# CHAPTER 50: Animal Nutrition

1. What is the difference between heterotrophs and autotrophs?

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2. What is an energy budget?

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3. What role do the various essential nutrients play in animal metabolism (refer to Ch. 3)
   a. proteins – _____
   b. carbohydrates – _____
   c. lipids – _____
   d. minerals – _____
   e. vitamins – _____
   f. water – _____
4. What is the main role of food for animals regarding biosynthesis?

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5. Why are there only 8 essential amino acids?

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6. Identify and describe a few deficiency diseases.

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7. Identify and describe a few modes of heterotrophic nutrition.

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8. What is the significance of the molecular structure of polysaccharides such as cellulose and starch?

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9. What are ways that herbivores (or omnivores) have adapted to breaking down cellulose?

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10. What are the four main stages of food processing in heterotrophic nutrition?

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11. What is a zymogen?

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12. What is the adaptive value of an alimentary canal?

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13. What two major changes occur to food in the mouth?

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14. List a few significant aspects of the stomach's physiology.

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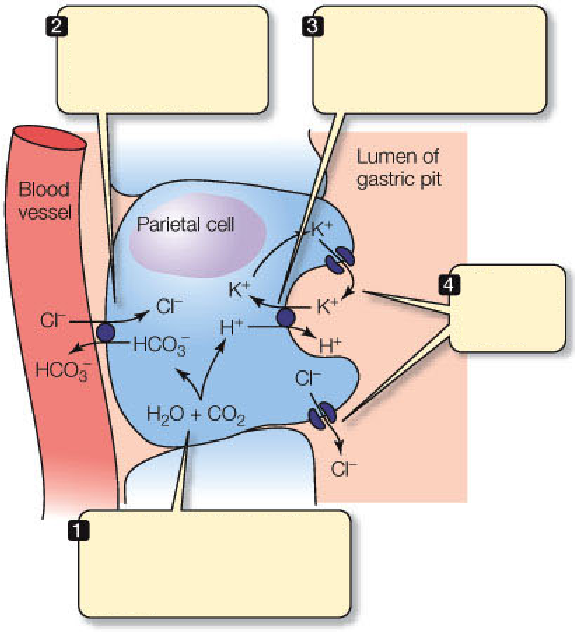
15. Using **Figure 50.13**, diagram the steps used by the stomach to provide the low pH that exists there.




16. How does the stomach prevent digesting itself?

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17. How does the pancreas prevent itself with digesting itself with the peptidases it makes?

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18. Where is each of the following chemically digested?

    a. proteins – _____

    b. carbohydrates – _____

    c. lipids – _____

    d. minerals – _____

19. Describe features of the small intestine that improve its function.

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20. Describe the important functions of the large intestine.

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21. Describe the role of the following hormones:

    a. gastrin – _____

    b. secretin – _____

    c. CCK (cholecystokinin) – _____

    d. GIP (gastric inhibitory protein) – _____

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22. Outline the regulation of blood glucose levels and explain how glucose metabolism demonstrates a homeostatic mechanism.

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23. Describe the evidence that leptin influences satiety?

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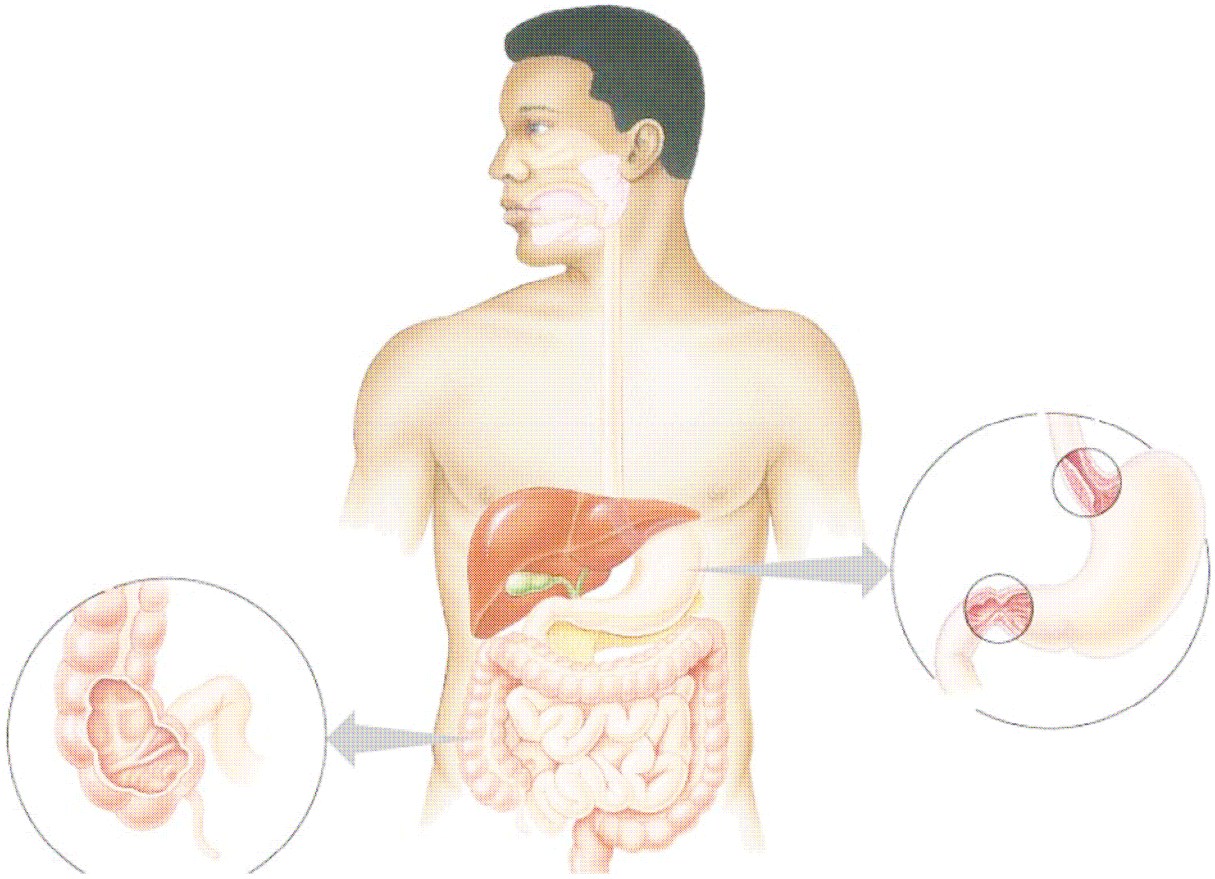
24. Label the diagram of the human digestive system using the class lecture.



# END OF CHAPTER 50 MULTIPLE CHOICE

1. Most of the metabolic energy needed by a bird for a long-distance migratory flight is stored as
   A) glycogen.
   B) fat.
   C) protein.
   D) carbohydrates.
   E) ATP.

2. Which statement about essential amino acids is true?
   A) They are not found in vegetarian diets.
   B) They are stored by the body until they are needed.
   C) Without them, one is undernourished.
   D) All animals require the same ones.
   E) Humans can acquire all of theirs by eating milk, eggs, and meat.

3. Which statement about vitamins is true?
   A) They are essential inorganic nutrients.
   B) They are required in larger amounts than are essential amino acids.
   C) Many serve as coenzymes.
   D) Vitamin D can be acquired only by eating meat or dairy foods.
   E) When vitamin C is eaten in large quantities, the excess is stored in fat for later use.

4. The digestive enzymes of the small intestine
   A) do not function best at a low pH.
   B) are produced and released in response to circulating secretin.
   C) are produced and released under neuronal control.
   D) are all secreted by the pancreas.
   E) are all activated by an acidic environment.

5. Which statement about nutrient absorption by the intestinal mucosal cells is true?
   A) Carbohydrates are absorbed as disaccharides.
   B) Fats are absorbed as fatty acids and monoglycerides.
   C) Amino acids move across the plasma membrane only by diffusion.
   D) Bile transports fats across the plasma membrane.
   E) Most nutrients are absorbed in the duodenum.

6. Chylomicrons are like the tiny micelles of dietary fat in the lumen of the small intestine in that both
   A) are coated with bile.
   B) are lipid soluble.
   C) travel through the lymphatic system.
   D) contain triglycerides.
   E) are coated with lipoproteins.

7. Microbial fermentation in the gut of a cow
   A) produces fatty acids as a major nutrient for the cow.
   B) occurs in specialized regions of the small intestine.
   C) occurs in the cecum, from which food is regurgitated, chewed again, and swallowed into the true stomach.
   D) produces methane as a major nutrient.
   E) is possible because the stomach wall does not secrete hydrochloric acid.

8. Which of the following is stimulated by cholecystokinin?
   A) Stomach motility
   B) Release of bile
   C) Secretion of hydrochloric acid
   D) Secretion of bicarbonate ions
   E) Secretion of mucus

9. During the absorptive period,
   A) breakdown of glycogen supplies glucose to the blood.
   B) glucagon secretion is high.
   C) the number of circulating lipoproteins is low.
   D) glucose is the major metabolic fuel.
   E) the synthesis of fats and glycogen in muscle is inhibited.

10. During the postabsorptive period,
    A) glucose is the major metabolic fuel.
    B) glucagon stimulates the liver to produce glycogen.
    C) insulin facilitates the uptake of glucose by brain cells.
    D) fatty acids constitute the major metabolic fuel.
    E) liver functions slow down because of low insulin levels.