Study Unit

Nutrition and General Health, Part 1

By

John Fixl

Revised by

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About the Reviewer

Alan M. Levine, Ph.D., R.D., is Professor of Nutrition at Marywood University, Scranton, Pennsylvania, and Deputy Director of Research of the Military Family Institute at Marywood. He received his doctorate and master’s degree in Food, Nutrition, and Dietetics from New York University and his bachelor’s degree in Psychology from Hofstra University, Long Island.
A basic understanding of nutrition is important for everyone interested in wellness. You’ll need to make informed dietary decisions that relate to weight control, disease prevention, athletic performance, and general good health.

This study unit and the following unit will introduce you to the basic concepts of nutrition and well-being.

After completing this study unit, you’ll be able to

- Explain the importance of observing specific dietary guidelines as well as the significance of integrating all the guidelines for nutritional well-being
- Describe the issues surrounding healthy weight maintenance, including dietary modifications, the danger of gimmicks and fad diets, and health disorders that can result from improper nutrition
- Explain the importance of dietary fiber
- Identify the food sources of fat, and list tips for reducing fat from your diet
- Explain the dangers of high blood cholesterol and list steps to reduce health risks stemming from elevated cholesterol levels
- Explain the reasons for limiting sugar intake
- Compare the relationship between high blood pressure and high-sodium diets, and list steps to reduce intake of sodium
- Describe the effects of alcohol consumption on your health, including malnourishment, cirrhosis of the liver, addiction, and impairment of judgment that leads to serious accidents
- Explain the importance of water and the dangers associated with dehydration
- Explain the importance of proper nutrition and diet for individuals with special dietary health conditions, such as persons with debilitating diseases, food allergies, and obesity, as well as pregnant women, children, and the elderly
Dietary Guidelines

Nutrition is critical for sustenance and for your overall well-being. It’s the means by which the parts of your body use food for nourishment and for maintenance of proper functioning. Without a proper diet and nutrition, your body can’t grow and function properly, and you’ll be more susceptible to chronic illnesses or diseases, and even premature death.

Following appropriate dietary guidelines, therefore, is essential to your well-being. Your dietary guidelines should contain the following seven recommendations about the foods you eat. Think of them as one integrated package of suggestions to improve your overall general health. Each recommendation must involve variety, balance, and moderation in the total diet.

*Eat a variety of foods.* The best way to get the energy, protein, carbohydrates, vitamins, minerals, and fiber you need for good health is to eat a wide variety of nutritious foods (Figure 1).

*Balance the food you eat with physical activity; maintain or improve your weight.* In order to reduce your chances of developing high blood pressure, heart disease, stroke, and diabetes, you should monitor and control your weight. Successful weight control will promote a positive and healthy lifestyle.

*Choose a diet with plenty of grain products, vegetables, and fruits.* Vegetables, fruits, and grains provide essential vitamins, minerals, complex carbohydrates, and fiber. These foods are generally low in fat.

*Choose a diet low in fat, saturated fat, and cholesterol.* A high-fat and cholesterol diet will inevitably have serious health implications. If you’re serious about reducing your risk of heart disease and certain types of cancer, take steps to reduce your consumption of high-fat and high-cholesterol foods.

*Choose a diet moderate in sugars.* Although sugars and sweetened foods supply calories, they’re limited in vitamins and minerals. If your diet involves a high sugar intake, you’re probably not receiving the proper nutrients necessary for good health.

*Choose a diet moderate in salt and sodium.* Reducing salt and sodium in your diet is important in reducing your chance of developing high blood pressure. If you have high blood pressure, limiting your salt intake can help you control the condition.
FIGURE 1—Put some variety in your diet with some of the selections listed above.
If you drink alcoholic beverages, do so in moderation. Alcoholic beverages contain few vitamins or minerals, and drinking is linked with many health problems. A heavy drinker is often a malnourished individual. Limit the number of drinks to one or two per day. Pregnant women are advised not to consume any alcohol.

Before you start learning about nutrition, your health, and dietary guidelines, take time out to identify your nutritional habits and knowledge of proper nutrition by completing the “Nutritional Habits Self-Check” found on the next page.

The Food Guide Pyramid

The first rule for good nutrition is to eat a wide variety of foods. The Food Guide Pyramid provides you with an easy-to-use visual graphic illustrating the relative amounts of food to eat from each of the major food groups (Figure 2). A varied diet includes foods from all of the major groups. Choosing different foods from within each major group is also important.

When planning your diet, keep the following facts in mind:

- Each of the food groups provides some, but not all, of the nutrients you need. People need more than 40 different nutrients for good health, including protein, fat, carbohydrates, water, and a number of vitamins and minerals.

- Foods in one group can’t replace those in another.

- No one of the major food groups is more important than another. For proper nutrition and good health, you need them all.

Use the Food Guide Pyramid to help you eat better every day. Remember to go easy on fats, oils, and sweets—the foods in the small tip of the pyramid. These foods contain a lot of calories, but little nutrition.

Healthy Weight Maintenance

Successful weight control—the ability to control weight over a long period of time—is the result of a positive lifestyle rather than simply a specific diet (Figure 3). If you consume more calories than you burn, you’ll gain weight, and if you consume fewer calories than you burn, you’ll lose weight. As sound as that principle may be, it still may not be beneficial to actually count calories. Metabolism, or the rate at which you process food, is a very individual thing. The actual computation of calories is seldom exact.

Drastic caloric restriction, which is popular in most fad or crash diets, can actually make a person heavier because low-calorie diets lower your metabolism and require fewer calories for basic life functions. People who regularly engage in aerobic activity burn fat stores and maintain metabolically active muscle tissue. This is one reason exercise should be a part of any long-term weight control program.
### NUTRITIONAL HABITS SELF-CHECK

Circle one response from column 1, 2, or 3 for each question.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I crave chocolate.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>2</td>
<td>I use sugar.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>3</td>
<td>I eat/drink lowfat or nonfat (skim milk) dairy products.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>4</td>
<td>I eat pasta.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>5</td>
<td>I eat fish and/or poultry.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>6</td>
<td>I limit my intake of butter or margarine.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>7</td>
<td>I drink sugar drinks.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>8</td>
<td>I eat nuts.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>9</td>
<td>I eat dark-green and/or yellow/orange vegetables.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>10</td>
<td>I crave greasy foods.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>11</td>
<td>I eat beans and other legumes.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>12</td>
<td>I eat fruits rather than sweets for instant energy.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>13</td>
<td>I eat lettuce salads.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>14</td>
<td>I use a liquid diet plan.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>15</td>
<td>I use a one-food diet plan.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>16</td>
<td>I use “quick loss” weight programs.</td>
<td>Always</td>
<td>Sometimes</td>
</tr>
<tr>
<td>17</td>
<td>I drink juices.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>18</td>
<td>I drink 7–8 glasses of water daily.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>19</td>
<td>I get my vitamin C daily.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>20</td>
<td>I eat 2–4 fruits daily.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>21</td>
<td>I eat breakfast.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>22</td>
<td>I eat lunch.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>23</td>
<td>I eat dinner.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>24</td>
<td>I avoid salty snacks.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>25</td>
<td>I avoid canned and commercially prepared meals.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>26</td>
<td>When eating red meats, I choose lean cuts.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>27</td>
<td>I avoid sausages, bacon, and meats high in salt.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>28</td>
<td>I eat freshly prepared foods.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>29</td>
<td>I avoid sweet rolls, cakes, and pastries.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
<tr>
<td>30</td>
<td>I follow the Food Guide Pyramid.</td>
<td>Never</td>
<td>Sometimes</td>
</tr>
</tbody>
</table>

**How to Score Your Self-Check.** Each response from Column 1 counts as one point; each response from Column 2 counts as two points; and each response from Column 3 counts as three points. If you’re a vegetarian, score three points for items #6 and #26. If you’re a vegan, score three additional points for item #8. Total your number of points. If you scored between 0 and 59, your diet and nutritional practices should be changed. You probably need encouragement to practice better nutritional habits. Don’t be discouraged because this course will help motivate you to change your lifestyle and get you on the road to nutritional fitness. If you scored between 60 and 79, your status is described as “satisfactory.” This is a more acceptable level and you should be commended. Keep up the good work! If you scored between 80 and 90, your status is described as “very good.” This is obviously the level a fitness and nutrition trainer should strive to attain.
Controlling your weight involves a positive, active lifestyle—not a steady diet of sitting on the couch in front of the television set.
For weight control, the exercises should be of an aerobic nature (walking, jogging, cycling, swimming), high duration, and low intensity. These types of exercise tend to burn more calories (specifically body fat), and raise metabolism (Figure 4).

Walking one mile burns about the same amount of calories as running one mile; the only real difference is the time it takes to perform the activity. For people with excess weight, walking is the preferred exercise since heavy cardiovascular activity may place too much strain on the heart (Figure 5).

### Dietary Modifications

When you modify your diet, there are several steps you should follow:

- Eat less fat. Because fat has such a high caloric density, it adds up to many unwanted calories. Learning to identify high-fat foods...
helps to reduce a person’s calorie intake without drastically reducing food intake.

- Eat fewer refined sugar products. Because it’s so concentrated, refined sugar contains many calories. Refined sugar is often combined with fat in processed foods. Pastries, for example, are approximately 50 percent fat and 50 percent sugar.

- Include approximately 70 percent of natural carbohydrates and a moderate reduction in calories in your diet, coupled with an aerobic program that raises your caloric expenditure.

- Lose weight gradually. Rapid weight loss is always a sure indication that the weight will be gained back. Tissue, water, and muscle account for most of the weight lost in crash diets, while fat accounts for most of the weight gained back. Slow, gradual, long-term weight loss is the healthiest way to lose weight. You should lose no more than one to two pounds a week. The diet and exercise programs that promise quick weight loss with little effort or long-term commitment always fail. The use of pills, crash diets, powdered diet packages, saunas, and wraps are all guarantees that the dieter will gain the weight back over time.

**Eating Prior to Athletic Competition**

What you eat in your meal prior to athletic competition is more likely to hurt your performance than to help it, unless you make wise selections. Most of the energy you require for physical performance is derived from the foods you eat several days prior to competition. The pregame meal should be a light meal that’s easily digested. A low-calorie, high-carbohydrate meal is best. The carbohydrates in a pregame meal should be easily digestible (e.g., lowfat milk, yogurt, cereal, pancakes and syrup, oranges, bread with jelly). The key is not to feel full during competition. High-fiber foods aren’t advised since they may cause an athlete to feel very full during competition. Avoid high-protein foods and fat in the pregame meal because they digest slowly.

Emphasis should be placed on adequate hydration of the body prior to, during, and after competition to prevent dehydration.

For athletes, weight control can be as important as any other factor of training. Overweight athletes don’t perform at their optimum level, regardless of skill or talent. For power sports such as football, it’s important to have body mass, and most of it should be in the form of muscle, not fat. In sports where excess weight limits performance (gymnastics, running, wrestling), it’s equally important that any weight loss is fat and not essential muscle mass (Figure 6).

Two tests are currently being used to determine and monitor body fat percentages: the underwater weighing test (hydrostatic weighing) and the skinfold test with calipers. By monitoring the percent of body fat, you can tell, for example, if a football player is gaining muscle weight and if a gymnast is losing fat weight.
For most athletes, a low level of body fat correlates with a higher level of performance. For both the serious athlete or the average individual, the correct diet and conditioning program will result in reaching an ideal weight with the correct body fat percentage (Figure 7).

FIGURE 6—A weight control program should be geared toward losing body fat through low-intensity/high-duration aerobics and building muscle through weight training activities.

Comparing Weight Loss Programs

START
120 pounds (54 kilograms)
30 percent body fat
(80 pounds lean body mass)
(36 pounds fat)

CORRECT DIET AND EXERCISE
105 pounds (48 kilograms)
17 percent body fat
(Lost 18 pounds of fat)

INADEQUATE DIET AND NO EXERCISE
105 pounds (48 kilograms)
25 percent body fat
(Lost only 7 pounds of fat and 5 pounds of protein. The rest of the weight is lost in water.)

The person with the greater lean-body-weight percentage has a higher metabolic rate and so will burn more calories.

FIGURE 7—Following the correct diet will help you lose more body fat and less lean body mass.
Dieting Facts and Fads

Be suspicious of diet gimmicks and fad diets that promise miracles. They can be dangerous. Some of these diets are appealing because they promise quick and easy weight loss. However, quick weight loss is often followed by weight gain, which may lead to eating disorders. Unless a diet is nutritionally balanced (and many fad diets aren’t), it could be harmful to your health. Diets that encourage little or no eating, diets that limit eating to one kind of food, diets that are very low in calories, and liquid diets can all cause health problems. Limiting your eating to just once a day, for example, lowers your metabolism. Eating three or four small meals is healthier. Remember, you didn’t gain all your weight overnight, so don’t expect to lose it all overnight.

Eating Disorders

Excessive dieting can pose physical and psychological health risks. Eating disorders often develop from unrealistic and unobtainable goals for weight loss and physical appearance. Anorexia nervosa (lack of an appetite due to a pathological fear of weight gain) and bulimia (compulsive overeating followed by self-induced vomiting and the use of laxatives or diuretics to help control weight) are serious eating disorders. Both involve use of inappropriate dietary techniques and are thought to be caused in part by extremely low levels of self-esteem. People with these disorders usually think they look fat, even though they might be thin. They also have an abnormal fear of being fat.

Common traits of people suffering from either anorexia nervosa or bulimia include

- Unusual eating habits
- A refusal to eat
- Binge eating or gorging followed by vomiting
- Abuses of laxatives and diuretics
- Extreme daily exercise
- Denial that there’s a problem

Any of these behaviors can result in starvation, chronic health problems, and even life-threatening conditions.

Eating disorder treatment programs are available nationwide, and a national support group is available for families of persons with these problems. Consult your doctor for additional information regarding eating disorders.

Take a few minutes now to complete Health Check 1.
COMPLEX CARBOHYDRATES AND DIETARY FIBER

Introduction to Complex Carbohydrates

Grain products, vegetables, and fruits contain complex carbohydrates, dietary fiber, and other food components linked to good health. Complex carbohydrates are made of chains of many sugar units, not just the one or two units found in simple sugars. Carbohydrates are a basic source of energy. They’re stored in all tissues, but primarily in the liver and muscles in the form of glycogen. Glycogen is utilized by the muscles to power muscle contraction. Dietary fiber provides added bulk to your diet by absorbing large amounts of water, and it helps prevent various diseases.

You should eat

- At least six servings of breads, cereals, rice, or pasta a day
- At least three servings of vegetables a day. This includes starchy vegetables like potatoes, corn, or peas; foods made with dry beans, lentils, or peas; and dark-green or deep-yellow vegetables, such as broccoli, spinach, collards, carrots, sweet potatoes, and squash.
- At least two servings of fruit a day. This includes citrus fruits and juices, such as oranges, grapefruit, and tangerines; and whole fruit with skin or seeds, such as berries, apples, and pears.

Eating a variety of complex carbohydrates and dietary fiber will assure you of good health.

Health Check 1

At the end of each section of Nutrition and General Health, Part 1, you’ll be asked to check your understanding of what you’ve just read by completing a “Health Check.” Writing the answers to these questions will help you review what you’ve studied so far. Please complete Health Check 1 now.

Indicate whether each statement is True or False.

_____ 1. Fruits and vegetables comprise the most important food group.

_____ 2. Following a specific diet is all you need to do for successful weight management.

_____ 3. Quick-fix diet programs that promise rapid weight loss with little or no effort are usually successful and reasonably guarantee long-term benefits.

_____ 4. Before athletic competition, it’s wise to eat easily digestible foods.

_____ 5. Anorexia nervosa and bulimia are diet disorders that are in part caused by low levels of self-esteem.

Check your answers with those on page 49.
Grain Products

Grain products are an important part of a balanced diet. Whole-grain breads are important sources of dietary fiber. They also provide folic acid, magnesium, and phosphorus in addition to the nutrients found in enriched white bread.

Whole grains are products that contain the entire kernel or all of the kernel that’s edible. Some examples of whole grains are whole wheat, cracked wheat, oatmeal, whole cornmeal, popcorn, brown rice, whole rye, and scotch barley.

Whole grains aren’t limited to just bread or cereal. They also include puffed rice cakes, corn tortillas or taco shells, whole wheat pasta, and scotch barley in soups.

Both whole-grain and enriched breads and cereals provide carbohydrates, or starch; the vitamins thiamin, riboflavin, and niacin; and the mineral iron. Whole grains are also sources of dietary fiber and provide the vitamin folic acid and the minerals zinc and magnesium. You should eat both whole-grain and enriched products every day.

Vegetables supply many of the nutrients you need for good health. But vegetables vary in the amount of the different vitamins and minerals they contain. Use this chart to see at a glance good sources of some important vitamins and minerals and some sources of dietary fiber.

<table>
<thead>
<tr>
<th>VITAMIN A</th>
<th>VITAMIN C</th>
<th>FOLIC ACID</th>
<th>POTASSIUM</th>
<th>DIETARY FIBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans, kidney</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans, lima</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black-eyed peas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broccoli</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Carrots</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Collards</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kale</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lentils</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Peas, green</td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Peas, split</td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>Potato</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potato, with skin</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinach</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Squash, winter</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet potato</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomato</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Turnip greens</td>
<td></td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:** A good source of a vitamin or mineral contributes at least 10 percent of its U.S. Recommended Daily Allowance (U.S. RDA) in a selected serving size. A source of dietary fiber contributes at least 2 grams of dietary fiber in a selected serving size.

**FIGURE 8**—Vegetables provide dietary fiber and contain many vitamins and minerals.
Vegetables

Vegetables supply many of the nutrients you need for good health (Figure 8). Vegetables vary in the kinds and amounts of nutrients they provide. All vegetables provide dietary fiber and contain many vitamins and minerals; some also provide starch or protein.

Dark-green vegetables contain vitamin A, vitamin C, riboflavin, folic acid, iron, calcium, magnesium, and potassium. Deep-yellow vegetables contain vitamin A as carotene.

Dry beans and peas contain thiamin, folic acid, iron, magnesium, phosphorus, zinc, and potassium. Starchy vegetables contain varying amounts of vitamins and minerals such as niacin, vitamin B₆, and potassium.

Figure 9 lists some complementary foods that will help the vegetarian obtain his or her protein requirements.

**FIGURE 9—Plant foods can be combined to reach your daily protein requirements.**

<table>
<thead>
<tr>
<th>COMPLEMENTARY PLANT PROTEINS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A complete protein equivalent can be obtained by eating any one of the following plant food meals.</td>
</tr>
<tr>
<td><strong>Rice</strong> with legumes (such as soybeans or peanuts), sesame seeds, or lowfat dairy products</td>
</tr>
<tr>
<td><strong>Wheat</strong> with legumes, sesame seeds, or lowfat dairy products</td>
</tr>
<tr>
<td><strong>Legumes</strong> with corn, rice, wheat, sesame seeds, barley, oats, or lowfat dairy products</td>
</tr>
</tbody>
</table>

Be aware that pesticides are often used to grow high-quality fruits and vegetables. Although governmental regulations by the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA) monitor the use of pesticides, it’s important to clean your fruits and vegetables carefully.

- Use a brush to scrub away dirt that may be hard to see and to remove remaining pesticide residues. Then rinse in running tap water before serving.
- Throw away the outer leaves of leafy vegetables such as lettuce.
- Peel and cook vegetables, if appropriate, although remember that some nutrients and fiber are lost in this process.

Fruits

Fruits add color, flavor, texture, and sweetness to the diet and also provide vitamins, minerals, and dietary fiber (Figure 10). Citrus fruits, such as oranges and grapefruits, melons, and berries, are good sources of vitamin C. Kiwifruit and papaya are also good sources of vitamin C. Deep-yellow fruits such as apricots, cantaloupes, and mangos are high in vitamin A. All fruits provide additional nutrients, such as folic acid, potassium, and magnesium.
Fruits can be whole, sliced, crushed, sauced, chopped, stewed, or baked and used in sandwiches, salads, desserts, and snacks, or as a colorful garnish for a simple main dish.

Starch

Starch and most types of dietary fiber are complex carbohydrates. Starches are found in breads, cereals, pasta, rice, dry beans and peas, potatoes, and corn. During digestion, starch is broken down into sugar units and is used by the body for energy.

Dietary Fiber

Dietary fiber is the part of plants that human digestive enzymes can’t break down. Plants contain different kinds and amounts of fiber components. Whole wheat bread, oatmeal, apples, and cabbage each contribute fiber to the diet, but their fiber compositions are all different.

Most high-fiber foods contain both soluble and insoluble fiber, but in different proportions. Soluble fiber can be found in oats, dry beans and peas, and some fruits and vegetables. Insoluble fiber can be found in the tough,
chewy texture of wheat bran, whole grains, and vegetables. Choose a variety of high-fiber foods, such as vegetables, fruits, and whole-grain products, so you get enough of both soluble and insoluble fibers daily (Figure 11).

<table>
<thead>
<tr>
<th>GRAINS</th>
<th>VEGETABLES</th>
<th>FRUITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>½ cup All bran</td>
<td>⅛ cup Mixed beans</td>
<td>3 Pears</td>
</tr>
<tr>
<td>1 cup Rolled oats</td>
<td>⅛ cup Peas, lentils</td>
<td>3 Bananas</td>
</tr>
<tr>
<td>1 cup Whole-grain cereal</td>
<td>1 cup Peanuts</td>
<td>4 Peaches</td>
</tr>
<tr>
<td>2 cobs Sweet corn</td>
<td>2 cups Steamed vegetables</td>
<td>4 oz. Blackberries</td>
</tr>
<tr>
<td>3 slices Whole rye bread</td>
<td>4 servings Mixed salad</td>
<td>5 Apples</td>
</tr>
<tr>
<td>3 cups Puffed wheat</td>
<td>4 Carrots</td>
<td>6 Oranges</td>
</tr>
<tr>
<td>4 oz. bag Popcorn</td>
<td></td>
<td>6 Dried pear halves</td>
</tr>
</tbody>
</table>

**FIGURE 11**—Grains, vegetables, and fruits are perfect sources of dietary fiber.

Fiber is often concentrated in the skin and other outer layers of fruits and vegetables. When fruits and vegetables are peeled, some of the fiber is removed. Processing methods also frequently reduce fiber content. For example, white flour contains less fiber than whole-grain flour, and white rice has less fiber than brown rice (Figure 12).

**FIGURE 12**—The way a food is prepared affects its fiber content.
Research continues on the possible role that dietary fiber plays in fighting colon cancer, heart disease, and diabetes. Some studies indicate that foods containing fiber may help reduce blood cholesterol levels. Eating foods that contain insoluble fiber is important for proper bowel function and can reduce symptoms of chronic constipation, such as hemorrhoids and diverticular disease (a painful ailment usually characterized by waste products being trapped in the bowel lining and causing inflammation).

Take a few minutes to review this section by completing Health Check 2.

---

**Health Check 2**

1–3: Match the terms in Column 1 with their descriptions in Column 2.

<table>
<thead>
<tr>
<th>1. complex carbohydrates</th>
<th>a. a storage form of carbohydrate found in the liver and muscles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. dietary fiber</td>
<td>b. starch and dietary fiber</td>
</tr>
<tr>
<td>3. glycogen</td>
<td>c. part of plants that human digestive enzymes can’t break down</td>
</tr>
</tbody>
</table>

4–6: Indicate whether the following statements are True or False.

<table>
<thead>
<tr>
<th>4. Canned vegetables provide more dietary fiber than raw vegetables.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True or False?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. You should eat at least three servings of breads, cereals, rice, or pasta a day.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True or False?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6. You should eat at least three servings of vegetables a day.</th>
</tr>
</thead>
<tbody>
<tr>
<td>True or False?</td>
</tr>
</tbody>
</table>

Check your answers with those on page 49.

---

**EATING LESS FAT AND CHOLESTEROL FOR BETTER HEALTH**

**Dietary Fats**

Fat is the most concentrated source of food energy, or calories. Fat contains over twice the calories of an equal weight of carbohydrates or protein. Each gram of fat supplies about nine calories, compared with about four calories per gram of protein or carbohydrates and seven calories per gram of alcohol. Fat accounts for 34 percent of the total calories in an average diet. You can compute how much fat you’re consuming by using the following formulas.

\[
\text{grams of fat in food} \times 9 \text{ (calories in a gram of fat)} = \text{total calories of fat in food}. \\
\text{[(total calories of fat in food )/total calories in food] } \times 100 = \text{percentage of fat in food}.
\]
High-fat diets have been strongly implicated as a cause of atherosclerosis, a disease of the arteries characterized by progressive thickening and hardening of the artery walls, and of certain types of cancer (Figure 13). Fats, platelets, and other debris block arteries and could eventually close them if they’re consumed in large quantities over a long period of time (Figure 14). Fats can also provide too many calories, which could lead to obesity.

<table>
<thead>
<tr>
<th>Atherosclerosis: Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Established</strong></td>
</tr>
<tr>
<td>High concentration of blood cholesterol—particularly low-density lipoprotein (LDL)</td>
</tr>
<tr>
<td>High blood pressure</td>
</tr>
<tr>
<td>Cigarette smoking</td>
</tr>
<tr>
<td>Family history of atherosclerosis</td>
</tr>
</tbody>
</table>

**Figure 13**—Several factors that cause atherosclerosis have already been established, while research continues into other causes.

**The Progression of Atherosclerosis**

- **10 years old**
  - Clean artery
- **20 years old**
  - Fatty streak
- **30 years old**
  - Fibrous plaque
- **40 years old**
  - Calcification

**After the calcification stage comes infarction, stroke, gangrene, or aneurysm.**

**Figure 14**—Atherosclerosis can eventually lead to the closing of arteries.
Fats should be consumed in moderation in a healthy diet. We do require some dietary fats because they provide the essential fatty acids needed in the human diet. Fats can be classified as either saturated or unsaturated. Saturated fat is high in hydrogen and is found primarily in animal products and tropical vegetable oils. Saturated fat tends to elevate the cholesterol level in the blood.

Because of their molecular structure, unsaturated fats contain less hydrogen. They can be classified as monounsaturated or polyunsaturated (Figure 15). Neither type of unsaturated fat raises blood cholesterol levels. *Polyunsaturated fat* is more liquid than saturated fats and is commonly found in plant products such as safflower, sunflower, corn, soybean, and cottonseed oils; and walnuts and sunflower seeds. It’s also found in fatty fish—fish that’s high in oil such as tuna and salmon. *Monounsaturated fat* contains less hydrogen than saturated fats and can be found in olive, peanut, canola, and avocado oils.

<table>
<thead>
<tr>
<th>SATURATED</th>
<th>MONOUNSATURATED</th>
<th>POLYUNSATURATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>beef</td>
<td>avocados</td>
<td>almonds</td>
</tr>
<tr>
<td>butter</td>
<td>canola oil</td>
<td>com oil</td>
</tr>
<tr>
<td>cheese</td>
<td>cashews</td>
<td>cottonseed oil</td>
</tr>
<tr>
<td>chocolate</td>
<td>olives/olive oil</td>
<td>fish</td>
</tr>
<tr>
<td>coconut oil</td>
<td>peanuts/peanut oil</td>
<td>margarine</td>
</tr>
<tr>
<td>eggs</td>
<td></td>
<td>mayonnaise</td>
</tr>
<tr>
<td>lamb</td>
<td></td>
<td>pecans</td>
</tr>
<tr>
<td>milk</td>
<td></td>
<td>safflower oil</td>
</tr>
<tr>
<td>palm oil</td>
<td></td>
<td>salad dressing</td>
</tr>
<tr>
<td>pork</td>
<td></td>
<td>soybean oil</td>
</tr>
</tbody>
</table>

**FIGURE 15**—Fat can be classified as saturated or unsaturated (monounsaturated and polyunsaturated).

For better health and the prevention of disease, you should consume less saturated fat (found predominantly in animal products) and less cholesterol (found only in animal products). Of the fats you do consume, you should consume a mixture of polyunsaturated and monounsaturated fats. It’s recommended that you reduce your total fat intake to 30 percent or less of your total calories. Some authorities recommend a more extreme diet of 10 percent fat to prevent atherosclerosis, although studies to support this practice are still pending. Certainly a diet this low in fat should not be offered to children.

If you’re watching your calorie intake, reducing the fat you eat is an especially good idea. By choosing lean or lowfat foods, you can get the nutrients you need with fewer calories.

**Food Sources of Fat**

Saturated fats are found in animal products and many dairy products as well as coconut oil, palm kernel oil, and palm oil (Figure 16).
Some of the unsaturated fats in vegetable oils are made more saturated by a process called \textit{hydrogenation}, the process of changing a liquid unsaturated fat to a solid saturated fat by the addition of hydrogen in the presence of a catalyst. Hydrogenated fats are polyunsaturated fats that are hydrogenated through food processing. An example of hydrogenated fat is margarine made from vegetable oil. Commercially prepared and processed foods made with these vegetable oils or with saturated fats such as butter and lard can also be high in saturated fat. Soft (tub) margarines are less hydrogenated than the stick forms and therefore contain less saturated fat.

Substitute both kinds of unsaturated fats for saturated fat in your diet.

\textbf{Tips for Reducing Fat}

There are several useful tips that will help you in your quest to reduce fat in your diet.
- Reduce your intake of red meats, such as beef, pork, and lamb, and substitute smaller portions of fish, poultry, and lean cuts of meat that are lower in total fat (Figure 17).

![Figure 17—All animal products contain cholesterol and fat. Red meats such as beef, pork, and lamb are the worst offenders.](image)

- Remove the skin from chicken, and trim the fat from meat.
- Roast, bake, broil, or simmer meat, poultry, or fish rather than frying them. You should avoid fried foods, especially deep-fried foods, since they’re very high in fat.
- Cool meat or poultry broth until the fat becomes solid. Spoon off the fat before using the broth.
- Be cautious of processed foods and fast foods, which aren’t only high in fat but may also contain coconut oil or palm oil, which are among the undesirable highly saturated fats.
- Reduce your intake of dairy products by replacing whole milk with 1 percent or skim milk in puddings, soups, and baked products; drinking skim milk or 1 percent milk instead of 2 percent milk or whole milk; eating cheeses that have less than five grams of fat per ounce, such as lowfat cottage cheese; avoiding processed, natural, and hard cheeses, such as American, brie, and cheddar; and using margarine or liquid vegetable oils that are high in unsaturated fat (Figure 18).
- Substitute plain lowfat yogurt or blender-whipped lowfat cottage cheese for sour cream or mayonnaise.
- Limit plant foods that are high in oil, such as nuts, olives, and avocados, to avoid fat-dense calories.
Read labels to choose products that are low in saturated fats and total fat content. Avoid commercially prepared and processed foods made with saturated fats or oils.

Steam, boil, stir-fry, bake, or microwave vegetables rather than frying them.

Season vegetables with herbs and spices instead of fatty sauces, butter, or margarine.

Try flavored vinegars or lemon juice on salads, or use smaller servings of oil-based or lowfat salad dressings.

Use vegetable oil in place of solid shortening, margarine, and butter whenever possible.

Try whole-grain flours to enhance the flavors of baked goods made with less fat and cholesterol.

Limit egg yolks to one per serving when making scrambled eggs. Use additional egg whites for larger servings. Limit total egg intake to two or three per week.

**Cholesterol**

*Cholesterol* is a component of all the body cells of humans and animals. Because your body makes cholesterol, you don’t need to add it to your diet.

Cholesterol is present in all animal products—meat, poultry, fish, milk and milk products, and egg yolks. It’s contained in the muscle and fat of red meat and the meat and skin of poultry. It isn’t found in foods of plant origin, such as fruits, vegetables, grains, nuts, seeds, and dry beans and peas.

High blood cholesterol occurs when there’s too much cholesterol in the blood, which tends to increase the risk of heart disease. Your cholesterol level is determined by your genetic makeup and by the total fat,
saturated fat, and cholesterol in the foods you eat. Eating a diet high in fat, especially saturated fatty acids, and cholesterol raises blood cholesterol levels.

The effect that diet has on blood cholesterol varies. High blood cholesterol levels can be reduced by eating foods that are lower in total fat, saturated fatty acids, and cholesterol and that aren’t excessive in calories.

**High-Density and Low-Density Lipoproteins**

Cholesterol is carried in your blood by two different types of lipoprotein—high-density lipoprotein (HDL) and low-density lipoprotein (LDL). Lipoproteins aren’t found in foods. They’re simply carriers found in the blood.

Lipoproteins are packages of fat, cholesterol, and protein. LDLs contain less protein and more fat and cholesterol than HDLs. LDLs carry most of the cholesterol in the blood. LDLs may be referred to as bad cholesterol because they tend to deposit cholesterol in the arteries. HDLs are often called good cholesterol because they tend to remove cholesterol from the arteries. Reducing saturated fatty acids and cholesterol in the diet helps lower LDL-cholesterol levels in your blood and thus reduces your risk of heart disease. You can generally raise HDL levels with exercise.

**Reasons for Lowering Your Cholesterol**

High blood cholesterol is one of the three major risk factors for coronary heart disease. Cigarette smoking and high blood pressure are the other two factors. When your high blood cholesterol level is combined with another major risk factor, your risk for coronary heart disease increases even further. For example, if your cholesterol level is high and you also have high blood pressure, your risk for coronary heart disease increases six times. If you also smoke, your risk increases more than 20-fold. Other factors that increase your risk for coronary heart disease include being male and a family history of the following diseases and conditions: coronary heart disease before the age of 55; diabetes; vascular or blood vessel disease; and obesity.

Lowering your high blood cholesterol level will slow fatty buildup in the walls of the arteries. It will also reduce your risk of a heart attack.

**A Desirable Cholesterol Level**

A blood cholesterol level of 240 milligrams per deciliter of blood (240 mg/dl) or greater is considered high blood cholesterol. Any level above 200 mg/dl, however, increases your risk for heart disease. If your blood cholesterol is 240 mg/dl or greater, you have more than twice the risk of someone whose cholesterol is 200 mg/dl, and you need medical attention and further testing. If your cholesterol level is desirable, you should have your level checked again in five years and maintain a low-cholesterol diet.

**Measuring Your Cholesterol**

To get your blood cholesterol measured, visit your doctor or a local clinic. Technicians will take a blood sample and send it to a laboratory. Your
blood cholesterol level may vary from day to day and from one laboratory to the next. Your doctor will take these factors into consideration. Try to have your cholesterol level measured at the same place each time.

**Setting your goals.** Before starting your cholesterol-lowering diet, your physician will determine your blood cholesterol goal and an LDL-cholesterol level that’s right for you. This goal will vary depending on whether or not you have coronary heart disease. In general, you’ll be aiming for a total cholesterol level that’s below 200 mg/dl and an LDL-cholesterol level that’s below 130 mg/dl.

**Measuring your progress.** Your physician will probably want to measure your cholesterol level after you’ve been on the diet for four to six weeks and again after three months. If the total cholesterol goal is met after three months, your physician will probably measure your LDL-cholesterol level. If both total cholesterol and LDL-cholesterol goals have been met, you’ll enter a phase of long-term monitoring. Long-term monitoring may involve remeasuring total cholesterol twice a year and LDL-cholesterol once a year.

**Influences on Cholesterol Levels**

Several factors can have an influence on your cholesterol level.

**Diet.** Among the factors you can control, diet has the greatest effect on your blood cholesterol level. Saturated fat raises your blood cholesterol level. If you have high blood cholesterol, changing your diet is a very important step you can take to lower it. Many physicians and the National Cholesterol Education Program (NCEP) recommend a Step I Diet (Figure 19). Keep in mind that a three-ounce piece of meat, fish, or poultry has 60 to 90 milligrams of cholesterol, while one egg yolk contains about 270 milligrams of cholesterol, and a three-ounce serving of liver has about 390 milligrams of cholesterol.

**Weight.** Being overweight may also increase your blood cholesterol level. Most overweight patients with high cholesterol levels can help lower their levels by losing weight.
**Physical activity and exercise.** Although it’s not clear whether physical activity can prevent atherosclerosis, regular exercise may help you control your weight, lower your blood pressure, and increase your level of HDL cholesterol—the good type of blood cholesterol.

**Genetic factors.** Genetic factors play a major role in determining your blood cholesterol level and can determine your ability to lower your cholesterol level. A small number of people have an inherited tendency to have a high blood cholesterol level. If you have a genetic disorder that contributes to a high blood cholesterol level, then your parents, children, brothers, and sisters should also have their blood cholesterol levels measured.

**Sex and age.** Coronary heart disease is the leading cause of death and disability for both men and women. It’s estimated that one out of every five men and one out of every 17 women will have symptoms of heart disease before the age of 60. This means that men have two to three times the risk of developing heart disease as women. Monitoring cholesterol levels is useful for predicting the risk of coronary heart disease.

**Alcohol.** You might have heard that modest amounts of alcohol can improve your cholesterol profile by increasing your HDL-cholesterol level. However, it’s not known whether the higher level produced by alcohol protects against coronary heart disease. In addition, drinking alcoholic beverages can have serious adverse effects on your overall health. With these considerations in mind, the use of alcohol isn’t recommended to prevent coronary heart disease. Remember that alcohol is also high in calories, which can lead to an overweight condition. If you do drink alcohol, moderation is the key.

**Stress.** Although stress has been reported to raise blood cholesterol levels, there may be other explanations for this effect. For example, during periods of stress, people may eat more foods that are high in saturated fat and cholesterol. These foods, rather than the stress itself, may increase blood cholesterol levels.

**Tips for Reducing Cholesterol**

Your intake of cholesterol can be reduced by decreasing your intake of all animal products, especially eggs and organ meats (Figure 20). The primary treatment for high blood cholesterol is a diet that’s low in total fat, saturated fat, and cholesterol, and contains all the protein, carbohydrates, vitamins, and minerals your body needs.

To lower your blood cholesterol, you should

- Eat fewer high-fat and high-cholesterol foods, especially those foods that are high in saturated fat.
- Replace part of the saturated fat in your diet with unsaturated fat.
- Eat fewer organ meats, such as liver, brain, and kidney.
- Eat fewer processed meats like lunch meat, bacon, and hot dogs.
- Eat fewer egg yolks. Try substituting two egg whites for each whole egg in recipes.
Choose foods that are high in complex carbohydrates and fiber.

If you’re overweight, restrict your calorie intake and exercise regularly.

Read food labels carefully. Some items labeled low in cholesterol or containing no animal fat may still contain a large amount of fat.

Set goals and monitor your progress toward these goals.

Remember, by closely controlling your diet and monitoring your progress with regular checkups, you can lower your blood cholesterol level and greatly reduce your risk of developing coronary heart disease.

Generally, both your total and LDL-cholesterol levels will begin to drop two to three weeks after you begin your cholesterol-lowering diet. Over time, the more you reduce your cholesterol level, the more you’ll reduce your risk of developing coronary heart disease.

Take a few minutes to review this section by completing Health Check 3.
DIETARY SUGAR AND SODIUM

Sugar Facts

The major problems in eating too many sugary foods are that sugar promotes tooth decay, provides too many empty calories, and doesn’t provide the essential nutrients that the body needs.

Sugars are simple carbohydrates, made of one or two sugar units. Sugars are found naturally in some foods such as most fruits and some vegetables that contain glucose, fructose, and sucrose (table sugar). Another sugar, lactose, is found in milk and in milk products. Legumes and cereals contain small amounts of maltose (Figure 21).

Sugars also serve as flavorings, preservatives, and thickeners. In baked products, sugars contribute to both tenderness and volume. They’re added to foods during processing, preparation in the home, or at the table.

Since sugars supply calories and are limited in nutrients, an overuse of sugars in your diet may mean that you’re not eating other nutritious foods, and you may not be getting sufficient vitamins, minerals, and fiber in your diet. Sugars can be disguised on food labels by a host of names. You should familiarize yourself with some of these names, which are given in Figure 22.

Health Check 3

Fill in the blanks in the following statements.

1. Your total fat intake should be _______ percent or less of your total calorie intake.
2. Two kinds of unsaturated fat are _______ and _______.
3. _______ is found in all the body cells of humans and animals but isn’t found in foods of plant origin.
4. _______ are often called “good cholesterol” because they tend to remove cholesterol from the arteries. The _______ are often referred to as “bad cholesterol.”
5. The three major risk factors for coronary heart disease are high blood cholesterol, cigarette smoking, and _______.
6. Of all the cholesterol-causing factors within your control, _______ has the greatest effect on your blood cholesterol level.

Check your answers with those on page 49.
Tooth decay is another reason to limit your intake of sugar. Both sugars and starches, which break down into sugars, can contribute to tooth decay. Many nutritious foods naturally contain sugars and starches. These foods include milk, fruits, vegetables, breads, cereals, rice, and pastas.
They may also contain added sugars as ingredients. Other foods such as candies and sweets are high in added sugars. The more often these foods are eaten (even in small amounts) and the longer they’re in the mouth before teeth are brushed, the greater the risk for tooth decay. Eating sugary foods as frequent snacks may be more harmful to teeth than eating sugary foods at meals, when beverages and additional saliva help rinse the teeth.

For healthy teeth and gums, practice good dental care—which includes brushing, flossing, and regular checkups—and eat fewer snacks containing sugars and starches.

**Tips for Reducing Sugar**

As you shop for, cook, and eat your food, there are several ways you can reduce sugar in your diet.

- Read ingredient labels so you select products that are low in sugar. Ingredients are listed on the label in order by weight, from greatest to least. If a sugar is listed as one of the first two ingredients, or if several sugars are listed on the label, the product is probably high in sugars.

- Buy fresh fruits or fruits that are packed in water, juice, or light syrup rather than in heavy syrup.

- Reduce the amount of sugar you use in foods that you prepare at home.

- Try new recipes or adjust your own until you’ve gradually decreased the sugar content in them by one-third or more.

- To reduce sugar in cakes, try using one-half cup of sugar for every one cup of flour (Figure 23).
To reduce sugar in muffins and quick breads, use one tablespoon of sugar for every one cup of flour.

To reduce sugar in yeast breads, use one teaspoon of sugar for every cup of flour.

To reduce sugar in cakelike cookies such as those that contain juice, milk, or water, use one-half cup of sugar per one cup of flour.

Experiment with spices such as cinnamon, coriander, nutmeg, and ginger to enhance the sweet flavor of foods. Spiced foods will taste sweeter if they’re warmed.

Use home-prepared items that are made with less sugars than commercially prepared items, which are generally higher in sugars.

While eating, use less of all sugars, including white and brown sugars, honey, molasses, syrups, jams, and jellies.

Eat fewer foods that are high in added sugars, such as prepared baked goods, candies, and sweet desserts (Figure 24).

Add less sugar to foods, such as coffee, tea, cereal, or fruit. Get accustomed to using half as much sugar as you usually do, then see if you can cut back even more.

Cut down on the number of sugar-sweetened soft drinks and punches you drink.

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**FIGURE 24**—It’s better to eat natural sources of sugar, such as fruit, rather than soft drinks, candy, or syrups, which have high amounts of added sugar.

---

- **FOODS**
  - **ADDED SUGARS (tsp.)**
    - **BREADS, CEREALS, RICE, PASTA**
      - Bread, 1 slice
        - *
      - Ready-to-eat or cooked cereals unsugared, 1 oz.
        - *
      - Ready-to-eat or cooked cereals frosted, or sugar coated, 1 oz.
        - 2-3
      - Doughnut, 1 medium
        - 2
      - Cake, frosted, ¼ 8-inch
        - 6
      - Pie, two crust, ½ 9-inch
        - 5
    - **FRUIT GROUP**
      - Fruits, all, fresh or frozen, unsweetened
        - *
      - Fruits, canned in juice, ½ cup
        - *
      - Fruits, canned in light syrup, ½ cup
        - 2
      - Fruits, canned in heavy syrup, ½ cup
        - 4

- **FOODS**
  - **ADDED SUGARS (tsp.)**
    - **MILK, YOGURT, AND CHEESE GROUP**
      - Milk
        - *
      - Chocolate milk, 1 cup
        - 3
      - Chocolate shake, 10 fl. oz.
        - 9
      - Low-fat yogurt, plain, 8 oz.
        - *
      - Low-fat yogurt, fruitied, 8 oz.
        - 7
      - Ice cream or ice milk, ½ cup
        - 3
      - Frozen yogurt, ½ cup
        - 3
    - **SUGARS AND SWEETS**
      - Sugar, jam, jelly, 1 tsp.
        - 1
      - Syrup and honey, 1 Tbsp.
        - 3
      - Cola, 12 fl. oz.
        - 9
      - Chocolate bar, 1 oz.
        - 3
      - Sherbet, ½ cup
        - 5

*Trace or none
Salt and Sodium

High Blood Pressure and Sodium

Blood pressure measures the force of blood against artery walls as the heart pumps blood through the body. A normal reading for an adult is less than 140 over less than 85 (140/85). The top number is the force of the blood against the artery walls when the heart beats. The bottom number is the force on the artery walls when the heart relaxes between beats.

High blood pressure, or hypertension, is a condition in which blood pressure goes above normal limits and stays at that level. In most cases, the cause of high blood pressure is unknown. Certain people are at more risk than others, but anyone can develop high blood pressure. For some people, high blood pressure is related to diets that contain high levels of sodium.

Limiting sodium may be an important part of treating high blood pressure. Exercise, weight reduction, and medication are usually essential to reducing high blood pressure. Check with your doctor to see if you need to take steps to lower your blood pressure.

Sodium Content of Foods

Grains are naturally low in sodium, but foods made from grains, such as ready-to-eat cereals and breads, can vary widely in sodium content. Check the nutrition label for the sodium content per serving (Figure 25).

Most canned vegetables, vegetable juices, and frozen vegetables with sauce are higher in sodium than fresh or frozen ones cooked without added salt.

Fresh, frozen, and canned fruits and fruit juices are low in sodium (Figure 26).

The sodium content of milk and milk products varies. Natural cheese has the greatest amount of sodium, followed by cottage cheese, processed cheeses, cheese foods, and cheese spreads. Milk and yogurt contain the least sodium.

Most fresh meats, poultry, and fish are low in sodium. Most cured and processed meats, such as frankfurters, sausage, and luncheon meats, are higher in sodium because sodium is used as a preservative.

The daily recommended sodium intake is 2,000 to 3,000 milligrams.

Tips for Reducing Sodium

When food shopping, preparing meals, and eating, keep the following guidelines in mind:

- Read the labels on processed foods to identify the sodium content of a serving.
- Select fresh or plain frozen vegetables and meats instead of those canned with salt.
Look for low-sodium or no-salt-added versions of canned vegetables; vegetable juices; dried soup mixes and bouillon; condiments, including catsup and soy sauce; snack foods such as chips, nuts, and pretzels; crackers and bakery products; canned soups; butter and margarine; cheeses; canned tuna; and processed meats.

Learn to identify foods that are low in sodium so you can plan meals that contain less sodium.

Choose recipes that contain only limited amounts of high-sodium ingredients.

**FIGURE 25—Sodium should be eaten in moderation.**

- Look for low-sodium or no-salt-added versions of canned vegetables; vegetable juices; dried soup mixes and bouillon; condiments, including catsup and soy sauce; snack foods such as chips, nuts, and pretzels; crackers and bakery products; canned soups; butter and margarine; cheeses; canned tuna; and processed meats.

- Learn to identify foods that are low in sodium so you can plan meals that contain less sodium.

- Choose recipes that contain only limited amounts of high-sodium ingredients.
Cook rice, pasta, and hot cereals without salt or use less salt than the package calls for. For example, try using \( \frac{1}{8} \) teaspoon of salt for two servings.

Adjust your recipes, gradually cutting down on the amount of salt you include.

Experiment with the flavors of lemon or lime juice, herbs, and spices instead of salt as seasonings for vegetables and meats (Figure 27).

Leave the salt shaker off the table (Figure 28).

**FIGURE 26**—Fresh foods contain less sodium than their processed versions.
Taste the food before you salt it. One teaspoon of salt contains 2,325 milligrams of sodium (Figure 29).

Limit your intake of condiments, such as soy sauce, dill pickles, salad dressings, and sauces.

When eating out, eat foods prepared without sauces. Ask for salad dressings and sauces to be served on the side so you can control the amount you use.

Ask to have food prepared without added salt, if possible.

Balance your meal to moderate your sodium intake. If you have a high-sodium main dish, choose a low-sodium side dish with it.

Before continuing, take a few minutes to review this section by completing Health Check 4.

---

**SPICING IT UP WITHOUT THE SALT SHAKER**

A dot (·) means the seasoning at the top goes well with the food to the left.

<table>
<thead>
<tr>
<th></th>
<th>ALLSPICE</th>
<th>BASIL</th>
<th>CARAWAY SEEDS</th>
<th>CHIVES</th>
<th>CLOVES</th>
<th>CURRY POWDER</th>
<th>DILL</th>
<th>GARLIC</th>
<th>GINGER</th>
<th>MARJORAM</th>
<th>ONION POWDER</th>
<th>OREGANO</th>
<th>POPPY SEEDS</th>
<th>ROSEMARY</th>
<th>SAVORY</th>
<th>TARRAGON</th>
<th>THYME</th>
<th>TURMERIC</th>
</tr>
</thead>
<tbody>
<tr>
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<td>·</td>
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**COOKED VEGETABLES:**

|             |       |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Cabbage     | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Broccoli    | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Brussels sprouts | · |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Cauliflower | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Carrots     | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Beets       | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Green beans | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Lima beans  | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |
| Peas        | ·      |       |               |        |        |              |      |        |        |          |              |         |            |          |        |          |       |          |

**FIGURE 27**—Flavor can be added to your food by using other seasonings such as those suggested above.
FIGURE 28—You’re probably not even aware of how much salt you use. Remove the salt shaker from the table and see if you miss it.

FIGURE 29—Each teaspoon of salt adds up. Try gradually cutting down on your salt intake.

1 TEASPOON

1 TEASPOON OF SALT CONTAINS 2,325 mg SODIUM

1/2 TEASPOON

1/2 TEASPOON OF SALT CONTAINS 1,160 mg SODIUM

1/4 TEASPOON

1/4 TEASPOON OF SALT CONTAINS 580 mg SODIUM
Facts about Alcohol

Alcoholic beverages such as beer, wine, and whiskey supply calories, but few nutrients (if any). The calories in alcoholic beverages come from alcohol and sugars. Limiting your intake of alcoholic beverages saves room for foods that provide important nutrients.

Be sure to check the serving sizes when comparing beverages. In general, the amount of alcohol in a serving is about the same, though the serving size may vary. For example, a 12-fluid-ounce regular beer contains about the same amount of alcohol as a 5-fluid-ounce glass of table wine or one “shot” of liquor (Figure 30).

Heavy drinkers may be malnourished because they often don’t eat enough food to get the vitamins and minerals they need. Additionally, their bodies often aren’t able to absorb all of the nutrients in the food they do eat. Drinking too much alcohol may cause cirrhosis of the liver, inflammation of the pancreas, damage to the brain and heart, and increased risk for some cancers. It can impair one’s judgment and is the cause of many accidents. Drinking alcoholic beverages can also lead to addiction.
Some studies suggest that moderate drinking is linked to lower risk for heart attacks. Drinking, however, is also linked to higher risk for high blood pressure and stroke.

Alcoholic beverages should never be consumed before an exercise workout because of the effect alcohol has on the central nervous system. Alcohol consumption impairs balance and coordination and could easily result in exercise injuries.

For all of these reasons, drinking alcoholic beverages isn’t recommended. As an instructor, if you suspect that a student has been drinking, advise the individual of the potentially harmful side effects of alcohol. Discuss the possibility of skipping the current exercise session for safety reasons.

What’s the difference between light beer and regular beer? Does light wine have fewer calories than regular wine? The answers to these questions, contained in Figure 31, may surprise you.

Water and Physical Performance

Water is a critical nutrient, yet its importance is often overlooked or forgotten. It’s recommended that you drink at least six to eight glasses per
However, if you’re extremely active and exercise regularly, you should increase your intake of water to prevent possible dehydration.

**FIGURE 31**—Alcoholic beverages come in many different forms.

**FIGURE 32**—Drinking six to eight glasses of water daily prevents possible dehydration for most individuals. An athlete will need even more water each day.
Dehydration occurs if you fail to consume enough water. It can result in fatigue and shifting body temperatures as well as heat exhaustion and heat stroke. Keeping the body hydrated is one of the most important aspects of optimum physical performance. As water loss increases, specifically due to sweating, dehydration occurs and physical performance diminishes rapidly (Figure 33).

For most athletes, a 3 percent water weight loss impairs performance, although highly conditioned and acclimated athletes may be able to tolerate a 4 to 5 percent loss. Once significant dehydration occurs, such as a 3 percent water loss from the body, it will take at least 24 hours to restore water balance. Thirst is a poor indicator of dehydration. Hydrating the body before, during, and after a workout is the best approach to reduce or prevent dehydration.

Concern for replacing carbohydrates and electrolytes, such as potassium, sodium, and chloride, during exercise should be secondary to water replacement. Electrolytes assist in the body’s metabolic processes. A basic diet, high in mineral-rich foods, is more than adequate for electrolyte replacement. The small loss of electrolytes that occurs during exhaustive workouts doesn’t seem to directly affect performance.

The need for carbohydrates during exercise is minimal. Small amounts of highly diluted sugar may help to replenish liver glucose and delay fatigue, but this is only significant in endurance events lasting more than two hours. For other events, such as football and tennis tournaments, occasional use of fruit and diluted fruit juices between events is fine, as long as a regular water intake is occurring. In sports such as wrestling, where weight fluctuation is common, the athlete should understand the dangers of rapid weight loss through dehydration. Rapid weight loss affects performance. Dehydrated athletes can’t rehydrate their bodies in sufficient time to perform at an optimum level.

Take a few minutes now to review this section by completing *Health Check 5*. 
Diabetes and Nutrition

**Introduction to Diabetes**

*Diabetes* is a disease in which the body is unable to produce adequate amounts of insulin. This results in abnormally high levels of blood sugar and acetone (a liquid found in the blood when fats and glucose aren’t properly oxidized). High blood sugar levels can damage your eyes, nerves, and kidneys. Damage to your nerves can lead to foot sores, problems with digestion, and impotence. Diabetes also damages your blood vessels, which results in an increased risk of heart attack and stroke.

The best way to control diabetes is to control your blood sugar level. This can be done by eating properly, exercising, and taking your insulin or medicine as directed.

Checking your blood sugar regularly is a good way to help you control your diabetes. It can help you see how eating different types of foods affects your blood sugar level and how exercise can help to lower it.

**Eating Tips for Diabetics**

The following eating guidelines should be followed by diabetics:

- Learn how different foods affect both your blood sugar level and how you feel.
- Eat at the same time every day so your insulin and sugar levels are steady.
- Eat three meals a day and snack smartly. Ask your doctor or registered dietitian for snacking advice.

---

**Health Check 5**

Indicate whether each statement is True or False.

1. Excessive alcohol consumption has been linked to malnourishment and cirrhosis of the liver.
2. The alcohol content of light beer is about the same as regular beer.
3. You should drink two to three glasses of water daily.
4. Dehydration occurs when you consume too much water.

Check your answers with those on page 49.
Lose weight. Losing just a little weight—five to 10 pounds—can lower your blood sugar and cholesterol levels.

Eat plenty of fiber such as green leafy vegetables and fruits. Fiber helps slow down the release of sugar into your blood after eating and thus helps to control your blood sugar lever.

Eat fewer sweets, particularly if you’re overweight.

Avoid drinking too many beverages that have sugar in them, such as fruit juices and nondiet sodas. Try not to put sugar in coffee or tea. (Artificial sweeteners may be utilized as an alternative.)

Drink one or two glasses of water with each meal to help you feel full and to improve your blood sugar control.

Don’t have more than two servings of alcoholic beverages twice a week with meals. One serving is 4 ounces of wine, 12 ounces of beer, or 1.5 ounces of hard liquor. If you drink on an empty stomach, you risk causing your blood sugar to drop.

Cancer and Nutrition

The National Cancer Institute estimates that about 80 percent of all cancer may be related to smoking, diet, and the environment. About one-third of all cancer deaths may be related to the foods you eat. Eating foods that are high in fiber may reduce the risk of cancer of the colon and the rectum. It’s important to choose fiber-rich foods, not supplements. Whole-grain breads and bran cereals, vegetables, cooked dry peas and beans, and fruits are all good sources of fiber.

Diets that are high in fats have been linked to breast, colon, uterine, and prostate cancers. Some studies have even suggested that fat may act as a cancer promoter.

Diets that are rich in vitamin A, vitamin C, and beta-carotene may help reduce the risk of certain cancers. Good sources of vitamin A include yellow-orange vegetables, such as carrots, winter squash, sweet potatoes, and pumpkins, and yellow-orange fruits, such as peaches, cantaloupes, and mangoes.

Good sources of vitamin C include dark-green leafy vegetables, such as kale, spinach, watercress, broccoli, asparagus, and tomatoes, and fruits such as oranges, lemons, grapefruit, peaches, berries, and cantaloupes.

There’s some evidence that vegetables in the cabbage family may help protect against cancer of the colon. These vegetables are also good sources of fiber, vitamins, and minerals. Cabbage-family vegetables include cabbage, broccoli, cauliflower, brussels sprouts, collards, kale, turnips, mustard greens, turnip greens, kohlrabi, watercress, and radishes.

Excessive consumption of smoked meats or barbecued foods has also been linked to cancers of the upper gastrointestinal tract.
Nutrition for Pregnant Women

If you’re overweight when you become pregnant, you shouldn’t go on a low-calorie diet until your baby is delivered. Diets that are low in energy are also likely to be low in the nutrients your baby needs. Follow a well-balanced diet, and make sure your calories count. The foods you eat should provide nutrients, not just calories.

Health professionals recommend a weight gain of 25 to 35 pounds for women who have a normal weight before pregnancy. Underweight women should gain 28 to 40 pounds. Overweight or obese women should gain 15 to 25 pounds. See your doctor regarding how much weight you should gain during pregnancy.

There’s no proof that an occasional drink during pregnancy is harmful to your baby. However, babies whose mothers were heavy drinkers during pregnancy are at greater risk for major birth defects. Women who are pregnant or who are trying to become pregnant shouldn’t drink alcoholic beverages. Researchers simply don’t know how much alcohol is too much for the health of the baby.

Nutrition for Children

Serve young children the same variety of foods that you would serve to individuals in other age groups; however, serve foods in smaller proportions to suit their smaller needs. Young children should have the equivalent of two cups of milk each day, but you can serve it to them in three or four portions. Many young children may need higher-calorie foods, such as whole milk, to get enough calories to grow.

Young children and teenage girls need to eat plenty of iron-rich foods, such as lean meats, dry beans, and whole-grain and iron-enriched breads, cereals, and other grain products.

Children need calories to grow and develop normally. Weight-reducing diets aren’t recommended for children. Instead, overweight children may need help in choosing physical activities to participate in and nutritious diets that include adequate, but not excessive, calories.

Poor Eating Habits

A child who carries poor eating habits into adulthood may develop anxiety and low self-esteem. Good health is linked to the proper amounts of nutritious food. If breakfast is skipped or lunch consists of a candy bar and potato chips, a child’s concentration is apt to fade later that day.

Snack Ideas

Children judge a food by how it looks. They like colorful foods. A slice of apple or orange can make a meal look better to a child. Figure 34 lists some healthy snack suggestions.
Nutrition for Older Adults

As you age, health conditions might limit what you can eat and make eating a balanced diet more difficult. You might need to pay more attention to getting adequate nutrients and fluids and to achieving and maintaining a healthy weight. You might also need to consider possible interactions between foods and medications.

As people age, they usually need fewer calories to maintain a healthy weight, and there’s a tendency to become less active. Achieving and maintaining a healthy weight should be an ongoing part of caring for your health. If you need to lose weight, do it slowly. Avoid extreme approaches. Remember, quick weight-loss plans often deprive the body of important nutrients and usually don’t keep the weight off.

Precautions with Medicines

Many older adults take several medications, both prescription and over-the-counter types. It’s important to find out from your doctor or pharmacist whether these medicines should be taken with meals or on an empty stomach. Some medicines might have serious or unpleasant side effects or might not work well if they’re taken in combination with certain foods or alcoholic beverages.

You might need special advice from a pharmacist or other health professional about how diet influences the following medications:

- Diuretics and other high blood pressure medicines
- Antibiotics
- Pain relievers

### Healthy Snacks

- Cinnamon toast with apple juice
- Cheese slice with fruit cup
- Cereal with milk
- Graham crackers with milk
- Wheat crackers with cottage cheese
- Blueberry muffin with orange juice
- Peanut butter toast with milk
- Frozen banana with fruit juice
- Peanut butter with apple slices
- Cut-up fruit
- Vegetable sticks
- Strips of cooked meat or poultry

FIGURE 34—Include a little color in the snacks you offer children.
Antidepressants
Anticoagulants, or drugs for blood thinning
Antacids

Making a schedule for your meals and medicines can help you take your medicines properly and ensure you get adequate nutrition.

Calcium and Milk

Milk is the most obvious and popular source of both calcium and vitamin D. Some people, however, have trouble digesting lactose (the sugar occurring naturally in milk) and need to consider other ways to get calcium.

If you have trouble digesting milk or getting enough calcium in your diet, consider the following suggestions:

Drink milk that has had lactase added to it, or add it yourself. Lactase is an enzyme that breaks down milk sugar and can be purchased at many drugstores. Ask your pharmacist about various lactase preparations.

Drink only a small amount of milk at a time.

Eat products such as yogurt or cheese that already have partially broken down lactose in them.

Try cooked foods made with milk, such as soups, puddings, or custards.

Eat more of other foods that contain calcium, such as foods made with milk or cheese; tofu, a soy product that’s sometimes made with calcium sulfate (four ounces of tofu made with calcium sulfate has about the same amount of calcium, protein, and fat as one cup of milk); dark-green leafy vegetables, such as kale, collards, and broccoli; tortillas made with calcium-fortified cornmeal; and canned or dried fish with edible bones, such as salmon and sardines.

Vitamin Supplements

Many adults take a daily multivitamin pill. Some even take extra vitamins and minerals. Most of these supplements are unnecessary, however, if you maintain a well-balanced diet. High doses of some vitamins, such as vitamin A and vitamin D, can actually be harmful. Large doses, called megavitamins, contain 10 to 100 times the recommended daily allowance for a vitamin or mineral and can have potentially serious results.

While researchers continue to learn more about how nutrient requirements change during aging, eating a balanced diet that contains foods from each food group is the best approach to getting the nutrients you need. Supplements might be beneficial for people who can’t eat a balanced diet or don’t eat enough food or for people who take medicines that interact with nutrients. Before you decide to take a nutritional supplement, discuss it with your doctor or dietitian.
Fluids

The sense of thirst declines with age; therefore, older people may not drink enough water and other fluids. Sometimes people intentionally drink less to avoid going to the bathroom often. If you aren’t getting enough fluids, you can become dehydrated, especially during hot weather.

Drinking plenty of fluids is important to help your body flush out wastes. Water can come from any beverage—juice, coffee, tea, milk, or soft drinks—as well as from soup. The caffeine in coffee and other drinks, however, may increase your urge to urinate, and the sugar in regular soft drinks is an added source of calories. Plain water, unsweetened fruit juices, and lowfat milk are better choices. For a refreshing carbonated drink, mix fruit juice with club soda or seltzer water. To make plain water more appealing, try it chilled with a twist of lemon or lime.

Constipation

Constipation bothers many older adults. The frequency of bowel movements among healthy people varies from three times a day to three times a week. Know what’s normal for you, and avoid relying on laxatives.

To prevent constipation, follow these guidelines:

- Eat foods with dietary fiber, such as whole wheat breads and cereals, fruits, and vegetables, every day.
- Drink plenty of liquids.
- Exercise regularly.
- Go to the bathroom when you feel the need. Don’t delay.

Diminished Appetite

People often find that their senses of taste and smell get duller as they age. As a result, they may overload their food with salt or even lose interest in food. Be creative with herbs, spices, and lemon juice. They all add flavor that can perk up your sense of taste again. Experiment with different spices to see what appeals to you. You might even want to try growing fresh herbs either in your garden or in a pot on a sunny windowsill. Trying new recipes and choosing colorful foods with a variety of textures may also add interest to your meals.

Diuretics and Potassium Levels

It’s important to know if the diuretic you take is one that depletes potassium or one that has little effect on it. Generally, the more potent diuretics produce significant potassium losses that the normal person’s diet doesn’t make up for. You should discuss the specific drug you’re taking with the doctor who prescribed it for you. Potassium-rich foods can be added to your diet to replace potassium losses.
Fruits, vegetables, milk, yogurt, some meats, poultry, and fish are good sources of potassium. High levels of potassium are available in:

- Bran cereals
- Cooked dried fruit, such as apricots, peaches, and prunes
- Bananas
- Potatoes, baked or boiled
- Sweet potatoes, pumpkin, and winter squash
- Stewed tomatoes
- Lima beans
- Cooked dry beans, peas, and lentils
- Milk and yogurt, all types

**Food Allergies**

People who suffer from allergic reactions to food usually manifest symptoms such as asthma, hives, stomach cramps, diarrhea, and vomiting. These reactions may occur immediately or hours after eating. A small amount of food may not cause a response, while a large amount of food may cause a severe reaction.

Cow’s milk, egg white, corn, wheat, nuts, soybean products, fish (flounder, trout, cod), and shellfish (shrimp, crab, lobster) are all commonly known to cause allergic reactions in some individuals. Simple ingredients in foods, such as corn syrup, can also produce allergic responses.

**Label Reading**

Food ingredients made from milk, eggs, corn, or wheat are sometimes listed on the label only by their technical names. Look for words that are clues to the food substance. Some food substances may also be found in other food products.

**Cooking without Eggs or Milk**

You’ll find that some foods made without milk, eggs, corn, or wheat will have a different taste, texture, and appearance. For example, baked products made without eggs or milk have less color and flavor, have crusts that brown less, are usually heavier in texture, are more crumbly, and dry out faster.

Eggs give structure and help to leaven, or increase the volume of, baked products. You can omit eggs from many cookies with little change in texture, but cakes made without eggs tend to be more crumbly. To avoid this problem, serve a cake made without eggs from the pan in which it’s baked, or bake the cake mixture as cupcakes in paper liners.
Try omitting eggs when preparing one-layer cake mixes. However, be sure the other ingredients in the mix are those you can tolerate.

Milk is used in many baked products to add flavor or to increase nutritional value. If someone in your family is allergic to milk, try substituting soy milk, fruit juice, liquid nondairy creamer that doesn’t contain milk or milk derivatives, or water for the animal milk. Fortified soy milk is nutritionally similar to milk.

**Baking with Nonwheat Flours**

When baking, you can use rice, soybean, oat, rye, or barley flour or potato starch instead of wheat flour. The strong gluten in wheat flour helps to form the structure of breads and cakes. Since nonwheat flours or starches contain weak gluten or none at all, baked products made with these flours tend to be heavier and more crumbly than products made with wheat flour. Nonwheat flours work best in baked products when two or more flours are combined to make the most of the qualities of each. Oat, rye, barley, and buckwheat flours contain small amounts of gluten and should be avoided if you have a severe intolerance to gluten.

Tips for baking with nonwheat flours include the following:

- Stir the flour or the starch thoroughly before measuring.
- Expect the batters of nonwheat flours and starches to be of a different consistency than wheat-flour batters. Variations are due to a lack of gluten and different thickening properties of the starches.
- Remember that baked products made with nonwheat flours and starches tend to be heavier, smaller in volume, and more crumbly than those made with wheat flour.
- Cover nonwheat baked products tightly, and store at room temperature for a short time or freeze them for longer storage.
- Use nonwheat flours and starches for thickening sauces, soups, puddings, and pie fillings.
- Don’t cook foods thickened with nonwheat flours or starches beyond the point at which they thicken. Be especially careful not to overheat or overcook sauces thickened with arrowroot or potato starch. These sauces should be served the same day that they’re made, since they tend to thin the longer they sit.

**Adapting Favorite Recipes**

In most cases, your favorite recipes can be adapted to accommodate a healthier diet. The specific changes you make will depend on which foods you must avoid. Start with simple recipes so that substituting ingredients is easy. Replace undesirable ingredients with ingredients that don’t cause reactions.

*To avoid wheat.* Make cookies, pie crust, and the bottom layer of desserts with crushed breakfast cereal made from rice or corn. Substitute rolled oats for wheat flour when you make fruit crisps. Use rice in place of wheat bread in poultry stuffing. Make cornbread with all cornmeal
and no wheat flour. Add fruits and vegetables to improve the texture of baked products made with nonwheat flours. Nuts and chocolate chips will also enhance flavor; however, they’re higher in fat than fruits and vegetables.

To avoid chocolate. Try replacing chocolate with carob. Carob is sold as powder, flour, or chips. Carob chips and bars may contain milk products.

To avoid milk. Use vegetable oil, shortening, or milk-free margarine. Kosher margarine contains no milk solids. Check labels to find chocolate chips made without milk.

To avoid corn. Use margarines that don’t contain corn oil, and use cereal-free baking powder. Regular baking powders contain cornstarch.

To avoid peanuts. Use sunflower or safflower oil rather than peanut oil.

**Obesity and Nutrition**

Obesity is associated with high blood pressure, high blood cholesterol, diabetes, heart disease, and stroke. Extreme obesity has also been linked to several cancers. If you’re obese, losing weight may reduce your chances of developing these serious diseases or conditions. If you already suffer from hypertension and are overweight, weight loss alone can often lower your blood pressure to normal levels. Because fat provides more than twice the number of calories provided by equal weights of carbohydrates or protein, decreasing the fat in your diet may help you lose weight. It can also help reduce your risk of cancer and heart disease.

Please take a few minutes now to review the material in this section by completing Health Check 6.

**Health Check 6**

Match the terms in Column 1 with their descriptions in Column 2.

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Check your answers with those on page 49.
KEY POINTS TO REMEMBER

Proper nutritional habits are essential for sustenance and overall well-being. These habits include eating a variety of foods; maintaining a healthy weight; choosing a diet low in fat and cholesterol that includes many vegetable, fruit, and grain products; and using sugar, salt, and alcohol in moderation.

The major food groups are best visualized through the Food Guide Pyramid. They include bread, cereal, rice, and pasta; fruits and vegetables; milk, yogurt, and cheese; meat, poultry, fish, beans, eggs, and nuts; and fats, oils, and sweets. Fats, oils, and sweets should be used sparingly.

Successful weight control is the result of a positive lifestyle, not maintaining a specific diet. Fad diets and other dietary gimmicks are dangerous to your health and only provide short-term “quick fixes.”

Vegetables, fruits, and grains contain complex carbohydrates, dietary fiber, and other vitamin and mineral nutrients that are important for your nutritional well-being.

Fats should be consumed moderately. Avoid saturated fats—fats found predominantly in animal products—and substitute polyunsaturated and monounsaturated fats wherever possible.

High blood cholesterol is a major cause of serious heart disease, especially when combined with another major risk factor, such as high blood pressure or cigarette smoking.

Consuming too much sugar promotes tooth decay and doesn’t provide many basic nutrients that your body needs.

Elevated levels of sodium are linked to high blood pressure or hypertension in some people. It’s important to learn the sodium content of foods, to purchase low-sodium foods, to restrict your use of salt in preparing foods, and to avoid adding salt at the table.

Excessive alcohol consumption can lead to malnourishment, cirrhosis of the liver, addiction, and serious injury to yourself and others if it causes impairment of judgment.

Although frequently overlooked, water is an important nutrient. Lack of sufficient water in your diet may result in dehydration. To avoid this condition, you should drink at least six to eight glasses of water daily.

Although there are general dietary guidelines that may apply to all situations, there are special health conditions that require individual nutritional recommendations. For example, diabetes is controlled by maintaining a proper blood sugar level. Eating food high in fiber can reduce the risk of certain types of cancer. Many young children may need higher-calorie foods than do adults to allow them to grow. Older people need fewer calories and may need to choose foods and beverages that don’t adversely affect the medicines they take.
Health Check Answers

1. False
2. False
3. False
4. True
5. True

2. b
2. c
3. a
4. False
5. False
6. True

3. 30
2. polyunsaturated, monounsaturated
3. Cholesterol
4. HDLs (high-density lipoproteins); LDLs (low-density lipoproteins)
5. high blood pressure
6. diet

4. True
2. False
3. False
4. True
5. True
6. True
7. True
8. 2,325
9. 2,000 to 3,000

5. True
2. True
3. False
4. False

6. f
e
a
d
b
g
c
When you feel confident that you have mastered the material in this study unit, complete the following examination. Then submit only your answers to school headquarters for grading, using one of the examination answer options described in your first shipment. Send your answers for this examination as soon as you complete it. Do not wait until another examination is ready.

Questions 1–20: Select the one best answer to each question.

1. The most successful weight control program involves
   A. eating a lowfat diet.
   B. exercising aerobically.
   C. combining aerobic exercise with a healthy diet.
   D. weight training.

2. A person trying to lose weight should
   A. lose one to two pounds a week.
   B. reduce his or her intake of water.
   C. lift weights every day.
   D. lose 20 pounds a month.

3. The main reason why you should reduce your intake of eggs is because egg yolks
   A. lack carbohydrates.
   B. are high in cholesterol.
   C. are high in protein.
   D. lack fiber.
4. High-fat diets can cause atherosclerosis, a disease characterized by
   A. reduced protein availability to cells.
   B. decreased glycogen storage.
   C. thickening and hardening of the artery walls.
   D. softening of the artery walls.

5. Which of the following is a disaccharide?
   A. Sucrose
   B. Glucose
   C. Fructose
   D. Galactose

6. Vegetables and fruits are beneficial for good health because they contain
   A. single sugar units that don’t require the breakdown of glucose.
   B. important vitamins, minerals, and dietary fiber.
   C. saturated fats.
   D. natural, not processed foods, and little added starch.

7. A pregame meal should include foods that are
   A. high-fiber carbohydrates.
   B. easily digestible carbohydrates.
   C. high in fat.
   D. high in protein.

8. Which of the following statements is true?
   A. Fiber concentration is found only in the skins of fruits and vegetables.
   B. Eating soluble fiber is important for proper bowel functioning.
   C. Whole grains contribute to chronic constipation.
   D. Food processing is known to reduce the content of fiber.

9. Sodium intake can be controlled by
   A. carefully reading labels of processed foods.
   B. choosing frozen dinners over fast foods.
   C. keeping a blood pressure level higher than 140 over less than 85.
   D. increasing your intake of water to balance the sodium in your bloodstream.

10. Which type of exercise increases fat loss?
    A. High-intensity
    B. High-duration
    C. High-duration/low-intensity
    D. High-intensity/low-duration

11. If you ran 3 miles and burned 420 calories, about how many miles would you have to walk to burn 420 calories?
    A. 3 miles
    B. 5 miles
    C. 7 miles
    D. 8 miles

12. To lower your dietary cholesterol, you should reduce your intake of
    A. vegetable oils.
    B. animal products.
    C. protein.
    D. cereal.
13. Which of the following statements about alcohol is true?
   A. Alcoholic beverages should be consumed to lower health risks such as heart attacks.
   B. Light beer contains fewer calories but more alcohol content than regular beer.
   C. Excessive alcohol consumption may pose serious health risks such as high blood pressure and may damage body organs and muscles.
   D. Moderate alcohol consumption is an effective warm-up technique in order to loosen and relax the muscles.

14. Which one of the following eating tips would be appropriate for a diabetic?
   A. Vary mealtimes from day to day.
   B. Avoid drinking water at mealtime.
   C. Eat high-fiber vegetables and fruits.
   D. Avoid high-fiber vegetables and fruits.

15. People who have trouble digesting milk should consider getting vitamin D and calcium from
   A. milk that has lactase added.
   B. well-cooked fruits and vegetables.
   C. soups with no milk added.
   D. fatty fish.

16. Which of the following is true?
   A. It would take three to five hours to hydrate the body after a water loss of 3 percent.
   B. A critical time to replace bodily fluids is while exercising.
   C. Mild food ingestion during exercise increases water absorption from the stomach during exercise.
   D. Thirst is the best indicator of water requirement during competition.

17. What effect does the aging process have on dietary guidelines?
   A. You'll need additional calories to fuel the body.
   B. Prescription drugs often present side effects and therefore should always be taken with food.
   C. It causes nutrient deficiencies so you'll need to rely more heavily on nutrient supplements.
   D. If you take diuretics, they can deplete potassium levels, so you may have to eat more foods containing this nutrient.

18. The eating disorder characterized by compulsive overeating followed by self-induced vomiting and the use of laxatives or diuretics is
   A. malnutrition.
   B. cirrhosis.
   C. anorexia nervosa.
   D. bulimia.

19. Saturated fats are found primarily in
   A. fruits and grains.
   B. animal products.
   C. vegetable oils.
   D. alcoholic beverages.

20. The greatest water loss per day occurs
   A. through the skin (perspiration).
   B. through the lungs (exhalation).
   C. in feces.
   D. in urine.