

Chapter 2 – Digestion and Absorption

Multiple Choice

1. Another name for the digestive tract is the:
 - a. urinary tract.
 - b. exocrine system.
 - c. gastrointestinal system.
 - d. muscular system.
2. The digestive tract begins at the ____ and ends at the ____.
 - a. stomach; large intestine
 - b. pharynx; rectum
 - c. lower esophageal sphincter; rectum
 - d. mouth; anus
3. A bolus is a(n):
 - a. sphincter muscle separating the stomach from the small intestine.
 - b. portion of food swallowed at one time.
 - c. enzyme that hydrolyzes starch.
 - d. portion of partially digested food expelled by the stomach into the duodenum.
4. The ____ is formed in the mouth.
 - a. bile
 - b. bolus
 - c. chyme
 - d. villus
5. The ____ prevents food from entering the lungs.
 - a. lower esophageal sphincter
 - b. pharynx
 - c. ileocecal valve
 - d. epiglottis
6. The stomach empties into the:
 - a. ileum.
 - b. cecum.
 - c. jejunum.
 - d. duodenum.
7. Chyme is:
 - a. a semiliquid mass of partially digested food.
 - b. a portion of food swallowed at one time.
 - c. an enzyme in the stomach needed for the digestion of protein.
 - d. an esophageal secretion.
8. Two organs that secrete digestive juices into the small intestine are the ____ and ____.
 - a. gallbladder; pancreas
 - b. pancreas; liver
 - c. gallbladder; liver
 - d. duodenum; pancreas
9. The movement of chyme from the stomach into the small intestine is regulated by the:
 - a. pancreas.
 - b. pyloric sphincter.
 - c. ileocecal valve.
 - d. duodenum.
10. Immediately before passing into the large intestine, the food mass must pass through the:
 - a. pyloric sphincter.
 - b. lower esophageal sphincter.
 - c. ileocecal valve.
 - d. bolus.
11. *Peristalsis* is a term that refers to the:
 - a. circulation of blood in the blood vessels.
 - b. absorption of nutrients in the intestines.
 - c. mixing and moving of food through the lymphatic system.
 - d. last phase of digestion.
 - e. action of the involuntary muscles of the digestive tract.

12. Involuntary muscle contractions move food through the intestinal tract. The movement that forces the contents back a few inches before pushing it forward again is called:
- segmentation.
 - rotation.
 - peristalsis.
 - liquefaction.
13. Enzymes:
- facilitate chemical reactions.
 - draw water into the small intestine.
 - are present in all parts of the GI tract.
 - encourage bacterial growth.
14. Which enzyme breaks down starch in the mouth?
- lingual protease
 - lipase
 - salivary amylase
 - gastric protease
 - secretin
15. Saliva contains an enzyme that digests:
- proteins.
 - minerals.
 - starches.
 - vitamins.
 - fiber.
16. Which of the following is not a component of gastric juice?
- water
 - enzymes
 - chylomicrons
 - hydrochloric acid
17. The normal pH of the stomach is:
- very acidic.
 - slightly acidic.
 - neutral.
 - slightly alkaline.
 - strongly alkaline.
18. Which of the following organs does not contribute juices during digestion?
- salivary glands
 - small intestine
 - pancreas
 - esophagus
19. The function of mucus in the stomach is to:
- neutralize stomach acid.
 - activate pepsinogen to pepsin.
 - protect stomach cells from gastric juices.
 - emulsify fats.
 - collect bacteria.
20. The major digestive work in the stomach is the initial breakdown of:
- starch.
 - proteins.
 - fat.
 - vitamins.
21. In addition to hydrochloric acid, the stomach cells also secrete:
- mucus.
 - bile.
 - amylase.
 - lipoproteins.
 - cholesterol.
22. The major digestive enzyme secreted by the stomach is:
- amylase.
 - lipase.
 - pepsin.
 - disaccharidase.
23. Which nutrients are digested in the small intestine?
- carbohydrate, fat, and protein
 - fat, water, and fiber
 - protein, vitamins, and fiber
 - water, fiber, and minerals

24. The digestion of proteins begins in the _____ and ends in the _____.
- stomach; pancreas
 - pancreas; small intestine
 - stomach; small intestine
 - small intestine; liver
25. Which of the following organs is the primary source of digestive enzymes?
- pancreas
 - gallbladder
 - stomach
 - liver
26. After the pancreatic juices have mixed with chyme in the intestine, the resulting mixture is:
- very acidic.
 - slightly acidic.
 - strongly alkaline.
 - slightly alkaline.
27. The liver:
- reabsorbs water and salts.
 - secretes bile.
 - churns food to chyme.
 - performs enzymatic digestion.
 - stores bile.
28. The main function of bile is to:
- emulsify fats.
 - stimulate the activity of protein digestive enzymes.
 - neutralize the intestinal contents.
 - decrease the acidity of the contents of the stomach.
29. If the gallbladder becomes diseased, the digestion of _____ can become compromised.
- fat
 - protein
 - carbohydrate
 - fiber
30. The gallbladder:
- reabsorbs water and salts.
 - churns food to chyme.
 - performs enzymatic digestion.
 - stores bile.
31. The emulsification of fat requires:
- bile.
 - enzymes.
 - prostaglandins.
 - intestinal flora.
32. Which of the following contains no digestive enzymes?
- saliva
 - gastric juice
 - intestinal juice
 - bile
33. Which of the following does not secrete digestive juices?
- stomach
 - pancreas
 - salivary glands
 - large intestine
34. Which of the following nutrients takes longest to digest?
- fat
 - sugar
 - vitamin C
 - iron
 - glucose
35. Fats present in the GI tract:
- slow down the process of digestion and absorption.
 - cause difficulty in digestion.
 - stimulate and hasten digestion and absorption.
 - are carriers of thiamin, riboflavin, and niacin.

36. Which of the following foods would take the most time to digest?
- a piece of toast with strawberry jam
 - a grilled steak
 - a green salad with low-fat salad dressing
 - a cup of green beans
37. Which of these foods would be digested most quickly?
- sugar cookies
 - peanut butter sandwich and milk
 - stew and cornbread
 - hamburger, french fries, and milkshake
38. Which of the following foods would be digested most rapidly?
- a scoop of lemon sherbet
 - an apple
 - a baked potato with sour cream
 - a piece of cheese on a cracker
39. Which nutrients must be broken down in order to be absorbed?
- vitamins, minerals, water
 - carbohydrate, vitamins, minerals
 - fat, protein, minerals
 - carbohydrate, protein, fat
40. Bacteria in the GI tract perform all of the following functions except:
- producing biotin.
 - protecting people from infection.
 - producing vitamin K.
 - producing bile.
41. Fiber functions to:
- aid in the absorption of vitamins.
 - produce GI bacteria.
 - stimulate the GI tract muscles.
 - stimulate the absorption of nutrients.
42. A benefit of fiber is that it:
- promotes mineral absorption.
 - aids in keeping stools soft.
 - prevents diarrhea.
 - keeps individual foods from getting mixed together.
43. Once the digestive process is complete, the colon retrieves materials that the body must recycle. These materials are:
- water and dissolved salts.
 - iron and water.
 - protein and sodium.
 - water and fiber.
44. One of the functions of the colon is to absorb:
- salts.
 - vitamins.
 - sugars.
 - fiber.
45. The primary site of nutrient absorption is the:
- stomach.
 - pancreas.
 - small intestine.
 - large intestine.
46. Villi are part of the structure of the:
- esophagus.
 - stomach.
 - small intestine.
 - large intestine.
47. The microscopic hairs that cover the surface of each cell lining the small intestine are called:
- intestinal folds.
 - villi.
 - microvilli.
 - lymphatics.
48. Which of the following nutrients is/are absorbed into the lymphatic system?
- fat-soluble vitamins
 - water
 - amino acids
 - glucose

49. After absorption, the water-soluble nutrients are released directly into the:
- bloodstream.
 - kidneys.
 - liver.
 - lymph.
50. After absorption, the larger fats and fat-soluble vitamins are first released into the _____ transport system.
- excretory
 - mesentery
 - vascular
 - lymphatic
51. After digestion, lipids are packaged for transport as lipoproteins known as:
- HDL.
 - VLDL.
 - LDL.
 - chylomicrons.
52. Which of the following is not part of the structure of a chylomicron?
- phospholipid
 - protein
 - triglyceride
 - water-soluble vitamins
53. The lymphatic system:
- contains fluid with the same composition as blood.
 - eventually drains into the blood circulatory system.
 - carries chylomicrons to the intestines.
 - is where metabolism of nutrients takes place.
54. When nutrients enter the blood vessels from the small intestine, they are first transported to the:
- kidney.
 - liver.
 - cells throughout the body.
 - thoracic duct.
55. Which of the following is the body's major metabolic organ?
- pancreas
 - small intestine
 - gallbladder
 - liver
56. Elevated LDL concentrations are associated with a high risk of heart disease because they:
- transport cholesterol and triglycerides from the liver to the tissues.
 - carry excessive amounts of fat that is deposited around the heart.
 - encourage high levels of iron in the blood.
 - take excess cholesterol back to the liver, which increases the production of cholesterol.
57. Elevated HDL concentrations are associated with a low risk of heart disease because they:
- transport newly absorbed lipids from intestinal cells to the rest of the body.
 - carry cholesterol and triglycerides from the liver to the rest of the body.
 - carry lipids around in the blood more often than LDL.
 - take excess cholesterol and phospholipids from the tissues and return them to the liver.
58. The lipoprotein that contains the greatest proportion of triglyceride is the:
- HDL.
 - LDL.
 - VLDL.
 - chylomicron.
59. Which of the following factors is not required for optimal health and performance of the digestive system?
- adequate sleep
 - enzyme supplements
 - mental state
 - nutrition

60. Which of the following will cause a foodborne infection?
- foods containing toxin-producing microbes
 - Clostridium botulinum*
 - Campylobacter jejuni*
 - Staphylococcus aureus*
61. To prevent bacterial growth when holding cooked foods, they should be kept at _____° F or higher until served.
- 40
 - 140
 - 165
 - 200
62. To prevent foodborne illnesses:
- Fresh produce should be washed before it is eaten.
 - Only new sponges and towels should be used in the kitchen.
 - Leftovers can safely be covered and left at room temperature until the next meal.
 - Meats should be marinated at room temperature.
63. Cold food should be stored at _____.
- 40° F or colder
 - 55° F or colder
 - 80° F or colder
 - 140° F or colder
64. Leftovers should be used within _____ days.
- 5-7
 - 3-4
 - 2-3
 - 1-2

Essay

- Outline and trace the path food follows through the digestive tract from one end to the other.
- Describe the role of the stomach in the process of digestion.
- Should antacids be taken to decrease the strong acidity of the stomach? Explain your answer.
- Explain what determines the rate of digestion of the energy nutrients.
- Explain the benefits of intestinal microflora to health.
- Describe the difference between low-density lipoproteins (LDL) and high-density lipoproteins (HDL). What is the relationship between blood levels of these lipoproteins and risk of heart disease?

Matching

- | | |
|-----------------------------------|--|
| 1. anus | a. the oral cavity containing the tongue and teeth. |
| 2. appendix | b. the passageway leading from the nose and mouth to the larynx and esophagus, respectively. |
| 3. duodenum | c. a cartilage structure in the throat that prevents fluid or food from entering the trachea when a person swallows. |
| 4. epiglottis | d. the passageway from the mouth and nose to the lungs. |
| 5. esophagus | e. the conduit from the mouth to the stomach. |
| 6. gallbladder | f. the sphincter muscle at the junction between the esophagus and the stomach. |
| 7. ileocecal valve | g. the sphincter muscle separating the stomach from the small intestine. |
| 8. ileum | h. the organ that stores and concentrates bile. |
| 9. jejunum | i. a gland that secretes enzymes and digestive juices into the duodenum. |
| 10. large intestine | j. a 10-foot length of small-diameter (1-inch) intestine that is the major site of digestion of food and absorption of nutrients. |
| 11. lower esophageal sphincter | k. the top portion of the small intestine. |
| 12. mouth | l. the first two-fifths of the small intestine beyond the duodenum. |
| 13. pancreas | m. the last segment of the small intestine. |
| 14. pharynx | n. the sphincter muscle separating the small and large intestines. |
| 15. pyloric sphincter | o. the last portion of the intestine, which absorbs water. |
| 16. rectum | p. a narrow blind sac extending from the beginning of the large intestine; stores lymphocytes. |
| 17. small intestine | q. the muscular terminal part of the GI tract extending from the sigmoid colon to the anus. |
| 18. trachea | r. the terminal sphincter muscle of the GI tract. |
| 19. chylomicrons | a. class of lipids composed of glycerol with three fatty acids attached. |
| 20. high-density lipoproteins | b. the lipoproteins that transport lipids from the intestinal cells into the body. |
| 21. lipoprotein | c. a cluster of lipids associated with proteins that serves as a transport vehicle for lipids in the lymph and blood. |
| 22. low-density lipoproteins | d. the type of lipoproteins made primarily by liver cells to transport lipids to various tissues in the body; composed primarily of triglycerides. |
| 23. triglycerides | e. the type of lipoproteins derived from VLDL as cells remove triglycerides from them; composed primarily of cholesterol. |
| 24. very-low-density lipoproteins | f. the type of lipoproteins that transport cholesterol back to the liver from peripheral cells; composed primarily of protein. |

Answer Key (ANS = answer, DIF = level of difficulty, REF = page reference, TOP = chapter section)

Multiple Choice

1.	ANS: c	DIF: Knowledge-level	REF: 38	TOP: 2.1
2.	ANS: d	DIF: Knowledge-level	REF: 38	TOP: 2.1
3.	ANS: b	DIF: Knowledge-level	REF: 39	TOP: 2.1
4.	ANS: b	DIF: Knowledge-level	REF: 39	TOP: 2.1
5.	ANS: d	DIF: Knowledge-level	REF: 39	TOP: 2.1
6.	ANS: d	DIF: Knowledge-level	REF: 40	TOP: 2.1
7.	ANS: a	DIF: Knowledge-level	REF: 40	TOP: 2.1
8.	ANS: a	DIF: Knowledge-level	REF: 40	TOP: 2.1
9.	ANS: b	DIF: Knowledge-level	REF: 40	TOP: 2.1
10.	ANS: c	DIF: Knowledge-level	REF: 40	TOP: 2.1
11.	ANS: e	DIF: Knowledge-level	REF: 40	TOP: 2.1
12.	ANS: a	DIF: Knowledge-level	REF: 41	TOP: 2.1
13.	ANS: a	DIF: Knowledge-level	REF: 43	TOP: 2.2
14.	ANS: c	DIF: Knowledge-level	REF: 43	TOP: 2.2
15.	ANS: c	DIF: Knowledge-level	REF: 43	TOP: 2.2
16.	ANS: c	DIF: Knowledge-level	REF: 43	TOP: 2.2
17.	ANS: a	DIF: Knowledge-level	REF: 43	TOP: 2.2
18.	ANS: d	DIF: Knowledge-level	REF: 43	TOP: 2.2
19.	ANS: c	DIF: Knowledge-level	REF: 44	TOP: 2.2
20.	ANS: b	DIF: Knowledge-level	REF: 44	TOP: 2.2
21.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
22.	ANS: c	DIF: Knowledge-level	REF: 44	TOP: 2.2
23.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
24.	ANS: c	DIF: Knowledge-level	REF: 44	TOP: 2.2
25.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
26.	ANS: d	DIF: Knowledge-level	REF: 44	TOP: 2.2
27.	ANS: b	DIF: Knowledge-level	REF: 44	TOP: 2.2
28.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
29.	ANS: a	DIF: Application-level	REF: 44	TOP: 2.2
30.	ANS: d	DIF: Knowledge-level	REF: 44	TOP: 2.2
31.	ANS: a	DIF: Knowledge-level	REF: 44	TOP: 2.2
32.	ANS: d	DIF: Knowledge-level	REF: 43-44	TOP: 2.2
33.	ANS: d	DIF: Knowledge-level	REF: 43	TOP: 2.2
34.	ANS: a	DIF: Application-level	REF: 45	TOP: 2.2
35.	ANS: a	DIF: Knowledge-level	REF: 45	TOP: 2.2
36.	ANS: b	DIF: Application-level	REF: 45	TOP: 2.2
37.	ANS: a	DIF: Application-level	REF: 45	TOP: 2.2
38.	ANS: a	DIF: Application-level	REF: 45	TOP: 2.2
39.	ANS: d	DIF: Knowledge-level	REF: 45	TOP: 2.2
40.	ANS: d	DIF: Knowledge-level	REF: 45	TOP: 2.2
41.	ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.2
42.	ANS: b	DIF: Knowledge-level	REF: 45	TOP: 2.2
43.	ANS: a	DIF: Knowledge-level	REF: 45	TOP: 2.2
44.	ANS: a	DIF: Knowledge-level	REF: 45	TOP: 2.2
45.	ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.3

46. ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.3
47. ANS: c	DIF: Knowledge-level	REF: 45	TOP: 2.3
48. ANS: a	DIF: Knowledge-level	REF: 47	TOP: 2.3
49. ANS: a	DIF: Knowledge-level	REF: 47	TOP: 2.3
50. ANS: d	DIF: Knowledge-level	REF: 47	TOP: 2.3
51. ANS: d	DIF: Knowledge-level	REF: 47	TOP: 2.3
52. ANS: d	DIF: Knowledge-level	REF: 47	TOP: 2.3
53. ANS: b	DIF: Knowledge-level	REF: 48	TOP: 2.4
54. ANS: b	DIF: Knowledge-level	REF: 48	TOP: 2.4
55. ANS: d	DIF: Knowledge-level	REF: 48	TOP: 2.4
56. ANS: a	DIF: Knowledge-level	REF: 48-49	TOP: 2.4
57. ANS: d	DIF: Application-level	REF: 48-49	TOP: 2.4
58. ANS: d	DIF: Knowledge-level	REF: 50	TOP: 2.4
59. ANS: b	DIF: Knowledge-level	REF: 51	TOP: 2.5
60. ANS: c	DIF: Knowledge-level	REF: 53-55	TOP: NIP 2
61. ANS: b	DIF: Knowledge-level	REF: 58	TOP: NIP 2
62. ANS: a	DIF: Application-level	REF: 58	TOP: NIP 2
63. ANS: a	DIF: Knowledge-level	REF: 58	TOP: NIP 2
64. ANS: b	DIF: Knowledge-level	REF: 58	TOP: NIP 2

Essay

1. DIF: Knowledge-level	REF: 38-40	TOP: 2.1
2. DIF: Knowledge-level	REF: 41-42 43-44	TOP: 2.1 2.2
3. DIF: Application-level	REF: 43-44	TOP: 2.2
4. DIF: Knowledge-level	REF: 45	TOP: 2.2
5. DIF: Knowledge-level	REF: 45	TOP: 2.2
6. DIF: Knowledge-level	REF: 48-50	TOP: 2.4

Matching

1. ANS: r	DIF: Knowledge-level	REF: 38	TOP: 2.1
2. ANS: p	DIF: Knowledge-level	REF: 38	TOP: 2.1
3. ANS: k	DIF: Knowledge-level	REF: 38	TOP: 2.1
4. ANS: c	DIF: Knowledge-level	REF: 38	TOP: 2.1
5. ANS: e	DIF: Knowledge-level	REF: 38	TOP: 2.1
6. ANS: h	DIF: Knowledge-level	REF: 38	TOP: 2.1
7. ANS: n	DIF: Knowledge-level	REF: 38	TOP: 2.1
8. ANS: m	DIF: Knowledge-level	REF: 38	TOP: 2.1
9. ANS: l	DIF: Knowledge-level	REF: 38	TOP: 2.1
10. ANS: o	DIF: Knowledge-level	REF: 38	TOP: 2.1
11. ANS: f	DIF: Knowledge-level	REF: 38	TOP: 2.1
12. ANS: a	DIF: Knowledge-level	REF: 38	TOP: 2.1
13. ANS: i	DIF: Knowledge-level	REF: 38	TOP: 2.1
14. ANS: b	DIF: Knowledge-level	REF: 38	TOP: 2.1
15. ANS: g	DIF: Knowledge-level	REF: 38	TOP: 2.1
16. ANS: q	DIF: Knowledge-level	REF: 38	TOP: 2.1
17. ANS: j	DIF: Knowledge-level	REF: 38	TOP: 2.1
18. ANS: d	DIF: Knowledge-level	REF: 38 39	TOP: 2.1
19. ANS: b	DIF: Knowledge-level	REF: 47	TOP: 2.3

20. ANS: f	DIF: Knowledge-level	REF: 48	TOP: 2.4
21. ANS: c	DIF: Knowledge-level	REF: 47	TOP: 2.3
22. ANS: e	DIF: Knowledge-level	REF: 48	TOP: 2.4
23. ANS: a	DIF: Knowledge-level	REF: 47	TOP: 2.3
24. ANS: d	DIF: Knowledge-level	REF: 48	TOP: 2.4