chapter 5

Food Groups To Encourage

OVERVIEW

Increased intakes of fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products are likely to have important health benefits for most Americans. While protein is an important macronutrient in the diet, most Americans are already currently consuming enough (AMDR = 10 to 35 percent of calories) and do not need to increase their intake. As such, protein consumption, while important for nutrient adequacy, is not a focus of this document. Although associations have been identified between specific food groups (e.g., fruits and vegetables) and reduced risk for chronic diseases, the effects are interrelated and the health benefits should be considered in the context of an overall healthy diet that does not exceed calorie needs (such as the USDA Food Guide or the DASH Eating Plan; see ch. 2). The strength of the evidence for the association between increased intake of fruits and vegetables and reduced risk of chronic diseases is variable and depends on the specific disease, but an array of evidence points to beneficial health effects.

Compared with the many people who consume a dietary pattern with only small amounts of fruits and vegetables, those who eat more generous amounts as part of a healthful diet are likely to have reduced risk of chronic diseases, including stroke and perhaps other cardiovas-

cular diseases, type 2 diabetes, and cancers in certain sites (oral cavity and pharynx, larynx, lung, esophagus, stomach, and colon-rectum). Diets rich in foods containing fiber, such as fruits, vegetables, and whole grains, may reduce the risk of coronary heart disease. Diets rich in milk and milk products can reduce the risk of low bone mass throughout the life cycle. The consumption of milk products is especially important for children and adolescents who are building their peak bone mass and developing lifelong habits. Although each of these food groups may have a different relationship with disease outcomes, the adequate consumption of all food groups contributes to overall health.

DISCUSSION

Fruits, vegetables, whole grains, and milk products are all important to a healthful diet and can be good sources of the nutrients of concern (see ch. 2). When increasing intake of fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products, it is important to decrease one's intake of less-nutrient-dense foods to control calorie intake. The 2,000-calorie level used in the discussion is a reference level only; it is not a recommended calorie intake because many Americans should be consuming fewer calories to maintain a healthy weight.

Fruits and Vegetables

Four and one-half cups (nine servings) of fruits and vegetables are recommended daily for the reference 2,000-calorie level, with higher or lower amounts depending on the caloric level. This results in a range of 2½ to 6½ cups (5 to 13 servings) of fruits and vegetables each day for the 1,200- to 3,200-calorie levels[11] (app. A-2). Fruits and vegetables provide a variety of micronutrients and fiber. Table 5 provides a list of fruits and vegetables that are good sources of vitamins A (as carotenoids) and C, folate, and potassium. In the fruit group, consumption of whole fruits (fresh, frozen, canned, dried) rather than fruit juice for the majority of the total daily amount is suggested to ensure adequate fiber intake. Different vegetables are rich in different nutrients. In the vegetable group, weekly intake of specific amounts from each of five vegetable subgroups (dark green, orange, legumes [dry beans], starchy, and other vegetables)[12] is recommended for adequate nutrient intake. Each subgroup provides a somewhat different array of nutrients. In the USDA Food Guide at the reference 2,000-calorie level, the following weekly amounts are recommended:

Dark green vegetables	3 cups/week
Orange vegetables	2 cups/week
Legumes (dry beans)	3 cups/week
Starchy vegetables	3 cups/week
Other vegetables	6½ cups/week

Most current consumption patterns do not achieve the recommended intakes of many of these vegetables. The DASH Eating Plan and the USDA Food Guide suggest increasing intakes of dark green vegetables, orange

KEY RECOMMENDATIONS

- Consume a sufficient amount of fruits and vegetables while staying within energy needs. Two cups of fruit and 2½ cups of vegetables per day are recommended for a reference 2,000-calorie intake, with higher or lower amounts depending on the calorie level.
- Choose a variety of fruits and vegetables each day. In particular, select from all five vegetable subgroups (dark green, orange, legumes, starchy vegetables, and other vegetables) several times a week.
- Consume 3 or more ounce-equivalents of whole-grain products per day, with the rest of the recommended grains coming from enriched or whole-grain products. In general, at least half the grains should come from whole grains.
- Consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

Key Recommendations for Specific Population Groups

- *Children and adolescents.* Consume whole-grain products often; at least half the grains should be whole grains. Children 2 to 8 years should consume 2 cups per day of fat-free or low-fat milk or equivalent milk products. Children 9 years of age and older should consume 3 cups per day of fat-free or low-fat milk or equivalent milk products.

[11] See appendix A-2 and table D1-16 from the 2005 DGAC Report (or USDA website) for information on children age 2 to 3 years.

[12] Includes all fresh, frozen, canned, cooked, or raw forms of vegetables. Examples of vegetables are dark green (broccoli, spinach, most greens); orange (carrots, sweetpotatoes, winter squash, pumpkin); legumes (dry beans, chickpeas, tofu); starchy (corn, white potatoes, green peas); other (tomatoes, cabbage, celery, cucumber, lettuce, onions, peppers, green beans, cauliflower, mushrooms, summer squash).

vegetables, and legumes (dry beans) as part of the overall recommendation to have an adequate intake of fruits and vegetables (see ch. 2).

Whole Grains

In addition to fruits and vegetables, whole grains are an important source of fiber and other nutrients. Whole grains, as well as foods made from them, consist of the entire grain seed, usually called the kernel. The kernel is made of three components—the bran, the germ, and the endosperm. If the kernel has been cracked, crushed, or flaked, then it must retain nearly the same relative proportions of bran, germ, and endosperm as the original grain to be called whole grain. In the grain-refining process, most of the bran and some of the germ is removed, resulting in the loss of dietary fiber (also known as cereal fiber), vitamins, minerals, lignans, phytoestrogens, phenolic compounds, and phytic acid. Some manufacturers add bran to grain products to increase the dietary fiber content. Refined grains are the resulting product of the grain-refining processing. Most refined grains are enriched before being further processed into foods. Enriched refined grain products that conform to standards of identity are required by law to be fortified with folic acid, as well as thiamin, riboflavin, niacin, and iron. Food manufacturers may fortify whole-grain foods where regulations permit the addition of folic acid. Currently, a number of whole-grain, ready-to-eat breakfast cereals are fortified with folic acid. As illustrated by the comparison of whole-wheat and enriched white flours in table 6, many nutrients occur at higher or similar levels in whole grains when compared to enriched grains, but whole grains have less folate unless they have been fortified with folic acid.

Consuming at least 3 or more ounce-equivalents of whole grains per day can reduce the risk of several chronic diseases and may help with weight maintenance. Thus, daily intake of at least 3 ounce-equivalents of whole grains per day is recommended by substituting whole grains for refined grains. However, because three servings may be difficult for younger children to achieve, it is recommended that they increase whole grains into their diets as they grow. At all calorie levels, all age groups should consume at least half the grains as whole grains to achieve the fiber recommendation. All grain servings can be whole-grain; however, it is advisable to include some folate-fortified products, such as folate-fortified whole-grain cereals, in these whole-grain choices.

> Increased intakes of fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products are likely to have important health benefits for most Americans.

Whole grains cannot be identified by the color of the food; label-reading skills are needed. Table 7 identifies names of whole grains that are available in the United States. For information about the ingredients in whole-grain and enriched-grain products, read the ingredient list on the food label. For many whole-grain products, the words "whole" or "whole grain" will appear before the grain ingredient's name. The whole grain should be the first ingredient listed. Wheat flour, enriched flour, and degerminated cornmeal are not whole grains. The Food and Drug Administration requires foods that bear the whole-grain health claim to (1) contain 51 percent or more whole-grain ingredients by weight per reference amount and (2) be low in fat.

Milk and Milk Products

Another source of nutrients is milk and milk products. Milk product consumption has been associated with overall diet quality and adequacy of intake of many nutrients. The intake of milk products is especially important to bone health during childhood and adolescence. Studies specifically on milk and other milk products, such as yogurt and cheese, showed a positive relationship between the intake of milk and milk products and bone mineral content or bone mineral density in one or more skeletal sites (see table 1 for information on equivalent amounts of milk products).

Adults and children should not avoid milk and milk products because of concerns that these foods lead to weight gain. There are many fat-free and low-fat choices without added sugars that are available and consistent with an overall healthy dietary plan. If a person wants to consider milk alternatives because of lactose intolerance, the most reliable and easiest ways to derive the health benefits associated with milk and milk product consumption is to choose alternatives within the milk food group, such as yogurt or lactose-free milk, or to consume the enzyme lactase prior to the consumption of milk products. For individuals who choose to or must avoid all milk products (e.g., individuals with lactose intolerance, vegans), nondairy calcium-containing alternatives may be selected to help meet calcium needs (app. B-4).

TABLE 5. Fruits, Vegetables, and Legumes (Dry Beans) That Contain Vitamin A (Carotenoids), Vitamin C, Folate, and Potassium

Many of the fruits, vegetables, and legumes (beans) are considered to be important sources of vitamin A (as carotenoids), vitamin C, and potassium in the adult population. Intakes of these nutrients, based on dietary intake data or evidence of public health problems, may be of concern. Also listed are sources of naturally occurring folate, a nutrient considered to be of concern for women of childbearing age and those in the first trimester of pregnancy. Folic acid-fortified grain products, not listed in this table, are also good sources.

Sources of vitamin A (carotenoids) (see app. B-6) • Bright orange vegetables like carrots, sweetpotatoes, and pumpkin • Tomatoes and tomato products, red sweet pepper • Leafy greens such as spinach, collards, turnip greens, kale, beet and mustard greens, green leaf lettuce, and romaine • Orange fruits like mango, cantaloupe, apricots, and red or pink grapefruit
Sources of vitamin C • Citrus fruits and juices, kiwi fruit, strawberries, guava, papaya, and cantaloupe • Broccoli, peppers, tomatoes, cabbage (especially Chinese cabbage), brussels sprouts, and potatoes • Leafy greens such as romaine, turnip greens, and spinach
Sources of folate • Cooked dry beans and peas • Oranges and orange juice • Deep green leaves like spinach and mustard greens
Sources of potassium (see app. B-1) • Baked white or sweetpotatoes, cooked greens (such as spinach), winter (orange) squash • Bananas, plantains, many dried fruits, oranges and orange juice, cantaloupe, and honeydew melons • Cooked dry beans • Soybeans (green and mature) • Tomato products (sauce, paste, puree) • Beet greens

TABLE 6. Comparison of 100 Grams of Whole-Grain Wheat Flour and Enriched, Bleached, White, All-Purpose Flour

Some of the nutrients of concern and the fortification nutrients in 100 percent whole-wheat flour and enriched, bleached, all-purpose white (wheat) flour. Dietary fiber, calcium, magnesium and potassium, nutrients of concern, occur in much higher concentrations in the whole-wheat flour on a 100-gram basis (percent). The fortification nutrients–thiamin, riboflavin, niacin, and iron–are similar in concentration between the two flours, but folate, as Dietary Folate Equivalent (DFE), µg, is higher in the enriched white flour.

	100 Percent Whole-Grain Wheat Flour	Enriched, Bleached, All-Purpose White Flour
Calories, kcal	339.0	364.0
Dietary fiber, g	12.2	2.7
Calcium, mg	34.0	15.0
Magnesium, mg	138.0	22.0
Potassium, mg	405.0	107.0
Folate, DFE, µg	44.0	291.0
Thiamin, mg	0.5	0.8
Riboflavin, mg	0.2	0.5
Niacin, mg	6.4	5.9
Iron, mg	3.9	4.6

Source: Agricultural Research Service Nutrient Database for Standard Reference, Release 17.

TABLE 7. Whole Grains Available in the United States

Whole grains that are consumed in the United States either as a single food (e.g., wild rice, popcorn) or as an ingredient in a multi-ingredient food (e.g., in multi-grain breads). This listing of whole grains was determined from a breakdown of foods reported consumed in nationwide food consumption surveys, by amount consumed. The foods are listed in approximate order of amount consumed, but the order may change over time. In addition, other whole grains may be consumed that are not yet represented in the surveys.

Whole wheat
Whole oats/oatmeal
Whole-grain corn
Popcorn
Brown rice
Whole rye
Whole-grain barley
Wild rice
Buckwheat
Triticale
Bulgur (cracked wheat)
Millet
Quinoa
Sorghum

Source: Agriculture Research Service Database for CSFII 1994–1996.