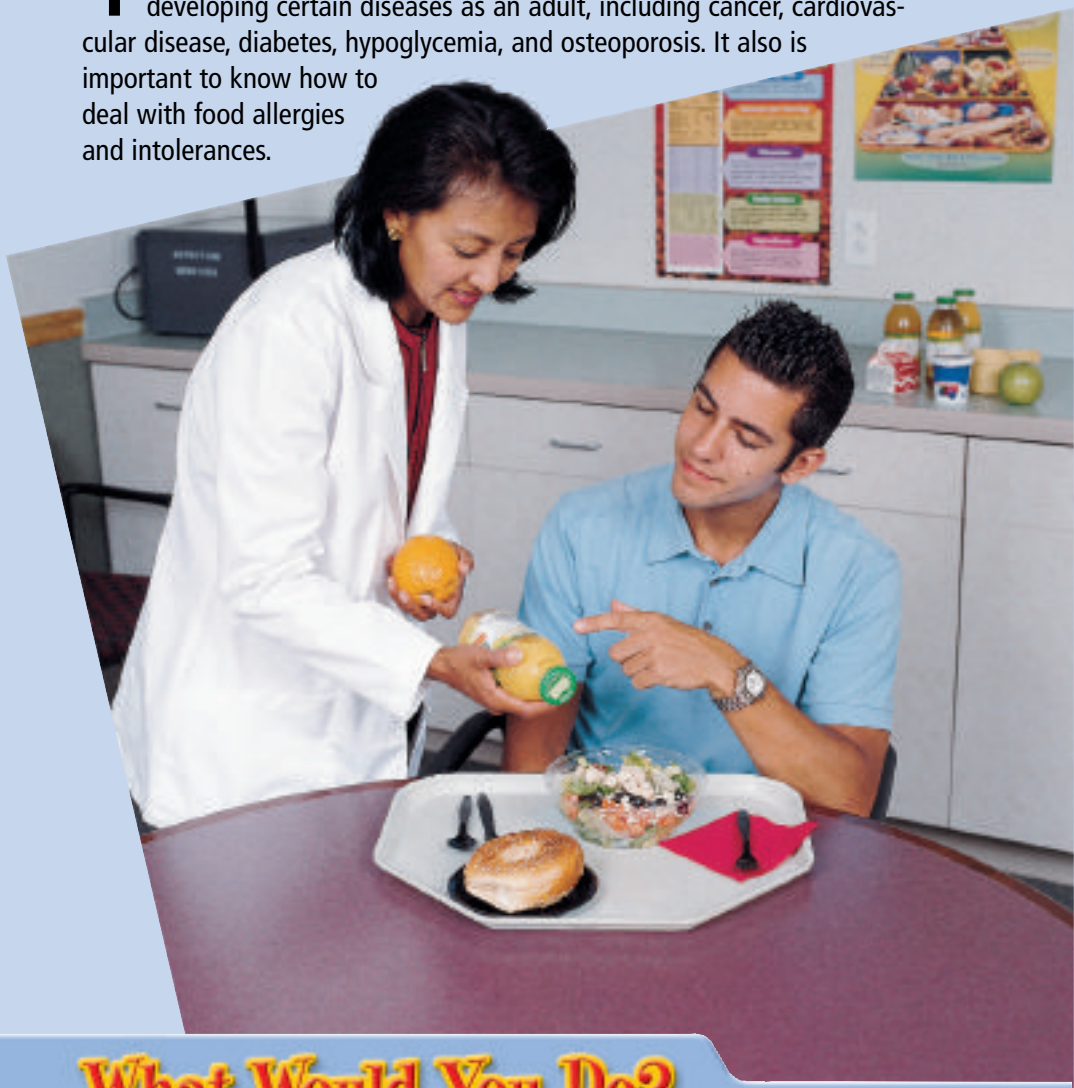
LESSON 27

Using Diet to Guard Against Disease

HEALTH GOAL • **I will follow a healthful diet that reduces the risk of disease.**

Your diet affects your health status right now, as well as in the future. Having a healthful diet right now helps reduce your risk of developing certain diseases as an adult, including cancer, cardiovascular disease, diabetes, hypoglycemia, and osteoporosis. It also is important to know how to deal with food allergies and intolerances.



What You'll Learn

1. Discuss dietary guidelines to reduce the risk of developing cancer. *(p. 303)*
2. Discuss dietary guidelines to reduce the risk of developing cardiovascular diseases. *(p. 304)*
3. Discuss dietary guidelines to reduce the risk of developing osteoporosis. *(p. 306)*
4. Discuss diet recommendations for people with diabetes or hypoglycemia. *(p. 307)*
5. Discuss ways to avoid reactions to food allergies and intolerances, including lactose intolerance, celiac disease, and reactions to MSG.

Why It's Important

A healthful diet can reduce your risk of getting cancer, cardiovascular diseases, diabetes, hypoglycemia, and osteoporosis.

Key Terms

- antioxidant
- cardiovascular disease
- atherosclerosis
- osteoporosis
- diabetes
- hypoglycemia
- food allergy
- food intolerance
- lactase deficiency
- celiac disease

What Would You Do?

Writing About Using Diet to Guard Against Disease Suppose that several people in your family have had osteoporosis, and you want to lower your chances of having it. After you read the information about diet and osteoporosis on page 306, write an entry in your health journal to answer this question: How could you change your diet to help you prevent this disease?

Health TEKS covered by Lesson 27: 1B, 1C, 4A, 5D, 7A

Aaron Haupt

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Diet and Cancer

The National Academy of Sciences, the National Cancer Institute, and the American Cancer Society are organizations that have examined the role of diet in preventing cancer. You can reduce the risk of developing cancer by practicing the following dietary guidelines.

What to Know About Diet and Cancer

Diets high in antioxidants have been associated with decreased rates of esophagus, lung, colon, and stomach cancer. An ***antioxidant*** (an tee AHK suh duhnt) is a substance that protects cells from being damaged by oxidation. Antioxidants prevent cell damage and repair damaged cells. Their actions help prevent healthy cells from becoming cancerous cells. Vitamins C, E, and A, and the mineral selenium are antioxidants.

TABLE 27.1 Tips to Reduce the Risk of Cancer

Dietary Guideline	Description
 Avoid obesity.	Obesity is a body weight that is 20 percent or more than desirable body weight. Being obese increases the risk of developing cancers of the uterus, breast, gallbladder, prostate gland, and colon.
 Eat several servings and a variety of fruits, vegetables, and fiber-rich foods each day.	Especially eat ***cruciferous*** (kroo SIH fuh ruhs) vegetables such as cauliflower, broccoli, and brussels sprouts. Fruits and vegetables provide antioxidants that reduce the risk of developing cancers. Fiber is the part of grains and plant foods that cannot be digested. Eating fiber-rich foods helps you have a daily bowel movement, which reduces the risk of developing cancer of the colon and rectum.
 Limit fat intake and the consumption of foods that are smoked, salted, or nitrate-cured.	Limiting the amount of fat you eat helps reduce the risk of developing cancers of the breast, prostate gland, and colon. Limiting your consumption of foods that are smoked, salted, or nitrate-cured helps reduce the risk of developing cancers of the esophagus and stomach.
 Do not drink alcohol as a teen.	Alcohol consumption robs the body of vitamins needed for optimal health. When you avoid drinking alcohol, you reduce the risk of developing cancers of the liver, throat, mouth, breast, and stomach.

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Diet and Cardiovascular Disease

A disease of the heart and blood vessels is ***cardiovascular disease (CVD),*** which also is called heart disease. Cardiovascular diseases are a leading cause of premature death and disability. You can reduce the risk of developing premature cardiovascular diseases by practicing the following dietary guidelines.

What to Know About Diet and Cardiovascular Disease

Make the Connection

CVD For more information on cardiovascular disease, see page 515 in Lesson 47.

Limit fat and cholesterol intake. A fat-like substance made by the body and found in some foods is ***cholesterol.*** Eating foods that are high in saturated fats and cholesterol may cause plaque to form on artery walls. Plaque is made up of cholesterol, fatty substances, cellular waste products, calcium, and other substances. A disease in which plaque deposits on artery walls is ***atherosclerosis*** (ah thuh roh skluh ROH suhs). When a person has atherosclerosis, the diameter of the artery becomes narrow. Blood pressure increases because blood is flowing through a narrower opening in the artery. Pressure may rupture the plaque causing a blood clot that blocks the artery or that breaks off, circulates in the bloodstream, and lodges in the bloodstream. An ***embolism*** is the blockage of an artery by a clump of material traveling in the bloodstream. If the blockage is in an artery in the brain, a person could have a stroke. If the blockage is in an artery in the heart, a heart attack could occur. A blockage in the lung is called a ***pulmonary embolism.***

Increase your intake of foods and beverages containing antioxidants. Antioxidants help prevent wear and tear in blood vessels. You can obtain antioxidants in your diet by: eating carrots, sweet potatoes, and squash to obtain vitamin A; eating citrus fruits, such as oranges and pineapples, to obtain vitamin C; and eating green vegetables, nuts, and whole-grain cereals and breads to obtain vitamin E.

How to Limit Fat Intake

Less than 30 percent of total calories per day should come from fat. Below are suggestions to limit fat intake.

- Limit your intake of cooked lean meat, poultry, and fish to two 3-oz servings per day.
- Broil, bake, or steam food rather than fry it.
- Trim fat from meats before cooking.
- Trim fat from poultry before cooking.
- Limit your intake of egg yolks; consider using egg substitutes.
- Limit your intake of high-fat processed meats, such as hot dogs and bologna.
- Substitute fruits and low-fat yogurt for high-fat desserts.
- Substitute turkey, such as turkey hot dogs and turkey chili, for red meat.
- Substitute nonfat or low-fat dairy products for whole-milk dairy products, such as low-fat yogurt for ice cream, skim milk for whole milk, reduced-fat mayonnaise for regular mayonnaise, low-fat or non-fat cheese for regular cheese.
- Substitute fruits and vegetables for high-fat snacks, such as potato chips.

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Limit your intake of sodium. A mineral your body needs only in small amounts is ***sodium.*** The recommended daily allowance of sodium is three grams. Some teens consume many times this amount.

Too much sodium can affect people in different ways. It may cause some people to retain body fluid and, as a result, have increased blood pressure. You can limit your sodium intake by eating fresh rather than canned foods. Salt is usually added to canned foods as a preservative. Select prepared foods that are labeled low-salt or salt-free, such as canned corn that is low-salt and unsalted potato chips. Avoid eating foods on which you can see the salt, such as pretzels and nuts coated with pieces of salt. Do not add salt to food. Season foods with herbs and spices rather than with salt and limit your intake of salty foods, such as bacon, barbecue sauce, chips, crackers, hot dogs, processed meats, ketchup, canned meat, and mustard. Sodium appears in food as sodium bicarbonate, monosodium glutamate, sodium nitrite, sodium propionate, and sodium citrate.

Include flax, soy, canola, olive, and fish oils in your diet. The unsaturated fats in these foods can help prevent heart disease, lower bad cholesterol (LDL) and increase good cholesterol (HDL). LDL is associated with an increased risk of CVD, while HDL lowers the risk of CVD. Substitute oils high in soy, canola, and olive oil for polyunsaturated oils (e.g., corn, safflower, sunflower), saturated oils (e.g., palm, coconut), and trans fats. High levels of favorable fish oils are found in salmon, trout, mackerel, and sardines.

HEALTH NEWS

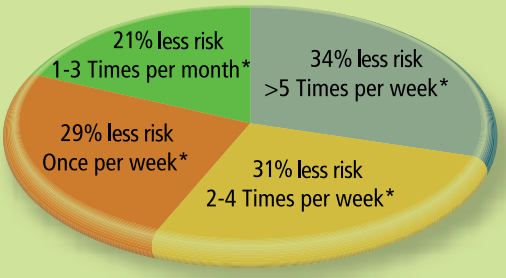
Omega-3

Did you know that eating fish at least twice a week helps keep your heart healthy? Some fish, such as mackerel, lake trout, herring, sardines, albacore tuna, and salmon are high in two omega-3 fatty acids. A third, less potent omega-3 fatty acid comes from soybeans, canola, walnuts, and flaxseed, as well as from the oils made from those beans, nuts, and seeds. Omega-3 fatty acids are used by the body to make nerve tissue in the retina of the eye and the brain. The body cannot manufacture omega-3 fatty acids. Our only source is from the foods we eat.

Omega-3 fatty acids decrease the incidence of blood clot formations, which can cause heart attacks and strokes. They are involved in the reduction of fat and cholesterol levels as well as slowing the rate at which plaque may be deposited on the interior walls of arteries. The deposition of plaque in arteries can lead to conditions, such as heart disease, angina, and heart attack. Omega-3 fatty acids also decrease the risk of irregular heartbeat, which can cause death. They are also noted to be involved in lowering blood pressure slightly. The American Heart Association recommends that people eat at least one serving of fish that are high in omega-3 fatty acids at least two times per week.

HealthOnline Visit tx.healthmh.com/diet_and_disease for more information on diet and heart disease.

The Benefits of Having Fish in One's Diet



The 2002 Nurses' Health Study found an inverse relationship between fish consumption, omega-3 fatty acids and coronary heart disease (CHD) in women. The more fish women ate, the lower their risk of CHD was.

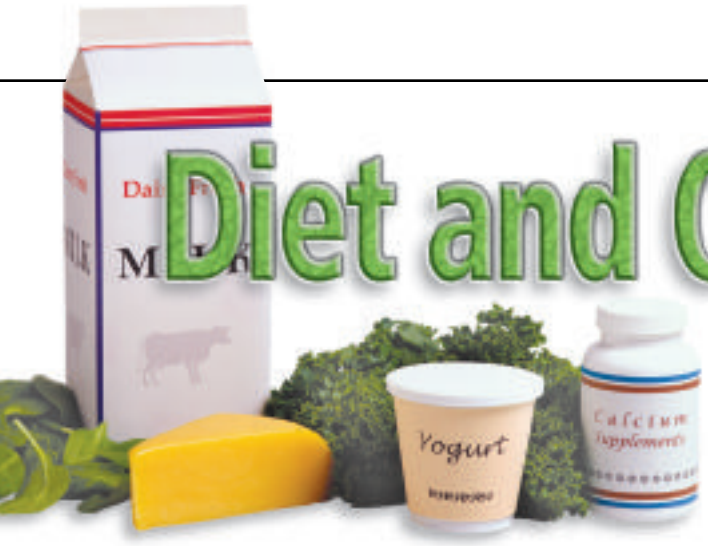
*as compared to females who ate fish once per month or less

Source: The Journal of the American Medical Association, *Nurses' Health Study*, 2002.

Analyzing Graphs

Study the graph above and answer these questions:

1. Which group received the most benefits from eating fish?
2. Compare the CHD risk for women who eat fish 1 to 3 times per month with women who ate fish less than once per month.



Diet and Osteoporosis

A disease in which the density of bone decreases is called ***osteoporosis.*** Osteoporosis causes bones to fracture easily, and is a major cause of disability in females. Females are ten times more likely to have severe osteoporosis than are males.

What to Know About Diet and Osteoporosis

Calcium and phosphorus form the hard substance in bone. Calcium is a mineral that is essential to bone growth. A deficiency of calcium, especially in females, increases the risk for osteoporosis. There are many good sources of calcium, including yogurt, milk, cheese, and leafy, green vegetables.

Adolescence is a time when an inadequate calcium intake can contribute to osteoporosis later in life. Bone growth occurs more rapidly in teenagers than it does during any other time in life.

Bones approach maximum density during childhood, adolescence, and young adulthood. Obtaining enough calcium during adolescence is critical to reduce the risk of osteoporosis.

Other ways to avoid osteoporosis Besides making sure that one eats a balanced diet rich in calcium, other ways to help prevent osteoporosis include engaging in weight-bearing exercise, avoiding smoking, and utilizing bone density testing and medications when appropriate.

Bone loss In both men and women, bone mass usually peaks between the ages 25 and 35. For women, an average bone loss before menopause is 1–1.25 percent a year, but it increases to 3–4 percent after menopause.

Heart disease and hormonal replacement A woman's estrogen production is reduced when she reaches menopause; thus, the body cannot use calcium effectively and the result is an increased risk of osteoporosis. In the past, it was commonly believed that hormonal replacement (estrogen and progesterone) would improve osteoporosis as well as decrease risk for heart disease.

Some scientists have found that hormonal replacement therapy actually increases the risk for heart disease, stroke, and cancer in some women.

▲ Consumption of dairy products in adolescence is important for reducing the risk of osteoporosis.

Health TEKS

1C (covered on page 306): Explain the relationship between nutrition, quality of life, and disease.

Quick Quiz: How does diet reduce the risk of osteoporosis?

Mini-Review

1. What is the leading cause of premature death and disability?
2. What happens during atherosclerosis?
3. What function do antioxidants play in blood vessels?

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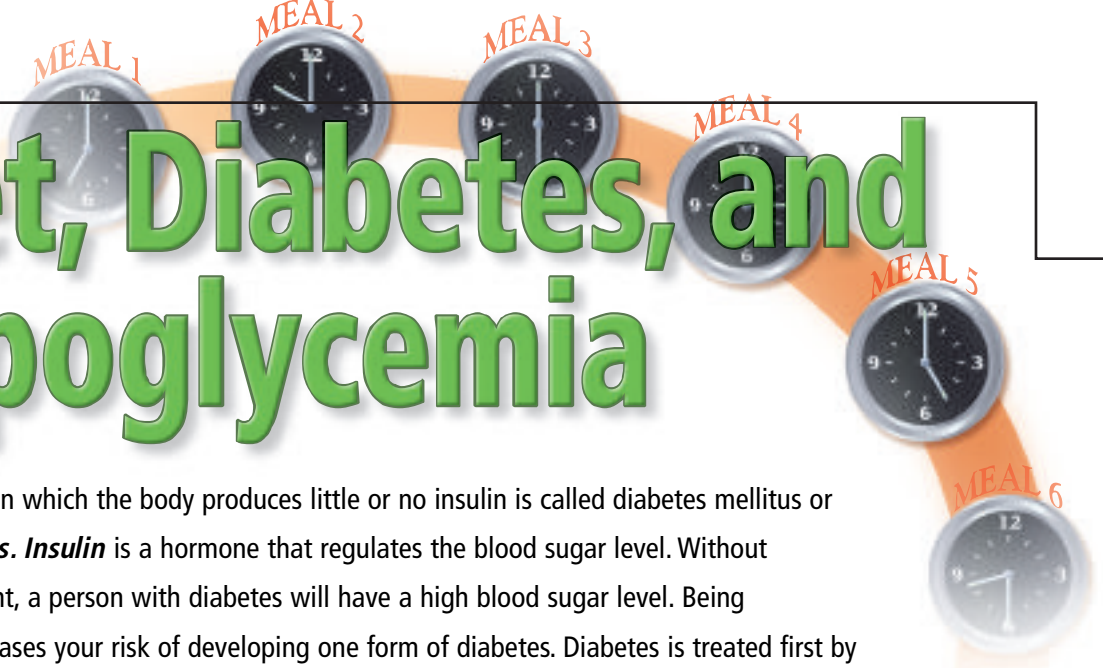

Diet, Diabetes, and Hypoglycemia

A disease in which the body produces little or no insulin is called diabetes mellitus or ***diabetes. Insulin*** is a hormone that regulates the blood sugar level. Without treatment, a person with diabetes will have a high blood sugar level. Being overweight increases your risk of developing one form of diabetes. Diabetes is treated first by diet and exercise. If needed, medications or insulin may be used.

What to Know About Diet, Diabetes, and Hypoglycemia

Dealing with diabetes A physician and dietitian can work with someone with diabetes to make a plan. The person may be advised to eat complex carbohydrates and protein to provide long-lasting energy; limit simple carbohydrate intake, especially sweets; eat six small meals a day to maintain a constant blood sugar level; have regular examinations to test blood sugar levels and re-evaluate diet; and maintain desirable weight.

Who is at risk? Diabetes is associated with increased risk of blindness, cardiovascular disease, kidney failure, amputation of toes and legs, and premature death. Lifestyle facts such as lack of physical activity and obesity greatly increase the risk for diabetes. The early signs of diabetes are frequent urination, excessive thirst, cravings for sweets, and weakness.

Hypoglycemia A condition in which there is too much insulin in the body, causing the blood sugar level to be low is called ***hypoglycemia*** (hi poh gli SEE mee uh). Normally, when a person eats, the blood sugar level increases. As the blood sugar level increases, the pancreas secretes insulin into the bloodstream. When proteins and complex carbohydrates are eaten, insulin is secreted at a slower rate. People with hypoglycemia experience a rapid increase in blood sugar followed by a sudden drop. When their blood sugar level drops, they feel dizzy, weak, irritable, and confused. They may have headaches and feel hungry. To relieve these symptoms, they need to eat again to restore their blood sugar level.

Did You Know?

Diabetes The number of children and teens who are developing type 2 diabetes—a form of diabetes usually diagnosed in adults—is growing. More young people are developing type 2 diabetes because more of the U.S. population is becoming overweight, a condition that increases a person's risk of developing diabetes.

Guidelines for People with Hypoglycemia

People with hypoglycemia follow a diet similar to people who have diabetes and may follow the same guidelines:

- Eat complex carbohydrates and protein to provide long-lasting energy.
- Limit the amounts of sweets. Simple sugars increase blood sugar and the need for insulin.
- Eat six small meals a day to maintain a constant blood sugar level.
- Have regular examinations to test blood sugar levels and reevaluate diet.
- Maintain a desirable weight.

tx.healthmh.com/diet_and_disease

Food Allergies and Intolerances

You may have felt ill after eating a food and wondered if you were allergic to it. An abnormal response to food that is triggered by the immune system is a ***food allergy***. Food allergies can cause severe illness, or even death.

What to Know About Food Allergies and Intolerances

A person who suspects he or she has a food allergy should see a physician. If a food allergy is diagnosed, the physician may recommend that the person completely avoid the food causing the allergy, or prescribe medication.

Food Allergies

Symptoms The most common foods that cause allergic reactions in adults are shellfish, peanuts, fish, and eggs. Symptoms of food allergies include: diarrhea, swelling, sneezing, itching, and nausea.

Food Intolerances

What many people think is a food allergy is actually a ***food intolerance,*** which is an abnormal response to food that is not caused by the immune system. It merely means that a food is not tolerated well.

Lactase deficiency A condition in which lactase, an enzyme that breaks down the milk sugar present in the cells of the small intestine, is missing is called ***lactase deficiency***. This condition results in the inability to digest lactose. This is called ***lactose intolerance.*** As the undigested lactose moves through the lower gastrointestinal tract, it releases products that are gaseous and cause discomfort, such as abdominal pain, bloating, and diarrhea. Lactase deficiency is the most common form of food intolerance. Drinking skim or low-fat milk will not help. It is not the fat, but the lactose, that causes the symptoms.

Celiac disease A condition in which a person is intolerant to gluten is called ***celiac*** (SEE lee ak) ***disease.*** Gluten is a part of wheat, rye, barley, and certain other grains. The symptoms of celiac disease include tiredness, breathlessness, weight loss, diarrhea, vomiting, and abdominal pain.

MSG A common cause of food intolerance is ***Monosodium glutamate*** (MSG). A flavor enhancer added to many foods, it can cause headaches, feelings of warmth, and chest pain in some people. MSG is often added to Chinese and other Asian foods. Sulfites added to foods also may cause food intolerance. Sulfites can be found in wines, potatoes, and packaged foods.

Make the Connection

Health Behavior Inventory For more information on how to complete a health behavior inventory, see page 27 in Lesson 3.

Mini-Review

1. What is a food allergy?
2. What is meant by lactase deficiency?
3. What are some side effects people exhibit who are intolerant to MSG?

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LESSON

27 STUDY GUIDE

antioxidant
atherosclerosis
cardiovascular disease
celiac disease
diabetes
embolism
food allergy
food intolerance
hypoglycemia
lactase deficiency
lactose intolerance
osteoporosis

Key Terms Review

Complete these fill-in-the-blank statements with the lesson Key Terms on the left. Do not write in this book.

1. A(n) _____ is a substance that protects cells from being damaged by oxidation.
2. _____ is a disease of the heart and blood vessels and can be termed heart disease.
3. _____ is a disease in which plaque deposits on artery walls and can lead to high blood pressure.
4. _____ is a decrease in the density of bone and is related to deficiency in calcium.
5. _____ is a disease in which the body produces little or no insulin.
6. _____ is a condition in which the pancreas produces too much insulin.
7. A(n) _____ is an abnormal response to food that is triggered by the immune system.
8. A(n) _____ is an abnormal response to food that is not caused by the immune system.
9. _____ is a condition in which lactase is missing, making it uncomfortable to eat or drink dairy products.
10. _____ is a condition in which a person is intolerant to gluten.

Recalling the Facts

11. What four dietary guidelines can you follow to reduce the risk of developing premature cardiovascular disease?
12. How can you limit your fat intake?
13. What are dietary sources of omega-3 fatty acids, and why are they good for you?
14. What kinds of diet recommendations do people with diabetes and hypoglycemia follow?
15. To what foods are people often allergic or intolerant?
16. Which vitamins are considered antioxidants?
17. What four dietary guidelines can you follow to reduce the risk of developing cancer?
18. Which cancer risks can you reduce by following the above guidelines?

Critical Thinking

19. Explain why it is important to limit the amount of fat and cholesterol in your diet.
20. If a teen girl does not eat dairy products and vegetables but starts to eat them in her 30s, has she protected herself against osteoporosis?
21. Why are antioxidants important?
22. Describe how increasing your intake of omega-3 fatty acids can improve your health.

Real-Life Applications

23. What are foods in your school cafeteria that are rich in omega-3 fatty acids?
24. What are foods that are in your school cafeteria that are low in cholesterol?
25. If you or a loved one were diagnosed with diabetes, what would you do?
26. Why do you think it is important to recognize symptoms of food allergies or food intolerance?

Activities

Responsible Decision Making

27. **Explain** Suppose you have lactase deficiency. You accept a dinner invitation at a friend's house. The main dish is cheese-heavy lasagna. Write a response to this situation. Refer to the Responsible Decision-Making Model on page 61 for help.

Sharpen Your Life Skills

28. **Make Responsible Decisions** Your family invites one of your friends to go on vacation. Your friend has diabetes. How might you consider your friend's dietary needs as you plan ahead for the vacation? List actions you might take.

Visit **tx.healthmh.com/study_guide** for more review questions.

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