoholic Beverages in the Process to Develop the *Dietary Guidelines for Americans, 2025-2030*, Dietary Reference Intakes (DRI): Energy and Macronutrients, Sustainability and the *Dietary Guidelines*, and a recent article authored by federal *Dietary Guidelines* staff titled [Addressing Misinformation about the Dietary Guidelines for Americans](#).

Alcoholic Beverages and Health: Dr. Stoody explained that because alcoholic beverages and health is a complex topic with unique considerations, USDA and HHS determined that for the upcoming edition of the *Dietary Guidelines*, the topic required a comprehensive review by experts with significant and specific expertise in the topic. Therefore, HHS and USDA are addressing this topic through efforts separate from the work of the 2025 Dietary Guidelines Advisory Committee. Those efforts are comprised

of scientific reviews on adult alcohol consumption and health that are currently being conducted by a committee within the HHS Substance Abuse and Mental Health Services Administration and by the National Academies of Sciences, Engineering and Medicine (NASEM), working in complementary and not duplicative tracks. Dr. Stoodly shared a slide outlining the purpose and methods of both efforts.

Both efforts have webpages, will include opportunities for public comment, and will include external scientific peer review prior to their anticipated completion by the end of December 2024. Each will result in a report with findings—not recommendations—on alcohol consumption, which will be delivered directly to the Departments for their consideration as they develop the next edition of the *Dietary Guidelines*.

Dietary Reference Intakes (DRIs): DRIs provide nutrient recommendations, whereas the *Dietary Guidelines* provide food-based recommendations to help the public consume healthy dietary patterns that meet the DRIs. The DRIs are established through NASEM and are funded and supported by the Joint U.S.-Canadian DRI Working Group (WG), which includes representatives from HHS, USDA, the U.S. Department of Defense (DoD), and Health Canada. The WG prioritized updating the DRIs for macronutrients and energy, which began in Fall 2021. The updated DRI for [energy](#) is now complete and the WG commissioned systematic reviews to be conducted by the HHS Agency for Healthcare Research and Quality (AHRQ) on protein, fat, and carbohydrates (including fiber). The systematic reviews will be used by a future NASEM committee that is likely to be charged to review and update, as needed, the DRIs for all three macronutrients within a comprehensive report.

Sustainability and the *Dietary Guidelines*: HHS and USDA convened a Federal Workgroup tasked with examining a process framework for considering incorporating sustainability in the *Dietary Guidelines* process as well as other federal nutrition policies and programs, as appropriate. The Workgroup is planning a public meeting, which will be announced through the Federal Register and other channels. The Workgroup’s recommendations for approaches are planned for public release in early 2025.

Recent Article Addressing Misinformation about the *Dietary Guidelines*: Dr. Stoodly underscored that transparency is key for promoting trust in the process to develop the *Dietary Guidelines*. HHS and USDA staff authored [an article](#) published in the *American Journal of Clinical Nutrition* to clarify and address misunderstanding and misinformation about the process, such as “The *Dietary Guidelines* is only for healthy people and isn’t relevant to the majority of the United States population who are at risk of or who have chronic diseases.” The article explains that the evidence informing the *Dietary Guidelines* includes studies with participants who are representative of the general public, including healthy individuals, those who are at risk of chronic disease, such as individuals with obesity or cardiovascular disease risk factors, and some people who are living with a chronic disease. The goal of the article is to improve transparency and trust in the rigor of the *Dietary Guidelines* development process, ultimately promoting better adherence to *Dietary Guidelines* recommendations.

DATA ANALYSIS

Dr. Heather Eicher-Miller (Subcommittee 3 [SC3] Co- Chair) shared progress of SC3’s data analysis efforts since Meeting 4. SC3 has received completed data analyses requested of federal data source experts at ARS, CDC, and NCI; reviewed staff-led summaries of federal data analysis results related to the four scientific questions for data analysis; synthesized the evidence from those results and discussed health equity considerations with the HEWG throughout the process. All results will be available in a federal

staff-led data analysis report (portions of which will be summarized in the Committee’s scientific report) and supplements that will contain hundreds of tables completed by federal data source experts.

Dr. Eicher-Miller recapped the four scientific questions to be addressed by data analysis as well as the nationally representative data sources for each of the four questions. She also reviewed considerations and limitations of the data, such as small sample sizes when stratifying data by sociodemographic groups, statistical testing for significance not being completed for most analyses, measurement error associated with self-reported or proxy-provided dietary intake data, and variation across analyses by, for example, demographic groups available or data years analyzed.

With regard to health equity, Dr. Eicher-Miller listed the sociodemographic groups examined in most analyses, like age/life stage, sex, race and/or ethnicity, and poverty to income ratio, and those examined in select analyses when available, such as education and health insurance status. She described considerations and limitations for interpreting data analyses results across population groups. For example, factors contributing to the results are complex and not captured in the data; data do not capture that members of one sociodemographic group also have other identities and characteristics; and data are cross-sectional and cannot be used to determine trends over time or causal relationships. Dr. Eicher-Miller underscored that despite differences between groups, data indicate that across all groups, dietary intakes do not meet recommendations, and the prevalence of some chronic diseases is high.

During a discussion of results from SC3’s data analysis efforts, Dr. Eicher-Miller began with a big picture summary of the state of U.S. dietary intakes. Current data indicate the food group and subgroup intakes do not align with dietary patterns recommended in the *Dietary Guidelines*, intakes of many nutrients and dietary components fall short of requirements, and some variation by sociodemographic groups exists.

Next, Dr. Carol Byrd-Bredbenner (SC3 member) elaborated on analyses examining current patterns of food and beverage intake. She discussed low diet quality (HEI-2020 and HEI-Toddlers-2020) scores across the lifespan, variation in types and amounts of beverages consumed across life stages, breastfeeding rates, prevalence of breakfast consumption across age and sociodemographic groups, and dietary intakes among snack reporters and late evening consumers.

Dr. Deirdre Tobias (SC3 member) presented analyses examining current intakes of food groups and subgroups, which reiterated that food group and subgroup intakes do not align with dietary guidance. Specifically, 60% or more of individuals ages 1+ years do not meet recommendations for intake of each of the following food groups/subgroups: Vegetables and all subgroups, Fruits, Whole Grains, Dairy and Fortified Soy Alternatives, Seafood, and Nuts, Seeds, and Soy Products. In contrast, >90% of individuals ages 1+ years exceed recommended intakes of Refined Grains. Dr. Tobias elaborated on mean intakes of food groups compared to recommended ranges of intake by age-sex groups, and noted that many of the top food category sources of food group intakes are not nutrient dense.

Dr. Teresa Fung (SC3 member) discussed the prevalence of nutrition-related chronic health conditions, which she explained vary by socioeconomic position, age, and sex. One notable example of a health disparity among population groups is breast and colorectal cancer incidence compared to mortality by race and/or ethnicity. Prevalence of overweight, obesity, and prediabetes is notably high among children and adolescents. Adults and older adults have a notably high prevalence of chronic disease risk factors (e.g., obesity, hypertension, high LDL, and low HDL cholesterol), and these risk factors also exist among children and adolescents, although at a lower prevalence.

Dr. Eicher-Miller reviewed nutrients and/or dietary components that present a substantial public health concern because of underconsumption or overconsumption. SC3's findings on this topic align with those of the 2020 Committee and apply to individuals ages 1+ years: vitamin D, calcium, potassium, and fiber (based on underconsumption); sodium, added sugars, and saturated fat (for ages 2+ only) (based on overconsumption). Nutrients of public health concern for specific life stages included iron in human milk-fed infants (based on underconsumption); folate during the 1st trimester of pregnancy (based on underconsumption); iron for reproductive-aged females and during pregnancy (based on biomarker data); and iodine during pregnancy (based on biomarker data).

SC3's next steps are to complete synthesis of analysis results to identify key results with implications for dietary guidance, draft conclusions and determine final directions (to be presented at Meeting 6), draft and publish a data analysis chapter in the Committee's scientific report, and (for federal staff) publish a data analysis report and supplements on DietaryGuidelines.gov.

Committee discussion following the data analysis update covered the following topics: underreporting of dietary intake and the substantive gaps that still remain between actual and recommended dietary intakes after accounting for such errors; challenges in measuring breastfeeding rates at 6 months of age; trends in iron intakes among infants ages 6-12 months; prevalence of consumption and average intakes of dairy alternatives; the cardiometabolic-kidney axis, which is being explored as chronic kidney disease prevalence is growing, driven by hypertension and diabetes trends; food sources driving intake of food groups and relationships with relevant nutrient intake, for example, recommendations are achieved for total Grains intake but fiber intakes fall short because most grains consumed are refined; temporality of intake trends and critical time windows for intake of certain nutrients, such as adolescence and calcium for bone health; declining trends in home economics course offerings in schools; observation that no single sociodemographic strata, health outcome, or food group/subgroup intake metrics have shown sustained improvement; importance of examining where (adequate or excessive) mean intakes of certain nutrients may be masking a proportion of a population group that is not meeting recommendations; lack of nutrition instruction in medical education and training; the role of the food environment in shaping eating behaviors, including the ability to follow one's cultural diet; and implications of data analysis findings for food pattern modeling work, particularly around potential adjustments to dietary patterns.

DIET IN PREGNANCY AND BIRTH THROUGH ADOLESCENCE

Dr. Jennifer Orlet Fisher (Subcommittee 2 [SC2] Chair) summarized SC2's progress since Meeting 4. SC2 has completed three systematic reviews that are presently under peer review, drafted conclusion statements for an additional systematic review; and is in the process of completing four remaining systematic reviews.

Dr. Fisher presented revisions to SC2's protocol for the systematic reviews examining complementary feeding and growth, body composition, and risk of obesity (GBCO); caregiver feeding practices and GBCO and diet quality; and dietary patterns consumed during pregnancy and gestational age at birth and birth weight. These revisions were made to address heterogeneity in exposures and comparators, ultimately excluding controlled trials that technically met inclusion criteria but were not designed to evaluate GBCO outcomes; to focus on the highest priority questions (such as those examining caregiver feeding styles and practices) and critical life stages for development of eating behaviors and eating socialization (2 to 6 years of age), in consideration of remaining workload and timeline for the SC's work; and to enable focus on birth outcomes of greatest public health concern.

Dr. Fisher then reviewed the analytic framework and presented a summary of 20 draft conclusion statements for the systematic review on associations between types and amounts of complementary foods and timing of introduction of those food groups with GBCO outcomes during infancy and childhood into adulthood. She noted that inclusion criteria for timing of introduction included studies evaluating introduction at any point from 0 to 24 months. The lack of data available led to 15 instances where a conclusion statement cannot be drawn about the influence of complementary feeding on GBCO outcomes. Dr. Fisher noted that this may in part reflect the NESR methodology's focus on the most rigorous study designs, which points to a gap in rigorous empirical research on the topic. She also pointed out that even for food groups where sufficient evidence existed to draw a conclusion statement, notable heterogeneity existed in types of foods and comparators, which limited the ability to draw conclusions about broad food categories of interest.

Dr. Andrea Deierlein (SC2 member) discussed the conclusion statements pertaining to types and amounts of complementary foods and GBCO outcomes.

- For infants and children ages 6 to 24 months, **limited** evidence suggests that grains consumption is not associated with unfavorable outcomes related to growth patterns and risk of obesity during childhood.
- For infants and young children up to age 24 months, **limited** evidence suggests that fruit consumption is not associated with unfavorable outcomes related to growth patterns during childhood.
- For infants and young children up to age 24 months, **limited** evidence suggests that **vegetable consumption** not associated with unfavorable outcomes related to growth patterns during childhood.
- **Conclusion statements cannot be drawn** about relationships between consumption of protein foods, dairy, or 100% juice among infants and children up to age 24 months and GBCO outcomes during childhood due to substantial concerns with consistency, and in some cases also with directness or precision, in the bodies of evidence on those topics.
- **Conclusion statements cannot be drawn** about relationships between consumption of grains and body composition (6 to 24 months); consumption of fruit or consumption of vegetables with body composition and risk of obesity (up to 24 months), and consumption of food sources and added sugars and GBCO outcomes (up to 24 months), because not enough evidence was available to answer the questions.

Dr. Deierlein moved on to review all conclusion statements pertaining to the timing of introduction of specific complementary foods and beverages. **Limited** evidence suggests that introducing grains at or before age 4 months is associated with higher BMI z-scores during childhood. **A conclusion statement cannot be drawn** about the relationship between the age when infants and young children, up to age 24 months, are introduced to grains and body composition and risk of obesity in childhood because not enough evidence is available.

Conclusion statements cannot be drawn pertaining to the timing of introduction of other complementary foods and beverages (among infants and children up to age 24 months) and outcomes related to growth patterns, body composition, and risk of obesity during childhood due a lack of evidence and/or differences in methodologies that made it difficult to compare studies.

- For protein foods and for sugar-sweetened beverages, substantial concerns exist with consistency in the body of evidence.

- For dairy, not enough evidence is available, and the evidence that is available has substantial concerns with consistency.
- For fruits, for vegetables, for 100% juice, and for food sources of added sugars, not enough evidence is available.

Discussion that followed Dr. Fisher’s and Dr. Deierlein’s presentations included a question about the rationale for the wording of conclusion statements, particularly the “not associated with unfavorable” verbiage. Dr. Fisher explained that the key takeaway is that a null association is being reported, and that SC2 wanted to word the statements to minimize misinterpretation about the role of these food groups and growth, given that young children are expected to be growing. When asked about the implications for the paucity of high-quality evidence on the topics discussed, Dr. Fisher confirmed that the Committee’s report would include discussion about why certain studies were excluded and urge the research community and funding agencies to prioritize rigorous research designs, so that the future body of evidence meets levels of rigor needed to make evidence-based decisions with more certainty.

DIETARY PATTERNS AND SPECIFIC DIETARY COMPONENTS ACROSS LIFE STAGES

Dr. Deanna Hoelscher (Subcommittee 1 [SC1] Chair) summarized SC1’s progress since Meeting 4. SC1 has completed five systematic reviews, which have undergone peer review and SC1 members are considering all comments and making revisions as needed. SC1 has drafted conclusion statements for six additional systematic reviews and is in the process of reviewing evidence for additional life stages for one systematic review and completing four additional systematic reviews. SC1 also deprioritized the systematic review on dietary patterns and bone health, because the literature on this topic has not grown substantially since the previous review conducted by the 2020 Committee.

Dr. Hoelscher summarized revisions that SC1 made to several protocols presented at prior public meetings, explaining that the changes were made to streamline SC1’s reviews and focus on the highest quality evidence. Revision to the systematic review protocol on dietary patterns and risk of type 2 diabetes was made to align the outcome criteria with the criteria from the beverages and type 2 diabetes protocols. Revisions to the systematic review protocol on food sources of saturated fat and risk of cardiovascular disease were made to: enable focus on studies that compare specific types of food sources and their replacement with other foods; exclude studies in which a food source of saturated fat was not adequately isolated; and to enable inclusion of studies that model substitution or replacement of food sources of saturated fat (e.g., replacing red meat with lentils).

Next, SC1 members presented draft conclusion statements on specific dietary pattern components and health outcomes.

Dr. Ed Giovannucci reviewed the analytic framework and presented draft conclusion statements for the systematic review on consumption of low- and no-calorie sweetened beverages and risk of type 2 diabetes.

- For infants, children, and adolescents, a **conclusion statement cannot be drawn** about the relationship between low- and no-calorie sweetened beverage consumption and risk of type 2 diabetes because not enough evidence is available.
- For adults and older adults, **limited** evidence suggests that low- and no-calorie sweetened beverage consumption may not be associated with risk of type 2 diabetes.

Dr. Giovannucci also reviewed the analytic framework and presented draft conclusion statements for the systematic review on consumption of sugar-sweetened beverages and risk of type 2 diabetes.

- For infants and young children, a **conclusion statement cannot be drawn** about the relationship between sugar-sweetened beverage consumption and risk of type 2 diabetes because there is no evidence available.
- For children and adolescents, a **conclusion statement cannot be drawn** about the relationship between sugar-sweetened beverage consumption and risk of type 2 diabetes due to substantial concerns with directness.
- For adults and older adults, **moderate** evidence indicates that sugar-sweetened beverage consumption may be associated with higher risk of type 2 diabetes.

Dr. Deierlein reviewed the analytic framework and presented draft conclusion statements for the systematic review on consumption of sugar-sweetened beverages and growth, body composition, and risk of obesity for infancy through adolescence. This question was prioritized for systematic review with meta-analysis for infancy through adolescence, and for adults and older adults.

- For infants, children, and adolescents, **moderate** evidence indicates that sugar-sweetened beverage consumption is associated with unfavorable growth patterns and body composition, and higher risk of obesity in childhood up to early adulthood.
- For adults and older adults, and for individuals during pregnancy and postpartum, conclusion statements will be presented at the next public meeting.

Following a lunch break, SC1 members presented draft conclusion statements on dietary patterns and health outcomes. Dr. Hoelscher reminded attendees that the Committee will examine these conclusion statements collectively with food pattern modeling and data analysis findings to inform recommendations in the Committee's scientific report.

Dr. Talegawkar reviewed the analytic framework and presented draft conclusion statements for the systematic review on dietary patterns consumed and risk of type 2 diabetes.

- For infants and young children up to age 24 months, as well as for individuals during pregnancy or during postpartum, no articles met inclusion criteria.
- For children and adolescents, a **conclusion statement cannot be drawn** about the relationship between dietary patterns and risk of type 2 diabetes due to substantial concerns with directness.
- For adults and older adults, **strong** evidence demonstrates that dietary patterns relatively higher in vegetables, fruits, and whole grains, legumes, nuts, and fish/seafood, and lower in red and processed meats, high-fat dairy products, refined grains, and sugar-sweetened foods and beverages, are associated with lower risk of type 2 diabetes. Dr. Talegawkar noted that this is an update to the existing conclusion statement for adults, which was graded "moderate" by the 2015 Committee. She noted that the current body of evidence included many studies with participants from a range of socioeconomic positions based on either education, household income, or other indicators.

Dr. Christopher Gardner reviewed the analytic framework and presented draft conclusion statements for the systematic review on dietary patterns consumed and risk of cardiovascular disease (CVD).

- For individuals during pregnancy or during postpartum, no articles met inclusion criteria.
- For children and adolescents, **limited** evidence suggests that dietary patterns emphasizing vegetables, fruits, whole grains, fish and/or seafood, legumes, nuts, unsaturated fats and oils, and lower intake of sugar-sweetened beverages and foods and red and processed meat, are associated with lower systolic and diastolic blood pressure and triglycerides later in life. This is the same grade assigned by the 2020 Committee, although the body of included evidence grew

from 4 to 18 studies between 2020 and 2025 Committee reviews. Nonetheless, Dr. Gardner explained that concerns, some serious, with the body of evidence led SC1 to determine that the strength of the evidence remains limited.

- For adults and older adults, **strong** evidence demonstrates that dietary patterns emphasizing vegetables, fruits, nuts, legumes, whole grains, unsaturated relative to saturated fats, lower sodium, and lower intake of red and processed meat, refined grains, and sugar-sweetened foods and beverages are associated with lower risk of cardiovascular disease, including clinically meaningful improvements in blood lipids and blood pressure. Some of these dietary patterns also included low-fat dairy and seafood. These findings were consistent across diverse racial/ethnic groups and socio-economic positions. Dr. Gardner listed a few differences between the wording in the 2015 Committee’s conclusion statement (which also assigned a grade of strong) for this topic and the present conclusion statement. He also noted that the health status of the participants was reflective of the U.S. population with several trials exclusively enrolling participants with overweight and/or obesity. Similarly, many observational studies also included participants with overweight, obesity, hypertension, metabolic syndrome, and risk of other CVD diseases, including stroke.

Dr. Fatima Cody Stanford reviewed the analytic framework and background information for the systematic review on dietary patterns with varying amounts of ultra-processed foods (UPF) and growth, body composition, and risk of obesity. She highlighted that UPF are highly prevalent in U.S. diets, are associated with nutrients of concern for overconsumption (saturated fat, sodium, and added sugars), and are not consistent with the healthy dietary patterns identified in SC1’s other systematic reviews. She explained that SC1 and federal staff had lengthy discussions about how to operationalize criteria to determine dietary patterns high in UPF. They did not apply a pre-determined definition for UPF due to the lack of a standard definition of UPF across the literature; nor did they endorse any one food classification system, although NOVA is most common. SC1 focused on foods that were “ultra” processed, regardless of the system used to define them. Dr. Stanford then walked through examples of how dietary patterns varying in UPF were described in included vs. excluded studies.

Next, Dr. Stanford presented a description of evidence reviewed and draft conclusion statements for dietary patterns varying in UPF and growth, body composition, and risk of obesity.

- For infants and young children up to age 24 months, **a conclusion cannot be drawn** about the relationship between dietary patterns with varying amounts of UPF and growth, body composition, and risk of obesity, because of substantial concerns with consistency.
- For children and adolescents, **limited** evidence suggests that dietary patterns with higher amounts of foods classified as UPF are associated with greater adiposity (fat mass, waist circumference, BMI) and risk of overweight.
- For adults and older adults, **limited** evidence suggests that dietary patterns with higher amounts of foods classified as UPF are associated with greater adiposity (fat mass, waist circumference, BMI) and risk of obesity/overweight.
- For individuals during pregnancy, **a conclusion cannot be drawn** about the relationship between dietary patterns with varying amounts of UPF and gestational weight gain because not enough evidence is available.
- For individuals during postpartum, **a conclusion cannot be drawn** about the relationship between dietary patterns with varying amounts of UPF and body composition and risk of obesity because not enough evidence is available.

Finally, Dr. Stanford shared some draft research recommendations for future inquiry into dietary patterns varying in UPF, emphasizing the importance of strengthening this body of evidence.

SC1's next steps are to continue work on its remaining systematic reviews and begin drafting its portions of the Committee's scientific report.

Discussion following the SC1 presentation focused primarily on UPF and health. Committee members noted differences between U.S. and non-U.S. countries in the proportion of dietary intakes contributed by UPF, which Dr. Gardner said made it difficult to pool data. They also discussed possible mechanisms by which UPF could confer observed health outcomes, such as a relative density in nutrients to limit, and/or presence of ingredients such as colorants, emulsifiers, additives, and other ingredients not typically used in home cooking. Committee members noted that food composition databases do not capture the latter, making it difficult to assess any dose-response relationships that may exist. One Committee member commented that diet quality is typically assessed based on intake of food groups and nutrients, not type or level of food processing. One Committee member added to the discussion of nutrients versus level of processing by referencing a controlled crossover study that tested two diets over 2 weeks that were matched for macronutrient content, nutrients of concern, calories, and fiber, but differed in degree of processing. The ultra-processed diet led to higher calorie intakes and weight gain in a metabolic ward setting, which the member said indicated that the level of processing and its associated ingredients plays a role above and beyond other aspects of diet quality as measured, for example, with the HEI. The Committee also discussed health equity considerations associated with UPF consumption, such as the affordability, accessibility, convenience, and shelf-stability of many UPF products. It was noted that it would be valuable to identify and promote foods that retain such benefits but do not drive poor health outcomes. Other comments mentioned that the topic area is relatively new, and that other health outcomes associated with or caused by UPF consumption are of interest.

Discussion also touched on the lack of evidence available to draw conclusion statements for individuals during pregnancy and during postpartum, particularly given concerns about excess gestational weight gain. A Committee member provided a few reasons to explain the lack of evidence, including that pregnancy is a difficult period during which to capture intake because some individuals do not know they are pregnant during the beginning of the period and diets change considerably from the first to the second and third trimesters. She added that research does not always enroll pregnant individuals until later in pregnancy, let alone pre-pregnancy, to capture dietary shifts that occur from the prenatal period throughout pregnancy and into postpartum.

CHAIR WRAP-UP

Dr. Sarah Booth (Chair) invited each Committee member to share something that made an impression on them during the meeting. Committee members lauded the federal staff for its dedication and expertise in helping the Committee organize and synthesize evidence; expressed disappointment in the poor state of U.S. dietary intakes; pointed out that environmental contexts affect people's access to food and eating behaviors, and that the Committee is keeping that complexity in mind as it works through difficult topics; observed that available data are rich but are not always rigorous or plentiful enough to answer the questions at hand; lamented the relative dearth of information for the period during pregnancy through age two compared to other life stages, as well as the lack of rigorous evidence about early development of dietary behaviors; emphasized the importance of conducting community-engaged research and addressing other social drivers of health in order to address dietary and health disparities; expressed excitement about the upcoming evidence synthesis across the three approaches the Committee is using to examine evidence; observed that middle childhood and adolescent years are marked by struggles to

choose healthful diets, complicated by unhealthy food environments; emphasized the importance of forming healthy pre-conception dietary patterns given that it is unrealistic to expect immediate changes when one enters pregnancy; discussed the need for research in diverse populations to improve generalizability of findings across the U.S. population; and appreciated the Committee's mutual grace and respect toward one another as they lean into the later stages of their work.

ADJOURNMENT

Ms. Janet de Jesus congratulated the Committee and staff for a successful Meeting 5. She shared that updated systematic review and food pattern modeling protocols will be posted during late June at DietaryGuidelines.gov and NESR.usda.gov. Meanwhile, subcommittees and working groups will continue conducting their evidence reviews and developing draft conclusions and report chapters. The Committee's sixth public meeting is planned for September 25-26, 2024. The Committee aims to complete its scientific report by the end of October. The Departments will then use the report and other resources developed as part of the Committee's work (as mentioned earlier in the meeting) to develop and update the *Dietary Guidelines for Americans*. Ms. de Jesus adjourned Meeting 5 at 2:43 PM ET.