

Recommendations

The Dietary Guidelines serve as the principal federal policy document related to making dietary choices. This policy document is intended to serve the public in at least five ways: (1) to assist consumers in making dietary choices most likely to promote their well-being and avoid or postpone the onset of diet-related chronic diseases; (2) to assist federal, state, and local agencies in the development of policies to guide the implementation of feeding and educational programs; (3) to assist agencies at the state and local levels in the formulation and implementation of regulatory policies and programs that relate to food, nutrition, and health; (4) to assist health care providers in primary disease prevention efforts; and (5) to guide other domestic and international for-profit and non-profit organizations in the implementation of food, nutrition, and health goals.

In recognition of the important roles of these guidelines, Congress mandates their review every 5 years. This mandate provides the basis for the timely revision of the guidelines, the identification of potential improvements in the review process itself, and the prioritization of information gaps that are uncovered by the process. This section of the report of the Dietary Guidelines Advisory Committee focuses on the latter two objectives. The committee's recommendations (see bullets below) are organized into two general areas: improving the review process and filling information gaps.

Improving the Review Process

- **Provide more information about specific users and uses of the Dietary Guidelines to help inform future Dietary Guidelines Advisory Committees about how best to approach the development of specific guidelines.**

There is increasing controversy as to the principal uses of the Dietary Guidelines. In particular, do they serve primarily as a consumer educational tool or as a policy guide for various federal, state, and local programs; or do they serve both of these purposes? These fundamentally different purposes demand substantially different approaches to the revision of the Dietary Guidelines and documentation of the basis for the revisions.

- **Improve ways of integrating communication expertise into the Dietary Guidelines Advisory Committee process.**

Dietary Guidelines Advisory Committee members are typically not consumer experts. Neither are they experts in the qualitative methods required to design educational materials that effectively communicate desired messages. If

advice from relevant experts of this type were available more readily, debate over the wording of messages would be more informed, and the text for the final consumer booklet likely would be improved.

- **Improve definition of the interrelationship between the Food Guide Pyramid and the Dietary Guidelines.**

If the Dietary Guidelines should include guidance on choosing a nutritionally adequate diet, and the Food Guide Pyramid is the consumer tool for accomplishing this, it will be helpful to include the Food Guide Pyramid in the Dietary Guidelines. Thus the processes and mutual responsibilities for articulating appropriate revisions of both educational tools should be improved. Moreover, both of these activities need to consider harmonization with Nutrition Facts on the food label.

Filling Information Gaps

Information gaps generally fall into three broad categories. The first focuses on relationships among specific foods, food components, and/or food-related practices and health outcomes of interest. The second centers on monitoring the effectiveness of the Dietary Guidelines and of activities designed to implement them for purposes of promoting well being and primary prevention. The third addresses educational tools designed to improve the implementation of the Dietary Guidelines.

Diet and Health Outcomes

- **Conduct prospective studies to evaluate short- and long-term benefits of adherence to the Dietary Guidelines, both as a coherent body of advice and also as specific guidelines.**

Although health benefits are expected from the implementation of the Dietary Guidelines, research testing this expectation has been limited both in quality and quantity. Addressing this recommendation would require the development of prospective methods to assess the implementation of recommended dietary patterns and changes in eating patterns over time. Ideally, it would also involve the development of biomarkers of early stages of diet-related chronic disorders that the guidelines are designed to prevent or postpone.

The committee recommends incorporating “variety” in the wording of two guidelines, but research is needed on the health consequences of variety, or the lack thereof, between and within food groups. In addition, associations among variety, energy intake, nutrient adequacy, and health outcomes should be evaluated thoroughly.

- **Improve our understanding of overweight and obesity, health risks related to obesity and overweight, and risks and benefits of their treatment.**

An enhanced database would allow better assessment of associations between obesity or overweight and health risks in specific age, gender, racial, and ethnic groups. Similarly, an improved understanding is needed of the risks and benefits associated with weight loss in those groups, especially the extent to which sustained reductions in body weight by obese persons can improve their long term morbidity and mortality. Also of interest are the roles of physical activity, food portion sizes, energy density of the diet, and specific dietary components (e.g., fat and added sugars) in the development of obesity and its treatment.

- **Conduct population studies to assess health outcomes related to the intake of different levels, types, and sources of dietary carbohydrates.**

Of all the databases related to specific nutrient groups, the database related to carbohydrate intake was among the most troublesome and deficient. Using USDA nationwide food consumption survey data, for example, a negative association was demonstrated between the intakes of beverages and foods high in added sugars and intakes of more nutrient-rich beverages. However, it was clear that there is no consensus of the best statistical methods for analyzing food consumption data to identify nutrient displacement issues.

Another principal problem that relates to this specific recommendation is that there is substantial disagreement on how “added sugars” and “total sugars” are defined and whether it is useful to distinguish between the two. Hence, the Continuing Survey of Food Intake by Individuals and the National Health and Nutrition Examination Survey should report intakes of both total and added sugars, using consistent, well-justified definitions.

Similarly, although a link is suspected between added or total sugars intake and body fatness, this association has not been demonstrated consistently. It is hypothesized that the putative association is masked by the persistent and pervasive problem of underreporting of food intake, the extent of which tends to differ with weight status. Additionally, foods high in added sugars are known to be underreported to a greater degree than are other foods. Research is needed to test more effectively the association between intake of sugars (both total and added) and BMI.

Much controversy was encountered related to the health consequences of diets characterized by a high glycemic index or load. Additional research is needed to evaluate their health impact.

Finally, much public input was received regarding the potentially adverse consequences of dairy product consumption for subpopulations with a high prevalence of lactose intolerance, lactose maldigestion, or both. Although these conditions may be caused by intestinal pathology, members of many ethnic groups in the United States have one or both conditions as a result of normal developmental decreases in intestinal lactase. Additional research is needed to explore the nature of the adverse effects and the apparent discrepancies between the bulk of the scientific literature and the public perception of the consequences of normally low levels of intestinal lactase.

- **Determine the optimal ratios between fat and carbohydrate for the American diet.**

Many important nutritional issues revolve about the question of the optimal ratio of fat to carbohydrate in the diet. This ratio may have an impact on body weight, dyslipidemia, insulin resistance and the metabolic syndrome, and risk for cancer.

- **Determine the optimal fatty acid composition of the diet.**

There is a need to investigate optimal ratios of saturated-to-monounsaturated-to- polyunsaturated fats, including ratios of omega-6 to omega-3 fatty acids. The potential for omega-3 polyunsaturated fat to reduce the risks for cardiovascular diseases and cancer deserves particular attention. The specific influences of the different fatty acids on many metabolic processes are poorly understood.

- **Evaluate the role of the Dietary Guidelines in promoting improved calcium status among at-risk populations.**

Repeated concerns were expressed about the role of the Dietary Guidelines in improving health outcomes related to calcium intake. Among the topics that received most attention were (1) relationships between various levels of calcium intake and health outcomes, (2) the impact of diet composition on calcium utilization, (3) the putative replacement of beverages that are rich in calcium by beverages that are low in calcium and high in added sugars, and (4) the role of non-dairy foods as a source of calcium. The committee recommends determination of the impact on overall nutrient adequacy and bone health of substituting high-calcium nondairy foods for high-calcium dairy foods.

Some committee members expressed concern that dairy foods may be serving as a surrogate marker for a “healthy” diet and a “healthy” lifestyle. Future studies should consider the potential bone protective effects of the higher fruit and vegetable intakes and lower carbonated beverage intakes characteristic of many dairy users. Furthermore,

some committee members identified a need to evaluate the effects of the nutrient composition of various dairy foods on urinary calcium loss and skeletal mass, especially among diverse racial and ethnic groups.

There was a lack of useful data to determine whether limiting the intake of beverages and foods high in added sugars would increase the consumption of more nutrient-rich beverages and foods, particularly those of high calcium content. For example, if children drink fewer soft drinks, will that necessarily result in increased milk consumption?

- **Develop improved, easy-to-use tools to measure physical activity, and improved measures of health benefits and risks of combined nutrition and physical activity interventions, especially for routine daily activities.**

Improved information of this type would enhance the basis for exploring the impact of an increasingly sedentary lifestyle and for setting age-, physiologic state-, and gender-specific norms or performance goals. Such goals can provide feedback to persons about their physical activity level and information to policy makers related to their effectiveness.

- **Investigate further the health benefits (and risks) of combined nutrition and physical activity interventions.**

For example, the committee found insufficient information related to the complementary aspects of strength training, aerobic activities, and nutrition-based interventions designed to promote improved physical abilities and cardiovascular health.

- **Explore potential mechanisms that account for the decreased risks of chronic or degenerative diseases that are attributable to whole grain and to fruit and vegetable intakes.**

Understanding is very limited of the biological mechanisms that account for the consistent associations between intakes of whole grains, fruits, and/or vegetables and the risk of selected diet-related chronic diseases. Such information could affect the selection of appropriate species and strains of various grain, fruit, and vegetable crops; shape the advice given to consumers; and lead to improvements in health.

Related to this recommendation is the need to develop a comprehensive database on phytochemicals and other constituents of specific fruits and vegetables. This type of database would improve our understanding of the biodiversity of our food supply and of food-related factors responsible for improved health outcomes.

- **Conduct studies on the appropriateness of population-wide recommendations related to sodium intake.**

Metabolic studies, population-based intervention trials, and surveys are needed to help resolve the continuing and often contentious debate on population-wide recommendations concerning sodium intake. Questions were raised concerning the need for such recommendations, the range of intake that should be recommended, and the feasibility and safety of such recommendations. Of particular interest was the impact of population-wide recommendations in the face of the variable blood pressure response of individuals to lowered sodium intakes.

It is likely that the relationship of sodium intake and hypertension will continue to be the primary health issue driving sodium reduction policy. However, it is apparent that the effect of sodium intake on blood pressure levels is becoming less acceptable as a proxy for effects on cardiovascular disease as such, particularly cardiovascular mortality. Since trials on mortality endpoints are no longer considered feasible and are unlikely to be undertaken, studies are needed that will link sodium reduction to cardiovascular morbidity. Also, since some nutrition experts are unwilling to conclude that population-wide sodium reduction is safe, population-based studies are needed to evaluate the potential adverse effects of moderate sodium reduction. Studies are also needed to clarify the relevance of children's sodium intakes to their long-term health status. In addition, studies are needed of the effects of selected anions and cations (e.g., chloride and potassium) on blood pressure.

Four additional health problems were identified that appeared to be linked with high sodium intake: osteoporosis; renal stones; asthma; and gastric cancer. In the case of osteoporosis, for which the evidence is strongest, clarification is needed of the circumstances (e.g., age, physiologic status) under which sodium intake influences calcium deposition in and mobilization from bone to maintain normal circulating levels of calcium. Other research questions are whether excessive sodium intakes predispose healthy individuals to renal stones and gastric cancer or aggravate asthma in affected individuals.

- **Improve our understanding of the risks and benefits of moderate levels of alcohol consumption in relevant age groups.**

The adverse health effects of excess alcohol consumption are well documented. However, mounting scientific evidence supports a beneficial effect of moderate alcohol consumption that is, a significant reduction in the risk of coronary disease in adults whose age places them at risk for this condition. Further research is needed to explore the mechanisms that underlie this protective effect. Additional research would also be useful on relationships between moderate alcohol consumption and gall bladder disease and type 2 diabetes, conditions for which limited data suggest a benefit.

Although the magnitude of the reported association between moderate alcohol consumption and coronary disease may merit a randomized clinical trial, more data are needed to quantify the potential hazards of requiring moderate alcohol intake in a trial and/or of recommending moderate alcohol consumption to nondrinkers. Additionally, research is needed on the determinants of alcoholism and other forms of problem drinking.

Monitoring

- **Continue to monitor dietary intakes and health outcomes.**

If efforts to curb tobacco use succeed, the proportion of preventable morbidity and mortality due to inappropriate diets and physical activity patterns will increase. Monitoring systems linked to appropriate decision making levels (i.e., community, state, regional, and national) will be required to identify the best strategies to minimize health disparities and preventable mortality and morbidity in all population groups.

Nutrition monitoring research also is needed to clarify how best to measure specific dietary components. One example of this is the development of measures of sodium intake that are feasible for surveys and effective in estimating total sodium intake in people with different patterns of sodium consumption.

- **Monitor the health outcomes and effectiveness of school physical education classes and community programs designed to engage children, adolescents, and adults in physical activity.**

The Committee was alarmed at the continuing decreases in the opportunities for children and adolescents to engage in physical activities through school physical education classes and other community programs. Information reviewed by the committee argues strongly for increasing the number of programs designed to enhance physical activity and for monitoring outcomes as a means of improving program effectiveness.

- **Improve methods and systems for monitoring the incidence of foodborne illnesses, especially methods and systems that would be applicable at the household level.**

Underreporting of foodborne illnesses experienced by consumers in the home appears to be common. The definition of a foodborne disease outbreak currently requires only two or more cases. More research is necessary to develop means for detecting and reporting single-case outbreaks, especially those that occur in the home and among vulnerable, high-risk populations. Improvements in methods and systems also are essential to determine the effectiveness of food safety advice in altering related consumer behaviors.

Design of Educational Tools

- **Take steps to harmonize the information on the Nutrition Facts Label with the Food Guide Pyramid, particularly with respect to serving sizes and energy levels.**

The serving sizes used in the Nutrition Facts Label and the Food Guide Pyramid differ greatly for some foods, potentially leading to consumer confusion. In addition, the relationship between serving sizes included in these educational tools and usual portions should be documented better.

It would be helpful to consumers if the energy levels shown for the Food Guide Pyramid (1600, 2200, and 2800) corresponded with the energy levels used for the Daily Values on the Nutrition Facts Labels (2000 and 2500). These differences cause substantial consumer confusion and make it difficult to integrate the Food Guide Pyramid and the Nutrition Facts Label into meaningful guidance for the public.

- **Conduct intervention studies to guide the development of strategies, educational tools, and programs designed to help change dietary patterns at the individual and population levels.**

The effectiveness of educational tools and of programs that are designed for the implementation of Dietary Guidelines should be tested in appropriately designed interventions. For example, there is an expectation that splitting the 1995 grains/fruit and vegetable guideline into two separate guidelines will result in a more effective educational tool and lead to an increased intake of a variety of these foods, especially whole grains and fruits.

A second example is the expectation that using food thermometers will decrease the incidence of foodborne illness from undercooked animal foods prepared at home. The evidence base for this assertion should be improved, especially for high-risk foods. Similarly, studies are needed of the actual risks and benefits derived from the use of food thermometers.

- **Revise the “Food Guide Pyramid” to incorporate all elements of the Dietary Guidelines proposed in this report.**

The promotion and uses of the Food Guide Pyramid led to the committee’s interest in evaluating the feasibility of incorporating all 10 recommended guidelines in an effective Food Guide Pyramid graphic. The committee urges the development and use of graphics that encourage low-fat choices from the meat and dairy groups, the consumption of

whole grain foods, and physical activity. The committee expressed special enthusiasm for the development of a physical fitness pyramid graphic to be included in the Dietary Guidelines booklet.

- **Investigate what motivates people, on an individual and societal level, to adopt recommended behaviors, such as engaging in physical activity, making healthy food choices, and improving food safety.**

The number of persons in the United States who engage in regular physical activity is less than the proposed *Healthy People 2010* goals. Our understanding is incomplete of the influences of the technical revolution on physical activity. For example, what is the combined effect of having multiple remote control devices at our ready disposal, and of other factors that influence the amount of routine and work-related physical activity undertaken? Improving this understanding is expected to provide improved tools for promoting physical activity goals.

An example of the need to study the adoption of recommended food choice behaviors relates to sodium intake. Consumer research is needed to identify attitudes and behaviors that affect dietary sodium intake. Such information could be used to improve both food industry and consumer education approaches to sodium reduction. Research topics might include perceptions of the importance of salty flavor in various foods or types of food; the priority given to sodium content, calorie content, fat content, convenience, and nutrition value when selecting various

types of foods; consumers' knowledge of sources of salt in their usual eating patterns; the ability of consumers to discern salt content from food labels (e.g., awareness that an item like "garlic pepper" may be primarily table salt); consumers' attitudes towards eating unsalted catered and restaurant foods; their attitudes towards the wholesomeness of foods from which salt-containing preservatives have been omitted; and their interest in or willingness to reduce salt intake under different assumptions about the ease of accomplishing this. Stratification of consumers on age, income, and perceived susceptibility to hypertension (e.g., based on family history) would be important for such research. Similar approaches would apply to behaviors recommended for other guidelines.

- **To evaluate methods for educating the public on how to differentiate between different kinds of fat.**

With the increased emphasis on reducing saturated fat, methods need to be developed to educate the public to recognize foods that are high in saturated fat. New research needs to be sponsored to develop and evaluate methods to achieve this aim.