

2015 Dietary Guidelines Advisory Committee Meeting 6
Via Webinar (not an in-person meeting)
Sponsored by the
U.S. Department of Health and Human Services (HHS)
U.S. Department of Agriculture (USDA)

November 7, 2014

Meeting Summary

Friday, November 7, 2014

(10:03 a.m.)

Participants

Dietary Guidelines Advisory Committee (DGAC): Dr. Barbara Millen (Chair), Dr. Alice H. Lichtenstein (Vice-Chair), Dr. Steven Abrams, Dr. Lucile Adams-Campbell, Dr. Cheryl Anderson, Dr. J. Thomas Brenna, Dr. Wayne Campbell, Dr. Steven Clinton, Dr. Frank Hu, Dr. Miriam Nelson, Dr. Marian Neuhouser, Dr. Rafael Pérez-Escamilla, Dr. Anna Maria Siega-Riz, Dr. Mary Story

Co-Executive Secretaries: Dr. Richard Olson, Ms. Colette Rihane, Dr. Kellie O. Casavale, Dr. Shanthy Bowman

Others: Mr. Kevin Concannon, Dr. Don Wright, Ms. Angela Tagtow, Ms. Jackie Haven

Opening Remarks

Dr. Richard Olson, Designated Federal Officer, Division of Prevention Science, Office of Disease Prevention and Health Promotion. U.S. Department of Health and Human Services, called the sixth meeting of the 2015 Dietary Guidelines Advisory Committee (DGAC) to order at 10:00 a.m. Dr. Olson noted that the Committee is not meeting in person for this meeting and that it's a virtual meeting via webinar. He reminded the public that they would be able to see the Committee slides and hear the Committee members discuss the issues, but would not see the members.

Dr. Olson reviewed the federal officials who are overseeing and supporting the advisory committee as well as the members of the Committee. All 14 members of the Committee were

present. He noted that committee member Miriam Nelson would be absent from the call from approximately 10:15 a.m.-11:45 a.m. Eastern time.

Dr. Olson reviewed the role and responsibilities of the Committee including the charge. He noted that the product of the Committee is its report to the Secretaries of HHS and USDA. He stated that the Committee is expected to finalize its report by the first part of January 2015. The Committee will be disbanded once the report is submitted to the two Secretaries. Dr. Olson noted that the role of the HHS and USDA federal agencies is to develop the *Dietary Guidelines for Americans, 2015* based on the Committee's report with consideration of comments from the public and from several federal agencies that deal with nutrition. Dr. Olson stated that the *Dietary Guidelines for Americans, 2015* are expected to be released by the end of 2015.

Dr. Olson reviewed the agenda for the meeting. He noted that Meeting 7 is scheduled for December 15, 2015 and that the *Federal Register* notice will go out in about two weeks with the time, agenda, and other details.

Dr. Olson acknowledged requests to make Committee slides available online before the meeting starts. He replied that Committee members can be working on slides right before the meeting. Also, the government must comply with the 508-compliance requirement for posting documents on the Web, which can take about two weeks. Dr. Olson indicated that people who requested a copy of the slides on their registration form can expect to receive them in about a week.

Dr. Olson reiterated that once the Committee submits its report around the first part of the January, the public comments period will close. He added that a *Federal Register* notice will be published inviting the public to submit written comments and/or oral testimony, directed at federal officials, on the Committee's report. Dr. Olson noted that it will take several weeks for the Committee's report to be made 508-compliant and posted on the Web.

Dr. Olson turned the meeting over to the Chair of the DGAC, Dr. Barbara Millen, to introduce the subcommittee reports.

Introduction to Subcommittee Reports

Dr. Barbara Millen, Chair of the DGAC, began by reviewing the purpose and charge of the Committee which will result in a scientific report that will be submitted to the Secretaries of the two Departments.

Dr. Millen reviewed the themes of the Committee which included: 1) Focus on dietary patterns, which captures the overall content and quality of the diet (versus only individual foods or

nutrients), 2) ‘what works’ at individual and population levels to help Americans make better eating and physical activity choices, and 3) a systems approach considering the multiple spheres and systems of influence on dietary patterns, physical activity, and health.

Dr. Millen then reviewed the scope of each of the five subcommittees, noting that the presentations to follow will describe the remaining work of Subcommittees 1-4, as well as work on several topics that cross two or more subcommittees such as sodium, added sugars, and saturated fat. She stated that Subcommittee 5 has already presented all of its findings at previous public meetings.

Dr. Millen described the Committee’s development of a 2015 DGAC conceptual model to capture the scope of its work and frame its report. The conceptual model will focus on diet, health promotion, and disease prevention at individual and population levels across the life course.

Dr. Millen described two types of expertise that may be sought by the Committee: invited experts and consultant subcommittee members. Invited experts are individuals invited by a subcommittee, usually on a one-time basis, to provide their expertise to inform the subcommittee’s work; they do not participate in decisions at the subcommittee level. Consultant subcommittee members are individuals sought to participate in subcommittee discussions and decisions on an ongoing basis but are not members of the full Committee. Like Committee members, consultants complete training and have been reviewed and cleared through a formal process within the Federal government. The subcommittees and working groups will note in their reports whether they used outside experts or consultants.

To set the stage for the subcommittee reports, Dr. Millen reviewed the approaches for examining the evidence that are common to all the subcommittees. This includes use of Nutrition Evidence Library (NEL) systematic reviews, existing high-quality reports, original data analyses, and food pattern modeling analyses, as well as consideration of public comments. She then reviewed the six steps of the NEL process managed by USDA. She noted that details related to USDA’s NEL methodology can be found on NEL.gov. She introduced the types of materials the subcommittees might use in presenting the review of the evidence for the full Committee’s consideration. Dr. Millen also reviewed the basis for the conclusion statements, grading, and implication statements of the Committee. She stated that the DGAC report will be used by HHS and USDA to develop the *Dietary Guidelines for Americans, 2015* policy. She then turned the floor over to the Subcommittee 1 Chair, Dr. Marian Neuhouser.

Subcommittee 1 (SC 1): Food and Nutrient Intakes, and Health: Current Status and Trends

Dr. Marian Neuhouser, SC 1 Chair, identified the members of SC 1, who are Dr. Steven Abrams, Dr. Cheryl Anderson, Dr. Mary Story, and Dr. Alice H. Lichtenstein. She described the scope of the SC 1 work as identifying the current status and trends in: 1) food group, food, and nutrient intake; 2) eating behaviors; 3) diet-related chronic diseases and weight status; and 4) dietary pattern composition. She noted that the SC had no invited experts or consultants since the September meeting. Dr. Neuhouser stated that the SC would address the current status of its work on three topics: Nutrients of Public Health Concern; Dietary Pattern Composition; and Health Conditions—Prevalence and Trends.

Nutrients of Public Health Concern

Dr. Neuhouser noted that most of the questions and draft conclusion statements on this topic have been presented at previous meetings, but one question remains and is being presented today. The question is: “How well do the USDA Food Patterns meet the nutritional needs of children 2 to 5 years of age and how do the recommended amounts compare to their current intakes? Given the relatively small empty calorie limit for this age group, how much flexibility is possible in food choices?” This question was answered using Food Pattern Modeling. The question was posed by the committee members because the nutritional needs and diets of young children differ from those of adults and older children. Therefore, the patterns were modified for children 2 to 5 years of age. Nutrient profiles for dairy and fruit groups were modified to represent intakes of young children. In comparison to the intake of older children and adults, fruit juice was changed from 33% to 42% of total fruit intake and milk intake was changed from 54% to 71% of total dairy intake. Also, fluid milk was represented by lowfat (1%) rather than fat-free milk. The resulting patterns were compared to their nutritional goals and to current intakes, and the potential for flexibility in the patterns was identified.

Dr. Neuhouser then presented the key findings that 1) Modified USDA Food Patterns meet the nutrient needs of young children; 2) Nutrients for which the RDAs are not met are the same as for older children and adults; 3) Recommended food group amounts fall within the range of usual intakes (5th to 95th percentiles) of this age group for most food groups and subgroups; and 4) Patterns have limited flexibility to allow for calories from solid fats or added sugars (empty calories). Options to increase flexibility in food choices include a small reduction in the amount of protein foods or a change from 1% milk to fat-free milk at 4 years of age. The draft summary statement for this question is that the USDA Food Patterns provide suitable guidance for feeding young children 2 to 5 years of age. The pattern assumes use of 1% rather than fat-free milk, and the allowance for empty calories is limited.

Dr. Neuhouser then asked for any questions and discussion by the committee on the nutrients of concern topic.

Dr. Siega-Riz asked for an explanation of the recommendation for milk for young children. Dr. Abrams explained that for most children, whole milk is recommended up to 2 years of age and then a gradual transition downward to lowfat or fat-free milk. This slightly affects the calories consumed but not much else. Therefore, instead of using fat-free milk for the modeling, 1% milk was used for children 2 to 4 years of age.

Dr. Hu asked for a quantification of the amount of fruit juices used in the modeling. Dr. Neuhouser said the nutrient profile for juice was changed from 33% to 42% of total fruit intake for this age group because this is what children are consuming. It does not mean more juice is recommended; it just acknowledges more juice is being consumed. Dr. Hu asked the amount of juice per day. Dr. Neuhouser said the amount from the modeling reflects AAP's recommendations of no more than 4 to 6 oz of juice per day. Trish Britten, from USDA, was asked to elaborate and replied that Dr. Neuhouser is correct. The total amount of fruit recommended is from 1 to 1 ½ cups for this age group. Based on consumption, the proportion of that amount which is juice is 42% for young children, and this is within the AAP recommended limit of ½ to ¾ cups of fruit juice per day.

Dietary Patterns Composition

Dr. Cheryl Anderson first provided some background on SC 1's dietary patterns composition work. A primary focus of SC 2 is to examine the associations of dietary patterns (rather than single nutrients) with risk of obesity, cardiovascular disease, type 2 diabetes and cancer. Several types of patterns emerged as having healthful benefits. SC 1 has complemented that work by seeking to determine the specific quantities of food groups that appeared most consistently in the studies examined by SC 2. She noted that there are three questions related to dietary pattern composition today. Dr. Anderson will address the first question and Dr. Neuhouser will address the next two questions. The first question is: What is the composition of dietary patterns with evidence of positive health outcomes (eg, Med, DASH, HEI, Vegetarian), and of patterns commonly consumed in the US? What are the similarities (and differences) within and amongst the dietary patterns with evidence of positive health outcomes and the commonly consumed dietary patterns?

Dr. Anderson continued with the methods used for the first question. 1) Reviewed articles examined by SC 2 to identify those that reported quantified data on food group intakes in the population or intervention group with positive health outcomes. Many articles were excluded because of insufficient quantitative information. 2) Quantified food group intakes from these studies were converted to grams, if presented in servings; serving to gram conversions from the study or related documents (e.g., Harvard FFQ conversions) were used. 3) Converted grams per day to grams per 1000 calories, to enable comparison across studies. 4) To present a comparison to usual intakes, the usual intakes from NHANES 2007-10 for adults were converted into grams

per 1000 calories for each adult age/sex group. The range of these intakes was used as the comparator. 5) For comparison to USDA Food Patterns (Healthy US-Style Patterns), the recommended amounts of each food group in the patterns from 1800 to 2400 calories were converted to grams per 1000 calories. The range of these recommended intakes was used as the comparator.

Dr. Anderson then introduced a series of slides showing the results of the analysis. Each slide is a graph that shows amounts the amount of a food group in grams per 1000 calories for each included study. These studies are grouped by type of study along the x axis, and the data point for each study is labeled. The y axis shows the grams per 1000 calories and a conversion to household amounts. The pink band shows the range of intakes for adults from NHANES, and the blue band shows the range of recommended intakes for adults from the USDA Food Patterns. The graph for vegetables shows that the various studies present a range of intakes, and most fall within recommended USDA Food Pattern range or above it, while some studies fall within the range of current intakes. The graph for fruits shows that studies not part of the DASH/OMNI studies are more tightly clustered, and for DASH/OMNI, which are efficacy feeding studies, the range is above recommended intakes in the USDA Food Patterns. The graph for dairy foods shows that the DASH/OMNI and two other studies fall within the recommended USDA Food Pattern range, while other studies fall either within the range of usual intakes or between intakes and recommendations. For red and processed meats, the graph shows that some healthful patterns fall below recommended USDA Food Pattern intakes and typical intakes, while others are above. For seafood intake, the majority of the studies are above or within the amounts recommended in the USDA Food Patterns.

Dr. Anderson presented the draft conclusion statement for this question, that dietary patterns with varying food group composition, but certain common elements, were observed across intervention and cohort studies to have health benefits and they offer options for achieving a healthy diet; and, in general, the ranges of intake in dietary patterns with positive health benefits are very close to that recommended by the USDA food patterns, but amounts of some specific food groups vary across the various diet patterns types. Specifically, 1) DASH-style diets and Mediterranean-style diets are very similar with respect to amounts of daily quantities of fruit and vegetables and higher than amounts recommended in the USDA Food Patterns. 2) Dairy intake is comparable between DASH-style diets and the USDA Food Patterns, but dairy is lower for Mediterranean-style diets. 3) Red and processed meats are higher in the Mediterranean-style diets but lower in the DASH-style diet than is recommended by the USDA Food Patterns. 4) Seafood intake is similar in DASH-style and higher in Mediterranean-style diets than the USDA Food Patterns. The data from the intervention trials and the cohort studies provide empirical data that the USDA Food Patterns provide an evidence-based guide to food consumption.

Dr. Anderson then presented the draft implications statement that the quality of current diets of the US population is suboptimal overall (as presented in previous DGAC meetings) and has major adverse health consequences. To improve the population's diet, there are several eating patterns that can be adopted. The approaches that can be taken are varied and can be adapted to personal and cultural preferences. The opportunity to consume a variety of dietary patterns may help to promote and support more sustained dietary changes leading to improved health in the U.S. population.

Dr. Neuhouser continued with the second Dietary Patterns Composition question: To what extent does the U.S. population consume a dietary pattern that is similar to those observed to have positive health benefits [e.g., Mediterranean-type diets, Dietary Approaches to Stop Hypertension (DASH)- type diets, diets that closely align with the Healthy Eating Index and vegetarian diets] overall and by age/gender and race/ethnic groups? The method used to answer this question was to compare HEI-2010 scores and subscores for age/sex groups to ideal scores, using NHANES 2009-10 intake data.

Dr. Neuhouser then showed slides with graphs that compared the overall HEI score and its 12 component subscores by sex groups and age groups. Overall HEI scores are between 50 and 60 out of 100 points, which suggest that there is a lot of room for improvement. When component subscores are broken out by age, more variability is seen, for example, with young children doing well on fruit and milk subscores. Overall HEI scores show a U shape by age, with young children and middle to older age adults having better scores than adolescents and younger adults.

Dr. Neuhouser noted that the key findings from this analysis were that HEI component scores varied in the WWEIA data, with females, young children and middle-aged and older adults having better component scores while preadolescent and adolescent children had the poorest scores. She noted that WWEIA data are not available to examine how the U.S. population is doing in comparison to DASH-style or Mediterranean-style diets, and this would be a research need for the future. The draft conclusion statement is that: 1) Data from WWEIA show that the average HEI score in the U.S. population is 57 points out of a total of 100 points; 2) The best scores were observed for the following components: total protein foods (average score of 100%), seafood and plant protein (84%), and dairy (69%) while the poorest scores were observed for whole grains (25%), sodium (37%), fatty acids (41%), greens and beans (46%), and empty calories (average score of 60%); 3) In addition, young children ages 2-3 years and middle aged and older adults (51 years and older) have the best HEI scores (total scores of 63% and 66%, respectively) while preadolescents and adolescents have the poorest HEI scores (total scores of 49% and 48 %, respectively).

Dr. Neuhouser then proceeded to the third question: Using the Food Pattern Modeling process, can healthy eating patterns for vegetarians and for those who want to follow a Mediterranean-

style diet be developed? How do these patterns differ from the USDA Food Patterns previously updated for the 2015 DGAs?

Dr. Neuhouser first described the methods used for modeling the Vegetarian Patterns. 1) Reviewed data on food group intakes from analysis of self-identified vegetarian's diets, from NHANES 2007-10, to select foods to include/exclude in Vegetarian Patterns. Based on this data, chose to model a lacto-ovo vegetarian pattern. 2) Selected the types and amounts based on the average amounts consumed of each food group or subgroup by vegetarians vs. non-vegetarians in the NHANES sample. 3) Determined amounts from each food category that could be included to meet nutrient goals in the Patterns at 12 calorie levels based on vegetarians' choices, using an iterative process. 4) Balanced calories by adjusting amounts of oils, solid fats, and added sugars as appropriate. 5) Assessed nutrient adequacy of the Vegetarian Patterns in comparison to Dietary Reference Intakes and Dietary Guidelines recommendations.

Dr. Neuhouser then described the methods used for modeling the Mediterranean-style Patterns. 1) Reviewed data from Dietary Patterns Composition project on food group intakes for studies assessing diets with a Med-diet index. Compare range of food group intakes to the food group amounts in the Healthy U.S.-Style Food Patterns. 2) Selected food groups for modification and the range of amounts of each food group to include in initial analysis. Using an iterative process, adjust the amounts to provide smooth transitions across calorie levels. 3) Balanced calories by adjusting amounts of oils, solid fats, and added sugars as appropriate. 4) Compared nutrients in the Med-Style Patterns to Dietary Reference Intakes and 2010 Dietary Guidelines. Determined to what extent nutrient standards for Patterns may be modified for Med-Style Patterns.

Dr. Neuhouser presented the data used to determine amounts of protein foods to use for the vegetarian patterns. Meat, poultry, and seafood are consumed in smaller quantities by vegetarian than non-vegetarians, while soy products, legumes, and nuts are consumed in larger amounts. She then showed the data used for the Med-style patterns, summarized from the data previously presented by Dr. Anderson. The differences between the Med-style and the USDA food patterns, which were highlighted, include higher fruit and seafood and lower dairy amounts. Next, she presented a comparison of the composition of the three USDA Food Patterns, the Healthy U.S.-style, the Healthy Vegetarian, and the Healthy Mediterranean-style Patterns, at the 2000 calorie level. There are many similarities, as Dr. Anderson had noted for healthy dietary patterns in the research literature, among these patterns. Differences include more fruit and seafood in the Mediterranean-style pattern, more legumes, nuts and seeds, and processed soy in the Vegetarian Pattern, less dairy in the Mediterranean-style Pattern, and no meat, poultry, or seafood in the Vegetarian Pattern.

Dr. Neuhouser then showed a comparison of selected nutrients in the three patterns for a 19 to 30 year old woman, compared to the nutrient standard or limit. For the most part, the three patterns

are all quite similar in meeting nutritional goals, with some slight differences in fiber, calcium, vitamin D, and sodium. One nutrient that was examined in particular was calcium, because the Mediterranean-style Patterns contain only two instead of three cups of dairy. The range of calcium intakes meets standards for the Healthy U.S. and Vegetarian Patterns, and in the Mediterranean-style Patterns is lower than the standard for preadolescents, adolescents, and adult females ages 51 to 70.

Dr. Neuhouser presented the conclusion statement for this question: Food Pattern Modeling demonstrates that healthy eating patterns can be achieved for a variety of eating styles including “healthy U.S.-style”, “healthy Mediterranean-style” and “healthy vegetarian style” eating patterns. While there are some differences across the three eating patterns, comparable amounts of nutrients can be obtained using nutrient dense foods while maintaining energy balance. She then identified the implications for this question, that there are a variety of options available to help Americans accomplish healthful eating patterns that maintain energy balance and meet Dietary Guidelines. These include a healthy U.S.-style, Mediterranean-style, or vegetarian eating patterns. These diets meet nutritional goals and use a variety of foods. Importantly, these diets reflect the range of foods that can be used to accomplish a healthful eating pattern, and they support the inclusion of diverse foods that are consistent with one’s individual, cultural, or religious practices. These diets can be translated to a variety of settings including homes, schools, worksites, health care facilities, and places of worship.

Dr. Millen then asked for any questions about the Dietary Patterns Composition topic. She began by asking about the comparison of the dietary patterns with current U.S. consumption. We are not as close as we would like to be, to a healthy pattern. Across the age groups, one sees the different components of the healthy eating patterns. Americans are approaching these levels of intake that are being recommended. What does this mean in terms of moving the American public toward a healthier eating pattern? Where are we, relative to the healthy pattern, and then what is the significance in terms of these options?

Dr. Neuhouser replied that from the total HEI scores, Americans are halfway there. They are better in some aspects than others. There is a tremendous amount of room for improvement, for example sodium and added sugars are too high. Some of these are challenging for Americans to change now. We need concerted efforts through the food supply, what is available in schools, and the ability to obtain the foods. Americans seem to be doing well, but there is tremendous room for improvement.

Dr. Anderson added this might be encouraging for the population. This sort of examination of the patterns gives the sense that there are many paths to follow. It opens up the many options to Americans, to tailor patterns. Individual preferences and culturally-relevant food components will give us more flexibility.

Dr. Lichtenstein noted that we have made extraordinary progress. This is very helpful and will have many applications. The one thing we need to incorporate is absolute quantities. A person can be consuming a healthy quality diet, but if it is in excess of energy needs, the benefits will not be realized. We need to marry those two concepts.

Dr. Campbell said SC 1 has done a very nice job comparing the features of the different patterns with respect to fruits and vegetables. He wondered about the utility and messaging to consumers, about doing a similar comparison of what the patterns do not contain. It is about decreasing intakes of some foods while increasing others. Dr. Neuhausser asked if he means one pattern has a lower intake of refined grains and added sugars; is it in terms of not consuming them? Dr. Campbell said it is about the upper threshold of how those parts of a typical person's diet fit into these patterns. It is not a message of exclusion but a message of considerable moderation. Dr. Anderson replied that this is an important comment. In our attempt to do these analyses, SC 1 chose healthful patterns. There are other aspects to eating. It would round out the Report nicely to address the issues Dr. Lichtenstein just did, to consider energy balance. Certain components are not being encouraged. Red and processed meat are higher in the Mediterranean-style pattern but lower in others, so what does that look like, as people try to model these diets? This needs to be clarified in the Report. Dr. Lichtenstein said we have to emphasize what people eat, the positive food groups, but also the negative – it is getting at the concept of changing. It is not just that we want more fruits and vegetables to be consumed, but what do we want them to take out of their diet? Dr. Siega-Riz indicated that this will come out in SC 2's presentation.

Dr. Pérez-Escamilla said the HEI 2010 scores show a subscore for seafood and plant protein. Can seafood be separated from plant protein in the HEI data? Dr. Neuhausser replied that they will take this back to staff.

Dr. Campbell asked about the term 'healthy,' which was used to describe each of the three different patterns. Are the health benefits common among these patterns? Is there some variability in what the health benefits might be? The different patterns add variety. If someone is trying to obtain a particular health outcome, would any of these patterns work? Dr. Anderson replied that is the charge for SC 2. They will be talking about how these patterns relate to health outcomes.

Dr. Hu noted that SC 1 has completed modeling analysis for three patterns, and that in addition, Dr. Anderson mentioned DASH, OMNI, and PRUDENT patterns. Dr. Hu wondered why food pattern modeling did not look at other healthy patterns. His second question concerns diet quality across different ages, genders, and socioeconomic groups. A recent paper discusses socioeconomic groups, reporting that the gap has widened in the last 10 years or so in the U.S. population. This will have huge implications for how to improve diet quality in the population.

Dr. Neuhouser responded that they did not model some of the other patterns; it was a bandwidth issue of what could be accomplished. They would like to do this in the future. This is the first time staff did this modeling, and the DGAC is grateful. We are hopeful in the future we can delineate other patterns; additional food pattern modeling will be able to be presented. We desire to do this, and it is on the list. Dr. Neuhouser said for the second question that they are aware of that recent publication and will keep it in mind.

Dr. Millen commented that it is extremely positive that what is presented here is not a single formula or prescription for a pattern that would lead to healthy eating. The DASH was presented in the 2010 Report. The second point Dr. Neuhouser made shows the American public is half the way there. That does not mean they are not going to emphasize nutrients of concern, but for the population to understand they are partway to the goal is motivating. Since there are similar qualities to the patterns, the population can use combinations of the patterns on a day-to-day basis, depending on what their preferences are. Dr. Neuhouser replied that this is very possible, since they are providing three healthy patterns. There is room for variation in the diet, so the answer is yes. Dr. Lichtenstein said, following up on that and the current quality of the diet, the trends are really important. They should emphasize the trajectory and not where we are now. Dr. Anderson noted that we want to see success. There is an apparent gap, and acknowledging this in the Report and how to close the gap is important. Dr. Lichtenstein agreed and added that the genesis is important. Is it affordability or availability? Dr. Neuhouser said SC 3 will address that, so stay tuned for that presentation.

Health Conditions – Prevalence and Trends

Dr. Anderson then presented some updated information for Health Conditions, Prevalence and Trends topic. Data, conclusion statements, and implications have all been presented at the earlier public meetings. Today SC 1 is presenting edits and additions to the conclusions and implications based on DGAC discussion and further SC deliberations.

Dr. Anderson began with the first question: What is the current prevalence of overweight/obesity and distribution of body weight, BMI, and waist circumference in the U.S. population and age, gender, racial/ethnic, and income groups? What are the trends in prevalence? The conclusions for this question are: 1) The current rates of overweight and obesity are extremely high among children, adolescents, and adults. These high rates have persisted for more than 25 years. 2) Overall, 65% of adult females and 70% of adult males are overweight or obese, and rates are highest in middle-aged and older adults. 3) Rates of overweight and obesity in adults vary by age and ethnicity. Overweight is most prevalent in those 40+ years of age and in Hispanic American adults. Obesity is most prevalent in African American adults. Obesity is least prevalent in all adults with highest incomes (400+% the poverty threshold). 4) Abdominal obesity is present in

U.S. adults of all ages, increases with age, and varies by gender and race/ethnicity. Abdominal obesity rates are highest in individuals aged 60 years or older, and are higher in women than men at all ages. In men, abdominal obesity rates are slightly higher among Whites than Mexican American or African American. In women, abdominal obesity rates are lower in Whites than in Mexican American or African American. 5) Nearly one in three youth, 2 to 19 years, is now overweight (85th - 94th percentile) or obese (\geq 95th percentile) and rates vary by age and ethnicity. In youth, 2-19 years of age, obesity prevalence increases with age, and the age category with the highest prevalence is 12-19 year olds. In youth, 2-19 years of age, the race categories with the highest prevalence of obesity are African Americans and Hispanics.

Dr. Anderson continued with the implications for the first question, that long-standing high levels of overweight and obesity require urgent population and individual-level strategies that work in multiple settings. There is a need to develop and implement comprehensive interventions that are evidence-based, by trained interventionists and professional nutrition service providers, in healthcare settings and community locations. Quality of care standards in healthcare settings should include preventative nutrition services to be provided by multidisciplinary teams and nutrition professionals, with incentives for providers and systems. The public should monitor body weight and engage with providers in evidence based approaches aimed at achieving and maintaining healthy body weight.

Dr. Anderson then presented the second question: What is the relative prevalence of metabolic and cardiovascular risk factors (i.e., blood pressure, blood lipids, and diabetes) by BMI/body weight/waist circumference in the U.S. population and subgroups?

Dr. Anderson reviewed the conclusions for this question. 1) Approximately 50% of individuals who are normal weight have at least one cardio-metabolic risk factor; approximately 70% percent of individuals who are overweight and 75% of those who are obese have one or more cardio-metabolic risk factors. 2) Rates of elevated blood pressure, adverse blood lipid profiles (i.e., low HDL-C, high LDL-C, and high triglycerides), and diabetes are highest in individuals with abdominal obesity (waist circumference >102 cm in men, 88 cm in women). 3) In children, aged 3 to 19 years with type 2 diabetes, the prevalence of obesity was higher in African Americans, followed by American Indians, and Hispanics compared to Whites or Asian Pacific Islanders youths. 4) Lipid abnormalities and rates of borderline high blood pressure vary by weight status in boys and girls; and rates are particularly high in obese boys. 5) In adults with type 2 diabetes or hypertension or adverse blood lipid profiles, the prevalence of obesity varies by race/ethnicity. 6) Nearly three-fourths of the overweight or obese population also have at least one cardio-metabolic risk factor indicating that they qualify for preventive lifestyle and nutrition interventions for weight management by trained professionals and nutrition professionals as recommended by AHA /ACC.

Dr. Anderson continued with the implications for the second question, that rates of cardio-metabolic risk factors are extremely high and reflect the high rates of population overweight and obesity. Multiple metabolic risk factors co-exist that substantially increase risks for coronary heart disease, hypertension, stroke, diabetes and other obesity-related co-morbidities. These are costly, preventable, and can be managed with intensive, comprehensive and evidence-based lifestyle interventions implemented by multidisciplinary teams or medical nutrition therapy. Bold action is needed to confront the Nation's obesity epidemic and its devastating metabolic consequences, including revamping healthcare and public health systems to integrate preventive nutrition and lifestyle services, shifting the healthcare paradigm towards prevention, and revising quality of care guidelines to incentivize personalized lifestyle and nutrition interventions. In adults, prevention and treatment of overweight and obesity across the lifespan requires both individual and population-based, environmental strategies. Initiatives in healthcare and public health sectors need to be complemented with collaborative programming in agriculture, retail, educational, and social service settings for long-term adoption of healthy nutrition and lifestyle behavior. Change should be not only feasible but normative. In youth 8-17 years of age, the high rates of overweight and obesity and their concomitant cardio-metabolic risk factors require early preventative interventions at individual and population levels. Evidence-based strategies are needed and should be complemented by environmental approaches across wide-ranging sectors.

Dr. Anderson proceeded with the third question on prevalence and trends in health conditions: What are the current rates of nutrition-related health outcomes (i.e. incidence of and mortality from cancer [breast, lung, colorectal, prostate] and prevalence of high blood pressure, CVD, and type 2 diabetes), birth defects/congenital abnormalities, neurological and psychological illness, and bone health in the overall U.S. population?

Dr. Anderson noted the conclusion statement for this question, modified from the previous meeting. 1) Adults have high rates of nutrition-related chronic diseases, including high blood pressure, CVD, type 2 diabetes, and various forms of cancer. 2) Children and adolescents also have nutrition-related chronic diseases, including borderline high blood pressure and type 2 diabetes. 3) At all ages, rates of chronic disease risk are linked to overweight and obesity. The rates of these chronic diseases vary by race/ethnicity and income status. 4) Prevalence of osteoporosis and of low bone mass increases with age, particularly in post-menopausal women. 5) Among the less common health outcomes, congenital abnormalities are a relatively rare pregnancy outcome but important, and nutrition-related neurological and psychological conditions are a growing concern.

Dr. Anderson then identified the implications for this question, which are that given the high rates of nutrition-related chronic diseases in the adult population and rising rates in youth, it is imperative that we develop prevention policies for all age groups and address nutrition and lifestyle issues with evidence-based interventions that are appropriate for delivery in multiple

settings. Qualified professionals should be delivering effective multidisciplinary interventions. More data are needed to understand the complex etiology of congenital abnormalities and neurological and psychological conditions, and factors that influence bone health so as to inform potential dietary choices by the U.S. population.

Dr. Anderson asked for questions and comments.

Dr. Pérez-Escamilla thanked Dr. Anderson for the presentation. He would like to see a clear, specific implication calling for strengthening the link between local health care and local food systems, with both working in coordination to promote health and treat chronic conditions. Dr. Anderson thanked him for his point and said they could add this to the implications statement.

Dr. Millen said this resonates with the recommendations and implications from the other subcommittees on public-private partnerships. It is clear in a public health model that all of this cannot be accomplished in a health care system. It will take broad strategies across all sectors, not just traditional healthcare. It cannot be a silo approach. Dr. Lichtenstein supports this. Dr. Neuhausser said this is supported by the socio-ecologic model the committee devised, and cuts across many of the subcommittees.

Dr. Millen commented that a large proportion of a family's income is spent on health care. We should incentivize addressing a preventative health style. This is paramount, and she fully endorses this. Dr. Lichtenstein noted that issues related to environmental changes that promote healthy lifestyles are being addressed by the Committee, so that the default option is the healthier option.

Dr. Siega-Riz was stunned by the chronic nutrition-related health outcomes for young adults and adolescents. She said they would be better off by starting with them. It is important to be able to really focus in a meaningful way, not just on schools, but thinking about the healthcare system for children. This is a point we really need to make a strong call for, for this population, before this population carries this onward in their lives. Dr. Neuhausser agreed and noted that preadolescents and adolescents had the lowest HEI scores; this is an important target group to decrease overweight and obesity, improve dietary intake, and increase physical activity. Dr. Millen said it would be helpful to understand across the age span what motivates the adolescent to revert from the healthier eating habits of the younger ages. What could motivate them to adopt a healthier intake since they are not likely thinking in the perspective of the long term? This underscores an important research need. Dr. Lichtenstein added that as adolescents become independent and spend more time away from home, their choices dictated by what is available; it depends on when they get a job and what is available in the college cafeteria.

Dr. Adams-Campbell said cultural factors play into some of these practices. In some cultures, obesity and overweight is not a big issue.

Dr. Neuhouser then noted that the next steps for SC 1 are to complete the chapter writing and draft research recommendations. She said that we are well on our way to completing our work. She thanked committee members and staff without whom they could not complete their work.

Subcommittee 2 (SC 2): Dietary Patterns, Foods and Nutrients, and Health Outcomes

Dr. Anna Maria Siega-Riz, SC 2 Chair, began her presentation by acknowledging the work of the other members of SC 2: Dr. Cheryl Anderson, Dr. Tom Brenna, Dr. Steven Clinton, Dr. Frank Hu, Dr. Marian Neuhouser, Dr. Rafael Pérez-Escamilla, and Dr. Alice H. Lichtenstein, Committee Vice Chair, and those of the Committee Chair, Dr. Barbara Millen. Dr. Siega-Riz reviewed the scope of SC 2 which is to examine the relationship between dietary patterns, foods, and nutrients, *and* preventable diet-related diseases, obesity, and mortality. She noted that when the body of evidence is not strong or moderate for the relationship between dietary patterns and health outcomes, the Subcommittee will consider the evidence for specific foods and nutrients.

Input from Consultants or Invited Experts: SC 2 did not receive input from consultants or invited experts from September to November 2014.

Dr. Siega-Riz outlined the topics she planned to cover during the presentation. SC 2 conducted evidence reviews on dietary patterns and CVD, body weight, type 2 diabetes (T2D), cancer, congenital anomalies, neurological and psychological illnesses, and bone health. Draft conclusions and most of the implications based on the evidence reviews were presented at DGAC public meetings #4 and #5; no substantive changes have been made since those meetings. The SC has looked across the dietary patterns evidence to describe common characteristics of the diet that are associated with positive health outcomes. Thus the primary goals of the presentation are to discuss the common dietary pattern characteristics that have been observed and to discuss the draft implication statements for the SC 2 chapter.

Dr. Siega-Riz reviewed the draft conclusion statements that were presented at previous meetings before moving on to new findings related to the common dietary components across the dietary patterns. The evidence was consistent for dietary components across health outcomes. Vegetables and fruits were consistently identified as beneficial components of the diet in every conclusion statement across health outcomes. Whole grains were identified slightly less consistently, but were identified in every conclusion with moderate to strong evidence. For studies with limited evidence, grains were not as consistently defined and/or they were not identified as a key characteristic. Low-fat dairy was identified as a beneficial component of the

diet for most outcomes with moderate to strong evidence and was less consistently identified for those outcomes with limited evidence. With respect to other common components across dietary patterns, fish/seafood, legumes, lean meat, and nuts were all identified as beneficial components of the diet. For all conclusions with moderate to strong evidence, higher intake of red and processed meats was identified as detrimental. Moderate intake of alcohol was identified as a beneficial component of the diet for conclusions with moderate to strong evidence. Higher consumption of sugar-sweetened foods and beverages as well as refined grains were identified as detrimental in almost all conclusion statements with moderate to strong evidence. The common components of dietary patterns that are associated with positive health outcomes include: higher intake of vegetables, fruits, whole grains, low-fat dairy, fish/seafood, legumes, lean meat, and nuts; moderate intake of alcohol; lower consumption of red and processed meat; and low intake of sugar-sweetened foods and drinks and refined grains.

The slides that followed focused on alcohol intake and health. Dr. Siega-Riz reported that moderate alcohol intake was identified as a component of a healthy dietary pattern associated with some health outcomes, thus reaffirming the conclusions of the 2010 DGAC related to moderate alcohol consumption. The Committee concurs with the 2010 conclusions related to alcohol intake and unintentional injury and lactation; the conclusions of the 2010 DGAC will be brought forward for both topics. Dr. Siega-Riz described SC 2's review of the evidence on the impact of alcohol on specific cancers. SC 2 based its assessment of the impact of alcohol on specific cancers on the 2007 AICR/WCRF report used by the 2010 DCAC, and the AICR/WCRF Continuous Update Reports (2010-2014).

Dr. Siega-Riz presented cross-cutting draft implications related to healthy dietary patterns the U.S. population should consume to maintain health, and when combined with a food energy deficit, to achieve a healthy weight. She added that healthy dietary patterns are flexible and can be tailored to the individual's biological needs and socio-cultural preferences. Individual and population level strategies are needed to help achieve healthy diet and other lifestyle behaviors and the SC recommends the development and implementation of programs and services that facilitate healthy behaviors in various settings.

The proposed implications for alcohol will bring forward the 2010 DGAC recommendations on moderate alcohol consumption by adult men and women and acknowledgement of circumstances in which people should not consume alcohol. Additionally, the Committee will include a statement that initiation of alcohol use and/or increased frequency of alcohol use to achieve potential health benefits is not intended because moderate alcohol use is also associated with an increased risk of breast cancer, violence, and accidents. The 2015 DGAC concurs with the 2010 DGAC recommendation that if alcohol is consumed, it should be consumed in moderation, and only by adults. Moderate alcohol consumption is defined as an average daily consumption of up

to one drink per day for women, up to two drinks per day for men, and no more than three drinks in any single day for women and no more than four drinks in any single day for men.

In closing, Dr. Siega-Riz noted that although a majority of the evidence presented focuses on dietary patterns consumed in adulthood and health risks, the dietary pattern recommendations also have implications for children. The dietary pattern research reviewed by SC 2 supports and extends the food group research reviewed by the 2010 DGAC.

Discussion

Dr. Story requested clarification on the alcohol implication statements. Specifically, she asked why lactating women were excluded from the list of groups and circumstances when people should not consume alcohol. Dr. Story added that current U.S. breastfeeding rates are high; thus it is advisable to clarify when alcohol should be avoided versus consumed within certain guidelines. Dr. Siega-Riz stated 2010 DGAC recommendations were brought forward and the 2010 DGAC included standard recommendations for lactating women to protect their babies from alcohol exposure. Dr. Siega-Riz stated this will be brought back to the subcommittee for clarification.

Dr. Story asked if SC 2 will define what “lower amounts of red and processed meats” constitutes, adding that simply saying consume “lower amounts of red and processed meats” will not be very useful to consumers. Dr. Siega-Riz noted that complementary work on the food patterns has been done by SC 1 and includes extensive food pattern modeling work. She added that the ability to provide specific recommendations for food amounts requires better tools for assessing dietary intake. More research is needed in this area.

Dr. Anderson responded on behalf of SC 1. She concurred with Dr. Siega-Riz’s assessment of the available dietary intake data and current limitations with respect to recommending specific amounts or ranges of food intakes. The Committee discussed the limitations of the data collection methods used by researchers, acknowledging the fact that 24-hour dietary recalls and food frequency questionnaires (FFQs) have inherent strengths and limitations with respect to capturing food amounts and food specificity. Dr. Wayne Campbell expressed concerns related to this topic, commenting that the inadequacy of previous literature is disturbing related to carrying forward the messages related to red, processed, lean meats and so forth such that messages for consumers will be vague and ill-served.

Dr. Neuhausser commented that this very issue is what motivated SC 1 to undertake the dietary patterns composition work. She noted that although we have a better handle on the food quantification issues, we are really at the “tip of the iceberg” in this field and need to complete research to improve dietary intake assessment methodology to assess population dietary intakes,

quantify and describe foods, including cuts of meat, and capture information about the prepared foods many Americans consume that contribute sodium, sugars, and so forth.

Dr. Hu agreed with Dr. Neuhouser, noting that this is diet patterns analysis. As such, most studies did not capture a lot of detailed diet or food information; often red and processed meats were combined. Dr. Hu added that there is a large body of literature on red meats and various health outcomes, and thus, the Committee may need to supplement the diet patterns analysis with systematic reviews and meta-analyses that have this level of detail. It may be possible to derive amounts of processed and unprocessed red meats. Dr. Hu noted that although an evidence base exists for some health outcomes related to processed and unprocessed red meats, the classification schemes for red and processed meats vary between studies.

Dr. Campbell requested clarification on food pattern intakes and the use of the term “lean meats.” Specifically, he asked if the term is broad enough to include lean red meats? Dr. Barbara Millen responded that the recommendations based on the SC 1 diet patterns and modeling analyses have specific calorie level recommendations for food groups and that red and other lean meats were included. Specific portions or allowances were used for different age and calorie levels. Dr. Alice H. Lichtenstein added that one needs to consider how the food pattern modeling was done and how best to describe the modeling in the report. Dr. Neuhouser mentioned that nutrient-dense, lean cuts of meat were used for the SC 1 food pattern modeling. She added that based on her experience with the Women’s Health Initiative (WHI) FFQ data, the questions can be worded to capture information about intake of lean and higher fat cuts of meats. Dr. Patricia Britten, USDA/CNPP confirmed that the SC 1 diet patterns analyses used the leanest, most nutrient-dense meats, and healthier forms of foods; issues related to red and processed meats and poultry frequently arise given the variety of formulations and cuts of meat and poultry that are found in the food supply. Dr. Lichtenstein added that reconciling the food pattern modeling with individual reports of food intakes is challenging; the term “lean” in a questionnaire for example can mean different things to different people. Dr. Neuhouser commented that for many FFQ instruments, several foods may be grouped together—“lunch meat” being a one example. “Lunch meats” include many types of meat & poultry, can be lean or higher fat, and so forth. The WHI FFQ database is weighted by NHANES frequency of consumption data, though some assumptions and expert opinions are required as well. Dr. Neuhouser reiterated that we need better tools to collect specific information about foods consumed.

Dr. Millen remarked that in going forward, a new approach has been used to look at diet and health. We are trying to refine what we know about diet and health relationships and have identified several research needs. An important take-home message is to understand how critical it was to define these relationships as it informed the modeling effort. We have a strong evidence base for a new approach to communicate with the American public regarding strategies to achieve a healthier diet. We can take under advisement the need to refine the messages and

recommendations. Dr. Hu agreed with Dr. Millen regarding the importance of cross-cutting integration. Diet pattern analysis is qualitative and semi-quantitative. The modeling analyses help to improve precision by differentiating red and processed meat components—more so than the diet patterns analysis can. The diet patterns analysis identified common elements of healthy diet patterns. The work undertaken by the different work groups is very helpful. The Saturated Fat Working Group is looking at amounts of saturated fat in the diet and its relationship to health outcomes. This work will refine the recommendations for the general public.

Dr. Campbell asked if there have been comparable discussions related to the recommendations for fruits and vegetables which are listed as a healthy, yet underconsumed component of the diet. Can more specificity about types of vegetables be provided such as starchy vs. dark green, solid vs. liquid, and so forth? He requested clarification with respect to the way fruits and vegetables were handled during the evidence reviews. Dr. Siega-Riz agreed that specificity is an important point for fruits and vegetables and whole grains too. She added that the amount of specificity in the studies varied tremendously; some of the evidence was based on feeding studies, but others reported other types of intake data. Thus the amount and specificity of the dietary information varied greatly. The work completed by SC 1 and SC 2 will be combined and will serve as the basis for overall guidance.

Dr. Story asked if specific statements or results were reported for potatoes. Dr. Siega-Riz stated that specificity varied among studies with respect to including or excluding potatoes, excluding fried potatoes, and so forth. She asked Dr. Anderson and Dr. Hu if they wished to comment. Dr. Anderson did not have all of the data tables at hand, but agreed with Dr. Siega-Riz that studies varied with respect to inclusion or exclusion of potatoes. This is something that should be re-checked. Dr. Story also agreed this is an important question, citing recent press coverage related to potatoes. Dr. Hu commented that this is a food level versus a diet patterns question. Dr. Hu noted that most U.S. cohort studies excluded potatoes and French fries from their definitions of total vegetables, although some European studies may have included potatoes. Individual studies have looked at weight gain and T2D related to potatoes but that level of evidence was not part of the diet patterns review. Dr. Anderson noted that 2014 paper reporting results from the Women's Health Initiative included potatoes in the vegetable quantities.

With respect to Dr. Campbell's question regarding fruit and vegetable recommendations, **Dr. Hu** stated that the diet patterns analysis is not specific enough to provide this level of detail. It may be possible to review the 2010 DGAC evidence summary on fruits and vegetables for guidance on the specific types of fruits and vegetables and their association with CVD and other health outcomes.

Dr. Millen said it is important to explain what is meant by "nutrient-dense" foods in the food plans developed by SC 1 to illustrate healthy dietary patterns in the Committee's final report. We

know there are limitations with diet assessment methodology and the dietary patterns work. We have moderate to strong evidence on diet patterns and health outcomes, and this has permitted us to model dietary patterns. Dr. Hu added that although there is a lack of specificity in the dietary patterns literature, we can show that current food consumption patterns are not consistent with the healthy dietary patterns in the literature. That gap is important to look at, and the Committee can make recommendations on approaches to close the gap.

Dr. Neuhouser clarified earlier discussion pertaining to dietary data specificity for the benefit of the Committee and the meeting attendees. She stated that the SC 1 presentation on current dietary consumption trends was based on findings from the NHANES/What We Eat in America 24-hour dietary recall interview component in which detailed food-specific information is obtained on individuals. During the data discussion some of the comments that were made about the lack of specificity were more germane to data obtained using FFQ instruments.

Dr. Campbell asked if shortfalls in nutrient intakes occur when people consume a healthy diet such as those modeled as part of the SC 1 effort. Dr. Neuhouser responded that there are shortfalls of some nutrients--vitamin D for one, and calcium in the case of the Mediterranean style food pattern. In follow-up, Dr. Campbell asked if the shortfalls can be overcome or if dietary supplements are needed. Dr. Neuhouser and Dr. Steven Abrams stated that the Committee report will include comments on the shortfall nutrients in the healthy dietary patterns.

Dr. Millen was pleased to see so much collaborative effort undertaken by SC 1 and SC 2. She remarked that the SC 2 presentation demonstrates the complementary nature of the Committee's activities.

The meeting adjourned for lunch at 12:50 p.m. until 1:40 p.m. EST.

Subcommittee 3 (SC 3): Diet and Physical Activity Behavior Change

Dr. Rafael Pérez-Escamilla, SC 3 Chair, began by acknowledging the other members of SC 3, Dr. Wayne Campbell, Dr. Steven Clinton, Dr. Anna Maria Siega-Riz, Dr. Lucile Adams-Campbell, Dr. Barbara Millen, the Committee chair, and Dr. Michael G. Perri, consultant. Dr. Pérez-Escamilla discussed the scope of SC 3 which was previously shared in detail at the January, March, July, and September meetings. This subcommittee is focused on motivators/facilitators/barriers of dietary and physical activity behaviors and interventions to improve adherence to dietary and physical activity recommendations. Dr. Pérez-Escamilla highlighted acculturation and household food insecurity as two important contextual factors that shape the ability of Americans to achieve recommended behaviors focusing on 1) family shared meals; 2) eating out; 3) food and menu label use; 4) sedentary behaviors; 5) self-monitoring; and

6) sleep patterns. It was noted that these behaviors and interventions are assessed with 1) diet and physical activity outcomes; 2) weight/anthropometry outcomes; and 3) chronic disease risk/biomarker outcomes.

Dr. Pérez-Escamilla stated that acculturation and the mobile health topic areas were presented at the July meeting and that mobile health was later combined with the self-monitoring topic area. He also noted the key topic areas including household food insecurity, family shared meals, eating out, sedentary behavior, self-monitoring, and sleep patterns were discussed at the September meeting, leaving the final topic area, food and menu labeling, to be presented at this meeting. Dr. Pérez-Escamilla highlighted that Dr. Marie-Pierre St-Onge was an invited expert for SC 3 that spoke on sleep patterns, dietary outcomes, and obesity risk. She presented information on sleep deprivation and dietary as well as physical activity behaviors to SC 3. Dr. St-Onge noted in her presentation that there is little evidence on dietary patterns and sleep quality. Dr. Pérez-Escamilla also noted that Dr. Perri has continued to help SC 3 to understand the evidence examining the association between behavioral strategies, including self-monitoring, with dietary and weight outcomes. Finally, Dr. Pérez-Escamilla introduced Dr. Clinton to address the food and menu labeling topic.

Invited Expert

Dr. Marie-Pierre St-Onge, Assistant Professor, New York Obesity Research Center, Institute of Human Nutrition, College of Physicians and Surgeons, Columbia University

Consultant SC Member

Dr. Michael Perri, Dean, College of Public Health and Health Professions and The Robert G. Frank Endowed Professor of Clinical and Health Psychology, University of Florida

Food and Menu Labeling

Dr. Clinton spoke on the topic of food and menu labeling. The questions for this topic are: “What is the effect of use of food and menu labels on measures of food selection and dietary intake in U.S. population groups?” and “What is the effect of use of food and menu labels on body weight across population groups?” The analytical framework, inclusion/exclusion criteria, and literature search results were presented. Literature searches identified 1,274 articles and seven articles were ultimately included in a systematic review. Dr. Clinton noted in the description of the evidence that the seven studies assessed the effect of restaurant menu calorie labeling on food selection.

Dr. Clinton then presented draft key findings and limitations noting that no studies were conducted in actual restaurant settings limiting the external validity of the findings. The draft conclusion statement stated “Limited and inconsistent evidence does not support an association

between menu calorie labels and food selection or consumption under laboratory conditions.” The Committee grade was limited. Draft research recommendations were then presented.

Discussion

Dr. Story asked why the subcommittee chose a limited grade for this topic and did not grade as insufficient evidence since there were only seven studies that were all in laboratory conditions. Dr. Clinton responded that the conclusion is still in draft form and noted a new recent study by Nikolaou which studied the effects of adding food labeling at a college cafeteria. Dr. Story inquired whether the subcommittee would be able to further discuss the grading, and Dr. Clinton agreed.

Dr. Hu followed up on Dr. Story’s question mentioning he was aware of some recent studies that were not in laboratory settings, but were with free living populations. Dr. Clinton agreed that observational literature is out there although this literature search was looking for randomized controlled trials (RCTs). Dr. Hu followed up by saying these quasi-experimental studies in free living populations may be more relevant than randomized controlled trials when looking at the impact of food labeling on actual purchases and behavior in fast-food settings. Dr. Clinton noted that this information could be put in context with the subcommittee’s systematic review. Dr. Millen shared that she felt the criteria the committee used are strong, but that the research within laboratory settings is limited and justifies the limited grade. Dr. Hu suggested that RCTs may not be the most informative study design for these questions. Dr. Lichtenstein noted that the literature Dr. Hu is suggesting is also quite mixed, and Dr. Millen noted that other settings, such as the workplace, may be studying this as well. Dr. Nelson commented that she thought adding quasi-experimental studies and other study designs would be beneficial to add to this question.

Dr. Anderson commented as a follow up to the original question and mentioned that as a member on the sodium working group, she has found that when people read food labels with low sodium, they equate that with low flavor and possibly low taste. Dr. Anderson suggested this dimension be included in the research recommendations. Dr. Anderson stated there is emerging literature around replacing sodium with spices and herbs and suggested it would be helpful to communicate this information to consumers so they understand that flavor is not being compromised when they see lower sodium on a food label. Dr. Clinton noted that SC 3 just finished this systematic review and agreed there is additional data on this topic within other study designs. Dr. Clinton thanked the committee members for their comments and questions.

Subcommittee 4 (SC 4): Food and Physical Activity Environments

Dr. Mary Story, SC 4 Chair, began the presentation by recognizing the other subcommittee members, Dr. Lucile Adams-Campbell, Dr. Wayne Campbell, Dr. Miriam Nelson, and Dr. Barbara Millen. Dr. Story then reviewed the scope for SC 4, which is looking at the food environment in key settings such as neighborhood and community food access, early care and education, schools, and worksites, and stated that these are primary places where foods are consumed. Subcommittee 4 is also interested in understanding and assessing the role of the food environment in promoting or hindering healthy eating in key settings and identifying the most effective evidenced-based diet-related approaches and policies (“what works”) to improve health and reduce disparities. Dr. Story stated that subcommittee members would be discussing evidence on two topics: 1) schools, and 2) worksite. Dr. Story stated that no experts had been invited to present to SC 4 and that the subcommittee does not have any consultant members. She then turned the presentation over to SC 4 member, Dr. Campbell.

Dr. Campbell started his presentation noting that there are four questions that the Committee reviewed related to the schools topic area. He stated that these questions have all been presented and reviewed at a previous DGAC meeting. Dr. Campbell then stated that the purpose of today’s discussion is to review the findings for the question related to school-based policies and dietary intakes of school-aged children, which was evaluated using existing systematic reviews. After describing the key findings, Dr. Campbell presented the draft conclusion statement: Strong evidence indicates that implementation of school policies for nutrition standards to change the availability, accessibility and consumption of foods and beverages sold outside the school meal programs (competitive foods and beverages) are associated with higher quality purchasing behavior and dietary intake while at school (Grade: Strong). Dr. Campbell handed the presentation over to Dr. Adams-Campbell.

Dr. Adams-Campbell began her presentation for the worksite topic area by reviewing the four questions that are being evaluated. She then stated the four questions, which include the impact of worksite-based approaches and policies on dietary intake and weight status of employees. Dr. Adams-Campbell presented the first question on worksite-based approaches and dietary intake, and after describing the evidence and key findings, she presented the draft conclusion statement: Moderate evidence indicates that multi-component worksite approaches can increase fruit and vegetable consumption of employees (Grade: Moderate). Dr. Adams-Campbell then presented the second question focused on worksite-based policies and dietary intake. After describing the evidence and key findings, she presented the draft conclusion statement: Moderate and consistent evidence indicates that worksite nutrition policies, alone and in combination with individual-level strategies, can improve the dietary intake of employees. Multi-component strategies appear to be more effective than single-component strategies (Grade: Moderate). Dr. Adams-Campbell then presented the third question focused on worksite-based approaches and weight status. After describing the evidence and key findings, she presented the draft conclusion statement: Moderate and consistent evidence indicates that multi-component worksite approaches targeting physical

activity and dietary behaviors favorably impact weight-related outcomes (Grade: Moderate). Dr. Adams-Campbell then presented the final question focused on worksite-based policies and weight status. After describing the evidence and key findings, Dr. Adams-Campbell presented the draft conclusion statement: The body of evidence assessing the impact of worksite policies on the weight status of employees is very limited (Grade: Not assignable). Dr. Adams-Campbell then presented the draft implications statement for the worksite topic area: Existing evidence indicates that worksite approaches focused on dietary intake can increase fruit and vegetable intakes of employees. Multi-component programs targeting nutrition education in combination with dietary modification interventions are found to be effective. Environmental modification in conjunction with a variety of worksite policies targeting dietary modification inclusive of point-of-purchase information, catering policies, and menu labeling are also effective. Given that approximately 64 percent of adults are employed and spend an average of 34 hours per week at work, the workplace remains an important setting for environmental interventions for health promotion and disease prevention. Dr. Mary Story facilitated a discussion with the DGAC about the school and worksite topic areas.

Discussion

Dr. Neuhouser noted that the evidence presented in the schools topic area appeared to focus more on restricting the sale of certain foods (i.e., competitive foods and beverages) and asked if there was evidence to the contrary, for example switching out refined grains for whole grains. Dr. Campbell responded that the systematic review did not include experimental designs like Dr. Neuhouser described. The systematic reviews were focused on reviewing policies related to competitive foods. He did note that other questions in the schools topic area look at specific approaches, like switching out whole milk for skim milk, and these were shown to be effective for altering dietary intake.

Dr. Neuhouser stressed that data conducted by SC 1 demonstrates that the diets of young children [ages 2-8 years old] [as measured by Healthy Eating Index scores] were healthier and the poorest dietary intake was among adolescents from 9-13 years old and among adolescents from 14-18 years old. School meals present an imperative opportunity to improve children's dietary intake. Dr. Campbell agreed and stated that the subcommittee will consider this comment as the implications statement is developed.

Dr. Pérez-Escamilla agreed with the Dr. Neuhouser's comments and stressed that equity components are also considered, so that the quality of food is not only determined by the school's resources. Dr. Campbell agreed and noted that some of the most effective and robust improvements were seen in lower income schools or schools that served lower income or disadvantage populations.

Dr. Siega-Riz asked a question related to the worksite topic area, specifically about the grading of the conclusion statement related to the worksite policies and weight question. Dr. Adams-Campbell stated that although the systematic review included a number of studies, only one of the studies specifically addressed the question at hand so the SC was not able to grade the evidence.

Dr. Millen asked if more information could be pulled from the worksite literature to provide detail about what worked to improve dietary intake or weight or what were the most effective strategies. Dr. Adams-Campbell said the SC will review this and see what else can be included in implications statement.

Dr. Siega-Riz asked if the DGAC felt that the schools interventions were enough to improve dietary intakes of children or if a stronger call to action needs to be made. Dr. Campbell responded that from a research standpoint, we need better evaluation of dietary intake both within and outside of the school environment and that the length of interventions needs to be longer in order to support or refute their use.

Cross-Cutting Topic: Sodium Working Group

Dr. Cheryl Anderson, Chair, Sodium Working Group reported on the activities of the Working Group, whose members included the Committee Vice-Chair, Dr. Alice H. Lichtenstein, Dr. Wayne Campbell, and Dr. Steven Clinton. The Working Group did not receive input from any experts or consultants between September and November 2014.

Dr. Anderson reviewed the scope of the Sodium Working Group (SWG) activities which are to describe the relationship between sodium intake, blood pressure, and cardiovascular disease; describe how sodium recommendations may be influenced by the interaction of sodium and potassium; and identify strategies to promote recommended intake of sodium.

Dr. Anderson provided updates on six questions. 1) What is the relationship between sodium intake and blood pressure in children? 2) What is the relationship between sodium intake and blood pressure in adults? 3) What is the relationship between sodium intake and cardiovascular disease? 4) What is the interrelationship of sodium and potassium on BP and CVD outcomes? 5) What individual strategies can be used to promote recommended intake of sodium (implications drafted)? 6) What policies and environmental (e.g., reformulation, menu labeling) strategies can be used to promote recommended intake of sodium (implications drafted)?

Dr. Anderson reviewed the evidence base and draft conclusion statement the SWG presented in September on the relationship between sodium intake and blood pressure in children and adults. The evidence considered for children consisted of the 2010 DGAC systematic evidence review covering Jan 1970-May 2009 and updated evidence consisting of two newly published studies. The Committee concluded that a moderate body of evidence has documented that as sodium intake decreases, so does blood pressure in children, birth to 18 years of age.

The evidence review for the relationship of sodium and blood pressure in adults was informed by the 2013 American Heart Association (AHA)/American College of Cardiology (ACC) Guideline on Lifestyle Management to Reduce Cardiovascular Risk. The Committee's draft conclusion statement concurred with the 2013 AHA/ACC Lifestyle guideline. Strong evidence exists to advise adults who would benefit from blood pressure lowering to lower their sodium intake. The Committee concurs with the 2013 AHA/ACC Lifestyle guideline that moderate evidence exists to advise adults who would benefit from blood pressure lowering to consume no more than 2,400 milligrams (mg)/day sodium and to aim for further reduction of sodium intake to 1,500 mg/day for even greater reduction in blood pressure adding that even without achieving the two aforementioned goals, reducing sodium intake by at least 1,000 mg/day lowers blood pressure. Dr. Anderson noted the moderate evidence grade reflects the fact that there is less clinical trial data available. The Committee concurs with the 2013 AHA/ACC Lifestyle guideline that there is strong evidence to advise adults who would benefit from blood pressure lowering to combine the Dietary Approaches to Stop Hypertension (DASH) dietary pattern with lower sodium intake.

With respect to sodium and cardiovascular disease (CVD) in children and adults, the 2015 DGAC updated the systematic reviews done by the Institute of Medicine (IOM) and NHLBI with four prospective cohort studies. Based on their review, the 2015 DGAC determined that changes were not warranted to the IOM and NHLBI conclusion statements. The 2015 DGAC concurs with the IOM, which concluded that although the reviewed evidence on associations between sodium intake and direct health outcomes has methodological flaws and limitations, when considered collectively, it indicates a positive relationship between higher levels of sodium intake and risk of CVD. This evidence is consistent with existing evidence on blood pressure as a surrogate indicator of CVD risk (DGAC Grade: Moderate).

The 2015 DGAC concurs with the IOM conclusion that evidence from studies on direct health outcomes is inconsistent and insufficient to conclude that lowering sodium intakes below 2,300 mg per day either increases or decreases risk of CVD outcomes (including stroke and CVD mortality) or all-cause mortality in the general U.S. population. The DGAC Grade was Grade not assignable. Dr. Anderson noted that the IOM grade was "Grade not determined; outside the statement of task."

The 2015 DGAC concurs with the NHLBI, which concluded that a reduction in sodium intake by approximately 1,000 mg/day reduces CVD events by about 30 percent and that higher dietary sodium intake is associated with a greater risk for fatal and nonfatal stroke and CVD (DGAC grade: Limited). The 2015 DGAC concurs with the NHLBI conclusion that evidence is not sufficient to determine the association between sodium intake and the development of heart failure (DGAC grade: Not Assignable).

Draft implication statements for sodium and blood pressure and sodium and CVD were presented. Because of the strong link between blood pressure and CVD, achievement of the recommendations to reduce sodium intake requires an emphasis on policies and population-based strategies. The draft implication statements for both outcomes had similar format and content with respect to the individual and population-based strategies to reduce sodium intake.

With respect to the interrelationship of sodium and potassium on blood pressure and CVD outcomes, the Committee used the NHLBI Lifestyle Work Group Evidence Report. First, evidence is not sufficient to determine whether increasing dietary potassium intake lowers blood pressure (DGAC Grade: Not assignable). Second, in observational studies with appropriate adjustments (e.g., BP, sodium intake, etc.), higher dietary potassium intake is associated with lower risk for stroke (DGAC Grade: Limited). Third, evidence is not sufficient to determine an association between dietary potassium intake and CHD, heart failure, and cardiovascular mortality (DGAC Grade: Not Assignable).

The Committee's implication statements for blood pressure and CVD outcomes acknowledge that current potassium intakes are suboptimal and encourage increased potassium intake through potassium-rich foods.

Discussion

Dr. Hu commented on the comprehensive nature of the report. He posed two related questions. First, he commented on the similarities in the two draft implication slides for blood pressure and CVD. Dr. Anderson confirmed that the wording is very similar, adding that that the SWG elected to provide separate statements; the relationship between blood pressure and CVD is such that similar strategies and implications are needed.

Dr. Hu requested clarification on the draft conclusion statements for CVD. One statement is graded moderate evidence and the other is graded limited evidence. Dr. Hu thought the statements were somewhat contradictory. He noted that the NHLBI conclusion pertaining to the evidence for 1,000 mg/day reduction lowering CVD events by 30 percent was too specific. Dr. Anderson explained the basis for the evidence statement grades. With respect to the NHLBI

systematic evidence review conclusion that a reduction in sodium intake of approximately 1,000 mg/day reduces CVD events by about 30 percent, the evidence was graded limited. When all of the sodium reduction evidence is considered however, the strength of evidence grade is moderate, as reported in the *Journal of the American College of Cardiology* report. Dr. Anderson and the Working Group members agreed to review the conclusion statement.

Dr. Neuhouser commented that a lot of information exists on the role of food processing and product labeling. Given the socio-ecological perspective the Committee is using, it might be useful to think of multiple levels or perspectives that impact food choices and food practices. This is not reflected in the current statements. Specifically, consumers should be encouraged to do more cooking at home and to use raw and lower sodium ingredients as strategies to reduce sodium consumption. It might be useful to include this in the socio-ecological model as a means of encouraging people to cook instead of eating pre-prepared foods. Dr. Anderson agreed this suggestion is consistent with the Committee's recommendations.

Dr. Pérez-Escamilla endorsed Dr. Neuhouser's recommendations to mention home cooking and food preparation. He added that improved labeling, currently a complementary policy recommendation, should be elevated to the level of policy. Dr. Pérez-Escamilla noted that we have research evidence on consumers' understanding of labeling so we need to elevate food labeling to a policy level instead of as an adjunct policy strategy to reduce sodium intakes. Dr. Anderson commented on other innovative methods that are being used to teach consumers how to prepare flavorful foods without salt and these can be brought forward as well. Dr. Lichtenstein added that if recommendations for cooking are included, the Committee should also comment on the value of teaching basic cooking in schools from grades K-12.

Dr. Millen noted that the added dimension of the SC 1 presentation on metabolic disease prevalence and the co-occurrence of multiple risk factors—BP, overweight and obesity, dyslipidemia, tracking of blood pressure with age and so forth makes for a rather complex presentation. Dr. Millen stated that the NHLBI and AHA/ACC reports emphasize lifestyle management and making use of available health services. We need to complement environmental strategies with appropriate one to one and small group interventions that are effective. In other words, call out the recommendations from Lifestyle report on prevention interventions.

The Committee recessed at approximately 3:20 pm for 15 minutes. Discussions resumed at 3:35 pm.

Cross-Cutting Topic: Added Sugars Working Group

Drs. Mary Story and Mim Nelson, Co-Leads, Added Sugars Working Group (ASWG) reported on working group's activities. The other members of the group are the Committee Chair, Dr. Barbara Millen, the Committee Vice-Chair Dr. Alice H. Lichtenstein, Dr. Cheryl Anderson, Dr. Marian Neuhouser, Dr. Frank Hu, and Dr. Wayne Campbell. The ASWG did not receive input from any experts or consultants between September and November 2014.

Dr. Story described the scope of the ASWG review which is to inform potential recommendations for added sugars by examining the relationship between the intake of added sugars and health and evaluating the amount of added sugars that can be consumed while meeting food group and nutrient needs within the USDA Food Patterns. The ASWG also considered the evidence on low-calorie sweeteners, which have been used to replace added sugars in some foods and beverages. The definition of added sugars is the proposed FDA definition in the March 2014 Proposed Rule to the revision of the Nutrition and Supplements Facts Label.

Dr. Story outlined the topics that would be addressed during the presentation, which included the evidence of the association of added sugars and body weight/obesity, type 2 diabetes, cardiovascular disease, dental caries, and food group and nutrient adequacy. She noted that Dr. Campbell would also present the evidence for low-calorie sweeteners and body weight/obesity and type 2 diabetes.

Dr. Nelson described the evidence used for the added sugars, key findings, and the draft conclusion statement which includes the wording, "Strong and consistent evidence indicates that intake of added sugars from food and/or sugar-sweetened beverages are associated with unfavorable body weight in children and adults." The evidence base consisted of the 2013 World Health Organization (WHO)-commissioned systematic review/meta-analysis supplemented with two systematic review/meta-analyses published since 2013.

Dr. Campbell reported on the evidence review for added sugars intake and type 2 diabetes (T2D). The ASWG considered five systematic reviews/meta-analyses published between January 2010 and August 2014. Increased consumption of SSBs is consistently associated with increased risk of T2D; the positive associations between SSBs and T2D are attenuated, but still exist, after adjusting for BMI. The draft conclusion statement notes that higher consumption of added sugars, especially sugar-sweetened beverages increases the risk for T2D among adults and the relationship is not fully explained by weight (DGAC Grade: Strong).

Dr. Hu reported on the relationship between added sugars intake and CVD. The analytical framework, literature search criteria, results, limitations, and evidence description were described. The draft conclusion states that evidence from prospective cohort studies indicates that higher intake of added sugars, especially in the form of sugar-sweetened beverages, is

consistently associated with increased risk of hypertension, stroke, and coronary heart disease in adults. Observational and intervention studies indicate a consistent relationship between higher added sugars intake and higher blood pressure and serum triglycerides (DGAC Grade: Moderate).

Dr. Story reviewed the evidence considered for the question on the relationship of added sugars intake and dental caries. The ASWG used an existing report based on WHO-commissioned systematic review of 65 papers, a majority of which reported on children. The draft conclusion statement read, “The DGAC concurs with the World Health Organization’s commissioned systematic review that there is moderate consistent evidence supporting a relationship between the amount of sugars intake and the development of dental caries among children and adults. There is also evidence of moderate quality showing that caries are lower when free-sugars intake is less than 10% of energy intake.” (DGAC Grade: Moderate)

Dr. Neuhouser reviewed USDA food pattern calorie limits for added sugars that were developed as part of the SC 1 food pattern modeling analysis project. Tabular data showing the calorie limits (absolute and percent of total calories) by eating pattern and daily calorie level were presented. The added sugars allowances assume that 45 percent of the empty calories come from added sugars and 55 percent from solid fats. Overall, 4-8% of total calories can be consumed as added sugars in the USDA food patterns. Dr. Neuhouser stated that the current intake of added sugars for the total U.S. population ages 1+ years is 268 calories or 13.4% of total calories. The current level of intake far exceeds the limits in the healthy eating patterns.

Dr. Campbell presented the low-calorie sweetener (LCS) evidence. Although the ASWG initially identified four different topics: CVD, T2D, dental caries and body weight, evidence was only identified for T2D and body weight. The evidence on body weight included three systematic reviews/meta-analyses published between January 2010 and August 2014. A variety of low-calorie sweetener compounds were used in the RCT and PCS studies that were included in the evidence review. The RCT evidence consistently indicated that LCSs (vs. sugar-containing foods and beverages) modestly reduce body weight in adults. When evidence for adults and children are combined, LCSs modestly reduce BMI, fat mass, and waist circumference.

The ASWG’s two-part draft conclusion statement reads, “The DGAC concludes that moderate and generally consistent evidence from short-term RCTs conducted in adults and children supports that replacing sugar-containing sweeteners with LCSs reduces calorie intake, body weight, and adiposity.” (DGAC grade: Moderate) Further, “Long-term observational studies conducted in children and adults provide inconsistent evidence of an association between LCS and body weight as compared to sugar-containing sweeteners.” (DGAC Grade: Limited)

The second LCS question related to LCSs and T2D. Two systematic reviews/meta-analyses published between January 2010 and August 2014 were used. Both reviews examined artificially-sweetened soft drinks and T2D. A positive association between artificially sweetened soft drinks and T2D risk was observed in both studies, but this association was confounded by weight status (BMI). Dr. Campbell added that the designs of the studies precluded the assessment of cause and effect relationships. The disparate findings when BMI is versus is not included in the statistical models added complexity to the topic review. The DGAC draft conclusion statement states, “Long-term observational studies conducted in adults provide inconsistent evidence of an association between LCS and risk of type 2 diabetes.” DGAC Grade: Limited.

Dr. Nelson presented the ASWG’s draft implications statements. The statements summarized the adverse effects of excess added sugars intakes on health, recommendations for healthy eating patterns and limited intakes of added sugars, and strategies to help consumers make informed food and beverage choices to reduce added sugars intakes to no more than 10% of total daily calories intake. The ASWG felt this goal was reasonable and achievable given the current intake levels of approximately 13.4% of calories.

Discussion

Dr. Story moderated the Committee discussion. Dr. Nelson remarked on the strength of the evidence. The triangulation of the food pattern modeling and evidence related to elevated disease risks came together nicely.

Dr. Millen concurred and commended the ASWG for identifying and reviewing literature and adding *de novo* work to produce a clear and coherent story. She recommended *a propos* the ASWG recommendations, that the recommendations be formatted with grams and household/teaspoon measure equivalents for added sugars. Dr. Nelson agreed. Dr. Neuhouser mentioned that the SC 1 tables have been modified to accordingly to improve their readability and utility.

Dr. Lichtenstein commented that she was struck by information presented on liquid calories, principally, sugar-sweetened beverages (SSBs). She asked about the contributions of other dietary sources of added sugars that may be less obvious, noting that many prepared foods contain added sugars. She asked if it would be beneficial to be more specific and possibly present the results on the basis of liquid versus solid sugars.

Dr. Story noted that the dental caries evidence reviews did not classify liquid versus solid sugars and she did not know if other studies made this distinction. Dr. Lichtenstein proposed

mentioning this when information is available to improve communication. The additional specificity might raise awareness of the amounts of sugars in glasses of beverages versus other foods that are consumed in meals. Dr. Neuhouser commented that there is likely to be considerable variability depending on the foods consumed. She noted that in the food pattern modeling slide she presented earlier, 123 grams of added sugars were available for a 2000 kcal eating plan. This amount could be consumed in small amounts throughout the day or all at once perhaps in the form of a SSB. Perhaps it would be useful to mention this when the guidance is formulated. Dr. Lichtenstein agreed and felt it is important to think of ways to communicate this—i.e., where sugars come from in messaging efforts. Dr. Nelson felt strongly that the addition of added sugars information on the Nutrition Facts label will permit consumers to assess their added sugars intakes. Dr. Lichtenstein agreed and urged the group to adopt a multi-pronged approach, noting that some people do not read food labeling.

Dr. Pérez-Escamilla commented that since taste preferences develop early in life, we need policies to prevent excess exposure in young children. Dr. Nelson agreed that additional emphasis might be needed for children. Dr. Story stated the ASWG will take the Committee's feedback into consideration and will seek to strengthen their statements accordingly.

Dr. Millen asked if the evidence provided a coherent presentation on the mechanisms of action of sugars. The evidence might be clear for dental caries, but what about other health outcomes? Should this be summarized in the review as well? Dr. Nelson commented that it appears excess calories is the main driver. Dr. Calloway added that the reviews focused primarily on outcomes and provided fairly brief discussion of the mechanisms. Dr. Millen suggested including this information when it is available.

Dr. Hu commented on a point that was raised earlier since he was temporarily cut off from the Committee discussion due to problems with his phone line. Dr. Hu commented that the evidence for SSBs is stronger than for “added sugars” per se. Most trials and observational studies used SSB exposure as they contribute about 50-55 percent of total added sugars intakes. Dr. Nelson agreed with Dr. Hu and asked that the SC 1 report include percent added sugars from foods and SSBs in perhaps a pie chart or other form. Dr. Neuhouser thanked Dr. Nelson for her comment and she responded that information on added sugars from foods as consumed will be provided in the food categories data.

Dr. Hu asked how the artificial sweeteners evidence will be integrated with the work done by Subcommittee 5 (SC 5) on artificial sweetener safety. Dr. Nelson was not certain, noting that the ASWG and SC 5 reviews used different approaches. The ASWG low-calorie sweetener reviews focused on specific health outcomes and did not deal with safety, whereas the SC 5 review only looked at the safety of aspartame, not efficacy for weight reduction. Dr. Nelson indicated that an

effort will be made to cross-reference and integrate the information compiled by the subcommittees and ASWG.

Dr. Millen asked for additional comments. Hearing none, Dr. Millen asked Dr. Hu to provide an update on the Saturated Fat Work Group activities.

Cross-Cutting Topic: Saturated Fat Working Group

Dr. Frank Hu, the Saturated Fat Working Group (SFWG) Lead, reported on the activities of the group, whose members include the Committee Chair, Dr. Barbara Millen, the Committee Vice-Chair, Dr. Alice H. Lichtenstein, and Dr. Tom Brenna. The Working Group did not receive input from any experts or consultants between September and November 2014.

Dr. Hu stated that the scope of the SFWG review is to examine the relationship between intake of saturated fat and risk of cardiovascular disease (CVD). The SFWG used existing reports for their review. Two systematic reviews and six meta-analyses published from January 2009 to August 2014 were identified. An emphasis was placed on reviews that examined the macronutrient replacement for saturated fat. The analytic framework, evidence base and draft conclusions were presented at the fifth public meeting in September. Dr. Hu reviewed the draft conclusions that were presented earlier. The remainder of his presentation reviewed the SFWG's implication statements.

The implication statements provide recommendations on saturated fat intake, and they specify the replacement macronutrients. A dietary pattern that is low in saturated fat and emphasizes intake of vegetables, fruits, and whole grains; includes low-fat dairy products, poultry, fish, legumes, non-tropical vegetable oils and nuts; and limits intake of sweets, sugar-sweetened beverages and red and processed meats is recommended. Additionally, non-hydrogenated vegetable oils that are high in unsaturated fats and relatively low in SFA, instead of animal fats or tropical oils rich in SFA, should be recommended as the primary source of culinary fat.

A healthy dietary pattern is relatively low in saturated fatty acids, but it can include lean meats and non- and low-fat dairy products in amounts that are consistent with the USDA pattern. Dr. Hu emphasized that simply reducing saturated or total fat in the diet by replacing it with any type of carbohydrates is not effective in reducing risk of CVD, and thus dietary advice should put more emphasis on the types of fat rather than the total amount of fat. Finally, carbohydrates sources in the dietary pattern should be primarily fiber-rich whole grains, legumes, fruits, and vegetables and should minimize the consumption of refined grains and added sugars. The consumption of "low-fat" or "nonfat" products with high amounts of refined grains and added sugars should be discouraged.

Discussion

Dr. Story asked if there is evidence that the saturated fat in whole milk is different from saturated fat found in other foods and/or has different effects on blood lipids. In Dr. Hu's opinion, there is no difference, though he added that this is a complex question given the saturated fat profiles in dairy foods. In his opinion, the data are too sparse to say more.

Dr. Campbell asked about red versus processed meats in the implication statement wording and whether additional clarification is needed. Dr. Hu recommended that SC 1, SC 2, and the SFWG coordinate and adopt consistent language and terminology in their conclusion and implication statements.

Dr. Neuhouser asked about the first bullet in the draft conclusion statement. She suggested adding "(sources not defined)" text from last bullet to be consistent. Dr. Hu agreed

Dr. Story asked if it is possible to give examples in the implications statement as to the type of oils to consume for CVD benefits. She added that it might be worthwhile to take a look at the wording on tropical oils and to provide further detail about composition and available commercial products.

Dr. Campbell commented on the conclusion statement that there is limited evidence of benefit for MUFA. He questioned how this conclusion aligns with recommendations in favor of Mediterranean patterns, which emphasize olive oils. Dr. Hu responded that U.S. and western European studies typically report little or no association of higher MUFA with coronary heart disease or sometimes even positive associations because with the typical western pattern, MUFA and SFA come from same sources—meats and dairy. In interventions using olive oil or where olive oil is the primary culinary oil, one sees more evidence of CVD benefit. There is a divergence of evidence and sources of MUFA. Olive oil is just one component of the Mediterranean diet pattern so one cannot say that olive oil is solely responsible for the Mediterranean diet pattern benefits. Dr. Lichtenstein agreed, adding that since these are U.S. Dietary Guidelines, we need to think of concomitant types of diet and lifestyle behaviors the U.S. population adheres to.

Dr. Millen commented on the conclusion statement slide—and confounder of western diet related to MUFA. In effect, no substitution occurs with Western diet patterns because as MUFA increases, so does SFA. Perhaps clarify the confounding issue –it is really the point that the fatty acids travel together. Increasing plant-based foods and non-animal MUFAs would be a real change. SFWG agreed to review and revise the conclusion statement to reflect the discussion.

Dr. Siega-Riz emphasized Dr. Lichtenstein’s point related to U.S. eating patterns. She indicated it is important to keep in mind that the implication statements in SC 1 and SC 2 are that the diet patterns are beneficial can be tailored to individual and cultural preferences.

Dr. Neuhouser commented on Dr. Story’s suggestion to list types of oils to use. It is important to define tropical oils in the report and to include the types that are used by consumers today as some have become very popular to the extent they are almost touted as health foods. Dr. Tom Brenna urged caution, adding that the tropical oils available in the marketplace today, such as virgin coconut oils, differ from the tropical oils used in the 1980s which are reflected in the findings from older studies. This topic was not examined specifically. It appears that it is not just the fatty acid profile that matters. The recommendations the Committee is making are robust but we need to be careful not to overstate what the evidence shows. Dr. Hu asked if the USDA staff could compile information on tropical oils fatty acid profiles. Dr. Neuhouser responded that SC 1 will try to do this.

Dr. Millen asked if additional text is needed in the implication statement that mentioned tropical oils; simply saying “tropical oils” might not be sufficient or clear. Dr. Millen suggested the subcommittees and SFWG integrate and summarize the tropical oils and fatty acid evidence in a consistent manner.

After the SFWG discussion ended, Dr. Millen moved on to discuss the integration of findings and the Committee’s future plans/next steps.

Integration of Findings

The following points were made by the respective subcommittee chairs and working group leads to describe an integration of the findings from each group.

Subcommittee 1

- Data reviewed by the SC come from What We Eat in America.
- The SC found a number of shortfall nutrients (calcium, vitamin D, magnesium, potassium, fiber) and several overconsumed nutrients (sodium, saturated fats).
- Nutrition-related health conditions persist at high and untenable levels. They include overweight and obesity, CVD, type 2 diabetes, and some cancers.
- Some food group intakes are poor and trend data show little improvement over time.
- There is some room for optimism in that the diets of young children have relatively high diet quality as measured by HEI. However, diet quality drops significantly among preadolescents

and adolescents, and that is a real concern. Greater knowledge of the reasons for this drop would be valuable.

- Sodium, added sugars, and saturated fat consumption is very high, and diet quality is generally poor.
- The SC has developed three healthy dietary patterns – the Healthy U.S. Pattern, the Healthy Mediterranean-style Pattern, and the Healthy Vegetarian-style Pattern.

Subcommittee 2

- The SC found several common characteristics of dietary patterns associated with positive health outcomes. The patterns are high in vegetables, fruits, whole grains, low-fat dairy, fish, legumes, and nuts; moderate in alcohol; lower in red and processed meats; and low in sugar-sweetened beverages and refined grains.
- The evidence comes from randomized clinical trials and is strong for CVD and body weight/obesity, and moderate for type 2 diabetes.
- The findings from SC 2's work complement those of the other subcommittees across the DGAC, which strengthens the findings.

Subcommittee 3

- This SC's work has been focused on the individual, who is at the inner core of the socio-ecological model. We must find ways to motivate and facilitate change at the individual level.
- The SC's work has revealed a number of promising interventions, including not eating at fast-food restaurants, family-shared meals, self-monitoring, and timely feedback from nutrition and health professionals.
- The social and environmental context has a strong effect in hindering or facilitating healthy dietary patterns. Household food insecurity and recent immigration are critical factors. Stronger policies are needed to ensure household food security, and nutrition programs and the health care system needs to pay attention to recent immigrants to help them retain the healthy dietary patterns they bring from their home countries.
- Local health systems and local food systems have a large role to play in supporting individuals in pursuing healthy eating.

Subcommittee 4

- SC 4's work on the food environments and the settings in which people obtain and consume food—early childhood education settings, schools, and worksites—clearly demonstrates that they can positively affect intakes and influence body weight.
- It is encouraging that multicomponent programs in the early childhood and schools setting showed beneficial effects.
- Programs that combined nutrition and physical activity are most effective.
- Family involvement also is critical.

- Action is needed to ensure access to healthy and affordable food.

Subcommittee 5

- A major area of this SC's work focused on dietary patterns and sustainability, and the SC found a clear synergy between the two. A dietary pattern that is higher in plant foods and lower in animal foods is health-promoting and sustainable both now and into the future.
- Seafood, both farmed and wild-caught, is safe and sustainable.
- Coffee consumed at moderate levels is not associated with increased risk of major chronic disease and is associated with lower risk of CVD, type 2 diabetes, and some cancers.

Sodium Working Group

- Reductions in sodium intake are needed to achieve health benefits, and strategies are needed across settings to achieve reductions.
- Reductions in sodium are amenable to the socio-ecological model. At the individual level, strategies like home cooking from scratch and engaging with family and social networks can help lower sodium intake. At the community level, strategies such as cooking classes, policy changes, food industry action, and education programs can be effective.

Saturated Fats Working Group

- Strong evidence supports the current recommendation to replace saturated fats with polyunsaturated fats.
- Replacing saturated fats with carbohydrates, especially refined carbohydrates, provides no benefit. (Low saturated fats does not equal low total fat/high carbohydrates.) Replacing saturated fats with unsaturated fats, especially polyunsaturated fats, has a clear benefit for CVD.
- These findings are consistent with those of SC 2's and SC 1's dietary pattern modeling and reinforce the importance of the overall dietary pattern (not just nutrients or individual foods).

Added Sugars Working Group

- Consumption of added sugars at high levels has a deleterious effect on obesity, type 2 diabetes, CVD, and dental caries.
- The U.S. population needs to reduce its consumption of added sugars.
- Food pattern modeling shows that added sugars in the range of 3-9% of calories can be included in a healthy dietary pattern.
- The DGAC recommends an upper limit of 10% of calories from added sugars. Changes on the Nutrition Facts panel, including adding grams and teaspoons of added sugars and the % Daily Limit, will help consumers reduce intake of added sugars.

Physical Activity

- An enormous gap exists between knowledge of the powerful benefits of regular physical activity and physical activity behaviors.
- Action is needed at all levels—individual, systems, policies—to help physical activity become a normative behavior in the U.S. population.

Closing Remarks from the DGAC Chair

Dr. Millen made the following closing remarks before the meeting adjourned.

- Drivers of behavior are challenging.
- Complementary approaches at individual and population level have been demonstrated.
- Modifying settings to make healthy behaviors normative is key.
- Actions across the lifespan is critical.
- We are part of the way there, but we have a way to go.
- Dietary pattern work was successful: that there are several healthy and sustainable patterns for the short- and long-term is a strong message from this work.
- Our healthy dietary pattern approach is strongly evidence-based.
- We know what works.

Adjourned 5:32 p.m.