Chapter 38

Digestive and Excretory Systems

Section 38–1 Food and Nutrition (pages 971–977)

This section identifies the nutrients your body needs and explains why water is such an important nutrient.

Food and Energy (page 971)

1. Cells convert the chemical energy in glucose and other molecules into ______ ATP _______.

2. The energy stored in food is measured in units called __________ Calories __________.

3. Is the following sentence true or false? The energy needs of an average-sized teenager are about 3000 Calories.
   ______ false _______

4. Is the following sentence true or false? Your body can extract energy from almost any type of food. ______ true _______

5. Besides supplying fuel, what are other important functions of food? Food supplies the raw materials used to build and repair body tissues and to manufacture proteins that regulate cellular reactions, the phospholipids in cell membranes, and DNA and other substances that the body needs but cannot manufacture.

6. What is the science of nutrition? It is the study of food and its effects on the body.

Nutrients (pages 972–975)

7. Substances in food that supply the energy and raw materials your body uses for growth, repair, and maintenance are called __________ nutrients _______.

8. List the six nutrients that the body needs.
   a. Water _______ c. Fats _______ e. Vitamins _______
   b. Carbohydrates _______ d. Proteins _______ f. Minerals _______

9. Circle the letter of each sentence that is true about water as a nutrient.
   a. Water is the most important of all nutrients.
   b. Every cell in the human body needs water.
   c. Many of the body’s processes take place in water.
   d. Water makes up the bulk of bodily fluids including blood.

10. How is water lost from the body? It is lost in sweat, exhaled breath, and urine.

11. If enough water is not taken in to replace what is lost, ______ dehydration _______ can result.
12. Complete the concept map.

Carbohydrates

<table>
<thead>
<tr>
<th>Include</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugars</td>
</tr>
<tr>
<td>Starches</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>found in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fruits</td>
</tr>
<tr>
<td>Sugar cane</td>
</tr>
<tr>
<td>Honey</td>
</tr>
<tr>
<td>Grains</td>
</tr>
<tr>
<td>Vegetables</td>
</tr>
<tr>
<td>Potatoes</td>
</tr>
</tbody>
</table>

13. Why do you need fiber in your diet? It supplies bulk that helps muscles keep food and wastes moving through your digestive and excretory systems.

14. Circle the letter of each choice that is a function of fat.
   a. Protecting body organs
   b. Insulating the body
   c. Storing energy
   d. Transporting oxygen

15. List four increased health risks associated with a diet high in fat.
   a. High blood pressure
   b. Heart disease
   c. Obesity
   d. Diabetes

16. Circle the letter of each choice that is a function of protein.
   a. Supplying raw materials for growth and repair
   b. Making up enzymes
   c. Helping the body absorb certain vitamins
   d. Producing cell membranes

17. The eight amino acids that the body is unable to produce are called essential amino acids.

Match each vitamin with its function.

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Function</th>
</tr>
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<tbody>
<tr>
<td>d</td>
<td>18. A</td>
</tr>
<tr>
<td>b</td>
<td>19. D</td>
</tr>
<tr>
<td>a</td>
<td>20. E</td>
</tr>
<tr>
<td>c</td>
<td>21. C</td>
</tr>
</tbody>
</table>

   a. Preventing cellular damage
   b. Promoting bone growth
   c. Repairing tissues and healing wounds
   d. Promoting growth of skin cells
Chapter 38, Digestive and Excretory Systems  (continued)

Match each mineral with a food that supplies it.

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>22. calcium</td>
</tr>
<tr>
<td>d</td>
<td>23. zinc</td>
</tr>
<tr>
<td>a</td>
<td>24. chlorine</td>
</tr>
<tr>
<td>c</td>
<td>25. iron</td>
</tr>
<tr>
<td>a. Table salt</td>
<td></td>
</tr>
<tr>
<td>b. Dairy products</td>
<td></td>
</tr>
<tr>
<td>c. Eggs</td>
<td></td>
</tr>
<tr>
<td>d. Seafood</td>
<td></td>
</tr>
</tbody>
</table>

Balancing the Diet  (pages 976–977)

26. Label the missing food groups in the Food Guide Pyramid.

Section 38–2  The Process of Digestion  (pages 978–984)

This section describes the organs of the digestive system and explains their functions.

The Mouth  (pages 978–979)

1. What is the function of the organs of the digestive system? Their function is to help convert foods into simpler molecules that can be absorbed and used by the cells of the body.

2. The physical breakdown of large pieces of food into smaller pieces is referred to as mechanical digestion.

3. The breakdown of large food molecules into smaller molecules that can be absorbed into the bloodstream is called chemical digestion.
4. Label the drawing of the digestive system with the following structures: mouth, esophagus, stomach, liver, small intestine, and large intestine.

Salivary glands
Mouth
Pharynx
Esophagus
Liver
Gallbladder
Stomach
Pancreas
Large intestine
Small intestine
Rectum

5. What is the role of teeth in digestion? They do much of the mechanical work of digestion by cutting, tearing, and crushing food into small fragments.

The Esophagus (page 980)

Match each term with its definition.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>6. bolus</td>
</tr>
<tr>
<td>c</td>
<td>7. esophagus</td>
</tr>
<tr>
<td>a</td>
<td>8. peristalsis</td>
</tr>
</tbody>
</table>

a. Contractions of smooth muscle that aid in swallowing
b. Clump of chewed food
c. Food tube connecting the mouth and stomach

9. Is the following sentence true or false? The pyloric valve prevents the contents of the stomach from moving back up into the esophagus. false

The Stomach (pages 980–981)

10. Circle the letter of each sentence that is true about the stomach.

a. It produces hydrochloric acid.
b. It produces trypsin.
c. It helps in the mechanical digestion of food.
d. It produces amylase.
Chapter 38, Digestive and Excretory Systems (continued)

11. Is the following sentence true or false? Pepsin cannot work under the acidic conditions present in the stomach. _______false______

12. A hole in the stomach wall is known as a(an) _______peptic ulcer______.

13. A mixture of stomach fluids and food is referred to as _______chyme______.

The Pancreas and Liver (pages 981–982)

14. Where does most chemical digestion take place? _______It takes place in the duodenum, the first of three parts of the small intestine______.

15. Circle the letter of each sentence that is true about the pancreas.
   a. It produces amylase.
   b. It produces sodium bicarbonate.
   c. Its enzymes help break down lipids and nucleic acids.
   d. It produces lactase.

16. What role does the liver play in digestion? _______It produces bile, which dissolves and disperses the droplets of fat found in fatty foods so that enzymes can reach the fat molecules and break them down______.

17. Bile is stored in a small pouchlike organ called the _______gallbladder______.

The Small Intestine (page 983)

18. Name the two parts of the small intestine where nutrients are absorbed.
   a. Jejunum _________ b. Ileum _________

19. Projections that cover the folds of the small intestine are called _______villi______.

20. Is the following sentence true or false? Molecules of undigested fat and some fatty acids are absorbed by lymph vessels called lacteals. _______true______

The Large Intestine (page 984)

21. What is the primary job of the large intestine? _______The primary job is to remove water from undigested material______.

22. Is the following sentence true or false? The appendix plays an important role in human digestion. _______false______

23. When something happens that interferes with the removal of water by the large intestine, a condition known as _______diarrhea______ results.