

15 The Digestive System

Chapter Summary

Digestion occurs within the alimentary canal and involves breaking down the components of food (proteins, carbohydrates, and fats) into their subunits (amino acids, glucose, and fatty acids and glycerol respectively). These breakdown products enter the blood and are transported to the cells. The text describes both physical and chemical digestive processes. The organs comprising the alimentary canal are the mouth, pharynx, esophagus, stomach, small intestine, and large intestine. The stomach stores food temporarily and secretes gastric juice, which contains an enzyme for degrading protein molecules. The release of gastric juice from the stomach is regulated by a hormone secreted by the stomach wall. The microvilli of the small intestine bear enzymes which complete the digestion of proteins, carbohydrates, and fats. The large intestine absorbs water from its contents. The accessory organs of the digestive system are the salivary glands, which secrete an enzyme that begins carbohydrate digestion; the liver, which secretes bile that facilitates in fat digestion; the gallbladder, which stores and releases bile; and the pancreas, which secretes enzymes that are involved in both carbohydrate and fat digestion. The liver performs several other functions including the regulation of the blood glucose level. Bile from the liver and gallbladder and the pancreatic enzymes are released into the first part of the small intestine, which is called the duodenum. The release of these juices is regulated by hormones secreted by the small intestine. The second and third parts of the small intestine are the jejunum and ileum. The ileum leads to the large intestine which is composed of a cecum that bears a vermiform appendix, an ascending colon, transverse colon, descending colon, sigmoid colon, and rectum. Jaundice, hepatitis, and cirrhosis are all disorders of the liver and are discussed in the text.

Chapter Outline

- I. Anatomy of the Digestive System
 - A. The Mouth
 - B. The Pharynx
 - C. Swallowing
 - D. The Esophagus
 - E. The Wall of the Digestive Tract
 - F. The Stomach
 1. Regions of the Stomach
 2. Digestive Functions of the Stomach
 3. Peritoneum
 - G. The Small Intestine
 1. Regions of the Small Intestine
 - a. duodenum
 - b. jejunum
 - c. ileum
 - H. The Large Intestine
 1. Diarrhea and Constipation
 2. Polyps
 3. Other Disorders of the Large Intestine

- II. Accessory Organs of Digestion
 - A. The Pancreas
 - 1. Pancreatic Juice
 - B. The Liver
 - 1. Liver Structure
 - 2. Liver Function
 - 3. Liver Disorders
 - C. The Gallbladder
 - 1. Function of Bile Salts
- III. Chemical Digestion
- IV. Effects of Aging
- V. Homeostasis
- VI. Nutrition
 - A. Vitamins
 - B. Minerals
 - C. Eating Disorders
 - 1. Obesity
 - 2. Bulimia Nervosa
 - 3. Anorexia Nervosa

Suggested Student Activities

1. Using a model of the human body, locate the digestive organs.
2. Discuss the measures involved in protecting the stomach from being destroyed by its own enzymes.
3. Discuss what happens to a steak and cheese sandwich as it passes along the digestive tract.

Answers to Objective Questions

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| 1. amylase | 6. duodenum |
| 2. epiglottis | 7. glycogen |
| 3. esophagus, protein | 8. bile, emulsifies |
| 4. acidic | 9. trypsin, chymotrypsin, lipase, amylase |
| 5. regions (colons), rectum, anus | 10. villi |

Answers to Medical Terminology Reinforcement Exercise

1. stomato/gloss/itis - inflammation of mouth and tongue
2. glosso/pharyngeal - pertaining to the tongue and throat
3. esophag/ectasia - dilating/stretching the esophagus
4. gastro/enter/itis - inflammation of the stomach and intestine
5. sub/lingu/al - beneath the tongue
6. gingivo/peri/odont/itis - inflammation around teeth and gums
7. dent/algia - pain in a tooth (toothache)
8. pyloro/myo/tomy - cutting into muscle of the pylorus (to correct congenital hypertrophic pyloric stenosis)
9. chol/angio/gram - X ray (record) of a bile vessel—radiopaque dye is injected into common bile duct and X ray made
10. chole/cysto/litho/tripsy - crushing stones in the gallbladder
11. procto/sigmoid/oscopy - visualization of the rectum and sigmoid colon with the use of an endoscope

12. colo/centesis – puncture of colon with hollow instrument to relieve pressure
13. tricho/phagia – eating of hair
14. duodeno/rrhaphy – suturing of the duodenum
15. ileo/cecal – relating to both ileum and cecum

Audiovisual Materials

1. Filmstrip - The Digestive System, (Unit 10) (Career Aids)
2. Transparencies - Digestive System (Career Aids)
3. Model - Digestive System (2073) (Concept Media)