



Chapter 4

Foods and Nutrients to Increase

A wide variety of nutritious foods are available in the United States. However, many Americans do not eat the array of foods that will provide all needed nutrients while staying within calorie needs. In the United States, intakes of vegetables, fruits, whole grains, milk and milk products,⁵⁷ and oils are lower than recommended. As a result, dietary intakes of several nutrients—potassium, dietary fiber, calcium, and vitamin D—are low enough to be of public health concern for both adults and children. Several other nutrients also are of concern for specific population groups, such as folic acid for women who are capable of becoming pregnant.

This chapter describes food choices that should be emphasized to help Americans close nutrient gaps and move toward healthful eating patterns.

Recommendations are based on evidence that consuming these foods within the context of an overall healthy eating pattern is associated with a health benefit or meeting nutrient needs. Guidance on food choices for a healthy eating pattern generally groups foods based on commonalities in nutrients provided and how the foods are viewed and used by consumers. The following recommendations provide advice about making choices from all food groups while balancing calorie needs.

FOR MORE INFORMATION

See **Chapter 5** for a description of and additional information about suggested healthy eating patterns and their food group intake recommendations.

57. Milk and milk products also can be referred to as dairy products.



Key Recommendations

Individuals should meet the following recommendations as part of a healthy eating pattern and while staying within their calorie needs.

Increase vegetable and fruit intake.

Eat a variety of vegetables, especially dark-green and red and orange vegetables and beans and peas.

Consume at least half of all grains as whole grains. Increase whole-grain intake by replacing refined grains with whole grains.

Increase intake of fat-free or low-fat milk and milk products, such as milk, yogurt, cheese, or fortified soy beverages.⁵⁸

Choose a variety of protein foods, which include seafood, lean meat and poultry, eggs, beans and peas, soy products, and unsalted nuts and seeds.

Increase the amount and variety of seafood consumed by choosing seafood in place of some meat and poultry.

Replace protein foods that are higher in solid fats with choices that are lower in solid fats and calories and/or are sources of oils.

Use oils to replace solid fats where possible.

Choose foods that provide more potassium, dietary fiber, calcium, and vitamin D, which are nutrients of concern in American diets. These foods include vegetables, fruits, whole grains, and milk and milk products.

Recommendations for Specific Population Groups

*Women capable of becoming pregnant*⁵⁹

Choose foods that supply heme iron, which is more readily absorbed by the body, additional iron sources, and enhancers of iron absorption such as vitamin C-rich foods.

Consume 400 micrograms (mcg) per day of synthetic folic acid (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet.⁶⁰

*Women who are pregnant or breastfeeding*⁵⁹

Consume 8 to 12 ounces of seafood per week from a variety of seafood types.

Due to their methyl mercury content, limit white (albacore) tuna to 6 ounces per week and do not eat the following four types of fish: tilefish, shark, swordfish, and king mackerel.

If pregnant, take an iron supplement as recommended by an obstetrician or other health care provider.

Individuals ages 50 years and older

Consume foods fortified with vitamin B₁₂, such as fortified cereals, or dietary supplements.

58. Fortified soy beverages have been marketed as “soymilk,” a product name consumers could see in supermarkets and consumer materials. However, FDA’s regulations do not contain provisions for the use of the term soymilk. Therefore, in this document, the term “fortified soy beverage” includes products that may be marketed as soymilk.

59. Includes adolescent girls.

60. “Folic acid” is the synthetic form of the nutrient, whereas “folate” is the form found naturally in foods.

SUPPORTING THE RECOMMENDATIONS

The following sections expand on the recommendations and review the evidence supporting the health benefits associated with increased emphasis on vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, and oils. An important underlying principle is the need to control calories to manage body weight while making choices to support these food and nutrient recommendations. The best way to do this is to consume foods in nutrient-dense forms.

Nutrient-dense foods provide vitamins, minerals, and other substances that may have positive health effects, with relatively few calories. They are lean or low in solid fats, and minimize or exclude added solid fats, added sugars, and added refined starches, as these add calories but few essential nutrients or dietary fiber. Nutrient-dense foods also minimize or exclude added salt or other compounds high in sodium. Ideally, they are in forms that retain naturally occurring components such as dietary fiber. All vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, lean meats and poultry, eggs, beans and peas (legumes), and nuts and seeds that are prepared without added solid fats, sugars, starches, and sodium are nutrient-dense.

Vegetables and Fruits

Three reasons support the recommendation for Americans to eat more vegetables and fruits. First, most vegetables and fruits are major contributors of a number of nutrients that are underconsumed in the United States, including folate, magnesium, potassium, dietary fiber, and vitamins A, C, and K.⁶¹ Several of these are of public health concern for the general public (e.g., dietary fiber and potassium) or for a specific group (e.g., folic acid for women who are capable of becoming pregnant).

Second, consumption of vegetables and fruits is associated with reduced risk of many chronic diseases. Specifically, moderate evidence indicates that intake of at least 2½ cups of vegetables and fruits per day is associated with a reduced risk of cardiovascular disease, including heart attack and stroke. Some vegetables and fruits may be protective against certain types of cancer.

BEANS AND PEAS ARE UNIQUE FOODS

Beans and peas are the mature forms of legumes. They include kidney beans, pinto beans, black beans, garbanzo beans (chickpeas), lima beans, black-eyed peas, split peas, and lentils.

Beans and peas are excellent sources of protein. They also provide other nutrients, such as iron and zinc, similar to seafood, meat, and poultry. They are excellent sources of dietary fiber and nutrients such as potassium and folate, which also are found in other vegetables.

Because of their high nutrient content, beans and peas may be considered both as a vegetable and as a protein food. Individuals can count beans and peas as either a vegetable or a protein food.

Green peas and green (string) beans are not considered to be “Beans and Peas.” Green peas are similar to other starchy vegetables and are grouped with them. Green beans are grouped with other vegetables such as onions, lettuce, celery, and cabbage because their nutrient content is similar to those foods.

DECIPHERING THE JUICE IN JUICE

The percent of juice in a beverage may be found on the package label, such as “contains 25% juice” or “100% fruit juice.” Some labels may say they provide 100% of a nutrient, such as “provides 100% Daily Value for vitamin C.” Unless the package also states it is “100% juice,” it is not 100% juice. Sweetened juice products with minimal juice content, such as juice drinks, are considered sugar-sweetened beverages rather than fruit juice.

61. Food sources of shortfall nutrients that are not of major concern for public health (e.g., magnesium, vitamin A, vitamin C) can be found in Chapter D.2 of the Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010, found at www.dietaryguidelines.gov.

Third, most vegetables and fruits, when prepared without added fats or sugars, are relatively low in calories. Eating them instead of higher calorie foods can help adults and children achieve and maintain a healthy weight.

Very few Americans consume the amounts of vegetables recommended as part of healthy eating patterns. (See Chapter 5 for specific information and recommendations.) For almost all Americans ages 2 years and older, usual intake falls below amounts recommended.

Similarly, although most Americans 2 to 3 years of age consume recommended amounts of total fruits, Americans ages 4 years and older do not. (See Chapter 5 for specific information and recommendations.) Children ages 2 to 18 years and adults ages 19 to 30 years consume more than half of their fruit intake as juice. Although 100% fruit juice can be part of a healthful diet, it lacks dietary fiber and when consumed in excess can contribute extra calories. The majority of the fruit recommended should come from whole fruits, including fresh, canned, frozen, and dried forms, rather than from juice. When juices are consumed, 100% juice should be encouraged. To limit intake of added sugars, fruit canned in 100% fruit juice is encouraged over fruit canned in syrup.

Grains

In the U.S. marketplace, consumers have a wide variety of grain-based food options. Although Americans generally eat enough total grains, most of the grains consumed are refined grains rather than whole grains. Some refined grain foods also are high in solid fats and added sugars.

Whole grains

Whole grains are a source of nutrients such as iron, magnesium, selenium, B vitamins, and dietary fiber. Whole grains vary in their dietary fiber content. Moderate evidence indicates that whole-grain intake may reduce the risk of cardiovascular disease and is associated with a lower body weight. Limited evidence also shows that consuming whole grains is associated with a reduced incidence of type 2 diabetes. Consuming enough whole grains helps meet nutrient needs. Choosing whole grains that are higher in dietary fiber has additional health benefits.

WHOLE, REFINED, AND ENRICHED GRAINS: WHAT'S THE DIFFERENCE?

Whole grains include the entire grain seed, usually called the kernel. The kernel consists of three components—the bran, germ, and endosperm. If the kernel has been cracked, crushed, or flaked, then, to be called a “whole grain” a food must retain the same relative proportions of these components as they exist in the intact grain. Whole grains are consumed either as a single food (e.g., wild rice or popcorn) or as an ingredient in foods (e.g., in cereals, breads, and crackers). Some examples of whole-grain ingredients include buckwheat, bulgur, millet, oatmeal, quinoa, rolled oats, brown or wild rice, whole-grain barley, whole rye, and whole wheat.

Refined grains have been milled to remove the bran and germ from the grain. This is done to give grains a finer texture and improve their shelf life, but it also removes dietary fiber, iron, and many B vitamins.

Enriched grains are grain products with B vitamins (thiamin, riboflavin, niacin, folic acid) and iron added. Most refined-grain products are enriched.

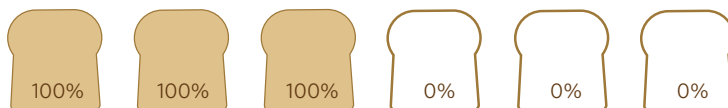
At least half of recommended total grain intake should be whole grains. (See Chapter 5 for specific information and recommendations.) Less than 5 percent of Americans consume the minimum recommended amount of whole grains, which for many is about 3 ounce-equivalents⁶² per day. On average, Americans eat less than 1 ounce-equivalent of whole grains per day.

Americans should aim to replace many refined-grain foods with whole-grain foods that are in their nutrient-dense forms to keep total calorie intake within limits. When refined grains are eaten, they should be enriched. Individuals may choose to consume more than half of their grains as whole grains. To ensure

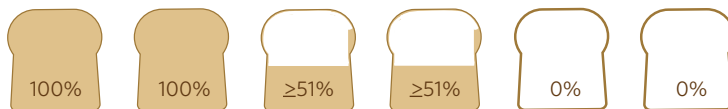
62. 1 ounce-equivalent of grain is: 1 one-ounce slice bread; 1 ounce uncooked pasta or rice; 1/2 cup cooked rice, pasta, or cereal; 1 tortilla (6" diameter); 1 pancake (5" diameter); 1 ounce ready-to-eat cereal (about 1 cup cereal flakes).

FIGURE 4-1. Three Ways to Make at Least Half of Total Grains Whole Grains^a

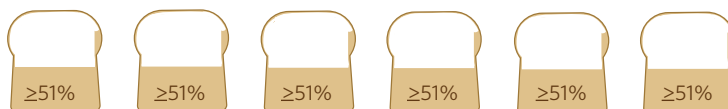
1. 3 ounces of 100% whole grains and 3 ounces of refined-grain products



2. 2 ounces of 100% whole grains, 2 ounces of partly whole-grain products,^b and 2 ounces of refined-grain products



3. 6 ounces of partly whole-grain products



a. Each one-ounce slice of bread represents a 1 ounce-equivalent of grains: 1 one-ounce slice bread; 1 ounce uncooked pasta or rice; 1/2 cup cooked rice, pasta, or cereal; 1 tortilla (6" diameter); 1 pancake (5" diameter); 1 ounce ready-to-eat cereal (about 1 cup cereal flakes). The figure uses an example for a person whose recommendation is 6 ounces

of total grains with at least 3 ounces from whole grains per day. b. Partly whole-grain products depicted are those that contribute substantially to whole-grain intake. For example, products that contain at least 51% of total weight as whole grains or those that provide at least 8 grams of whole grains per ounce-equivalent.

nutrient adequacy, individuals who consume all of their grains as whole grains should include some that have been fortified with folic acid, such as some ready-to-eat whole-grain cereals. This is particularly important for women who are capable of becoming pregnant.

The recommendation to consume at least half of total grains as whole grains can be met in a number of ways (Figure 4-1). The most direct way to meet the whole grain recommendation is to eat at least

FOR MORE INFORMATION
Appendix 4, Using the Food Label to Track Calories, Nutrients, and Ingredients, lists some of the whole grains available in the United States and explains how to use the ingredients list to find whole grains.

half of one's grain-based foods as 100% whole-grain foods. If the only grains in the ingredients list are whole grains, the food is a 100% whole-grain food. The relative amount of grain in the food can be inferred by the placement of the

grain in the ingredients list. The whole grain should be the first ingredient or the second ingredient, after water. For foods with multiple whole-grain ingredients, they should appear near the beginning of the ingredients list.

Many grain foods contain both whole grains and refined grains. These foods also can help people meet the whole grain recommendation, especially if a considerable proportion of the grain ingredients is whole grains. For example, foods with at least 51 percent of the total weight as whole-grain ingredients contain a substantial amount of whole grains. Another example is foods with at least 8 grams of whole grains per ounce-equivalent.⁶³ Some product labels show the whole grains health claim⁶⁴ or the grams of whole grain in the product. This information may help people identify food choices that have a substantial amount of whole grains.

63. Adapted from the Food Safety and Inspection Service (FSIS) guidance on whole-grain claims. Available at http://www.fsis.usda.gov/OPPDE/larc/Claims/Food_Guide_MyPyramid_Policy.pdf.

64. Products that bear the FDA health claim for whole grains have at least 51% or more of the total ingredients by weight as whole-grain ingredients, as well as meet other criteria.

Milk and Milk Products⁶⁵

Milk and milk products contribute many nutrients, such as calcium, vitamin D (for products fortified with vitamin D), and potassium, to the diet. Moderate evidence shows that intake of milk and milk products is linked to improved bone health, especially in children and adolescents. Moderate evidence also indicates that intake of milk and milk products is associated with a reduced risk of cardiovascular disease and type 2 diabetes and with lower blood pressure in adults.

Intake of milk and milk products, including fortified soy beverages, is less than recommended amounts for most adults, children and adolescents ages 4 to 18 years, and many children ages 2 to 3 years. Recommended amounts are 3 cups per day of fat-free or low-fat milk and milk products for adults and children and adolescents ages 9 to 18 years, 2½ cups per day for children ages 4 to 8 years, and 2 cups for children ages 2 to 3 years. (See Chapter 5 for specific information and recommendations.) In general, intake is lower for females than for males and declines with age.

The majority of current fluid milk intake comes from reduced fat (2%) or whole (full-fat) milk, with smaller amounts consumed as fat-free (skim) or low-fat (1%) milk. Almost half of the milk and milk product intake in the United States comes from cheese, little of which is consumed in a lower-fat form. Choosing fat-free or low-fat milk and milk products provides the same nutrients with less solid fat and thus fewer calories. In addition, selecting more of milk group intake as fat-free or low-fat fluid milk or yogurt rather than as cheese can increase intake of potassium, vitamin A, and vitamin D and decrease intake of sodium, cholesterol, and saturated fatty acids.

It is especially important to establish the habit of drinking milk in young children, as those who consume milk at an early age are more likely to do so as adults. For individuals who are lactose-intolerant, low-lactose and lactose-free milk products are available. Those who do not consume milk or milk products should consume foods that provide the range of nutrients generally obtained from the milk group, including protein, calcium, potassium, magnesium, vitamin D, and vitamin A. Soy beverages fortified with calcium and vitamins A and D are considered part of the milk and milk products

group because they are similar to milk both nutritionally⁶⁶ and in their use in meals.

Protein Foods

Protein foods include seafood, meat, poultry, eggs, beans and peas, soy products, nuts, and seeds. In addition to protein, these foods contribute B vitamins (e.g., niacin, thiamin, riboflavin, and B₆), vitamin E, iron, zinc, and magnesium to the diet. However, protein also is found in some foods that are classified in other food groups (e.g., milk and milk products). The fats in meat, poultry, and eggs are considered solid fats, while the fats in seafood, nuts, and seeds are considered oils. Meat and poultry should be consumed in lean forms to decrease intake of solid fats.

ARE SEAFOOD AND FISH THE SAME?

Seafood is a large category of marine animals that live in the sea and in freshwater lakes and rivers. Seafood includes **fish**, such as salmon, tuna, trout, and tilapia, and **shellfish**, such as shrimp, crab, and oysters.

Some Americans need to increase their total intake of protein foods, while others are eating more than is recommended. Americans should consume protein foods in amounts recommended for their nutrient and calorie needs. (See Chapter 5 for specific information and recommendations.) Meat, poultry, and eggs are the most commonly consumed protein foods, while seafood, beans and peas, soy products, nuts, and seeds are consumed in proportionally smaller amounts.

Consumption of a balanced variety of protein foods can contribute to improved nutrient intake and health benefits. For example, moderate evidence indicates that eating peanuts and certain tree nuts (i.e., walnuts, almonds, and pistachios) reduces risk factors for cardiovascular disease when consumed as part of a diet that is nutritionally adequate and within calorie needs. Because nuts and seeds are high in calories, they should be eaten in small portions and used to replace other protein foods, like some meat or poultry, rather than being added to the diet. In

65. Milk and milk products also can be referred to as dairy products.

66. Nutrition assistance programs may have additional nutrient specifications for soy beverages based on Federal requirements or the nutrient needs of target populations.

addition, individuals should choose unsalted nuts and seeds to help reduce sodium intake. Beans and peas, as discussed previously under **Vegetables and Fruits**, confer health benefits as sources of important nutrients such as dietary fiber.

FOR MORE INFORMATION

See **Chapter 5** for examples of how a variety of protein foods can be incorporated into eating patterns that can confer health benefits.

In recent years, moderate evidence has emerged about the health benefits of consuming seafood. Therefore, the *Dietary Guidelines for Americans, 2010*

includes a new quantitative recommendation for seafood intake. An intake of 8 or more ounces per week (less for young children), about 20% of total recommended intake of protein foods of a variety of seafood is recommended.⁶⁷ Additional information about seafood and the recommendations follows.

Seafood

Mean intake of seafood in the United States is approximately 3½ ounces per week, and increased intake is recommended. Seafood contributes a range of nutrients, notably the omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Moderate evidence shows that consumption of about 8 ounces⁶⁸ per week of a variety of seafood, which provide an average consumption of 250 mg per day of EPA and DHA, is associated with reduced cardiac deaths among individuals with and without pre-existing cardiovascular disease. Thus, this recommendation contributes to the prevention of heart disease. The recommendation is to consume seafood for the total package of benefits that seafood provides, including its EPA and DHA content.

Seafood choices can include those with higher and lower amounts of EPA and DHA, but, some choices with higher amounts should be included. Smaller amounts of seafood are recommended for children. (See Chapter 5 for specific information and recommendations.)

Moderate, consistent evidence shows that the health benefits from consuming a variety of seafood in the amounts recommended outweigh the health risks associated with methyl mercury, a heavy metal found in seafood in varying levels.⁶⁹ Benefits

are maximized with seafood higher in EPA and DHA but lower in methyl mercury. In addition, eating a variety of seafood, as opposed to just a few choices, is likely to reduce the amount of methyl mercury consumed from any one seafood type. Individuals who regularly consume more than the recommended amounts of seafood should choose a mix of seafood that emphasizes choices relatively low in methyl mercury. Appendix 11 lists common seafood varieties with the EPA+DHA and mercury content in a 4-ounce cooked portion. A total of 1,750 mg per week of EPA+DHA provides an average of 250 mg per day of these omega-3 fatty acids. Seafood varieties that are commonly consumed in the United States that are higher in EPA and DHA and lower in mercury include salmon, anchovies, herring, sardines, Pacific oysters, trout, and Atlantic and Pacific mackerel (*not* king mackerel, which is high in mercury).

In addition to the health benefits for the general public, the nutritional value of seafood is of particular importance during fetal growth and development, as well as in early infancy and childhood. Moderate evidence indicates that intake of omega-3 fatty acids, in particular DHA, from *at least* 8 ounces of seafood per week for women who are pregnant or breastfeeding is associated with improved infant health outcomes, such as visual and cognitive development. Therefore, it is recommended that women who are pregnant or breastfeeding consume at least 8 and up to 12 ounces⁶⁸ of a variety of seafood per week, from choices that are lower in methyl mercury. Obstetricians and pediatricians should provide guidance to women who are pregnant or breastfeeding to help them make healthy food choices that include seafood.

Women who are pregnant or breastfeeding should not eat four types of fish because they are high in methyl mercury. These are tilefish, shark, swordfish, and king mackerel (Appendix 11). Women who are pregnant or breastfeeding can eat all types of tuna, including white (albacore) and light canned tuna, but should limit white tuna to 6 ounces per week because it is higher in methyl mercury.

Oils

Fats with a high percentage of monounsaturated and polyunsaturated fatty acids are usually liquid at room temperature and are referred to as “oils” (see Figure

67. Protein foods recommendations for people who consume a vegetarian diet are described in Chapter 5.

68. Cooked, edible portion.

69. State and local advisories provide information to guide consumers who eat fish caught from local waters. This information can be found at www.epa.gov/fishadvisories. Accessed July 11, 2010.

3-3). Oils are not a food group, but are emphasized because they contribute essential fatty acids and vitamin E to the diet.

FOR MORE INFORMATION

See **Chapter 3** for additional discussion of the types of fats and effects of various fatty acids on blood cholesterol levels.

Oils are naturally present in foods such as olives, nuts, avocados, and seafood. Many common oils are extracted from plants, such as canola, corn, olive, peanut, safflower, soybean, and sunflower oils. Foods that are mainly oil include mayonnaise, oil-based salad dressings, and soft (tub or squeeze) margarine with no *trans* fatty acids. Coconut oil, palm kernel oil, and palm oil are high in saturated fatty acids and partially hydrogenated oils contain *trans* fatty acids. For nutritional purposes, they should be considered solid fats.

Americans consume more solid fats but less oil than is desirable. (See Chapter 5 for specific information and recommendations.) Because oils are a concentrated source of calories, Americans should replace solid fats with oils, rather than add oil to the diet, and should use oils in small amounts. For example, individuals can use soft margarine instead of stick margarine, replace some meats and poultry with seafood or unsalted nuts, and use vegetable oils instead of solid fats, such as butter, in cooking.

Nutrients of Concern

Because consumption of vegetables, fruits, whole grains, milk and milk products, and seafood is lower than recommended, intake by Americans of some nutrients is low enough to be of public health concern. These are potassium, dietary fiber, calcium, and vitamin D. In addition, as discussed below, intake of iron, folate, and vitamin B₁₂ is of concern for specific population groups.

FOR MORE INFORMATION

See **Chapter 5** for a discussion of the role of supplements and fortified foods.

Potassium

As described in **Chapter 3: Foods and Food Components to Reduce**, high intake of sodium is related to the high prevalence of high blood pressure in the

United States. Dietary potassium can lower blood pressure by blunting the adverse effects of sodium on blood pressure. Other possible benefits of an eating pattern rich in potassium include a reduced risk of developing kidney stones and decreased bone loss. The Adequate Intake (AI) for potassium for adults is 4,700 mg per day. AIs are amounts of a nutrient that are adequate for almost everyone in the population; therefore, intake below an AI may be adequate for some people. Available evidence suggests that African Americans and individuals with hypertension especially benefit from increasing intake of potassium.

Few Americans, including all age-gender groups, consume potassium in amounts equal to or greater than the AI. In view of the health benefits of adequate potassium intake and its relatively low current intake by the general population, increased intake of dietary potassium from food sources is warranted. Individuals with kidney disease and those who take certain medications, such as ACE inhibitors, should consult with their health care provider for specific guidance on potassium intake.

Dietary sources of potassium are found in all food groups, notably in vegetables, fruits, and milk and milk products. Appendix 12 lists food sources of potassium. Americans should select a variety of food sources of potassium to meet recommended intake rather than relying on supplements.

Dietary fiber

Dietary fiber is the non-digestible form of carbohydrates and lignin. Dietary fiber naturally occurs in plants, helps provide a feeling of fullness, and is important in promoting healthy laxation. Some of the best sources of dietary fiber are beans and peas, such as navy beans, split peas, lentils, pinto beans, and black beans. Additional sources of dietary fiber include other vegetables, fruits, whole grains, and nuts. All of these foods are consumed below recommended levels in the typical American diet. Bran, although not a whole grain, is an excellent source of dietary fiber. Appendix 13 lists food sources of dietary fiber.

Dietary fiber that occurs naturally in foods may help reduce the risk of cardiovascular disease, obesity, and type 2 diabetes. Children and adults should consume foods naturally high in dietary fiber in order

to increase nutrient density, promote healthy lipid profiles and glucose tolerance, and ensure normal gastrointestinal function. Fiber is sometimes added to foods and it is unclear if added fiber provides the same health benefits as naturally occurring sources.

The AI for fiber is 14 g per 1,000 calories, or 25 g per day for women and 38 g per day for men. Most Americans greatly underconsume dietary fiber, and usual intake averages only 15 g per day. Breads, rolls, buns, and pizza crust made with refined flour are not among the best sources of dietary fiber, but currently contribute substantially to dietary fiber consumption because they are ubiquitous in typical American diets. To meet the recommendation for fiber, Americans should increase their consumption of beans and peas, other vegetables, fruits, whole grains, and other foods with naturally occurring fiber. Whole grains vary in fiber content. The Nutrition Facts label can be used to compare whole-grain products and find choices that are higher in dietary fiber.

Calcium

Adequate calcium status is important for optimal bone health. In addition, calcium serves vital roles in nerve transmission, constriction and dilation of blood vessels, and muscle contraction. A significant number of Americans have low bone mass, a risk factor for osteoporosis, which places them at risk of bone fractures. Age groups of particular concern due to low calcium intake from food include children ages 9 years and older, adolescent girls, adult women, as well as adults ages 51 years and older. All ages are encouraged to meet their Recommended Dietary Allowance (RDA) for calcium.

Milk and milk products contribute substantially to calcium intake by Americans. Calcium recommendations may be achieved by consuming recommended levels of fat-free or low-fat milk and milk products and/or consuming alternative calcium sources (Appendix 14). Removing milk and milk products from the diet requires careful replacement with other food sources of calcium, including fortified foods. Calcium in some plant foods is well absorbed, but consuming enough plant foods to achieve the RDA may be unrealistic for many.

Vitamin D

Adequate vitamin D status is important for health. Extreme lack of vitamin D (i.e., vitamin D deficiency) results in rickets in children and osteomalacia

(softening of bones) in adults. Adequate vitamin D also can help reduce the risk of bone fractures. Although dietary intakes of vitamin D are below recommendations, recent data from the National Health and Nutrition Examination Survey (NHANES) indicate that more than 80 percent of Americans have adequate vitamin D blood levels. Vitamin D is unique in that sunlight on the skin enables the body to make vitamin D.

In the United States, most dietary vitamin D is obtained from fortified foods, especially fluid milk and some yogurts (Appendix 15). Some other foods and beverages, such as breakfast cereals, margarine, orange juice, and soy beverages, also are commonly fortified with this nutrient. Natural sources of vitamin D include some kinds of fish (e.g., salmon, herring, mackerel, and tuna) and egg yolks, which have smaller amounts. It also is available in the form of dietary supplements.

The RDAs for vitamin D, which assume minimal sun exposure, are 600 IU (15 mcg) per day for children and most adults and 800 IU (20 mcg) for adults older than 70 years. As intake increases above 4,000 IU (100 mcg) per day, the potential risk of adverse effects increases.

Additional nutrients of concern for specific groups

Iron: Substantial numbers of women who are capable of becoming pregnant, including adolescent girls, are deficient in iron. They can improve their iron status by choosing foods that supply heme iron, which is more readily absorbed by the body, as well as additional iron sources and enhancers of iron absorption such as vitamin C-rich foods. Sources of heme iron include lean meat and poultry and seafood. Additional iron sources are non-heme iron in plant foods, such as white beans, lentils, and spinach, as well as foods enriched with iron, such as most breads and cereals. However, non-heme iron is not as readily absorbed by the body. Women who are pregnant are advised to take an iron supplement as recommended by an obstetrician or other health care provider.

Folate: Folic acid fortification in the United States has been successful in reducing the incidence of neural tube defects. However, many women capable of becoming pregnant still do not meet the recommended intake for folic acid. All women capable of becoming pregnant are advised to

consume 400 mcg of synthetic folic acid daily (from fortified foods and/or supplements) in addition to food forms of folate from a varied diet. Women who are pregnant are advised to consume 600 mcg of dietary folate equivalents⁷⁰ daily from all sources. Sources of food folate include beans and peas, oranges and orange juice, and dark-green leafy vegetables such as spinach and mustard greens. Folic acid is the form added to foods such as fortified grain products.

Vitamin B₁₂: On average, Americans ages 50 years and older consume adequate vitamin B₁₂. Nonetheless, a substantial proportion of individuals ages 50 years and older may have reduced ability to absorb naturally occurring vitamin B₁₂. However, the crystalline form of the vitamin is well absorbed. Therefore, individuals ages 50 years and older are encouraged to include foods fortified with vitamin B₁₂, such as fortified cereals, or take dietary supplements.

CHAPTER SUMMARY

Many Americans do not eat the variety and amounts of foods that will provide needed nutrients while avoiding excess calorie intake. They should increase their intake of vegetables, fruits, whole grains, fat-free or low-fat milk and milk products, seafood, and oils. These food choices can help promote nutrient adequacy, keep calories in control, and reduce risks of chronic diseases. Consuming these foods is associated with a health benefit and/or with meeting nutrient needs. They should be emphasized to help Americans close nutrient gaps and move toward healthful eating patterns. They provide an array of nutrients, including those of public health concern: potassium, dietary fiber, calcium, and vitamin D. It is important that while increasing intake of these foods, Americans make choices that minimize intake of calories from solid fats and added sugars, which provide few essential nutrients.

70. Dietary Folate Equivalents (DFE) adjust for the difference in bioavailability of food folate compared with synthetic folic acid. 1 DFE = 1 mcg food folate = 0.6 mcg folic acid from supplements and fortified foods taken with meals.