

2020 DIETARY GUIDELINES ADVISORY COMMITTEE MEETING 4

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

January 23 and 24, 2020

Dietary Guidelines Advisory Committee members present:

Dr. Barbara Schneeman (Chair)
Dr. Ronald Kleinman (Vice-Chair)
Dr. Jamy Ard
Dr. Regan Bailey
Dr. Lydia Bazzano
Dr. Carol Boushey
Dr. Teresa Davis
Dr. Kathryn Dewey
Dr. Sharon Donovan
Dr. Steven Heymsfield
Dr. Heather Leidy
Dr. Richard Mattes
Dr. Elizabeth Mayer-Davis
Dr. Timothy Naimi
Dr. Rachel Novotny
Dr. Joan Sabaté
Dr. Linda Snetselaar
Dr. Jamie Stang

Also present:

Mr. Brandon Lipps, Deputy Under Secretary, Food, Nutrition, and Consumer Services, USDA
(January 24 only)
Ms. Jackie Haven, Deputy Administrator, Center for Nutrition Policy and Promotion, USDA
Dr. Eve Stoody, Center for Nutrition Policy and Promotion, USDA, Designated Federal Officer
and Co-Executive Secretary
Ms. Janet de Jesus, Office of Disease Prevention and Health Promotion, HHS

The Advisory Committee met at the USDA Agricultural Research Service, Children's Nutrition
Research Center, 1100 Bates Street, Houston, Texas, Barbara Schneeman, Chair, presiding.
The meeting allowed for public viewing, both in-person and by webcast.

***The following is a summary of Day 1 of Meeting 4. Please see videos and/or transcripts
on the Meeting 4 page at DietaryGuidelines.gov for details.***

WELCOME AND OVERVIEW

The 2020 Dietary Guidelines Advisory Committee (“Committee”), Meeting 4, was convened at 9:00 a.m. on Thursday, January 23, 2020, at the USDA Agricultural Research Service, Children’s Nutrition Research Center, 1100 Bates Street, Houston, Texas. Dr. Eve Stody, Designated Federal Officer of the 2020 Dietary Guidelines Advisory Committee and a Lead Nutritionist in the USDA Center for Nutrition Policy and Promotion, introduced herself, and welcomed everyone to the meeting. She also thanked Dr. Denny Bier and his team at the Children’s Nutrition Research Center for hosting the meeting.

Dr. Stody then reviewed the charge to the Committee and the process by which questions for the Committee were selected and prioritized. She also noted the many groups have specific roles to play in the “nutrition public policy conversation,” including the National Academies of Sciences, Engineering, and Medicine and the Food and Drug Administration and these groups’ work complements that of the Dietary Guidelines. She also described how the 2020 Committee’s work builds on that of previous Committees, and that the focus areas of Birth to 24 Months and Pregnancy and Lactation are new emphases of this Committee. She concluded her remarks by noting that the Committee will submit its report in May 2020 and that it is working hard to refine, streamline, and prioritize its remaining questions. She also explained that Meeting 4 would include an opportunity for oral public comments and that the public is always encouraged to submit comments through the written public comment process and to follow the work of the Committee on [DietaryGuidelines.gov](https://www.dietaryguidelines.gov). She also announced that the Committee would hold a one-day webinar-only meeting on May 11 to discuss final refinements to its draft report and recommendations. As usual, meeting information will be published in the *Federal Register* and members of the public will be able to register for that meeting. Dr. Stody then concluded her remarks and turned the meeting over to Dr. Barbara Schneeman, Chair of the Dietary Guidelines Advisory Committee.

CHAIR REMARKS

Dr. Schneeman thanked Dr. Stody, welcomed the Committee and members of the public, and warmly thanked Dr. Bier for hosting the Committee at the Children’s Nutrition Research Center. She then provided a review of the Committee’s Subcommittee structure and explained how the Subcommittees review the evidence and present it to the full Committee. She then noted that the Committee is using three approaches to examine the evidence—data analysis, food pattern modeling, and systematic reviews. Each of these approaches has its own rigorous protocol-driven methodology and plays a unique and complementary role in examining the science.

Dr. Schneeman then described the analytic frameworks and inclusion and exclusion criteria for NESR systematic reviews and the analytic plans for data analyses. She also reviewed progress since Meeting 3, noting that Subcommittees would be presenting new and updated protocols as well as findings and draft conclusions for 30 questions. She emphasized that the findings and conclusion statements would not be final until the Committee submits its report. She also noted that after the systematic reviews and draft conclusion statements are presented to the full Committee, they will go through a peer review process, coordinated by USDA’s Agricultural Research Service. After the peer review process is completed, the draft conclusion statements will be posted on [DietaryGuidelines.gov](https://www.dietaryguidelines.gov). She also explained that NESR staff have already screened more than 265,000 articles and extracted data and assessed risk of bias for more than 500 articles. Nearly 50 types of data analysis from NHANES What We Eat in America also are being used and work on the food pattern modeling has begun. The report outline has been refined and preparation of the content has begun. Dr. Schneeman concluded her remarks by

reviewing the agenda for both days of the meeting, and turned over the meeting to Dr. Ronald Kleinman, Vice Chair of the Committee. Dr. Kleinman introduced the first Subcommittee presentation.

BIRTH TO 24 MONTHS SUBCOMMITTEE UPDATE

Dr. Kathryn Dewey, chair of the Birth to 24 Months (B-24) Subcommittee, reported on the status of the Subcommittee's NESR systematic reviews. She reported that the Subcommittee would be presenting a total of 66 draft conclusion statements covering eight questions. She also noted that comments from the public have been helpful to the Subcommittee and encouraged the public to submit additional comments on the current work being discussed at Meeting 4 by February 7.

The first three questions cover the relationship between human milk and infant formula and: (1) micronutrient status; (2) atopic disease; and (3) long-term health outcomes. The remaining five questions cover the relationship between complementary feeding and: (1) atopic disease; (2) developmental milestones; (3) growth, size, and body composition; (4) micronutrient status; and (5) bone health. She noted that the Subcommittee is still working on two additional questions related to human milk and infant formula and three questions on nutrients from supplements. She also reviewed key definitions.

Dr. Dewey then presented the findings and draft conclusion statements for the eight questions. She presented the analytic frameworks, the literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades. She stated that some of the questions were answered with existing NESR systematic reviews that were completed as part of the Pregnancy and Birth to 24 Months Project, and acknowledged the work of the Technical Expert Collaboratives that were involved.

Dr. Dewey concluded her presentation by summarizing the Subcommittee's next steps. She explained that the Subcommittee decided to focus its review of the two remaining questions concerning human milk and infant formula and outcome domains on outcomes related to body composition, including overweight and obesity. Additionally, the Subcommittee will refine its review of the relationship between intakes of nutrient from supplements and health outcomes to (1) iron and growth, size, and body composition; and (2) vitamin D and bone health.

During the discussion that followed, in response to questions from Dr. Mattes, Dr. Dewey clarified a number of points on findings related to the nature of the associations in the "ever vs never" breastfeeding questions, type 1 diabetes, exposure to peanut, and sugar-sweetened beverages. In response to another question, she clarified that, for examined studies, the age of outcome assessment went up to 18 years.

Note: The Birth to 24 Months Subcommittee protocols discussed are available at DietaryGuidelines.gov.

PREGNANCY AND LACTATION SUBCOMMITTEE UPDATE

Dr. Sharon Donovan, chair of the Pregnancy and Lactation Subcommittee, reported on the status of the Subcommittee's NESR systematic reviews. She noted that she would be presenting findings and conclusion statements for eight systematic reviews. She first reviewed the three major categories of questions the Subcommittee was assigned: (1) nutrients from supplements and fortified foods and health outcomes, with six nutrients and five outcomes; (2)

dietary patterns during pregnancy and five outcomes; and (3) maternal diet and food allergies and atopic diseases in the infant.

Dr. Donovan then presented findings and draft conclusion statements on the relationship of maternal folate intake from supplements and fortified foods and: (1) hypertensive disorders of pregnancy; (2) developmental milestones of the infant, including neurocognitive development; and (3) micronutrient status of the mother. She first noted key definitions then presented the analytic frameworks, the literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades.

She also presented findings and draft conclusion statements on the relationship of dietary patterns during lactation on human milk composition and on the relationship of dietary patterns during pregnancy and: (1) risk of hypertensive disorders during pregnancy; (2) risk of gestational diabetes; (3) gestational age at birth; and (4) birth weight standardized by gestational age and sex. These latter four reviews were updates of existing NESR systematic reviews that were completed as part of the Pregnancy and Birth to 24 Months Project Technical Expert Collaboratives. She first noted key definitions then presented the analytic frameworks, the literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades.

Dr. Donovan concluded her presentation by noting that the Pregnancy and Lactation Subcommittee is refining and prioritizing its remaining systematic reviews, which include questions on dietary patterns in pregnancy and gestational weight gain, dietary patterns during lactation and postpartum weight loss, and maternal diet during pregnancy and lactation and risk of child food allergies and atopic diseases.

During the discussion that followed, Dr. Donovan was asked about the validity of self-reported supplement intake by women who are pregnant or lactating. She responded that women may be motivated to take supplements during these periods but she was unaware of any studies specifically examining this issue. She agreed with another Committee member about the importance of adequate sample sizes and noted that studies they examined varied widely in sample size, from 11 to 45,000. Finally, in response to another question, she replied that the Subcommittee considered folic acid intake from multivitamins when it was compared against a similar multivitamin, but without folic acid.

Note: The Pregnancy and Lactation Subcommittee protocols discussed are available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).

DIETARY FATS AND SEAFOOD SUBCOMMITTEE UPDATE

Dr. Linda Snetselaar, chair of the Dietary Fats and Seafood Subcommittee, noted that she would be presenting the systematic reviews and draft conclusion statements for questions concerning the relationship between seafood consumption: (1) during pregnancy and lactation and neurocognitive development of the infant; (2) during childhood and adolescence and neurocognitive development and health; and (3) during childhood and adolescence and risk of cardiovascular disease.

Dr. Snetselaar first reviewed the Subcommittee's definition of seafood and then described the analytic frameworks, literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades for the question on seafood consumption during pregnancy and lactation and neurocognitive development of the

infant. She noted that the Subcommittee prepared draft conclusion statements for each of the nine neurocognitive outcomes examined; five of these outcomes were presented at the Committee's October 2019 public meeting. She briefly reviewed those draft conclusion statements, then presented the draft conclusion statements for the final four neurocognitive developmental domains: cognitive, language and communication, movement and physical, and social-emotional and behavioral.

Dr. Snetselaar then presented findings from the systematic review on the relationship between seafood consumption during childhood and adolescence and neurocognitive development. She reviewed the analytic frameworks, literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades for the following outcomes: (1) developmental milestones, including neurocognitive development (2-18 years) and (2) neurocognitive health outcomes (19+ years).

Finally, she presented findings from the third question on the relationship between seafood consumption during childhood and adolescence and risk of cardiovascular disease. She reviewed the analytic frameworks, literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades.

Dr. Snetselaar concluded her presentation by summarizing the Subcommittee's next steps, which are to begin drafting the seafood questions for the Committee's report and to complete the review of the remaining questions, which look at dietary fats and health outcomes.

During the discussion that followed, Dr. Dewey asked whether the randomized controlled trials in children were of sufficient length to determine tissue changes in the brain and, if not, whether prospective cohort studies would be of great value in studying neurocognitive outcomes. Dr. Snetselaar agreed, noting that it would be helpful to work with the Birth to 24 Month Subcommittee on developing some recommendations for future research in this area. In response to other members' questions, Dr. Snetselaar agreed that determining key confounders was critical to the ability to ascertain any results, and that the seafood exposure dose could be important but that the amount of seafood consumed in many of the studies varied or was very small. She agreed that this could affect the final strength of evidence grade and stated that the Subcommittee would discuss this issue further among themselves and with other Subcommittees to ensure consistency in the approach to grade the strength of the evidence. Members agreed that the number of measures taken during the study period would be an important factor to consider in assigning the strength of evidence grade for the seafood questions. Another point raised in the discussion concerned the use of the word "improved," which may imply a treatment effect vs. use of "beneficial" for non-treatment studies, such as the ones included in the seafood review. Additionally, the Committee discussed whether the studies examined a potential harmful effect due to methylmercury exposure; if the studies were not designed in this way, then members cautioned against using the wording of "no detrimental effect" in conclusion statements.

Note: The Dietary Fats and Seafood Subcommittee protocols discussed are available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).

BEVERAGES AND ADDED SUGARS SUBCOMMITTEE UPDATE

Dr. Elizabeth Mayer-Davis, chair of the Beverages and Added Sugars Subcommittee, provided a status report on the Subcommittee's questions. Dr. Mayer-Davis opened her presentation by reviewing the current status of the Subcommittee's work and noting that she would be presenting findings and draft conclusions for a question on the relationship between consumption of non-alcoholic beverages during pregnancy and birth weight standardized for gestational age and sex. She also stated that she would be presenting some information about the Subcommittee's systematic review on consumption of alcoholic beverages and all-cause mortality.

For the question on the relationship between consumption of non-alcoholic beverages during pregnancy and birth weight standardized for gestational age and sex, Dr. Mayer-Davis began by reviewing the analytic framework, noting the beverage types and comparators considered, highlighting any comparators unique to specific beverage types. She reviewed the literature search and screening results, noting that evidence was synthesized and draft conclusion statements developed by beverage type. She then described in detail the evidence for sugar-sweetened beverages and low- or no-calorie sweetened beverages as an illustration of the Subcommittee's process for each beverage type. Following this explanation, she reviewed the remaining beverage types and presented draft conclusion statements and strength of evidence grades. She noted that many of the studies had limitations with respect to exposure definitions, assessment methods, timing of the assessment of intake during pregnancy, and inconsistencies in adjustment for birth weight.

Dr. Mayer-Davis then presented a status update on the Subcommittee's systematic review on the relationship between consumption of alcoholic beverages and all-cause mortality. She reviewed the Subcommittee's approach, including the analytic framework and inclusion and exclusion criteria.

She concluded her presentation by reviewing next steps, which include completing remaining work on the relationship between added sugars and: (1) cardiovascular disease; (2) type 2 diabetes; and (3) growth, size, body composition, and risk of overweight and obesity. The Subcommittee also will complete the alcohol and all-cause mortality question and, as time allows, address questions on the consumption of alcoholic beverages and: (1) cardiovascular disease; (2) cancer; (3) neurocognitive health; and (4) growth, size, body composition, and risk of overweight and obesity.

During the discussion that followed, Dr. Mayer-Davis responded to a question about the grade for the draft conclusion statement on dairy milk and birth weight, saying that the Subcommittee chose "insufficient" rather than "limited" because of concerns about studies not adequately addressing key confounders and total energy intake, lack of a dose-response relationship, high attrition rates in some of the included studies, and inconsistencies in adjustment of birth weight for gestational age and sex.

Note: The Beverages and Added Sugars Subcommittee protocols discussed are available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).

DATA ANALYSIS AND FOOD PATTERN MODELING WORKING GROUP UPDATE

Dr. Regan Bailey, chair of the Data Analysis and Food Pattern Modeling Working Group, reported on the status of the Working Group's analyses for the 2 years and older populations.

She reiterated the national-level data sources used by the Working Group, described analytic frameworks, and presented findings and draft conclusion statements for: (1) current intakes of food groups and nutrients; (2) current dietary patterns and beverage intakes; (3) dietary patterns across life stages; (4) prevalence of nutrition-related chronic health conditions; and (5) nutrients of public health concern.

Dr. Bailey concluded her presentation by summarizing next steps, which are to review analysis results and draft preliminary conclusion statements for the relationship between: (1) added sugars intakes and meeting food group and nutrient recommendations; (2) frequency of eating and meeting food group and nutrient recommendations; (3) beverage intake and meeting food group and nutrient recommendations; and (4) dietary patterns and meeting food group and nutrient recommendations. In addition, the Working Group will refine and prioritize remaining work on data analysis elements of the Birth to 24 Month age group, and food pattern modeling questions across the life span.

In the discussion that followed, Dr. Bailey agreed that intakes for some micronutrients may appear to be high for children but that may be an artifact of how the Tolerable Upper Limit (UL) Dietary Reference Intake is set. She also agreed that low nutrient intakes may be linked to underreporting of energy intakes. In response to several questions, she clarified the Working Group's approach to issues such as identifying nutrients of public health concern, accounting for beverage intake within eating occasions, and the relationship of body size to measures of physical strength and sarcopenia. She also clarified that the Working Group's data do include measures of severe obesity in children, but not nonalcoholic liver disease. In response to a question about whether NHANES data had been analyzed with other diet indices besides the Healthy Eating Index (HEI), Dr. Bailey noted that HEI scores have been shown to be highly congruent with other patterns, such as the Mediterranean diet and DASH.

Dr. Schneeman reminded the Committee that Dr. Bailey had asked for the members' thoughts about how to present conclusions on the chronic health conditions and nutrients of public health concern. Dr. Ard discussed potassium as an example. Potassium deficiency is not a problem in the United States, but higher intakes are associated with lower prevalence of blood pressure. The issue is whether potassium could be considered a nutrient of public health concern because of this indirect link to cardiovascular disease, not because of inadequate intakes in and of themselves. The question before the Committee was whether to retain the current general statement about nutrients of public health concern or to highlight issues of particular concern to specific life stages or disease conditions. One member suggested highlighting obesity-related concerns; another suggested highlighting the impact of racial, ethnic, and socioeconomic disparities.

Note: The Data Analysis and Food Pattern Modeling Working Group protocols discussed are available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).

DISCUSSION

Dr. Schneeman opened the final session of the day by noting that the Committee's report will include an Integration chapter, which synthesizes all the major themes and findings from the Committee's systematic reviews. She asked members to reflect on any issues that they thought were emerging as key themes or top priorities and that might be included in the chapter. Members agreed that the life course approach taken by the Committee was a good way to think about the evidence, and noted that for a number of questions presented so far, it has been

challenging to draw conclusions because of limitations in the evidence. Specific comments included:

- Foods and nutrients are inextricably linked and dietary recommendations must meet people where they are. For example, the fact that burgers and sandwiches are currently an important contributor of many nutrients suggests that it might be advantageous to speak to these foods specifically in dietary guidance.
- Highlighting generational implications of dietary intakes is important. For example, limitations in teen girls' intakes are significant because they are future mothers. Adolescent girls are a population of interest, yet few studies have been done in that group.
- The shifts in dietary intakes between children ages 2 to 5 and 6 and older suggest critical life periods, transitions, or settings that present opportunities for intervention. It will be important to discuss the evolutions in dietary patterns over the life course.
- A range of factors – e.g., the palatability of foods, issues related to social determinants and socioeconomic disparities, influence dietary choices and intakes – should be considered in the development of dietary guidance.
- High-quality research on frequency of eating is a huge gap in the scientific literature.
- The importance of obesity-related chronic conditions needs particular attention.

Dr. Schneeman thanked the members for their thoughtful comments and their participation throughout the day. She adjourned the meeting at 4:28 p.m.

The following is a summary of Day 2 of Meeting 4. Please see videos and/or transcripts on the Meeting 4 page at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov) for details.

Day 2 of the 2020 Dietary Guidelines Advisory Committee (“Committee”), Meeting 4, was convened at 9:00am on Friday, January 24, 2020, at the USDA Agricultural Research Service, Children’s Nutrition Research Center, 1100 Bates Street, Houston, Texas, Barbara Schneeman, Chair, presiding. The meeting allowed for public viewing, both in-person and by webcast.

WELCOME AND OVERVIEW

Jackie Haven, Deputy Administrator, Center for Nutrition Policy and Promotion, USDA, welcomed everyone back to Meeting 4 and introduced Mr. Brandon Lipps, Deputy Under Secretary, Food, Nutrition, and Consumer Services, USDA. Mr. Lipps welcomed all those watching in person and online, and noted that the second opportunity for oral public comments gave the Departments an incentive to hold the meeting outside of Washington DC. He expressed his appreciation for the warm welcome and support provided by the Children’s Nutrition Research Center. He noted that USDA’s Agricultural Research Service and the Baylor College of Medicine have had a longstanding mutual interest in public health, and it is an example of how collaborations can increase the power to address and potentially solve important nutritional challenges. Mr. Lipps also acknowledged the attendance of students from the Texas Medical Center and encouraged them to consider careers in public service. He concluded by thanking the Committee for their hard work and dedication to the Dietary Guidelines process, encouraging the public to follow the work of the Committee and submit written comments, and thanking the USDA and HHS staff for their support of the Committee.

Dr. Schneeman thanked Mr. Lipps, reviewed Day One of the meeting and provided a preview of the Day Two agenda.

DIETARY PATTERNS SUBCOMMITTEE UPDATE

Dr. Carol Boushey, chair of the Dietary Patterns Subcommittee, opened her presentation by noting that the area of dietary patterns research has grown dramatically since the previous Dietary Guidelines Advisory Committee and that NESR staff have already screened approximately 113,000 articles for the Subcommittee's questions. She stated that her presentation would cover the systematic review and draft conclusion statements for the relationship between dietary patterns and all-cause mortality.

She first reviewed the definition of dietary patterns, noting that it is an internationally recognized definition and that the Subcommittee also will extract information about macronutrients from the included articles. She also clarified that the Subcommittee is considering diets based on macronutrient distribution in which at least one macronutrient falls outside of the Acceptable Macronutrient Distribution Range (AMDR). This approach allowed the Subcommittee to review the overall scientific landscape of dietary patterns, including patterns that are both within and outside the AMDR, along with different diet types.

Dr. Boushey then presented the analytic framework, the literature search and screening results, the description and summary of evidence, and draft conclusion statements and strength of evidence grades for the question on the relationship between dietary patterns and all-cause mortality.

Dr. Boushey concluded her presentation by summarizing the Subcommittee's next steps, which are to refine and to prioritize work on the remaining questions on dietary patterns and cancer, neurocognitive health, and bone health. She also noted the Subcommittee's recent decision to refine the protocol for the dietary patterns and sarcopenia question to focus only on the endpoint outcome of sarcopenia and severe sarcopenia.

During the discussion that followed on the findings from the dietary patterns and all-cause mortality review, Subcommittee members explained that sample sizes and effect sizes varied, depending in part on duration of follow-up. Even so, the consistency of findings about the protective effects of healthful dietary patterns and all-cause mortality was remarkable. In addition, findings showed that a protective dietary pattern can be achieved using a variety of foods, so long as the foods fit within certain parameters (e.g., intake of vegetables, legume, fruit, nuts, whole grains, fish, lean meat or poultry and unsaturated fats relative to saturated fats.). A member asked whether it would be possible to put the reviews from other subcommittees that focus on a particular food or nutrient in the context of these dietary patterns reviews to help them better define diets based on their outcomes of interest. Dr. Boushey responded by noting that the Subcommittee was already working on an analysis to look at the various foods, nutrients, and food categories that comprise the various dietary patterns included in its reviews. In response to another question, Dr. Boushey responded that the focus of the dietary patterns analyses was on the foods and beverages contained in the patterns. Dr. Bazzano added that diets based on macronutrient distribution also will be considered as long as one macronutrient is outside of the AMDR, even if the article does not provide a description of the foods and beverages. Dr. Boushey concurred, noting that they are two separate concepts. Dr. Boushey and staff also clarified which cancer and neurocognitive outcomes the Subcommittee will carry over from existing systematic reviews. Dr. Ard explained the Subcommittee's approach to

considering the relationship between all-cause mortality and dietary patterns could lead to a consistent narrative for the Subcommittee's work. He stated that the evidence consistently showed that the dietary pattern drives the overall effects and that the strength of the effect is likely related to the food group composition and adherence to the pattern. In other words, a high level of adherence to a pattern like DASH—as it was studied in the trial—would have the strongest protective effect. If the quality of the foods included in the pattern decreased (even if they still fit within the food groups, such as vegetables or low-fat dairy), then the protective effect would decrease. In addition, a fairly consistent finding was that the independent macronutrient distribution did not have much of an effect. In effect, a hierarchy exists in which, in the context of overall energy intake, the dietary pattern matters most. The foods that make up the pattern are the next most important thing, followed by the macronutrient distribution. High-quality intake at the dietary pattern level, high-quality food choices at the food group level, and high-quality macronutrient choices provide consistency across the hierarchy and could be a way to conceptualize the Subcommittee's work. Dr. Sabaté added that it makes more sense to consider the type and source of macronutrients within the context of the dietary pattern than as isolated dietary factors. Following on Dr. Ard's comments, Dr. Mattes asked whether small positive changes in dietary patterns could have disproportionately large health benefits. Dr. Boushey agreed that would be an interesting topic to pursue. Dr. Ard emphasized the importance of communications to help people understand the concept of quality of intake across patterns, foods, and macronutrients.

Note: The Dietary Patterns Subcommittee protocols discussed are available at [DietaryGuidelines.gov](https://www.dietaryguidelines.gov).

FREQUENCY OF EATING SUBCOMMITTEE UPDATE

Dr. Steven Heymsfield, chair of the Frequency of Eating Subcommittee, reported that the Subcommittee had completed all of its systematic reviews. He noted that the frequency of eating and all-cause mortality question had been presented at the previous public meeting and that today he would be presenting updated results along with the Subcommittee's remaining questions using the updated analytic frameworks.

Dr. Heymsfield opened his presentation by defining "frequency of eating" and explaining that the Subcommittee decided to focus on frequency of eating occasions alone, and not consider the related concept of timing of eating occasions. He also noted that since the previous public meeting, the Subcommittee had refined its criteria for sample size and power calculations.

He then presented the findings and draft conclusion statements for all of the Subcommittee's questions. He presented the analytic frameworks, the literature search and screening results, description and summary of evidence, and draft conclusion statements and strength of evidence grades.

Dr. Heymsfield concluded his presentation by noting the Subcommittee's next steps, which are to submit the systematic review for peer review, collaborate with the Data Analysis and Food Pattern Modeling Working Group on the question on the relationship between frequency of eating and achieving nutrient and food group recommendations, and draft the Frequency of Eating chapter of the Committee's report. He also noted that the studies reviewed by the Subcommittee had a number of limitations that precluded the ability to draw conclusions about the relationship between frequency of eating and health outcomes. He added that this does not mean frequency of eating is not an important topic, but merely that the studies conducted to date did not meet a sufficiently high bar to examining these questions. For example, water

intake was rarely reported, measures of frequency of eating were inconsistent, study populations were not representative of the diversity of the U.S. population, and definitions of eating frequency events were inconsistent.

During the discussion that followed, members discussed how the inconsistencies in measures of frequency of eating and other limitations in the data hampered the Subcommittee's examination of its questions. In response to members' questions, Subcommittee members and staff also clarified the methods and results from several of the studies included in the review. Dr. Kleinman commented that it is difficult to adequately capture eating frequency in lengthy studies when frequency of eating measurements are taken only twice. Dr. Mattes agreed, saying that evidence on trends in eating frequency shows that adults have increased ingestive events by 1.5 per day and children have increased by 1 event per day. If that increase is not tracked over time in a study, substantial information is missed.

Note: The Frequency of Eating Subcommittee protocols discussed are available at DietaryGuidelines.gov.

DISCUSSION

Dr. Schneeman thanked the Subcommittees for their presentations and asked members to contribute their observations from particular presentations or from all of them in general. Comments included:

- The cost of food is a big issue for many families; dietary guidance must be sensitive to this issue in any recommendations about the components of dietary patterns.
- The life course and dietary patterns themes can be a unifying factor for the Committee's report as it applies across subpopulations.
- It will be important for dietary guidance to encourage people to change behaviors to eat more healthfully. The Committee must be clear that the U.S. diet needs major improvement. Guidance must be clearly conveyed, concrete, and pragmatic. Concepts such as "nutrient dense" must be clearly explained. Behavioral scientists may be able to help in developing strategies for change.
- The issue of timing of eating occasions would be a good topic for a future Dietary Guidelines Advisory Committee.
- The strong evidence around dietary patterns and all-cause mortality could be an anchor point for recommendations. Population assessments of dose-response relationships should be included to the extent possible. Developing more advanced statistical methods could help advance dietary patterns research.
- The large number of "limited" or "grade not assignable" conclusions provides opportunities for research recommendations and priorities for future Dietary Guidelines Advisory Committees.
- Randomized controlled trials should be a priority for future frequency of eating research. They would be relatively easy to conduct and could provide useful data. Mobile-based technologies could be very useful in future frequency of eating studies.
- The food supply is changing rapidly, particularly beverages. To track these changes, good definitions of beverages now and in the future are needed.

PUBLIC COMMENTS

A total of 51 members of the public provided oral testimony to the Committee during this session. The list of commenters as well as videos and transcripts of this session are available on the [Meeting 4 page](#) at DietaryGuidelines.gov.

MEETING ADJOURNMENT

Dr. Schneeman and Dr. Stody thanked the Committee members for their comments and adjourned the meeting at 3:57 p.m.