Dietary Guidelines Advisory Committee Meeting

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Held at the
USDA South Building, Jefferson Auditorium
1400 Independence Avenue, SW
Washington DC
January 29-30, 2009

Meeting Summary

Thursday, January 29, 2009 (8:08 a.m.)

Participants

Dietary Guidelines Advisory Committee: Dr. Linda V. Van Horn (Chair), Dr. Naomi K. Fukagawa (Vice-Chair), Dr. Cheryl Achterberg, Dr. Lawrence J. Appel, Dr. Roger A. Clemens, Dr. Miriam E. Nelson, Dr. Shelly M. Nickols-Richardson, Dr. Thomas A. Pearson, Dr. Rafael Pérez-Escamilla, Dr. Xavier Pi-Sunyer, Dr. Eric B. Rimm, Dr. Joanne L. Slavin, Dr. Christine L. Williams

Co-Executive Secretaries: Ms. Carole Davis, Ms. Kathryn McMurry, Dr. Shanthy Bowman, Ms. Holly McPeak

Others: Dr. Robert Post, RADM Penelope Slade-Sawyer, Dr. Sarah Linde-Fuecht, Ms. Joan Lyon, Ms. Alanna Moshfegh, Dr. Susan Krebs-Smith, Dr. Trish Britten

Welcome and Opening Remarks

Dr. Robert Post, Acting Executive Director of the Center for Nutrition Policy and Promotion (CNPP), USDA, welcomed participants to the second meeting of the 2010 Dietary Guidelines Advisory Committee (DGAC). He said that, though CNPP has the lead responsibility for managing the process for establishing the Dietary Guidelines and the Committee's activities, the process is a joint effort, including the Agricultural Research Service and HHS's Office of Disease Prevention and Health Promotion. The Committee's work will result in an advisory report to the Secretaries of USDA and HHS. The work of the 2010 DGAC remains consistent with and committed to the Departments' mutual interest in providing dietary guidance for Americans to support health and reduce the risk of chronic illnesses. The Departments will facilitate the Committee's application of its work for federal nutrition policy.

The Committee is governed by the Federal Advisory Committee Act (FACA). Meetings are announced in the Federal Register and are open to the public. The Committee receives written comments online at www.dietaryguidelines.gov and will receive oral comments at this meeting.

Meeting minutes will be posted on www.dietaryguidelines.gov. He gave the floor to Dr. Van Horn.

Dr. Van Horn, Chair of DGAC, said that, since the first meeting, the Committee has begun identifying the issues that warrant a literature review and has established subcommittees. The Fluid and Electrolytes subcommittee has been renamed the Sodium, Potassium, and Water subcommittee; it is chaired by Dr. Appel. Dr. Nickols-Richardson chairs the Nutrient Adequacy subcommittee. Dr. Pi-Sunyer chairs the Energy Balance and Weight Management subcommittee. Dr. Slavin chairs the Carbohydrates and Protein subcommittee, formerly called the Carbohydrates subcommittee. Dr. Rimm chairs the Ethanol subcommittee. Dr. Pearson chairs the Fatty Acids subcommittee. Dr. Clemens chairs the Food Safety and Technology subcommittee. Dr. Van Horn Chairs the Science Review subcommittee. The subcommittees' goals are to begin formulating scientific review questions, identifying high-priority questions, and proposing where outside experts will be needed to fill major information needs. The subcommittees have identified cross-cutting areas that require additional discussion, including macronutrient distribution, liquid versus solid added sugars, alcohol intake, probiotics and prebiotics, fish consumption, dietary patterns, and satiety. The Science Review subcommittee has been working to clarify the scientific approach. She reviewed the agenda and introduced the public oral testimony portion of the meeting.

Public Oral Testimony

Guy Johnson, PhD, Executive Director of The McCormick Science Institute, presented on the benefits of herbs and spices, both to health and to the flavor of food. Studies suggest that several spices and herbs have a powerful antioxidant effect, some have an anti-inflammatory effect, and some contribute to satiety and increased basal metabolic rate. Herbs and spices can be used to help reduce sodium intake and to add to the healthfulness of the diet without adding calories. He noted that herbs and spices can also have a role in food safety by impeding the formation of heterocyclic amines during grilling. He encouraged the Committee to keep spices in mind when discussing Dietary Guidelines.

Ann Marie Krautheim, MA, RD, LD, Senior Vice President of Nutrition Affairs at the National Dairy Council, raised three key points: the importance of the Dietary Guidelines, dairy's unique nutrient package, and the validity of the recommended three to four daily servings of dairy. Americans consume an increasing amount of high-calorie, nutrient-poor foods, and the Dietary Recommendations can reverse the trend. Dairy foods provide essential nutrients, such as calcium, potassium, phosphorous, magnesium, zinc, protein, riboflavin, and vitamins A, B12, and D. Dairy foods are nutrient-dense and available in forms safe for people with lactose intolerance. The potassium in milk blunts the effect of sodium on blood pressure. Health authorities recommend three to four servings of dairy daily for better nutrient uptake, better diet quality, and improved bone health and reduced risk of chronic disease.

Ceci Snyder, MS, RD, Assistant Vice President for Consumer Marketing at the National Pork Board, said Americans are eating too many calories and too few nutrients. Less than half of Americans consume the recommended 5.5 ounces of meat or meat equivalent and that 75 percent of school-age children are not reaching the MyPyramid recommendation for the meat

and beans group. She pointed out that lean red meat is especially nutritionally dense. A 3-ounce serving of lean beef or pork provides the same amount of protein as a cup and a half of legumes, with half the calories. She noted the role of protein in satiety, preserving lean body mass, and preventing sarcopenia. She said the published science supports lean meat's role in a healthy diet and asked that DGAC consider this in their deliberations.

Sue Levin, a dietitian for the Physicians' Committee for Responsible Medicine, said obesity has increased, despite the Dietary Guidelines. The guidelines were written for healthy people, who make up a minority of Americans. She noted high rates of cardiovascular disease and diabetes. She said animal products in the diet are high in fat and cholesterol and devoid of fiber. She recommended that the Guidelines support low-fat diets and include more information on the benefits of a vegetarian diet, which should be recommended as the ideal diet. She said science supports a low-fat, plant-based diet for optimal health and that vegan and vegetarian diets offer nutritional benefits, including protection from diabetes, heart disease, obesity, and cancer. She urged the Committee to rely on the research when writing the Guidelines.

Mary K. Young, MS, RD, Vice President for Nutrition with the National Cattlemen's Beef Association, said the industry has responded to government recommendations that Americans reduce their fat and cholesterol intake. Today's pork is 30 percent leaner than 30 years ago. Today's beef is 20 percent leaner than 14 years ago. Producers have used feeding and breeding techniques to produce leaner animals, and meat in the supermarkets is practically devoid of external fat. Pork tenderloin and sirloin steak have less than less than 2 grams of saturated fat in a 3 ounce serving. Lean beef or pork cuts, which make up the majority of beef and pork sales, have only one gram more of saturated fat per serving than a serving of skinless chicken breast. Not all animal fat is saturated fat. In beef, 50 percent of the fat is monounsaturated, and one third of the fat in pork is stearic. She urged the Committee to consider the nutrient density and reduced fat in lean red meat.

Neal Barnard, MD, President of the Physicians' Committee for Responsible Medicine, said prospective studies show that people who eat meat have shorter lifespans and a greater risk of cardiovascular disease and other illnesses. Merely limiting meat intake only reduces LDL cholesterol levels by 5 percent. A vegetarian or vegan diet reduces LDL cholesterol by 13 to 37 percent. He said vegetarian diets reduce the risk of heart disease, obesity, diabetes, and cancer. He said dairy products have problems similar to meat and that the nutrients in milk are available from plant sources. He concluded that the Guidelines should emphasize the health benefits of avoiding meat and the importance of making vegetarian and vegan foods a part of children's routines, including in school lunches.

James O. Hill, PhD, President of the American Society for Nutrition, offered ASN's service as a resource for evaluating the science. ASN endorses the recommendations made by Dr. Janet King, Chair of the 2005 Dietary Guidelines Advisory Committee, in her letter to HHS and USDA. The recommendations were that there be transparency in the translation of DGAC's report into the Dietary Guidelines; that food accessibility, marketing, economics, and culture be considered when reviewing the Guidelines to increase compliance; that non-evidence-based approaches supplement the systematic review, including food modeling, to fit the needs of subpopulations; and that the 2010 process address nutrient density (especially that of beverages),

behavioral changes to improve compliance, and the health-effects of different protein sources, nutritional supplements, specific functional foods or food components. ASN also endorsed the Physical Activity Guidelines and suggested a set of guidelines encompassing dietary and physical activity recommendations, since separating nutrition from physical activity may confuse the public and diffuse the message.

Christina Pirello, the host of *Christina Cooks* on National Public Television, said the healthcare crisis is directly related to people's diets, so changing eating habits can solve the problem. However, advertising creates a market for unhealthy food and misinforms consumers. She said the Guidelines should encourage consumption of vegetables, fruits, beans, and whole unprocessed grains and discourage consumption of saturated fats, sugar, and junk food. She said the Guidelines should provide more information on the benefits of vegetarian and vegan diets, that consumption of plant foods is linked to longevity, and that plant foods are more environmentally-friendly.

Stephen Abelman from the March of Dimes said his organization promotes healthy nutrition for women of child-bearing age in order to improve the health of babies. According to a recent survey, less than 40 percent of women of childbearing age take a daily multivitamin containing folic acid, which would reduce the incidence of neural tube birth defects. Other studies show that most women do not achieve the recommended 400 micrograms of folic acid from naturally folate-rich foods. This raises the importance of enriched grain products. He encouraged the Committee to maintain a balance between whole and enriched grains in the 2010 Guidelines in order to reduce birth defects.

Rosa Gonzalez, a citizen from Virginia, told of her experience. After being diagnosed with metabolic syndrome, diabetes, and high blood pressure, under the supervision of a dietician, started a vegetarian diet. She weighed 225 pounds at the time. Since becoming a vegetarian, she has lost nearly 100 pounds. Her blood pressure and her cholesterol level have gone down. Her diabetes is in remission. She said the Guidelines should support alternatives, such as a vegetarian diet.

Pamela Popper, PhD, ND, Director of the Wellness Forum, said her forum helps people reverse degenerative disease by making diet and lifestyle changes. Her organization reverses degenerative conditions by putting the patient on a near vegetarian or vegan diet. She said there is evidence for a plant-based diet as a means of preventing and treating disease. However, the Guidelines are not consistent with such a diet, since they give too much allowance for animal foods, dairy products, fats, oils, and refined foods. She said the best diet for humans is a near vegetarian or vegan, and the Guidelines should support such a diet.

Mary Van Elswyk, from the Martek Biosciences Corporation, urged the Committee to consider the availability, sustainability, and quality of food sources, especially sources of long-chain omega-3 fatty acids. The current Guidelines suggest two fish meals per week to reduce the risk of cardiovascular disease. Additional data suggest that n-3 LCPUFA supplementation of over 500 mg per day may significantly reduce blood pressure and heart rate, and there is evidence of DHA omega-3 improving neurocognitive health and development. She said the 2005 report overlooked the importance of DHA omega-3 among pregnant and nursing women,

women of childbearing age, children, and the elderly. Current expert group recommendations include consumption of at least 200 mg DHA/d during pregnancy and nursing from low-risk sources, such as low-methylmercury fish and dietary supplements from marine algal oil. Since meeting that level can be difficult, the Committee should consider fortified foods and dietary supplements in their recommendations.

Nina Gonzalez, a junior at Stafford High School in Fredericksburg, Virginia, has researched vegetarian options in her school cafeteria. When she became a vegetarian, the cafeteria did not have meatless options. She worked with the county nutrition director to get vegetarian options on the menu. She encouraged the Committee to consider vegetarian options in the new Guidelines.

Cheryl Leahy, General Counsel for Compassion Over Killing, said the Guidelines should promote a vegan or plant-based diet, which offers the health benefits of reduced rates of heart disease, certain cancers, diabetes, and obesity. She said public opinion is moving in favor of plant-based diets. She added that animal agriculture is harmful to the environment, inefficient, and cruel to animals. Though vegetarianism is increasing, current subsidy programs do not reflect a priority on plant-based diets. She said the Guidelines should actively promote vegetarian and vegan diets.

Jamie Zoellner, PhD, RD, spoke on behalf of the residents of the Lower Mississippi Delta Region, a rural, impoverished region with extensive health and nutritional problems. She researched health and nutrition literacy in the area two years after the 2005 Dietary Guidelines and MyPyramid were released. Of those surveyed, 12 percent could identify the newest mypyramid.gov. Participants did not trust the Internet as an information source, preferring doctors and television. She encouraged the Committee to make disseminating culturally-appropriate dietary guidance in hard-to-reach populations a priority. She warned that relying on the Internet as a central mode of communication will widen the nutritional disparity gaps in the region. .

Lorelei DiSogra, EdD, RD, Vice President for Nutrition and Health at the United Fresh Produce Association, said her organization supports the fruit and vegetable recommendations from the 2005 Guidelines. For the new Guidelines, she recommended clearer and stronger recommendations to motivate people to eat more fruits and vegetables. She asked that the recommendation on fruits and vegetables be easy to understand, like the Five-A-Day program or a recommendation that half the plate be fruits and vegetables. She asked the Committee to consider the policy implications of the recommendations.

Jennifer McGuire, MS, RD, of the National Fisheries Institute said Americans eat very little seafood. The most popular information source about seafood is the media, but the media is often inaccurate or misleading. The Guidelines should have clear, unequivocal recommendations on fish. The recommendations should be based on science and scientifically-measured outcomes. She recommended that the Committee adopt FDA's holistic approach to the net effect of eating fish, since elements and nutrients do not exist in a vacuum. She said eating fish is a dietary change that can immediately benefit Americans' health.

Maureen Ternus, MS, RD, Executive Director of the International Tree Nut Council Nutrition, Research and Education Foundation, said very few people actually consume the FDA-qualified health claim for nuts and heart disease recommended amount of nuts per day. Since the 2005 Guidelines were published, there have been more studies showing the positive role of nuts in reducing the risk of cardiovascular disease and diabetes and a positive effect on weight and satiety. Approximately 60 percent of nuts are consumed as snacks, and many people obtain 25 percent of their calories from snacks. Replacing some snacks that are high in refined carbohydrates with 1/4 to 1/3 cup of nuts would increase the nutrient density of the diet and reduce the risk of chronic illness.

Anne Banville of the USA Rice Federation, made three points. First, USA Rice supports the goal of increasing whole grain consumption, but it should not be at the expense of enriched grains, which provide folic acid. Second, most consumers do not understand the role and benefit of carbohydrates. She urged the Committee to include education on the need for carbohydrates and on the different kinds of carbohydrates in the 2010 Guidelines. Third, she recommended that the 2010 guidelines educate consumers on the number of calories they need daily, a Know Your Number campaign.

Constance Geiger, PhD, RD, CD, of the American Dietetic Association raised three points. First, she recommended that the Dietary Guidelines be updated every 10 years, not every 5 years, to provide more time both to strengthen the research base and for implementation. Second, she recommended that the Guidelines focus on food-based recommendations and meal patterns. Nutrient density and physical activity should be reviewed and reflected in the Guidelines, and types and amounts of food people should eat, as well as those they should limit, should be included. Finally, since fewer than 5 percent of Americans follow the Guidelines, consumer research should be included in the studies.

Alex Lewin, PhD, from the Center for Science in the Public Interest recommended several ways to strengthen the current recommendations. The salt guideline should be strengthened to make people aware of the risk of consuming excessive sodium, the daily limits for sodium, and the amount of sodium in restaurant and processed foods. The Dietary Guidelines should encourage Americans to switch from refined grains to whole grains and should steer consumers away from products that only appear to be whole grain. The Committee should advise on three crucial contributors to excessive calorie intake: soft drinks, portion sizes of calorie-dense foods, and restaurant food. Soft drinks are linked to obesity and are the number one source of calories in Americans' diets. The Guidelines should provide practical advice on limiting intake. The Guidelines should include advice on portion sizes. Eating out is linked to high calorie intake and obesity. The Guidelines should address limiting the intake of calories, saturated and trans fats, sugars, and sodium in restaurants. The sugars guideline should provide a quantitative recommendation for added sugars, using the MyPyramid limits. The Guidelines should establish a quantitative recommendation for trans fat. The Guidelines should be improved to provide better guidance on alcoholic beverages, including the risks and calorie content of drinks, including the calorie content of the mixers. The admonition on limiting cholesterol should be retained. Finally, he recommended that the Committee look at the evidence linking food dyes to behavior problems in children.

Michael Greger, MD, Director of Public Health and Animal Agriculture for the Humane Society of the United States, highlighted three recent studies. First was a Harvard study by L. Djousse, et al, linking egg consumption in males to all-cause mortality, linking eating one egg a day or more to a shorter life. He noted that eggs contain cholesterol and can contain salmonella. The second study, by Dr. Helund, et al., concluded that incorporation of N-glycolylneuraminic acid into some human cancers facilitates tumor progression. The only dietary source for the substance is meat and dairy products. He suggested recommending legumes as a protein source over meat. The third study, by Dr. Sarter, et al., showed unprecedented weight loss in obese individuals who were encouraged to follow a vegetarian diet. The patients showed an average weight loss of over 50 pounds at two years. He said that the vegetarian diet was linked to longevity and encouraged the Committee to recommend a more plant-based diet.

Rob Bisceglie, Executive Director of Action for Healthy Kids, which focuses on improving nutrition and physical activity in schools, spoke on the importance of nutrition and physical activity to learning and the importance of stressing foods of high nutrient density. Studies have linked diet quality to academic performance. He asked that the Committee recommend that school-age children eat a healthy breakfast every day. He said there are few simpler, more cost-effective interventions that can be taken. He also hoped that the Committee would reinforce the position that physical activity plays a profound role in health. He emphasized the continued need to encourage consumption of nutrient-dense foods. He stressed the importance of getting the message to low-income communities in a culturally appropriate manner.

Heather Katcher from the Washington Center for Clinical Research spoke on behalf of Barbara Wasserman, M.D., Chairperson of the Howard County Nutrition and Physical Activity Coalition. Howard County, Maryland, has a childhood and adolescent overweight and obesity rate of 31 percent, and Dr. Wasserman sees a lot of obesity-related medical problems. She urged HHS and USDA to look at studies that demonstrate the benefits of plant-based diets and the dangers of over-consumption of animal-related foods. She referred the Committee to Dr. Colin Campbell's study linking a plant-based diet to a reduced risk of colorectal cancer. She referenced a study by Dr. Bernard et al. that showed that a low-fat vegan diet can improve glycemic control and cardiovascular risk factors in those with type 2 diabetes. She said a plant-based diet can prevent, arrest, and reverse coronary artery disease and that increased body fat increased body fat increases the risk of certain cancers. She requested that the Committee prepare guidelines that advocate minimizing the intake of animal-based and processed foods.

Charles Barker, Executive Vice President and Chief Science Officer at the Sugar Association, said sugar is a safe, natural, and beneficial food ingredient. Although the Association is concerned about obesity rates, restricting dietary sugar is an outdated and flawed approach. Targeting a single nutrient is counterproductive, since nutritional adequacy is determined by the totality of the diet. He referred the Committee to his written comments for evidence. He advocated a common-sense approach to diet, stressing moderation, portion control, physical activity, and healthy lifestyles. He asked that the updated Guidelines de-emphasize the inordinate focus on sugar.

Alex Hershaft, PhD, President of FARM, said the epidemic of obesity and related diseases are linked to meat and dairy products, which contain saturated fat, cholesterol, hormones, antibiotics,

pathogens, and sodium. He said the national diet is shaped largely by politics, advertising, and the processed food industries. This impact is seen in the School Lunch Program, which sets lifelong eating habits. He said the 2010 Guidelines should reflect a spirit of change and should be science-based, not influenced by tradition or politics. He said a vegan diet is the healthiest diet and that the Guidelines should say so.

Bernice Deshay, a concerned citizen, shared her experience of a vegan diet improving health in her family. Her mother was one of thirteen children. All of her mothers' siblings died before 40 years of age due to cardiovascular problems, while her mother lived to be 93, having adopted a vegan diet. Ms. Deshay expressed concern that the US is encouraging bad diets worldwide. She urged the Committee to follow the science and recommend a vegetarian diet.

Richard Hanneman spoke for the Salt Institute. He said evidence-based medicine should not start with a foregone conclusion; it should look at health outcomes. He said there were two recent studies that suggest that normal sodium diets in comparison to low-sodium diets may actually be detrimental in congestive heart failure patients. He said the 2110 Dietary Guidelines Advisory Committee should take a step back on sodium.

Michelle Matto, RD, of the International Dairy Foods Association said the Association supported the 2005 recommendation of three servings of dairy per day and recommended that it be carried over to the 2010 Guidelines. She pointed out that dairy products are nutritionally dense and have benefits for the skeletal system as well as benefits for hypertension, weight maintenance, insulin-resistance syndrome, and type 2 diabetes. Dairy is a unique nutrient package, and there are options for people who are lactose intolerant, including reduced-lactose formulations and yogurt and cheese, which are naturally low in lactose. She recommended that the Committee recommend at least three servings of dairy per day; encourage consumption of nutrient-dense foods, including dairy products; encourage lactose-reduced dairy products as an alternative for those avoiding lactose; and specifically allow for discretionary calories to increase consumption of nutrient-dense foods like flavored milks and yogurt.

Betsy Faga, President of the North American Millers' Association, noted that the 2005 Guidelines addressed the importance of both enriched and whole grain products and agreed with the assessment. The milling industry has responded with new and improved whole grain products. She encouraged the Committee to put out a message consistent with FDA and CDC's positions on folic acid in enriched flour.

Michael I. McBurney, PhD, from DSM Nutritional Products, Inc., asked the Committee to include fortified foods and nutritional supplements in the Guidelines. With more than two-thirds of Americans overweight and obese, the 2005 Guidelines recommended that people eat fewer calories, be more active, and make wiser food choices. Supplements and fortified foods can aid in that effort for people to eat less and reduce their energy intake while obtaining essential nutrients.

Suzanne Havala Hobbs, RD, nutrition advisor for the Vegetarian Resource Group, encouraged the Committee to emphasize a plant-based diet in the Guidelines. Studies show that a vegetarian diet confers cardiovascular health benefits. Vegans have the lowest high blood

pressure and hypertension rates. She referred to studies in which vegetarianism is linked to reduced diabetes, overweight, and obesity. She urged the Committee to publicize the risks related to consumption of excessive red and processed meat. She also asked that plant-based protein sources not be categorized in the meat food group.

Adriane Griffen, Director of Health Promotion and Partnerships for the Spina Bifida Association, urged the Committee to update the 2010 Guidelines with a specific recommendation of at least 400 micrograms of folic acid for women of childbearing age and to incorporate messages about the importance of folic acid consumption into materials associated with the Guidelines. Adequate daily folic acid consumption significantly reduces the risk of spina bifida and related birth defects. Only a third of US women get the recommended amount of folic acid every day, and the Guidelines can educate women on the nutrient's importance.

Cathy Kapica, Vice President of Global Health and Wellness at Ketchum, spoke on behalf of the Canned Food Alliance. Urged that the Guidelines continue to include and promote canned products that are consistent with the overall dietary recommendations. Studies have confirmed the benefits of canned foods. The canning process locks in nutrients at the peak of freshness and extends the shelf life. Canned foods are comparable in nutrient contribution to fresh, or frozen foods, and some canned foods have more antioxidants than their fresh counterparts, and the heat treatment process enhances the bioavailability of some nutrients. Canned fruits and vegetables are affordable and do not contribute significantly to America's sodium and sugar intake. Although there have been many food-borne illness outbreaks linked to produce, none of them have been linked to canned products.

Catherine Ruhl of the Association of Women's Health, Obstetrics, and Neonatal Nurses, spoke for the National Council on Folic Acid. Folic Acid is necessary for proper cell growth, and it helps prevent neural tube birth defects that occur early in pregnancy. She supported the recommendation that Americans consume 400 micrograms of synthetic folic acid daily, either from fortified foods or multivitamins. This dosage can reduce neural tube birth defects by 70 percent.

Andrew Shao, Vice President of Scientific and Regulatory Affairs for the Council for Responsible Nutrition, noted that Americans often fail to meet the recommended intakes for a variety of nutrients and suggested that the Committee recommend a multivitamin to fill the gaps. He pointed out that adequate nutrient intake is linked to reduced risk of chronic disease. He supported the 2005 Guidelines' recognition of dietary supplements and encouraged the Committee to clarify the role of dietary supplements.

Saurabh Dalal spoke on behalf of the Vegetarian Union of North America, the International Vegetarian Union, and the Vegetarian Society of DC. She said a vegetarian diet has health advantages and that eating animal products is detrimental due to increased cholesterol, lack of fiber, and diet-related diseases. She asked the Committee to emphasize plant foods and alternatives to animal products. She added that a vegetarian diet can provide for all nutritional needs. She urged that the Committee incorporate a vegan diet into the Guidelines.

Penny Kris-Etherton, PhD, RD, a 2005 DGAC member, spoke for the American Heart Association. AHA has established a series of dietary, physical activity, and weight control guidelines. She made several recommendations to the committee. First, the Guidelines should set a limit on sugar intake, restricting it to less than half of discretionary calories. Second, the Committee should emphasize fish and plant foods as protein sources. Other protein sources should be lean. Third, The Committee should encourage consumption of healthier fats and recommend consumption of 250 to 200 mg of EPA and DHA per day and request that the Institute of Medicine (IOM) update the dietary reference intake (DRI) recommendations on essential fatty acids. The recommendations for saturated fatty acids and trans fatty acids should be reduced. Fourth, the sodium recommendation should be reduced to 1500 mg per day.

Dawn Moncrief Director of Well-Fed World, said reduced meat consumption, vegetarianism, and veganism reduces many chronic diseases. The benefits of a plant-based diet should be included made clear, and a plant-based diet should be encouraged. Refined, processed, high-fat or high-sugar foods should be discouraged. Since studies have linked animal foods to health problems, animal-based products should be discouraged, not recommended. Recommendations should be easy to understand and should provide details in each category for health-conscious consumers. She suggested renaming the food groups to correspond to their purpose, such as renaming the meat and dairy groups the protein and calcium groups.

Ilene Smith, RD, Senior Vice President and Associate Director of the Food and Nutrition Practice of Ketchum, said that, in 2008, Ketchum commissioned Food 2020, a global study on consumers' food concerns. The results showed that consumers want more information, choices, accountability, and control. Taste, quality, and price are top considerations in choosing food, followed by health benefits. The importance of taste makes it difficult to change consumers' eating habits. Consumers also want to know what's in their food and where it comes from, not only in terms of ingredients, but also in terms of conscience-based concerns. Consumers said that, in the future, their concerns will be nutritional value and health benefits.

Amie Hamlin, Director of the New York Coalition for Healthy School Food, spoke on the quality of school lunches. The majority of school meals are not health-supporting. She recommended that, since school meals should be consistent with the guidelines, the food groups be renamed. The meat and beans group change to the protein group, and that plant proteins be the primary source, since they are healthier. She said the dairy group should become the calcium group, since many people cannot digest dairy. She also noted that raising livestock causes global warming. She said grain consumption should be primarily whole grain. She asked that the statement that most calories should come from plant sources, which was removed from the 2005 Guidelines, be restored and emphasized.

Chris Phillips spoke for David Katz, MD, MPH, FACPM, FACP, representing NuVal, LLC, which has developed the Overall Nutritional Quality Index. The system computes a score for food and beverage products. He said food choices are usually not made with a plan in mind. Effective dietary guidance should encompass both the whole diet and specific food choices. The ONQI takes a number of factors, including nutritional content and health outcomes, into consideration to score foods with a single number. Mr. Phillips encouraged the Committee to look at all the available systems as ways of simplifying the message to consumers and offer the

public some advice on their value. He asked that the Guidelines consider such systems and to address relevant principles for food-level guidance, which would help the public choose among systems.

Mindy Kursban appeared as a private citizen. She told of her experience of switching to a vegan diet to improve her health and lose weight. Her father, who did not change his diet, has chronic diet-related diseases. She asked that three recommendations be included in the 2010 Guidelines: the inclusion of information on the benefits of a vegan diet and a recommendation of this diet for everyone, accurate information about the health risks of all meats and their non-recommendation, and the removal of dairy from the Pyramid and of recommendations that Americans consume dairy.

Kathleen McMahon, Director of Nutrition and Scientific Affairs for the William Wrigley, Jr., Company, suggested that chewing gum be considered for inclusion in the Guidelines. The primary benefits of chewing gum are reduction of dental caries and as a weight management tool. Studies show that chewing sugar-free gum after eating stimulates saliva, which neutralizes plaque acids; clears sugars, acids, and food debris; and remineralizes the enamel. The American Dental Association awarded a seal of acceptance to sugar-free gums. Chewing gum can help weight management, since it can serve as a substitute for a snack and as an appetite suppressant.

Julie Obbagy, RD, Director of Scientific Affairs for the Soy Foods Association of North America, said soy products are high in nutrients Americans should consume more of and low in those Americans should eat less of. Soy foods contain high-quality protein equivalent to eggs and milk. She recommended that the 2010 Dietary Guidelines feature soy foods more prominently, to reflect changing dietary preferences.

Eva Rand, RD, said the number of obese and overweight people in the US, as well as the rates of diet-linked disease, indicate that the Food Guide Pyramid has not been useful. None of her patients have learned anything from the Pyramid. She said people do not understand the Pyramid and suggested instead a Food Guide Plate. She encouraged the Committee to devote more attention to plant-based diets.

David Easley, MD, psychiatrist at the Center for Cognitive Therapy, said food processing removes potassium from food and replaces it with sodium. This causes intracellular loss of potassium throughout the body. The cardiovascular effect causes tightening of muscles, impotence, failure to respond to insulin, and obesity. In the brain, the effects of low intracellular potassium are irreversible, causing autism, attention deficit disorder, and behavior problems.

Kathy Hoy from Produce for Better Health Foundation said the current Guidelines are solid, overall. PBH supports continuing to base the guidelines on evidence-based science. She made three recommendations on properly translating the messages to the consumer. First, the Guidelines should highlight that dietary supplements do not replace fruits and vegetables. Second, the 2010 Guidelines should not only emphasize what people should eat more of, but also what they should eat less of. Third, she encouraged the Committee to recognize that fruits and vegetables are under-consumed in the US. This is probably due to advertising of other, less-

nutritious foods. Fruits and vegetables should be promoted aggressively through coordinated efforts of government agencies, PBH, industry educators, and individuals.

Becky Domokos-Bays, Director of Food and Nutrition Services for Alexandria City Public Schools in Virginia, spoke on behalf of the School Nutrition Association. Schools participating in the School Lunch or School Breakfast programs are required to serve meals consistent with the Dietary Guidelines for Americans, and they are committed to serving the most nutritious meals possible within the reimbursement rates. Since 2007, SNA members have begun proactively implementing the recommendations of the 2005 DGAs. SNA supports dietary guidelines that provide consistent standards for schools throughout the country. The guidelines should allow for a consistent and understandable meal pattern for school meals that is practical, achievable, and applicable to competitive foods sold outside of the program. SNA believes that the DGAs should apply to all foods and beverages sold in schools. Implementing this would require collaboration with all stakeholders. The Guidelines should be practical, achievable, and written in plain language. SNA looks forward to working with DGAC.

Maureen Storey, Senior Vice President for Science Policy for the American Beverage Association, said good health is not just about diet but also about a lifestyle that includes healthy choices, such as physical activity. ABA encourages the consumption of a balanced, moderate, varied diet and adequate physical activity to maintain energy balance. No one food or beverage should be branded as good or bad. She said the 2010 DGA should focus on the total diet, physical activity, and the role energy plays in maintaining a healthy weight. Additionally, she suggested a guideline for hydration. The IOM has stated that water is the most important nutrient for the body, and all beverages contribute to daily hydration needs.

Diana Zuckerman, PhD, President of the National Research Center for Women and Families, first addressed methylmercury in fish. FDA has recently released a draft report that has been strongly criticized and that has methodological flaws. She encouraged the Committee to not be influenced by that report. The 2005 report recommended a limit of 12 ounces of fish per week for pregnant and nursing women. However, only certain fish are high in mercury. She suggested that the Guidelines distinguish between fish that are and those that are not high in mercury. The second issue was Bisphenol A, an estrogen in the linings of canned food and beverages. NIH and CDC have found that the chemical gets into the food and beverages and into the body. People with high Bisphenol A levels are more likely to have diabetes and heart disease, and it may affect cognitive development and mood. She hoped the Committee would look at these issues.

Chair Van Horn thanked the presenters.

Discussion of the Nutrition Evidence Library

Ms. Joan Lyon, Center for Nutrition Policy and Promotion, USDA, presented on how the Committee and staff will use the Library. Following the meeting, the Committee will finalize and prioritize the research questions. Staff will upload the topic area outline and template tasks associated with conducting the evidence review for each question. Staff will assist the Committee in defining the literature search and sort plans for each question, and a research

librarian will conduct and document the literature searches in detail. When the results are received, staff will sort them first by title, then by abstract, using the Committee's inclusion and exclusion criteria. The subcommittees will then review and approve the articles to be included for the evidence-based review process. Evidence abstractors will then develop an evidence worksheet on each study.

When the search is completed and the papers have been identified and abstracted, the Committee will review the body of evidence and develop evidence summaries, conclusion statements with rationale, and an evaluation of the strength of the evidence. The Committee will develop the recommendation and supporting rationale for the Guidelines, based on all of the evidence. Once the Committee submits its report, the work will all be publically accessible.

Discussion

Dr. Nelson said it will be necessary to tolerate some ambiguities until the science is seen and the questions are well-defined. Ms. Lyon agreed that the questions can be refined along the way, provided that the process remains transparent.

Dr. Appel questioned the issue of grading the evidence and noted that rating the recommendations might reopen questions that were considered resolved. Chair Van Horn said that rating is important, since all evidence is not equal.

Dr. Pearson asked if there will be a master document for all of the questions. Ms. Lyon said the library portal will be online, and the subcommittees can structure them.

Dr. Perez-Escamilla asked about cases in which questions overlap. Ms. Lyon said staff has been looking to identify issues that come up in more than one subcommittee so that the Committee can decide how best to handle them.

(Lunch 11:18 a.m. - 1:14 p.m.)

Distributions of Usual Intakes of Nutrients and Food Groups in the United States

Ms. Alanna Moshfegh, Research Leader for the Food Surveys Research Group, presented summary data from *What We Eat in America*, the dietary interview component of the National Health and Nutrition Examination Survey (NHANES). Annually, two days of dietary intake data are collected on 5,000 individuals of all ages, using the Automated Multiple Pass Method (AMPM). The first interview is conducted in person, the second by telephone. AMPM is a computer-assisted, five-step dietary interview that includes multiple passes through the 24 hours of the previous day. The AMPM has been validated using a biomarker for energy expenditure, assessing mean energy intake within 11 percent of energy expenditure. Greater underreporting was found with higher BMI classifications, but underreporting was less than 3 percent for normal weight.

The data she presented assessed the adequacy of diets for 24 nutrients, based on the DRI standards, in nearly 9,000 individuals one year of age or older in 2001-2002. The observations

are used to statistically model an estimated usual intake. In response to a request from the Co-Executive Secretaries, she included choline and cholesterol in her data, as well as the nutrients in the report. Those data came from the two later surveys.

Very few people had intakes below their Estimated Average Requirements (EAR) for carbohydrates, selenium, niacin, and riboflavin. Across the population, only five percent had phosphorus intake below the EAR, but nearly half of adolescent females did. Most individuals had vitamin E intakes below the EAR, and a third to half of the population was below the EAR for vitamin C, vitamin A, and magnesium. Below-EAR levels of intake were most common in teens and the elderly for magnesium, and in teens and adults for vitamins A and C.

Nearly a third of the population had intakes of calcium at the level of Adequate Intake (AI), and females were less likely to meet the AI. Less than 5 percent of the population had potassium and fiber intakes above the AI. Nearly all individuals exceeded the AI for sodium. About 10 percent of individuals met the AI for choline, and females were less likely to meet the AI than males. For cholesterol, 35 percent of individuals had intakes above 300 mg. She said there is more data on the Food Surveys Research Group website.

Discussion

Dr. Pearson asked if there had been any changes in methodology among the studies, since he was interested in looking at change over time. Ms. Moshfegh said the AMPM method was adopted in 2002 and has been used since. She saw an increase in caloric intake over time.

Dr. Slavin asked about choline sources. Ms. Moshfegh said she hadn't looked at dietary sources.

Dr. Rimm asked about the quality of the measure for assessing ethanol intake. Ms. Moshfegh said she hadn't looked at ethanol. Dr. Rimm suspected that people underreport ethanol, which might account for some underreported energy.

Dr. Slavin asked about vitamin D. Ms. Moshfegh said vitamin D will be in the 2007-2008 data.

Dr. Appel asked about the precision of the measurements for different nutrients. Ms. Moshfegh said the analysis has not been done, but accurately remembering everything they ate and drank is difficult for the typical respondent. It is important to help the respondent remember all of their foods and to estimate portion size. Nutrients can then be calculated from the USDA National Nutrient Database for Standard Reference (SR).

Dr. Nickols-Richardson asked about individuals not meeting the EAR or AI to diet size, since the nutrients were linked to calories. Ms. Moshfegh said that could occur, and overweight people tend to underreport calories.

Chair Van Horn noted that there are a number of Americans who are below the recommended intakes of calcium, potassium, fiber, and choline but well above the recommended levels of sodium and cholesterol.

Susan Krebs-Smith, PhD, Chief of the Risk Factor Monitoring and Methods Branch in the Division of Cancer Control and Population Sciences at the National Cancer Institute (NCI), spoke about distributions of usual food intakes in relation to the MyPyramid recommendations. As the 2005 Dietary Guidelines pointed out, MyPyramid recommendations are similar to the DASH diet and are consistent with recommendations to control obesity, diabetes, heart disease, stroke, hypertension, cancer, and osteoporosis. She noted that the recommendations depend on appropriate energy intake levels and, within a given calorie level, eating too much in one area necessarily restricts intake in another. Usual intakes over time are the measure of interest. Twenty-four-hour recalls have advantages, but people do not eat the same thing every day; so they are a snapshot rather than an average. In other words, they measure usual dietary intake with some error. This source of error affects usual food intake distribution estimates. The mean of the 24-hour recalls can be used as an estimate of the mean of usual intake, but using unadjusted 24-hour recalls overestimates the portion of the population with very low or very high intakes.

A special issue of *The Journal of Nutrition* was published in 2001 to provide information on the diets of Americans and how they related to the Dietary Guidelines. A recurring theme in the data gaps and limitations sections was that it was impossible to assess distributions of usual dietary intake. But now NCI has developed the methodology to estimate usual dietary intake of foods for the population, using two 24-hour recalls.

The data presented today uses this methodology and data from the 2001-2004 National Health and Nutrition Examination Survey and the MyPyramid Equivalents Database. The tables for nearly all the food groups in the MyPyramid Equivalents Database and the percentage of energy from macronutrients are also available on the NCI website.

Since MyPyramid has no single set of recommendations, but rather recommendations that vary based on appropriate energy intake levels, the distribution of intakes are compared to the most conservative cut point. For consideration of insufficiency, intakes were compared to the minimum recommendation for each age/sex group. For examining the possibility of excessive intakes, the maximum recommendation was used.

For total fruit, intakes were below the recommendation up through the 75th percentile for most sex/age groups. Children do somewhat better because they tend to drink more juice than adults do.

For vegetable subgroups, including dark green, orange, legumes, and other vegetables, most people are below the recommendation. For dark green and orange vegetables, intakes through the 95th percentile are below the recommended amount among nearly all sex/age groups. Young children do slightly better with orange vegetables because their recommendations are lower, and vegetables like carrots and sweet potatoes are typically given to young children. For adolescents and young adults, intakes of total vegetables through the 95th percentile fall short of minimum recommendations.

Among all groups, consumption of whole grains through the 95th percentile was below the minimum recommended amounts. Total grain intakes were compared to both the minimum and maximum recommendations to identify potential excessive intakes. Among most sex/age groups, intake of total grains is sufficient. However, when compared to the maximum recommendations for an active lifestyle, intakes at the 90th and in some cases the 75th percentiles are above the maximum recommendations.

For some foods, there are concerns about both insufficient and excessive intakes, especially for vulnerable groups. One example is fish, with recommendations of 8 ounces of fish high in EPA and DHA per week for those with a previous cardiac event, and not more than 12 ounces per week of fish for women of child-bearing age, pregnant women, nursing mothers, and young children. Up through the 75th percentile, adult intakes are below 8 ounces per week, and at the 95th percentile of intake, none of the women or young children showed intakes greater than 12 ounces per week. These are intakes of all fish and seafood, not just fish that may be high in mercury.

Meat and meat alternates, which are measured in ounce equivalents of *lean* meat, are also compared to the minimum and maximum recommendations. For all age groups, intakes up through the 25th percentiles are below recommendations, and for some groups up through the 50th percentile or above are low. In contrast, about 25 percent of adult men and 10 percent of adult women have intakes in excess of the maximum recommendations.

For milk, yogurt, and cheese, intakes are below minimum recommendations through the 25th percentile for children, 50th for adolescent males, 75th of adult makes, and 90th percent for females in most age categories.

Most sex/age groups are below the recommendations for intake of oils. Intakes of solid fats and added sugars are compared to what can be considered upper level standards, and most are well above these levels. The recommended maximum intake for alcoholic beverages was up to one drink for women and two for men per day, and there was overconsumption at the high end of the distribution.

For all sex/age groups, 75 percent of the population had intakes of energy from solid fats, alcohol, and added sugars (SoFAAS) that exceeded the maximum recommendation for discretionary calories. SoFAAS represent a large portion of discretionary calorie intake.

Total fat intake recommendations are between 20 and 35 percent of calories. No sex/age group had total fat intake of less than 20 percent of all calories at the 5th percentile of intake. At the 75th percentile of intake and above, all groups had intakes of over 35 percent of their calories from total fat. Among all groups, intakes of saturated fatty acids at the 50th percentile exceeded the maximum recommendation.

Dr. Krebs-Smith concluded that a large swath of Americans have low intakes of fruit; vegetables, especially non-starchy vegetables; whole grains; milk, yogurt, and cheese; and oils. They have modest intakes of fish. They have sufficient, and in some cases excessive, intakes of total grains

and meats and meat alternates. They tend to have excessive intake of calories from SoFAAS and from saturated fat.

Discussion

Dr. Perez-Escamilla noted that it is clear that people underreport energy intakes as a function of their body mass index (BMI) category, but do we know if the macronutrient distribution of their reported food intake is more reliable? Dr. Krebs-Smith said there is little information on differential under-reporting of nutrients; however, there is less under-reporting of protein. If under-reporting were consistent across the board, there would be no difference. Keep in mind that some participants who are overweight may be on diets and cutting back on calories, or they may under-report because of social desirability. One thing of interest is that they are under-consuming the nutrient-bearing food groups, and still over-consuming solid fats and added sugars, despite the underreporting.

Dr. Fukagawa asked about subgroup analyses in terms of differences among regions, ethnic groups, socioeconomic class, or vegans vs. omnivores. Dr. Krebs-Smith said getting that information takes a lot of computing time and would require a very large sample size. Some of these analyses may be possible with four years of data. Regional differences cannot be calculated because of the way the sample is drawn.

Dr. Rimm asked if the excessive intake of SoFAAS was more from fats, sugars, or alcohol. Dr. Krebs-Smith said that data on solid fats, added sugars, and alcohol are shown in separate tables.

Dr. Nelson asked if there was a way to look into where the SoFAAS were coming from--from snacking, meals, desserts, or foods eaten away from home. Dr. Krebs-Smith said she does not know of any reports on when or where the calories are consumed. However, from other analyses they have done, it can be seen that a lot of the solid fat is coming from fattier meats, milk products containing fat, and grain-based desserts—such as cakes and cookies.

Dr. Appel asked about *trans* fats and other fatty acids. Dr. Krebs-Smith said individual fatty acids can be analyzed, but there is not yet a complete database on the amount of *trans*-fatty acids in foods.

Dr. Nickols-Richardson asked what the food group and nutrient information tell when looked at collectively—are certain groups more at risk? The nutrient needs could be met if the diet had better balance. Dr. Krebs-Smith said with MyPyramid, it has been demonstrated that nutrient needs can be met with appropriate choices. The public doesn't seem to get the message of how small the allotment of discretionary calories is.

Dr. Appel asked if a breakdown of the total calories from every food group was available. Dr. Krebs-Smith said that information was not available. Chair Van Horn said it would be useful to have the data to show how people who avoid certain foods don't meet nutrient needs. We all know that it is possible to be overweight and undernourished. To use our own data to document that could be very compelling because people don't quite understand that concept.

Updates to MyPyramid Food Intake Patterns

Patricia Britten, PhD, Technical Project Leader for MyPyramid with the Center for Nutrition Policy and Promotion of USDA, gave background on the Pyramid and how it was constructed, as well as ongoing research and work going into MyPyramid. In 1992, the original Pyramid first focused on total diet, rather than just ensuring that people get adequate nutrients. MyPyramid was built on that model. The guiding principles for the Pyramid are that it target overall health, use up-to-date research, focus on the total diet, and that it be flexible, practical, realistic, useful, and evolutionary. Commonly consumed foods are used, with multiple options for each food group. The food groups should be the same for every member of the family, and the Pyramid should be updatable over time. The food intake patterns are designed to meet DRI and Dietary Guidelines recommendations, based on twelve patterns that are designed to meet the energy needs of different population groups.

Intake patterns are determined by nutrient goals and calorie needs. The estimated energy requirement (EER) was determined for a reference-sized individual at a particular age, sex, and activity level. Many population groups overlapped, so they were categorized into twelve levels of calorie requirements and nutrient needs. MyPyramid adhered closely to the original food groups, and nutrient profiles were determined for each food group. The nutrient profile is a measure of what nutrients could be expected from a certain amount of food from a given food group, based on a weighted average of commonly-consumed items. These profiles were used in determining the recommended amounts from each food group. Once an intake pattern had been formed that met nutrient standards, the remaining calories were considered discretionary.

Dr. Britten gave some preliminary results on ongoing efforts. Nutrient profiles are being updated for all food groups. Intake patterns with these updated nutrient profiles will be available in the spring. A nutrient profile is being made for the milk group, which previously did not have one. Skim milk had been used as the representative food for the group. Item clusters are being identified, and work is being done on calculating a consumption-weighted nutrient profile. Some revised subgroups are being considered for the vegetable group in order to better meet nutrient needs. Another project is to identify tiers for foods within food groups based on their nutrient-density, as measured by the amount of SoFAAS (solid fats, added sugars, and alcohol) in the food. Then amounts and proportions can be recommended that provide guidance for choices within a food group. Tier one foods will be those lowest in SoFAAS.

Discussion

Dr. Perez-Escamilla asked about feedback ideas for the tier information. Dr. Britten said she is looking for consumer feedback on the materials and will do focus group testing. Additionally, she will look at how well the messages are understood. The tools will be interactive. Dr. Perez-Escamilla suggested including the tiers in food labels.

Dr. Achterberg hoped that as these datasets are built they will integrate with other existing data. Dr. Britten said the tiers project uses NHANES survey codes so it can be integrated.

Dr. Appel asked about putting nuts, seeds, and legumes into their own food group. Dr. Britten said it might work better to make recommendations within the meat and bean group, recommending more consumption of some subgroups and less of others. Since most people are not vegetarians, legumes may remain in the vegetable group, since they have vegetable-like nutrients. Products that cross groups are always an issue. Dr. Appel asked about reorganizing the food groups, at least the meat and beans group, by origin, for example, meat versus vegetable protein. Dr. Britten said that would suggest restructuring all of the food groups. Chair Van Horn said creating a protein group might be less confusing to consumers.

Chair Van Horn further commented that, since snacks make up so much of the diet, it is no longer clear what constitutes a meal, and the tiering of health benefits of different foods is important.

Dr. Nelson suggested renaming the meat and beans group to emphasize plant-based proteins. She commented that the Pyramid is already confusing without tiers. She asked if there is evidence that the Pyramid increases awareness of calories and suggested an image to raise calorie awareness. Dr. Britten said SoFAAS is a major problem with caloric intake, and tiering is a way to raise awareness of that. Dr. Nelson asked about research on the Pyramid's impact on food choices. Dr. Britten said there was little data on that.

Sodium, Potassium, and Water Subcommittee
Discussion Leader: Larry Appel

Dr. Appel said thirst and usual drinking behavior, especially fluid consumption with meals, is sufficient to maintain normal hydration. According to the IOM Committee on Fluid and Electrolytes, there is no chronic hydration problem in normal, healthy people. He said people with access to fluids who are not exposed to heat stress consume adequate levels of water. However, people exposed to heat or stress or performing sustained vigorous activity should purposefully drink water. The subcommittee did an initial literature search and a conference call with Dr. Michael Sawka, an expert on hydration, who agreed with the subcommittee's conclusions. The subcommittee is looking for data on increased fluid intake preventing kidney stones. So far, no convincing literature has been found. The subcommittee is also looking into water in the elderly, water with meals, the nutritional content of fortified water, and the recommendation for non-caloric fluid sources. He opened the floor for questions before moving on to potassium and sodium.

Dr. Slavin said the Carbohydrate and Protein subcommittee is looking at artificial sweeteners, which may overlap with non-caloric fluids.

Dr. Rimm asked if there was data on water and bladder cancer. He also suggested looking at the affect of water on the diet, regarding food choices and satiety. Dr. Appel said a literature search could be done.

Dr. Appel moved on to discuss potassium. He said diets rich in potassium can lower blood pressure, reduce the effects of sodium, reduce the risk of kidney stones, and possibly decrease bone loss. The recommendations are tentative, since the evidence is not strong. The subcommittee recommended at least 4,700 mg of potassium. Though African Americans are more likely to benefit from increased potassium, the literature neither enhances nor conflicts with the recommendation. The subcommittee had a conference call with Dr. Curtis Morris from the University of California, San Francisco, who agreed with the recommendation. The subcommittee plans a PICO (P = Population, I = Intervention, C = Comparators, O = Outcome) search, focusing on blood pressure and cardiovascular disease as outcomes. He opened the floor for questions on potassium.

Chair Van Horn commented that Americans have a very high intake of sodium and inadequate intake of potassium. Dr. Appel said a high sodium level and low potassium level usually go together. Chair Van Horn said it would take massive dietary changes for most Americans to get enough potassium. Dr. Slavin asked where all the sodium is coming from. Dr. Appel said sodium comes from many food groups, but much of it comes from bread as salt or sodium bicarbonate. Processed food is a large source. Sources of sodium is an area in need of research.

Dr. Appel turned to the third research question, the effects of sodium chloride on health. The subcommittee concluded that sodium chloride intake and blood pressure are directly linked. Daily intake of less than 2,300 mg is recommended. Many people will benefit from a further reductions in intake, to 1,500 mg, including hypertensive individuals, blacks, and middle-aged and older adults. Individuals should concurrently increase potassium consumption. The subcommittee has had two conference calls on sodium. IOM has a study on sodium reduction strategies. Within the broad question of sodium's effect on health are sub-questions of the effects of sodium intake on blood pressure in children; the effects of sodium on cardiovascular disease, stroke, coronary heart disease, left ventricular mass, heart failure, kidney disease, end-stage renal disease, proteinuria, bone mineral density, osteoporosis, gastric cancer, esophageal cancer, and stomach cancer; and the health effects of the sodium/potassium ratio. He opened the floor to questions.

Dr. Pearson suggested that IOM could serve as an implementation partner with regards to sodium intake reduction and the Guidelines.

Dr. Pi-Sunyer said the second sub-question, on the effect of sodium on the different conditions, should be worded to make clear that the effect of sodium is on the development of conditions, not the treatment of them. Dr. Appel said he was not looking at treatment, though many interventions involve reduced sodium.

Dr. Christine Williams spoke on the effect of sodium on blood pressure in children. There is an expanding body of literature linking sodium intake to blood pressure in youths. In US and many other industrialized nations, blood pressure rises by 1.9 mm of mercury per year for boys, 1.5 mm for girls. However, among South African Natives who do not use salt, blood pressure does not increase throughout life. The NHANES data shows there has been an increase in mean systolic (of 1.4 mm of mercury) and diastolic blood pressure (3.3 mm of mercury) in boys and

girls between 1989 and 2000. This increase is higher in minorities. Another study shows an increase in the proportion of children and adolescents with hypertension or pre-hypertension between 1988 and 1999. The increase in obesity in youth may exacerbate the problem, since obesity and sodium are both linked to high blood pressure. Many observational studies have evaluated the link between sodium and high blood pressure in youth. A meta-analysis of the literature showed that for a 42 percent reduction in sodium intake, the reduction was 1.17 mm of mercury systolic, 1.29 mm mercury diastolic. Sodium intake in US children is very high, most exceeding the upper limit; and potassium intake is very low, most not meeting the AI. The Dietary Guidelines should emphasize increasing potassium intake in children and adolescents through increased consumption of fruits, vegetables, and whole grains. The next step is a formal literature search on the question of health effects of sodium on blood pressure in children. The timeline will probably be from the 1980s to the present.

Dr. Nelson noted that food supply was different in the 1980s, as were obesity rates. Dr. Williams said the intervention trials from that period will still apply, though observational studies may not.

Dr. Appel said there might be some updates and revisions for water and potassium, but the general approach should be crafted by the next meeting. Sodium will take more work, since literature searches are needed on many topics.

Dr. Pearson asked about left ventricular mass and aortic stiffness in adolescents. Dr. Williams said there are studies looking at cardiovascular risk factors and precursors of heart disease, and they are related to high blood pressure. She said she would look into those studies. Dr. Pi-Sunyer suggested looking into the interaction between sodium intake and weight gain. Dr. Williams said she would be looking at studies on that interaction. Dr. Pi-Sunyer asked about the elderly as a subgroup. Dr. Appel said the elderly benefit immediately from sodium reduction.

Dr. Pearson asked if the IOM study looked at sodium reduction strategies in children. Dr. Appel said the IOM is studying sodium reduction at all stages.

Dr. Fukagawa asked about a recent study on sodium intake and congestive heart failure. Dr. Appel said there was a European trial for severe congestive heart failure. In those patients, sodium reduction was harmful, due to heavy medication and treatments very different from the US standard of care. However, long-term hypertension prevention trial showed that heart disease increased as the sodium/potassium ratio increased.

Chair Van Horn suggested increasing potassium levels in the School Lunch Program.

Dr. Nelson asked about very active adolescents and electrolytes. Dr. Appel said the body has compensatory measures to keep people from losing sodium. People who are routinely active on a low-sodium diet will acclimate.

Dr. Van Horn thanked the Committee for their participation and adjourned for the day.

(Meeting Recess 4:10 p.m.)

Friday, January 30, 2009 (8:11 a.m.)

Dr. Van Horn opened the second day's session and invited Dr. Nickols-Richardson to begin the day's discussions.

Nutrient Adequacy Subcommittee
Discussion Leader: Shelly Nickols-Richardson

Dr. Nickols-Richardson began by acknowledging the other members of the Nutrient Adequacy subcommittee. The subcommittee has had three conference calls and has identified several broad research areas in which the questions fall. The subcommittee looked at the 2005 Dietary Guidelines and identified the broad-scope questions. New research questions have emerged around dietary patterns, behaviors, food environment, and specific nutrients. One question from 2005 asked what nutrients are most likely to be consumed by the general public in amounts low enough to be of concern. That led to the sub-question asking what the health effects of the nutrient shortfall are. The shortfall nutrients appear to be the same as those from 2005, so the focus will be more on health outcomes.

Another question from the 2005 Guidelines asked how the flexibility of food patterns can be increased. The subcommittee has considered eliminating the question but are continuing to look at flexibility in the context of other content areas or questions.

A major research question in 2005 asked what dietary pattern is associated with achieving recommended nutrient intakes. The subcommittee is looking at recommended nutrient intakes, micronutrients, phytochemical properties of diets, and patterns such as breakfast intake. The subcommittee is looking at how SoFAAS intake affects overall nutrient adequacy of the diet. The subcommittee is considering what dietary patterns are associated with positive health outcomes and looking for dietary patterns with robust evidence to give guidance. They are looking at MyPyramid, DASH, vegetarianism and other diets.

Dr. Pearson said the fatty acid group was addressing a similar question. He said part of the robustness of evidence is the length of the study, and much of the evidence doesn't go past six months. Dr. Nelson said the issue of dietary patterns is an overarching question that is not specific to nutrition adequacy, so duplication of effort should be avoided.

Dr. Nickols-Richardson proceeded to modification of a question from 2005, what factors related to diet or physical activity may help or hinder achieving recommended nutrient intakes. The subcommittee modified the question to ask what environmental factors related to diet are associated with achieving recommended nutrient and food group intakes. This is another place where cross-cutting issues may occur. Dr. Appel said that will be a difficult question to address, since "environmental factors" is a broad field. Dr. Nickols-Richardson said the subcommittee is looking at economy, social and cultural issues, accessibility, availability, and away-from-home eating. Another new question is looking at behaviors related to achieving recommended nutrient

and food group intakes. This is another overarching theme, and behaviors have been operationally defined as the issues that determine what and how much people actually eat, such as portion size, meal frequency, and breakfast intake. Questions will focus on individual behaviors, such as self-monitoring, eating competency, television viewing, skipping breakfast, and snacking. These issues cross into the Energy Balance subcommittee area. Dr. Nelson said that we need to make sure we coordinate between the subcommittees. Chair Van Horn said the NEL team can address duplication of effort, since all the work is going to them.

Dr. Nickols-Richardson said that another 2005 question asked if special nutrient recommendations are needed for certain groups. The subcommittee felt that some recommendations may change, and there will be updated literature reviews. The questions will focus on nutrient shortfalls. The subcommittee will look into whether or not the previous sub-questions need to be addressed again. One sub-question addresses iron intake in women and adolescent females, and it is likely that this recommendation won't change. Another question is folic acid, the health implications at different stages of the lifespan, and the effects of fortification. Dr. Nelson said that for the folate question a search and sort framework is being refined, to look at the health benefits and any potential negative health outcomes. Dr. Nickols-Richardson said the subcommittee wants to look at vitamin D, acknowledging that the IOM is also reviewing vitamin D and calcium. The subcommittee will slow down their work on D to allow the IOM work to progress. They plan to use any public records related to the IOM work. Chair Van Horn said people will want to know how to get Vitamin D, regardless of IOM's findings. Dr. Appel said if IOM does recommend a higher intake, it might not be possible to get the new vitamin D level from diet alone. Dr. Nelson agreed that there is a precedent for the need for micronutrient supplements.

A new research question for the subcommittee is what pattern of dietary protein intake is associated with achieving recommended nutrient intakes? The subcommittee plans to review the literature and conduct modeling with different protein sources—plant or animal based, as well as percentage of total energy. Chair Van Horn noted that this cut across groups, especially regarding plant protein sources.

Dr. Pi-Sunyer said the vitamin D issue cannot be ignored, if IOM's report will come after the DGAC's. Dr. Nelson said the Committee will benefit from IOM's work and will address the issue later in the year. Dr. Appel said IOM may come up with an increased recommendation for vitamin D, and the Committee's role is to show how to achieve that level. Dr. Nelson agreed that a lot of the work can be done without a specific number in mind.

Dr. Nickols-Richardson said the last two questions were on nutrient composition of foods and bioavailability. The first question asked if the nutrient composition of foods has significantly changed since 2005 in a manner that impacts that nutrient adequacy. The second question asked if there is any evidence that nutrient bioavailability has significantly changed due to alterations in the nutrient matrix of foods. This question includes issues of food fortification and functional foods. The subcommittee will use ARS information to help examine these questions.

Dr. Nelson commented that the subcommittee looks at a lot of nutrients, so there is a lot of work to do. She suggested triaging the questions and limiting some literature searches to updates. Some of the questions will not need research, just application of the knowledge we have.

Dr. Pi-Sunyer expressed support for the subcommittee's looking at the implementation of the Guidelines. Chair Van Horn suggested focusing on nutrients for which inadequate intakes are already established, such as calcium, potassium, folate, and fiber. Dr. Achterberg suggested waiting for all the subcommittee presentations to see if aligning the subcommittees in other ways would more effectively address the questions. Dr. Nelson agreed that dietary patterns, flexibility, behavior, and the environment are cross-cutting issues.

Dr. Rimm said the Committee should think of the downstream effects of the Guidelines, such as their effect on food stamps. Dr. Perez-Escamilla said the Supplemental Nutrition Assistance Program is looking at incentives for healthier choices, and the Nutrient Adequacy subcommittee might want to look at that and other government initiatives. Dr. Appel noted that some shortfall nutrients don't seem to have a clinical or public health consequence, which may require a new way of looking at the questions. Dr. Fukagawa said the question might be to look at whether or not there are clinical nutritional issues that the Committee is aware of, then to look at how to address it. Dr. Slavin said that there are accepted nutrient standards and the Committee's recommendations need to find food patterns that deliver these nutrients.

Energy Balance and Weight Management Subcommittee
Discussion Leader: Xavier Pi-Sunyer

Dr. Pi-Sunyer began by reviewing the questions considered in 2005. There were five energy balance questions in the 2005 report, two about physical activity, one about proportions of fat and carbohydrates to maintain BMI or achieve long-term weight loss, one on the relationship between energy-dense food and BMI, and one on the relationship between portion size and energy intake. To these, the subcommittee added new research questions: what behaviors related to food intake most contribute to maintaining a healthy weight; what behaviors related to food intake most contribute to unhealthy body weight; what environmental factors contribute to an unhealthy body weight; and what is the role of dietary intake in the maintenance of energy balance and prevention of obesity in childhood? On the question of the proportion of fat and carbohydrates to maintain BMI or achieve long term weight loss, the subcommittee added protein to the question. The literature review from 2005 was extensive, so it will be updated.

Dr. Perez-Escamilla reported on the question on the relationship between the consumption of energy-dense foods and BMI. The 2005 subcommittee concluded that eating foods of low energy density may be a helpful strategy to reduce energy intake when trying to maintain or lose weight, but data to determine the contribution of energy-dense foods to unhealthy weight gain were insufficient. The subcommittee will focus on a few additional sub-questions: the extent to which dietary energy density is associated with BMI and whether this area of inquiry can be extended to type 2 diabetes and other chronic disease. He proposed an NEL search for studies since 2004 on the link between dietary energy density and the outcomes of interest. The review will cover adults and children. Energy density will be measured by kilocalories per gram of

food. There will be stratification by age, gender, and BMI. Dr. Nickols-Richardson noted that the question might overlap with the dietary patterns question from the Nutrient Adequacy subcommittee.

Dr. Nelson presented on the questions relating to physical activity. There were two physical activity questions in the 2005 report, one on how physical activity is related to body weight and other nutrition-related aspects of health and one on how much physical activity a weight-reduced person needs to avoid weight regain. These questions were addressed by the *Physical Activity Guidelines for Americans Advisory Committee Report, 2008*. The adult recommendation was 150 minutes per week of moderate activity, 75 minutes of vigorous activity, or a combination of the two; 60 minutes per day for children. For weight maintenance, the recommendation was to balance energy intake with physical activity. For weight loss, the recommendation was more activity, ideally combined with energy intake reduction. To maintain weight after weight loss, 60 minutes of moderate or 30 minutes of vigorous activity daily was recommended. Dr. Nelson noted that limiting intake appears to be key for successful long-term weight control.

Dr. Nelson addressed the questions on behaviors that contribute to maintaining healthy weight or to unhealthy body weight. There is work on self-monitoring, television viewing, maternal feeding practices, breakfast consumption, snacking, meal frequency, family meals, food eaten away from home, late night eating, container sizes, portion sizes, and food purchasing patterns. After the initial searches on these topics, this issue should be narrowed to the behaviors most related to intake.

Dr. Achterberg suggested separating behaviors predictive of food intake from behaviors that influence food intake. Dr. Appel wondered what the outcome variable would be. Dr. Pi-Sunyer said weight is an easier outcome variable than calorie intake. Chair Van Horn also noted that the heaviest people underreport calories. She noted the importance of self-monitoring and suggested it as a possible recommendation. Dr. Perez-Escamilla said television viewing is important, since unhealthy foods are heavily advertized.

Dr. Nelson discussed the question of what environmental factors contribute to an unhealthy body weight. While there is a lot of research on environment and food choices, few studies are controlled trials, and it may be difficult to develop a recommendation. Dr. Perez-Escamilla noted that much of this work, including Geographic Information Systems (GIS), is being done by non-nutritionists. Dr. Rimm suggested bringing in outside experts, such as Mary Story or Chris Economos.

Dr. Williams spoke on childhood obesity. The American Dietetic Association Evidence Analysis Library (ADA EAL) has examined factors associated with childhood overweight. The subcommittee will review the work done by the ADA EAL and update and expand their searches. To the questions on behavior, she added a sub-question on what dietary behaviors are associated with maintenance of healthy weight and prevention of obesity in children. Some behaviors ADA has investigated include eating away from home, portion size, eating frequency, and skipping breakfast. These behaviors will be looked at in children and adults, extending the searches ADA did.

Dr. Williams said that the majority of children are of healthy weight and most adults are overweight. The major challenge is to maintain healthy weight. For this question, the focus will be on food and nutrient intake including total energy, dietary fat, dairy and calcium, fruits and vegetables, and sweetened beverages. The subcommittee will look primarily at children between 2 and 19. Although ADA looked at total energy intake in children, they concluded that it may not have a strong association with overweight in children. The review will be updated to see if the conclusion holds. Dietary fat and sweetened beverage intake were associated with higher adiposity. Fruit and vegetable intake were inversely related to adiposity, and low intake of dairy and calcium intake may be associated with increased adiposity. The searches on the dietary intake factors will be updated.

Dr. Fukagawa suggested looking into factors of overweight in the older population. Dr. Pi-Sunyer said the question has not been dealt with by the subcommittee, but it should be discussed. Chair Van Horn raised the factor of excessive gestational weight gain. Dr. Perez-Escamilla said the subcommittee will use the IOM report, when it is released, to provide information about gestational weight gain.

Dr. Slavin said the Carbohydrates and Protein subcommittee will be handling added sugars, liquids versus solids, non-caloric sweeteners, and beverages.

Dr. Rimm stressed the importance of dietary guidelines for children and the effect on school lunches. Dr. Pearson asked if there is evidence of the establishment of eating patterns in childhood. Dr. Nelson said there is new tracking data. Dr. Appel suggested making a formal question on whether or not patterns in nutrient intake and behaviors in children continue into later life. Chair Van Horn suggested noting that the way to reduce obesity is to focus on children. Dr. Nelson said there is data on cardiovascular risk factors in children, including obesity. Dr. Perez-Escamilla said gestational weight gain, and infant feeding practices affect risk of childhood obesity. Dr. Pearson said poor nutritional and physical activity habits in children are attributable risk factors for adult obesity. Chair Van Horn thanked the members for the discussion.

Carbohydrates and Protein Subcommittee
Discussion Leader: Joanne Slavin

Dr. Slavin reported from the Carbohydrate subcommittee, which has added protein to its charge. She started with some questions from the 2005 report. The first question was on the relationship between the intake of carbohydrates and dental caries. The subcommittee decided that recommendation was unlikely to change, since there is little new data. The second question was on the relationship between carbohydrate intake and incidence of diabetes mellitus. For this question, the review for the 2005 report was extensive, and the update will build on it. The third question looked at the utility of glycemic index/glycemic load for providing dietary guidance for Americans. The Energy Balance subcommittee has also looked at this question. The Carbohydrates and Protein subcommittee added two sub-questions: what is the utility of the glycemic index for providing dietary guidance for Americans and what is the utility of the glycemic load for providing dietary guidance for Americans? The fourth question asked the

significance of added sugar intake to human health. The subcommittee will look at the work on added sugar intake and human health published since 2004. The fifth question looked at the major health benefits of fiber-containing foods. Exploratory searches have revealed new data supporting the existing recommendations, so the recommendation will probably not be changed, just strengthened.

The subcommittee also took up an issue from Section 6 of the 2005 report, *Selected Food Groups, Fruits and Vegetables, Whole Grains, and Milk Products*. There will be overlap with other subcommittees, but the subcommittee wants to pick up on any new data since 2004 on legumes, seeds, nuts, and other plant products.

The subcommittee plans a literature search on the optimal proportion of dietary carbohydrates and protein to maintain BMI and to achieve long-term weight loss. The subcommittee will also look at caloric compensation for liquids versus solid foods, though the strategy for this is not yet decided upon. The subcommittee is looking at low-calorie diets and how reducing calories affects the carbohydrate/protein balance. With this issue comes the consideration of different types of carbohydrates: sugars, complex carbohydrates, and fibers and how they affect body weight and maintenance. In many studies, the carbohydrates are not broken down by these categories. Generally, carbohydrates and fiber are protective of weight maintenance. Recent studies suggest that information on glycemic index and glycemic load will not help people make better carbohydrate choices, so it is probably best to recommend high-fiber, complex carbohydrates. The subcommittee is looking for evidence regarding the role of artificial non-nutritive sweeteners as an aid in weight loss or maintenance and has planned literature searches. They are also looking for literature on non-digestible carbohydrates, prebiotics, probiotics and whole foods. For whole foods, they are looking at epidemiological data to find what benefits they have.

The subcommittee is developing a PICO chart and planning a literature search to update the literature on the relationship between carbohydrates and dental caries and root caries. Dr. Nelson suggested handling the sugar-free gum issue here. Dr. Slavin said it can fit there, if there is data. Dr. Fukagawa said oral health is a broad outcome that includes more than caries and is influenced by, among other things, fluoridated water. Terms such as periodontal disease, oral health, root issues, and gum disease should be considered. Dr. Appel suggested starting with the disease and working back; focusing on dental caries as an outcome and then clinical trials to provide some idea of what potential exposures have been tested.

Dr. Slavin said the 2005 question asking about what the utility of the glycemic index and glycemic load for providing dietary guidance for Americans will be separated into two sub-questions, one on the utility of glycemic index for providing dietary guidance for Americans and one on the utility of glycemic load for providing dietary guidance for Americans. Dr. Pi-Sunyer said there has been much work on these questions since 2004 to assist in updating the literature.

Dr. Appel pointed out that the glycemic load issues are heavily confounded by surrogates. Dr. Pi-Sunyer said the issue was handled last time by recommending food groups that would lead to a lower glycemic index and load. Dr. Rimm pointed out that highly processed whole grains can have a glycemic index very similar to white bread. The words “minimally processed” might be

useful. Dr. Achterberg said potatoes are another issue to address, since it confounds the glycemic index discussion around fruits and vegetables.

Chair Van Horn observed that adding fiber supplements to a diet does not have the same benefits, regarding weight loss and glycemic load, as eating foods that are high in fiber. Consumers are confused on this issue, so the guidance should be updated to emphasize high-fiber foods. Dr. Appel noted that fiber supplements do not show the blood pressure benefits that high-fiber foods do. Dr. Slavin pointed out that many healthy foods, such as root vegetables, are high glycemic, and that may confuse consumers. Dr. Perez asked if the issue of soluble versus insoluble fiber will be addressed. Dr. Slavin said they will only address dietary fiber.

Dr. Slavin said that another area of interest is satiety, which the Fatty Acid subcommittee is looking at. She would like to see a speaker on that subject as it relates to carbohydrates. Dr. Clemens said several experts are looking at complex/simple carbohydrates, fortification, and satiety, whom he could contact. Dr. Achterberg added that there are three fiber issues: satiety, laxation, and gut health. Dr. Clemens said there is a good deal of recent literature on laxation. Dr. Slavin said that looking at glycemic index for controlling glucose does work, but not in addressing type I diabetes, since it is outside of the scope of practice.

Dr. Perez-Escamilla asked if the subcommittee would look at consumer knowledge and attitudes toward carbohydrates and the relationship of carbohydrate on health. Dr. Slavin noted that people think carbohydrates are bad and fiber is good. Chair Van Horn agreed that it is an issue arising from confusion about sugar, though there may be little literature on the issue. Consumers can be educated on reading food labels. Dr. Achterberg said there is literature on knowledge and attitudes on carbohydrates, but the issue might be handled more generally in the Guidelines. Dr. Nelson said the Committee should look into what sort of communications actually create behavior change.

Dr. Appel raised three issues. First, there is no question on the health effects of meat. Second, it is not clear what effect replacing enriched grains with whole grains has on folate intake. Third, consider whether there should be a separate subcommittee on food groups. Chair Van Horn said the food group topic can be addressed in the subcommittees with an affinity to the subject, like Nutrient Adequacy. Meat can be handled in the Fatty Acid discussions. The Scientific Review subcommittee could tie up the food groups area if need be. Dr. Nelson said it is important to triage and focus on shortfall nutrients that could have profound health implications. Choline will be looked at by the Nutrient Adequacy subcommittee

Ethanol Subcommittee
Discussion Leader: Eric Rimm

Dr. Rimm presented from the Ethanol subcommittee, starting with the 2005 Guidelines. In 2005, the first question was, "Among persons who consume four or fewer drinks per day, what is the dose response between alcohol and health?" The guidance was that one to two drinks a day lowers total mortality, lowers coronary heart disease, and slightly increases breast cancer risk. Risks and benefits do not differ between middle-aged and elderly. There is little or no benefit for younger people. It is unlikely that the guidance will change, except that there may be more

supporting data. There may be some evidence worth pursuing on age group-specific benefits and risks, which will require new questions. More work will be needed on the risks and benefits in the younger population. There may be a lower risk of diabetes, and the subcommittee will look into the risks associated with injury and binge drinking. There is documentation on the associations with coronary heart disease, cancer, and possibly other diseases in older populations, as well as the risk of injury.

The second question was, "What is the relationship between consuming four or fewer drinks and macronutrient/micronutrient profile and overall diet quality?" This is a cross-cutting issue. The guidance was that that this level of drinking is not associated with diet quality, and the guidance is not likely to change. Dr. Slavin pointed out that four drinks is a large calorie intake. Dr. Rimm agreed that the calories are an issue, especially in older populations with reduced caloric needs. There is a need for further work on this question, especially toward defining high-risk subgroups: overweight and obese, hypertension, diabetes, and the inability to metabolize ethanol. There is also data on suppression of folate and other nutrients. This was not covered in the earlier Guidelines, so the literature search should go back further.

The third question was, "What is the relationship between consuming four or fewer drinks and obesity?" A conclusive statement was not able to be drawn from the data in 2005. The data from observational studies may be flawed, since people cut out alcohol to lose weight. The subcommittee will look at prospective studies looking at alcohol and body weight. At one or two drinks per day, the prospective studies published prior to the last DGAC report did not suggest an association. He asked for discussion on this.

Chair Van Horn noted that alcohol impacts discretionary calories. Dr. Pearson said if alcohol affects coronary disease and HDL metabolism, it might be a nutrient. However, Chair Van Horn made clear that the Committee is not advocating that people start drinking. Dr. Rimm said moderate consumption can lower the glycemic index of a meal. At higher levels, people lose their inhibitions and overeat. Chair Van Horn pointed out that alcohol consumption is probably underreported. Dr. Rimm agreed but noted that 10 percent of people reported overconsumption, according to Dr. Krebs-Smith's earlier presentation. Dr. Perez-Escamilla said there may be a relationship between alcohol consumption and dietary nutrient intake, modified by context and the type of drink. Dr. Pearson said it is important to emphasize that above four drinks, it is a drug issue and that the study of alcohol has confounding factors. Dr. Fukagawa asked about beverage type. Dr. Rimm said, for chronic disease, the benefits are the same regardless of beverage type, but the subcommittee will review the literature regarding the beverage type.

Dr. Rimm moved on to the research addressing drinking patterns. The 2005 Guidelines addressed binge drinking. However, the subcommittee wants to look at age of initiation and the effects on young adults. There is data on light drinkers who become moderate drinkers and get a benefit, but it is difficult to see how to make that a guideline. The subcommittee is looking at successful interventions for those who drink too much, and that might become a new research question. The 2005 Guidelines addressed health issues related to heart disease, stroke, and cancers. The subcommittee wishes to include other chronic diseases within the moderate drinking range, including diabetes and gallstones. There are also people who should not drink at all. In the 2005 Guidelines, this group includes those who cannot control consumption, pregnant

women, and people operating machinery. The subcommittee is interested in identifying those at risk for overconsumption. The National Institute on Alcohol Abuse and Alcoholism has been contacted for such data. There are also potential research questions related to alcohol metabolism, effect on diet, lipogenesis, glycemic effect of a meal, and bowel function. These have not been addressed in past Guidelines and will require a longer search. The subcommittee is developing PICO formats to build on the old questions and refine the new questions. He opened the floor for discussion.

Chair Van Horn said drinking is expensive and wondered how it can impact food-buying decisions. Dr. Pearson noted that much of the cost of alcohol is taxes. Chair Van Horn wondered how the economic crisis would affect alcohol consumption. Dr. Rimm said he would like to update the caloric content and alcohol content of drinks, since they have risen. Dr. Slavin noted the high carbohydrate and alcohol contents in flavored malt beverages. Dr. Rimm agreed, noting that the caloric effect of mixers and flavorings was a factor. Chair Van Horn said the data does exist. Dr. Nelson expressed interest in eating patterns and the average dinner. Dr. Perez-Escamilla said the data exists. Dr. Williams asked if the recommendations should be broken down by populations with preexisting conditions. Dr. Rimm agreed, noting that moderate drinking can actually reduce heart disease risk in diabetics. Of course, excessive drinking is good for no one. He said there is talk of putting nutritional labeling on alcoholic beverages, but it probably will not happen before 2010. Ms. McMurry said the Department of Treasury is undergoing such a rulemaking process.

(Lunch 11:57 to 1:19)

Fatty Acids Subcommittee
Discussion Leader: Tom Pearson

Dr. Pearson reported on the subcommittee activities. The first activity was to look at the 2005 Guidelines. There were seven questions in 2005 looking at the relationships of the major dietary fats components to health, each with sizable literature. The evidence will be updated, but the Guidance is unlikely to change, though there may be sub-questions on specific levels and contexts. The subcommittee will look at trends in fatty acid consumption. The subcommittee will use Healthy People 2020 data and invite speakers to fill gaps.

The next question was, “What should the average daily intakes of total fat, saturated fat, and dietary cholesterol be in order to achieve or maintain the goal of desirable plasma LDL cholesterol, 100 milligrams per deciliter or less?” That cholesterol level is the point at which the progression of arterial graphically-defined coronary disease progression ceases. LDL cholesterol levels are related to fats, and the concern is whether total and LDL cholesterol in the US population is above the threshold that would control an epidemic of cardiovascular disease. Since the real goal is controlling atherosclerotic cardiovascular disease, the subcommittee considered whether to reconsider the goal for fat, saturated fat, and dietary cholesterol. The question was, “Should some of the goals for, total fat, saturated fat, and dietary cholesterol be reconsidered under the new goal of really controlling atherosclerotic cardiovascular disease?”

Dr. Pi-Sunyer suggested rewriting the question to indicate that the goal is less than 100 milligrams per deciliter, not 100 and over. Dr. Pearson said he would resubmit the question.

The next research question addressed whether the 2010 Dietary Guidelines should add HDL-cholesterol and/or triglyceride levels as metabolic endpoints. These lipids are associated with cardiovascular disease. Triglycerides are directly associated and HDL cholesterol is inversely associated. The Adult Treatment Panel has no target levels for HDL cholesterol or triglycerides. There is a literature on the relationship of these to other dietary fats, and the subcommittee will look at the relationship to cardiovascular disease and diabetes. Dr. Appel said HDL levels have a strange relationship with other fats and that FDA does not allow it to be used as a surrogate marker. Dr. Pearson said the issue was that raising HDL is beneficial to health. Dr. Appel said making decisions based on HDL has not been done in the Guidelines before. Dr. Pearson said the Adult Treatment Panel is doing work on this, and the subcommittee will be watching that work. Dr. Perez-Escamilla asked if inflammation markers and c-reactive protein should be metabolic endpoints. Dr. Pearson said they are too distal. He gave the floor to Dr. Rimm.

Dr. Rimm said n-3 fatty acids and coronary heart disease are being covered in the discussions on fish, but there is evidence of n-3 fatty acids having an effect on other health outcomes, including age-related macular degeneration, cognitive function, mental health, hypertension, and prostate cancer. There is also new data on the importance of n-3 fatty acids in brain development. With the better evidence of n-3 fatty acid being good for the child, there is more to focus on the benefits of fish than on toxicology. It will be a challenge to work this into PICO subcategories. Research question 8 addressed n-3 fatty acids, and there have been many meta-analyses on the topic that help.

Dr. Rimm addressed the question of the impact of the n-6 to n-3 ratio on predicting health outcomes. Epidemiologic data suggests reduced cardiovascular disease and a better lipid inflammation profile for people with higher n-3 than n-6 intakes. However, some people fear that higher intake of n-6 fatty acids relates to DHA absorption in the brain and increases cancer. A high n-6 in the ratio has shown adverse outcomes in animal models. He wants to invite good speakers who can present the argument from both sides. Dr. Appel said n-6 and n-3 should be viewed separately, not in terms of a ratio. A recommendation on the ratio would be hard to implement, so the question is, what are the benefits of increasing or decreasing n-6? Dr. Slavin said it would be good for the speaker also to have expertise in childhood nutrition.

Dr. Pearson addressed the research question on individual foods that have a fat basis for some of their potential health effects: meat, nuts, fish, eggs, and chocolate. Some reduce CVD, while others increase it. The role of nuts and fish are particularly interesting. At least one speaker will be invited on the health effects of nut consumption. Dr. Slavin asked about stearic acid in chocolate and meat. Dr. Pearson said stearic acid is linked to concerns about thrombosis. Dr. Slavin asked if it is better to have a category looking at the foods themselves rather than the nutrients or components. Dr. Perez-Escamilla said it is important for the subcommittee to come up with reasonable criteria as to which foods get listed. Dr. Pearson said the list is potentially endless. Dr. Rimm said chocolate can be taken off the list and meat, beans, and milk added. Dr. Pearson said the questions should look at the types of fats with lipid, cardiovascular, and metabolic endpoints. The questions will look at the average daily intake of nuts, fish, eggs, and

chocolate in relation to reduced risk of heart or cardiovascular disease. Then a more specific question is, does the type of nut or fatty acid composition affect the inverse association?

Dr. Pearson said question 14, which looked at a number of special diets that were thought to have had a lipid and fatty acid basis for their effects, could be moved to the Nutrient Adequacy or Energy Balance subcommittees.

Dr. Clemens spoke on satiety. The question is, what are the circulating factors that signal satiety? What are the time components associated with the signaling, and what do humans do to modulate or to respond to these various signals that have been delineated? There are GI satiety signals, and there are components in the diet that suppress or stimulate the vagus nerves, suppressing appetite. Another model looked at the role of fat in satiety. The fat model looks at oleic acid 18:1. It is hypothetical at this point, but there may be data for future guidelines. The subcommittee would like to look at the role of fatty acids in satiety and their influence on how quickly people eat. There may be a combination of foods that influences satiety. The subcommittee would also like to know what the physiological signals of satiety are and whether listening to them will modulate lifestyle and choice of foods. It is possible that there is a combination or ratio of fatty acids that contributes to satiety.

Because health benefits have been linked to a number of fatty acids, the subcommittee is looking at the entire bioburden and conversion efficiencies to identify the appropriate effect. Do these fatty acids actually contribute benefits, or are there associated risks with consumption or overconsumption? If so, the subcommittee must look for dietary behaviors that influence the consumption of these fatty acids.

Dr. Pearson said there are too many questions before the subcommittee and they will have to be narrowed down. He opened the floor for discussion. Dr. Slavin raised the issue of satiety with carbohydrates and proteins. There is a lot of new data, and a complete macronutrient picture would be important.

Dr. Pearson said there is epidemiologic data for the protective effects of fish consumption, but data from randomized trials with omega 3 fatty acids have not been convincing. It is possible that the fish effects come from other nutrients in the fish or are confounded with other dietary habits related to fish-eating. Dr. Slavin said the issue overlaps with the Carbohydrates and Protein subcommittee's and the Nutrient Adequacy subcommittee's work. She said different meats have different nutrients and will behave differently. Dr. Rimm said there are also issues of food preparation. Dr. Clemens said food processing also changes fats.

Dr. Nickols-Richardson asked if there could be a question on the relationship between fats and food enjoyment, since diet satisfaction affects compliance. Dr. Pearson said there is literature on fats and hedonics and that it might be worth it to have a speaker on that.

Food Safety and Technology Subcommittee
Discussion Leader: Roger Clemens

Dr. Clemens said the subcommittee is looking at emerging technologies and changes in recommendations regarding food safety for the general consumer. He gave the floor to Dr. Perez-Escamilla.

Dr. Perez-Escamilla spoke on methylmercury in fish. The Food Safety section of the 2005 report had three questions beyond the key FightBAC!® messages. One of those questions related to fish exposed to methylmercury. The mercury is bioaccumulated as it moves up the food chain, and it is found in the muscle tissue of seafood, especially long-lived predatory fish. There are concerns about methylmercury exposure during pregnancy causing neurological damage in the fetus' brain. There are also concerns regarding cardiovascular injury. The 2005 Committee endorsed the federal and state advisory recommendations. The FDA and EPA advisories recommended that women of childbearing age and young children to not eat shark, swordfish, king mackerel, and tilefish, because they contain high levels of mercury. The advisory recommended up to 12 ounces per week of fish or shellfish with low mercury levels; albacore or white tuna should be limited to up to 6 ounces per week due to a higher concentration of methylmercury. Consumers were advised to follow local and state advisories. The Guidelines did not include a key recommendation directly addressing fish consumption related to the risk of methylmercury exposure.

FDA has recently released a draft risk/benefit analysis, and an IOM report, *Seafood Choices*, was published in 2007. The IOM report is a comprehensive literature review on the risks and benefits of fish consumption. It also has a section on how to implement the recommendations. FDA's report, *Quantitative Risk and Benefit Assessment of Commercial Fish Consumption*, looked at neurological development, heart disease, and stroke. FDA also did a literature review, so an NEL review may not be necessary. The recommended level of consumption may be higher than the previous FDA and EPA recommendations.

The subcommittee is interested in data on methylmercury and fish consumption in pregnant women, nursing or lactating women, two- to five-year old children, and, in general, those over two years of age. Methylmercury has been found to affect cognitive function in adults. The subcommittee is interested in extending the work to include persistent organic pollutants (POP), and PCBs. However, there is little data on POPs. .

The question is, what are the risks for different levels and frequencies of fish consumption? The subcommittee is also looking at whether the risks differ by type and source of fish. The FDA risk analysis did not report by the type of fish. The source of the fish will also be a major issue. The outcomes of interest are neurological toxicity in the fetus, newborn, or child; cardiovascular disease; and other potential health outcomes. Cancer and neurological damage among adults would also be included in the review.

Dr. Clemens said this issue overlaps with the Nutrient Adequacy and Fatty Acids subcommittees' work. The nutrients might be cardio-protective, and that interplays with the potential toxicity. The subcommittee is not addressing PBAs, which is for EPA to address.

Dr. Clemens next discussed food allergies. Dr. Steven Taylor, an expert on food allergies, has met with the subcommittee by conference call. Nearly four percent of the population has some

form of food allergy, and food allergies may be linked to an increased risk of asthma. The subcommittee is looking at a number of questions related to food allergies: What is known about food allergies? What do consumers know about food allergies? Are they reading the labels for the products? Are all the components that may be allergens in the food declared? Food labeling requirements regarding allergens in food was updated in 2006 by the FDA. The risks associated with exposure can be very high. The greatest risk for exposure is in children, especially as they start making their own decisions.

The subcommittee wants to look at best practices in schools, homes, daycare centers, and camps. The subcommittee is looking at practices that can be implemented, such as separation of foods, utensils and dishes. The subcommittee will look at various outcomes and different environments and exposure opportunities. Morbidity and mortality will be examined, and the subcommittee will come up with recommendations.

Dr. Clemens moved on to food technology. The Food Code of 2005 was used in the 2005 Guidelines. Since 2005, there have been developments in cleaning reagents that can be used that are environmentally friendly and can reduce the potential pathogen load in the home. The subcommittee is looking at technologies that can improve food safety in the home while increasing the shelf life of foods, such as smart packaging and sensors that tell the microbial load. Color-coded cutting boards encourage separation of food and some have an antimicrobial agent incorporated.

Good hygiene is the ultimate safety practice, and that means understanding the risks associated with different storage environments. The subcommittee plans to develop a clear and concise recommendation to help consumers make good decisions about continuous hygiene, cleaning, and cost-effective materials for a safer home. The subcommittee also wants to compare various available technologies and make advisories on the technologies available and accessible to various homes. Data on this is limited, but there will be an NEL search. The subcommittee wants to recommend best practices to prevent contamination in the home. As technologies become available, they can be evaluated for effectiveness with the NEL team.

Dr. Perez-Escamilla said the 2005 Committee recommended the four steps of the FightBAC!® campaign. The steps are sound, and the subcommittee will not recommend they be changed. The Guidelines also included hand-washing and fruit and vegetable-washing protocols. The subcommittee wants to look for new data supporting different protocols or reaffirming this one.

The 2005 Committee also dealt with storage of foods, especially those at risk for Listeria. Consumers could benefit from specific information. Data will be reviewed to provide consumers with storage times. Listeria is important to address, and the subcommittee will look for other emerging or newly-antibiotic-resistant pathogens with an NEL update. The subcommittee wants to know the extent to which consumers follow proper food storage preparation and handling techniques and procedures, with the population broken down by race, ethnicity, gender, age, and region when possible. Very little is known about outbreaks in the home. The subcommittee will look for data, but not much is expected. The subcommittee is asking what food storage, preparation, and handling techniques are associated with food safety outcomes. He opened the floor for discussion.

Dr. Achterberg suggested including guidance on food storage and spoilage during a power outage.

Dr. Appel said there was initially a recommendation for two servings of fish per week that was removed. If the recommendation is to be put back in, it will be important to know why it was taken out. Ms. McMurry said the recommendation is in the Guidelines. However, the evidence was strongest for secondary prevention. Therefore, it was not a key recommendation for the general public, but rather a statement for individuals who have already experienced a cardiovascular event. Dr. Rimm said the issue of fish affects chronic disease and will have to be handled carefully to correctly inform the consumers without frightening them. Dr. Perez-Escamilla said the American Heart Association also has recommendations on fish and that no one is recommending that pregnant women *not* eat fish. It is important to do consumer-based research or find data to understand the best way to present the information and prevent misunderstanding. Chair Van Horn said the recommendations should be responsible, noting that there had been other problems with fish farming and recommended bringing in outside experts. Dr. Clemens said he knows people in aquaculture who can be brought in. Dr. Slavin noted that eating more fish will mean eating less of something else and that the balance must be maintained. Chair Van Horn said all of the discussions had been excellent and that many important questions were being raised.

Scientific Review Committee

Due to the lack of time, Chair Van Horn addressed the Scientific Review subcommittee's role going forward in the meeting wrap-up. The Scientific Review subcommittee's role will be to help the seven topic area subcommittees deal with cross-cutting issues and prioritize their research questions.

Meeting Wrap-Up

Chair Van Horn said the Committee has overarching issues to take up and that the subcommittees have received feedback to work into their discussions. The questions and issues should be prioritized, with the understanding that there is a finite amount of time. The most important issues should be chosen. The NEL searches have begun, so the Committee can start with discussions leading to the development of preliminary conclusion statements at the next meeting, on the 29th and 30th of April. The subcommittees should determine what issues require outside expertise and either speak with the expert via conference call or, for cross-cutting issues, consider whether the entire Committee would benefit from hearing the expert, remembering that time and resources are limited. The subcommittees should consider the top three cross-cutting topics and what expert would address them in ways that are not already published. The subcommittees will also deliver progress reports at that meeting.

Dr. Rimm said Dr. Nelson's question on food environment touched every subcommittee and suggested Mary Story as a presenter. Dr. Pearson said webinars can be a useful tool, especially for experts who are hard to schedule. The web archive will be available to other members and

the public. Chair Van Horn agreed, saying that the time that the full Committee meets should be used for Committee-wide cross-cutting issues.

Dr. Achterberg said there are still questions as to which subcommittee is handling which issue and that some subcommittees have a very large scope. It would be helpful to have a list of prioritized research questions from each subcommittee for the next Scientific Review subcommittee meeting, on February 11, 2009. Dr. Appel noted that there have been comprehensive reviews done by other bodies on many topics, so those reviews can be used. Chair Van Horn said the Committee should embrace work that has already been done. Ms. Lyon said existing systematic reviews from government entities can be used as a basis and merely updated. Those from independent organizations would have to be reviewed and considered on a case-by-case basis. She encouraged the subcommittees to pass on the studies to NEL staff. She mentioned the Cochrane reviews as being relevant to the Committee, though some will require review. ADA work can be built upon, updated, or modified to accommodate a slightly different question.

Chair Van Horn asked about data specific to obesity related to the presentations. Dr. Post said he would try to get the data through USDA and its partners.

Dr. Achterberg suggested having a speaker on consumer understanding of the Pyramid and the use and utility of the Guidelines. Dr. Pearson said he knows of lectures on the subject that he could make available.

Chair Van Horn thanked the Committee, staff, and public. She adjourned the meeting.

(Adjournment 3:32 p.m.)