The public health implications of the Dietary Approaches to Stop Hypertension Trial\textsuperscript{1,2}

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The Dietary Approaches to Stop Hypertension (DASH) Trial was designed to assess the relation between modification of dietary patterns and hypertension (1, 2). DASH provides evidence that existing dietary recommendations can produce concrete health results in a relatively healthy but sedentary population in which 50% of the participants were women and 60% were African American. Obarzanek et al (3) applied the Framingham risk equation (4) to the results of their study published in this issue of the Journal to estimate 10-y risk of coronary heart disease (CHD) in subjects consuming the recommended DASH diet. The results showed a 12.1% decreased risk of CHD in the participants consuming the DASH diet compared with a slightly increased risk in those consuming the control diet. The decrease was achieved in the absence of changes in weight or physical activity. Reductions in blood lipids were greater in men than in women, whereas the lipid response to diet did not differ significantly between African Americans and non-African Americans.

Data from DASH and other clinical trials offer the most significant evidence to date of the role of diet in health promotion, disease prevention, and disease treatment (5–7). These studies underscore the messages in the new Dietary Guidelines for Americans (8). The DASH diet and similar dietary patterns that include low-fat dairy products and a high intake of fruit, vegetables, and fiber provide important guidelines for public health policy (9, 10). Other lifestyle factors—such as physical activity levels, annual physical exams, immunizations, monitoring of vital signs, and other preventive health measures—might also affect outcomes. This may be particularly true for exercise, which can be expected to raise HDL cholesterol and lower triacylglycerol, results not achieved by the DASH diet alone. Weight loss can also be expected to potentiate the outcomes.

The lipid biomarkers of CHD risk are well established (4, 6, 7, 11), as are the salubrious effects of diets that include low-fat dairy products and certain fruit and vegetables, including legumes, potatoes, juices, apples, bananas, oranges, lettuce, spinach, string beans, and tomatoes. Absence of information on various fruit and vegetables, however, may be especially problematic if only certain types and diversities confer protection, eg, spinach, Brussels sprouts, broccoli, and string beans, which are particularly nutrient dense and require little insulin for their digestion and metabolism.

Dietary patterns are influenced by cultural, ethnic, and environmental factors, including the availability of foods, the ability to purchase and prepare foods, and food industry advertising. Dietary patterns are also not readily altered, and the major limitation of the DASH study is the questionable ability of most persons to maintain dietary changes in the long term.

The DASH diet requires twice the average daily servings of fruit, vegetables, and dairy products; one-third the usual intake of beef, pork, and ham; one-half the typical use of fats, oils, and salad dressings; and one-quarter the ordinary number of snacks and sweets. It also requires education for lactose-intolerant individuals on the use of lactase enzyme products and behavior modification to help change lifelong eating habits. The volume of food consumed from the 5 major food groups of the DASH diet is 1.94 kg (68.5 oz), whereas only 51 g (1.8 oz) comes from fats and sugars. This is twice the volume of healthful food and a fraction of the energy-dense, nutrient-poor junk food found in a typical Western diet (1, 10, 12).

According to public health researchers, those who make small, incremental changes in their diet over time have the highest probability of success. Recommendations include considering meat as just one part of a meal; centering food choices around carbohydrates such as pasta, rice, beans, or vegetables; and replacing traditional snacks and desserts with fruit or low-fat, low-energy foods such as sugarless gelatin. Portion-controlled foods and liquid meal replacement represent a new approach to healthful eating (5–7, 11).

Current clinical studies targeted to changes in diet and exercise patterns stress the importance of these community and individual challenges. However, long-term results do not bode well for healthful diets according to the results of DASH (9, 10). Nevertheless, DASH and other dietary pattern trials have provided significant knowledge on the role of diet in preventing chronic disease. It is incumbent on us to use that knowledge in the interest of public health (13).

The need to develop a simple, modern diet as effective as the DASH diet is one of the major challenges facing food technologists and nutrition scientists (13, 14). It is also an extraordinary

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opportunity for improving public health by broadening the appeal and use of scientifically sound functional foods. Tucker et al (15), for example, describes relations among consumption of whole grains, vegetables, fruit, and fish and the inverse association of these foods with meat. Fung et al (10) advanced this approach by examining the relation between 2 dietary patterns, a so-called prudent pattern and a Western pattern, and biomarkers of cardiovascular disease risk. This scientific approach, which used factor analysis, provided added evidence that dietary patterns can be related to measures of health. Other studies that used cluster analysis reached the same conclusion, particularly when the cohort was well defined and restricted to one population. The Healthy Eating Index, a comprehensive measure of diet quality, combines multiple aspects of diet in relation to guidelines into a single score (16).

We need to develop simple and clear food-selection tools that will meet the recommendations of the Dietary Guidelines for Americans. Evidence from DASH and similar controlled studies provides proof of the value of scientifically sound food selection, but there is a lack of science on which community strategies or individual interventions can be based. Our diverse society requires innovation in food delivery, convenience, and culture—changes that will deliver measurable improvements in compliance to new dietary patterns and in quality of life.

REFERENCES