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PCRM'S DIETARY GUIDELINES MONOGRAPH

INTRODUCTION

The U.S. government has promulgated dietary guidance in various forms throughout much of the last century. In recent decades, two major trends have occurred:

First, the dietary problem of undernutrition has been eclipsed by an epidemic of overnutrition. More Americans are now overweight or obese than at any time in history. Diabetes, cardiovascular disease, and cancer are now commonplace, exacting costs that are both personal and financial.

Abundant scientific information has established the role of nutrition in health, but much of this information has yet to be incorporated into practical dietary guidance for the benefit of the public. Although scientific knowledge has accumulated swiftly, nutritional guidelines have progressed only sluggishly.

We therefore sought to establish a set of dietary guidance materials that serve the current needs of the public, based on current scientific knowledge.

We first established eight general objectives for the guidance document. We then sought evidence-based materials that quantify nutritional needs and examined the most healthful sources of the essential nutrients.

PRINCIPLES AND GOALS

When the U.S. Department of Agriculture (USDA) established the Eating Right Pyramid in 1991, followed by the Food Guide Pyramid in 1992, it identified specific principles that guided the development of these graphics. These are detailed in the *USDA's Food Guide: Background and Development*, released in 1993 (1). Several of these principles remain relevant for the elaboration of an improved set of dietary guidelines and graphic and are listed below.

- 1. The new food guide should promote overall health and well-being.** The dietary guidelines should provide information that supports the total health and well-being of the population, rather than being directed to the prevention or treatment of a single disease.

However, a recommended diet should not only sustain individuals who are already healthy. Given that the majority of American adults are overweight and have elevated blood cholesterol concentrations, recommendations should provide a basic dietary framework that is useful for individuals with common health conditions, such as overweight, hypercholesterolemia, and hypertension, that may have resulted, in part, from poor dietary choices.

- 2. The new food guide should be based on up-to-date nutrition research on recommended intakes of nutrients and other food components.** A large body of nutrition research has produced important findings in recent years. Educational materials should be based on current, sound, and objective research.

The new food guide should focus on dietary staples that provide all essential nutrients. However, current scientific knowledge is limited regarding the risks and benefits of small amounts of certain additional, nonessential foods.

- 3. The new food guide must be useful to the target audience.** Nutrition education materials should serve as a helpful learning tool, describing foods and quantities in familiar terms.
- 4. The new food guide should promote optimal nutrition.** The USDA called for the new food guide to be based on commonly consumed foods, saying that a new food guide should be “realistic.” Its point was that consumers should not have to seek out unusual foods in order to meet nutrient needs, a point with considerable merit.

However, the USDA also called for a new food guide “to accommodate all types of foods,” a less defensible goal. There is no reason why foods without beneficial nutritional attributes or with distinct nutritional disadvantages should be included in a food guide for the public. It is important not to underestimate the public’s desire for better health and its willingness to alter maladaptive dietary habits. Many people make major dietary alterations, particularly in efforts to lose weight, yet have little guidance as to what constitutes a healthful regimen. It is also important to recognize that many people follow diets that are close to optimal, while others have strayed quite far from an optimal diet. Nutrition education materials should serve both groups.

5. **The new food guide should allow maximum flexibility for consumers to eat in a way that suits their taste and lifestyle while meeting nutritional criteria.** Optimal dietary guidelines may be implemented in many varied ways, based on culture and preference. Nutrition education materials should permit the incorporation of healthful foods into a wide range of dietary patterns.
6. **A new food guide should provide for the nutritional needs of individuals from a variety of age groups and activity levels.** In describing this goal, the USDA called for a food guide to be “practical,” such that there is no need for different guides for different age groups.

The guidelines and diagram should be applicable for people regardless of age, weight, cultural preference, or health status. However, they do not apply to children less than two years of age or individuals with medical illnesses requiring specialized dietary or medical intervention.

7. **A new food guide should be based on an understanding of the strengths and weaknesses of previous guides.** The USDA called for a food guide to be “evolutionary,” suggesting that consumers, who have become accustomed to certain dietary concepts should not have to erase what they already know, but rather, can build on that information base. However, the USDA did not differentiate which nutrition concepts merit continuation from those that consumers can safely set aside. It is nonetheless clear that nutrition guidance materials have evolved over several decades, and the process of improving nutrition guides can profit from past experience.

In the first half of the last century, nutrition education materials focused on preventing nutrient deficiencies. Subsequently, the focus shifted to the need to curb dietary excesses. Responding to changing needs, some guidance materials, such as the Food Guide Pyramid, were produced after extensive planning, and their subsequent successes and failures have been evaluated, providing a basis for improvement.

EDUCATIONAL DIAGRAMS

Food guide diagrams have long been used to present key principles of nutritional guidance in a simplified form and have evolved to accommodate changing nutritional knowledge. In 1916, the USDA released a wheel-shaped diagram, including seven food groups. Over the ensuing decades, an evolving understanding of nutritional science and changing nutritional patterns in the American population have led to major changes in nutrition guidance and graphics. The “Basic Four” guide established in the 1950s promoted eating habits to prevent nutrient deficiencies. Later, nutritional concerns shifted toward prevention of chronic disease (2).

The pyramid-shaped diagram debuted in 1991 as the Eating Right Pyramid, followed by the Food Guide Pyramid in 1992. Its shape suggested that certain foods (grains, vegetables, and fruits) should be emphasized in the diet, while other foods (meats, dairy products, sweets, and oils) should be included in more moderate quantities. The most recent iteration, MyPyramid, was introduced in 2005 as a computerized program. Its colored, unlabeled segments represent grains, vegetables, fruits, milk, meat and beans, and oils. It also presents a human figure climbing stairs, indicating the value of physical activity.

MyPyramid has been controversial since its introduction (3, 4). The MyPyramid program presents the advantage of allowing portion sizes to be based on personal tastes or needs. It retains its predecessors’ emphasis on whole grains, vegetables, and fruits as dietary staples. However, using MyPyramid to select individualized portion sizes requires users to go beyond the unlabeled main graphic and enter personal information into a computerized program, a process that may be difficult for some users, particularly those without Internet access or basic computer skills. Also, it retains food groupings and proportions that have been challenged. Researchers at the Harvard School of Public Health noted MyPyramid is “impossible to interpret” with advice that is “highly unrealistic” (4).

Toward a Simplified Graphic Representation

Historically, food diagrams have used geometric shapes that have no counterpart in food preparation. A pyramid, for example, conveys an abstract message that must be translated into concrete food choices. Several authorities have sought to simplify nutritional planning by using diagrams representing plates. A 2008 study used a plate diagram as a tool for weight loss diets (5). This plate was designed to limit certain food groupings such as protein, dairy, and fat. Once these portions were measured, the remainder of the plate could be filled with salad and vegetables.

The American Institute for Cancer Research (AICR) uses the “New American Plate” to communicate information about healthful nutrition. The plate suggests that one-third or less of a meal should come from animal-derived products, with

at least two-thirds from vegetables, fruits, whole grains, and beans. While this plate is intended to control portion sizes, it also emphasizes the AICR's expert report findings, "Eat mostly plant-based foods, which are low in energy density" (6). Similarly, the American Diabetes Association uses the "Plate Method" for weight loss and diabetes management. The plate is divided into three sections: half of the plate is for "non-starchy vegetables" and the other half is divided equally between "meat or meat substitutes" and "starchy foods" (7).

Given the advantage of the plate diagram, we sought to adapt the food groups depicted in MyPyramid to fit current nutritional knowledge and to develop a diagram that is easy to understand and use.

Diagram Development

A team of registered dietitians, physicians, marketing experts, and graphic designers developed candidate designs of nutritional diagrams depicting four food groups: vegetables, fruits, whole grains, and legumes, without specifying relative portion sizes for the groups. Four diagrams were initially created. Ultimately, after analyzing the results of an online survey, it was determined that simple circular diagrams were the most clear and appealing, and the remaining diagrams were discarded.

Dietary diagrams have long served as nutrition teaching tools that have evolved along with changes in nutritional and health sciences. We have developed and tested simple diagrams presenting whole grains, vegetables, fruits, and legumes as dietary staples. The Simple Plate diagram was easy to understand and appealing to viewers, leading to a high rate of recall.

There is no scientific basis for including a meat or dairy group, given that people who avoid these foods have no health disadvantages, and, in fact, have certain health advantages. Compared with meat-eaters, vegetarians have lower rates of diabetes (8, 9), cancer (10, 11), and risk factors for cardiovascular disease (12, 13). Dairy products are not essential for bone integrity in either childhood (14) or later life (15).

The plate-shaped food diagram does not provide serving size recommendations, nor does it present the food group hierarchy that was present in the 1991 and 1992 USDA pyramid diagrams. This is because of the lack of any scientific basis for emphasizing one or more groups (consuming fewer legumes than fruit, for example.) Healthful meal plans can be based on beans, grains, fruits, or vegetables and provide all the necessary nutrients. Since healthy plant-based diets come in variety of forms, from grain-based macrobiotic diets (16) to legume-based therapeutic diets (17), there appears to be little reason to limit the flexibility of the diagrams in this respect. The emerging message is to consume a variety of plant foods, rather than prioritizing specific food groups. The appeal of this diagram is its simple representation of a healthful diet.

A simple dietary graphic does not replace nutritional teaching, particularly with regard to nutrient adequacy, supplementation, and dietary changes for specific stages of life. It is important to note that vitamin B12 supplementation is essential for individuals following vegan diets. Because of absorption issues, the Dietary Guidelines for Americans and the IOM also recommend vitamin B12 supplementation for individuals older than 50 years (18).

Iron intake of vegans and vegetarians is typically higher than for nonvegetarians (19, 20), although plants provide iron in the non-heme form, raising the possibility of effects on iron status. However, the incidence of iron deficiency anemia is as similar among vegetarians and nonvegetarians (19). Zinc intake may be somewhat lower in individuals following vegetarian and vegan diets, but overt deficiencies are not seen in Western vegetarians (19).

While the diagram summarizes key nutritional points, no diagram can convey the full range of nutrition knowledge that consumers need. In summary, a simple plate diagram effectively conveys fundamental principles of healthful nutrition.

As an illustration of the fundamentals of a healthful diet, this simple plate diagram is a tool that can be used by teachers, nutrition professionals, industry, and others to provide new information to children and to reinforce healthy dietary habits for adults.

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