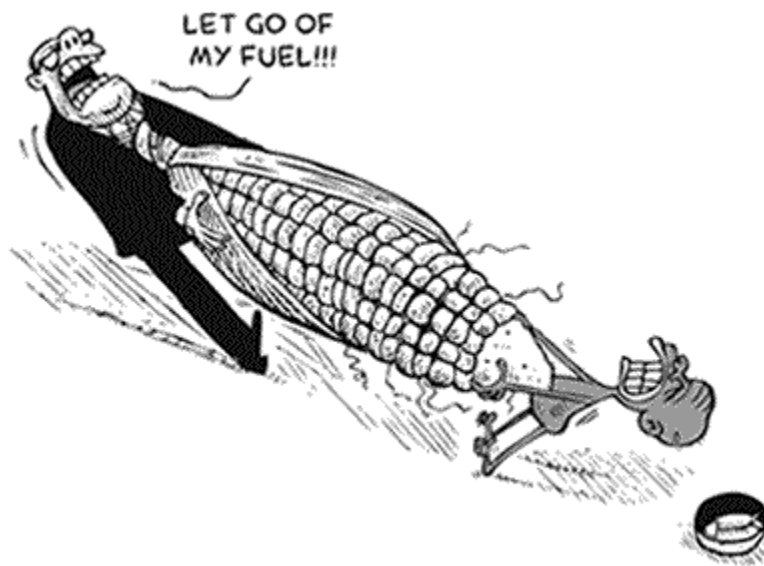


CHAPTER 15

FOOD AND DIGESTION



Chapter 15 Objectives

Section 1: Food and Energy

1. Explain why the body needs food.
2. Name the 6 essential nutrients needed for normal body functioning.
3. Describe how the energy in foods is measured.
4. Identify the main function of carbohydrates.
5. Describe the 2 types of carbohydrates and provide examples of each.
6. Identify 5 functions of fats.
7. Name and describe the 2 types of fats and give an example of each.
8. Identify 3 functions of proteins.
9. Name the units that make up proteins and how many of these are in the body and food.
10. Describe the difference between complete and incomplete proteins and give examples.
11. List the main functions of vitamin and minerals
12. Describe the difference between fat-soluble and water-soluble vitamins
13. List the fat-soluble vitamins
14. Name the 5 major functions of water

Section 2: Healthy Eating

15. Describe how the food pyramid can help you to plan a healthy diet
16. Name the 6 categories found on the food pyramid
17. Determine which 3 food groups should make up the largest part of your diet
18. Explain why sugar and fat should be limited in a diet
19. Describe the following terms: serving size, calories, percent daily value, and ingredients

Section 3: The Digestive Process

1. Explain why digestion of food is necessary.
2. List the 3 main functions of the Digestive System.
3. Differentiate between mechanical and chemical digestion.
4. Identify the location where mechanical and chemical digestion begins.
5. Define the following terms and describe their functions: saliva, enzymes, epiglottis, esophagus, mucus, stomach.
6. List the end products of the digestion of carbohydrates, proteins and fats.
7. Explain the function of enzymes in digestion.
8. Describe the function of peristalsis.
9. Describe the function of mucus in both the mouth and the stomach.

Section 4: Final Digestion and Absorption

10. Identify the digestive organ in which the majority of chemical digestion takes place.
11. Explain the process of absorption and elimination and where they occur
12. Explain the functions of the liver and bile in the digestive process.
13. Describe the function of the gall bladder.
14. Locate and describe the digestive functions of the pancreas.
15. Locate and describe the function of villi.
16. Explain why villi are necessary for absorption.
17. Describe how digested nutrients get to all the cells of the body.
18. Locate and describe the 3 functions of the large intestine.
19. Locate and describe the function of the rectum and the anus.
20. Label the parts of the digestive system.

ACTIVITY: How to Read a Nutrition Label

Directions: Answer the following based on the Nutrition Facts Label provided.

Nutrition Facts	
Serving Size 1 order (304g)	
Amount Per Serving	
Calories 740	Calories from Fat 240
% Daily Value*	
Total Fat 27g	42%
Saturated Fat 16g	80%
Cholesterol 50mg	17%
Sodium 350mg	15%
Total Carbohydrate 112g	37%
Dietary Fiber 0g	0%
Sugars 86g	
Protein 10g	
Vitamin A	15%
Vitamin C	0%
Calcium	25%
Iron	10%

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

NutritionData.com

1. What is the serving size? _____
2. How is the serving size measured?

3. How many calories per serving? _____
4. How much saturated fat is in this food? _____
5. What recommended daily allowance of carbohydrates does this food provide? _____
6. What does the recommended daily allowance mean?

7. This label is based on a _____ calorie diet.
8. How many calories come from fat? _____
9. What is the main reason this food is probably considered unhealthy?

10. Does this food contain a lot of cellulose? How do you know?

ITOUCH ACTIVITY: THE DIGESTIVE SYSTEM



Directions: Use the I-Touch to answer the following questions. Click on the “Anatomy 3D” application, then click on “Encyclopedia” and “Digestive system”

1. What happens when food passes into the stomach?
2. What does the action in #1 prevent?
3. Describe the features of the stomach.
4. The stomach is located between which two organs?
5. What are the dimensions of the stomach?
6. What is heartburn?
7. How much gastric juice is produced by the stomach per day?
8. How long is the small intestine in inches? (Hint: 1 meter = 39 inches)
9. Why is it called the small intestine if it is 4-5 times longer than the large intestine?
10. What takes place in the small intestine?
11. Where does the majority of absorption take place?
12. What are villi?
13. Where are microvilli located?
14. What is the main benefit of villi and microvilli in terms of absorption?

The Digestive System

Directions: Label the following parts of the digestive system.

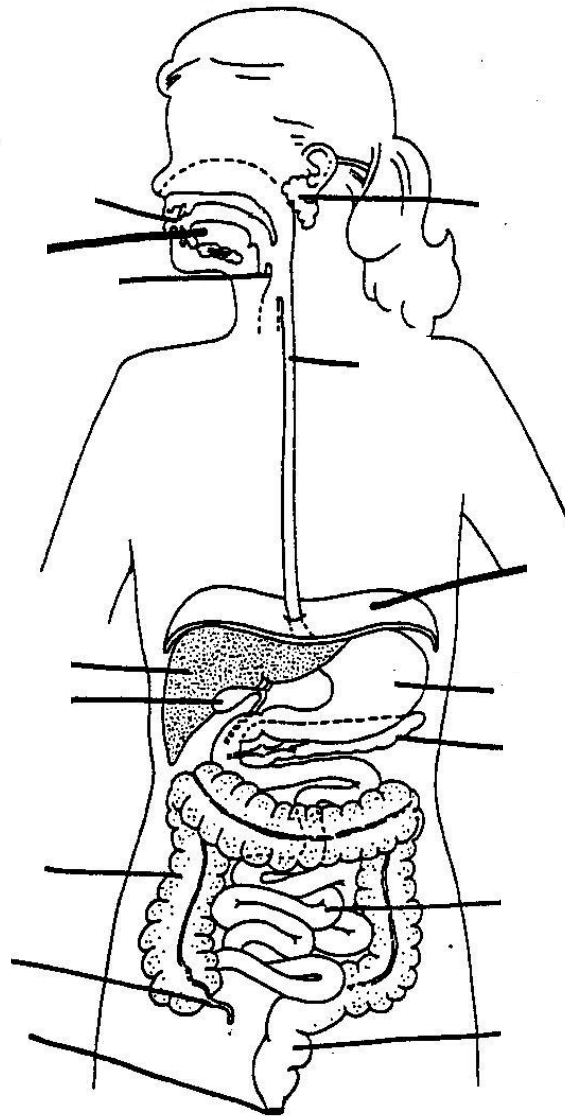
liver
mouth
rectum

anus
stomach
tongue

large intestine
small intestine
gall bladder

esophagus
diaphragm
salivary glands

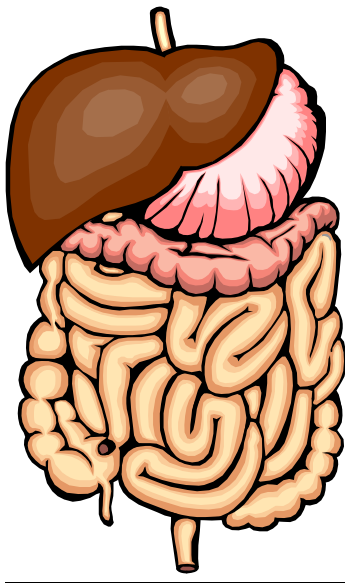
pancreas
appendix
epiglottis



Digestion of Food

Directions: In the space provided, write the term that could best replace the underlined descriptions.

1. _____ Saliva contains chemical substances that break down starches into sugar in the mouth.
2. _____ When you swallow, smooth muscles force food down the tube that moves food from the mouth to the stomach.
3. _____ Rhythmic muscle contractions push food through the digestive system.
4. _____ Food undergoes mechanical and chemical digestion in the organ that releases gastric juices.
5. _____ Most digestion occurs in the organ that can be over 6 meters long.
6. _____ The body's largest and heaviest organ that produces bile aids in digestion.
7. _____ The organ that produces insulin is important in regulating the sugar levels in the bloodstream.
8. _____ The organ located just next to the liver stores bile.
9. _____ The organ that moves wastes also absorbs water.



Put It In Order

Directions: Using the numbers 1 to 7, place the events of the digestive process in the correct order.

1. ____ Peristalsis moves food down the esophagus and into the stomach.
2. ____ Teeth begin mechanical digestion by chewing and grinding food.
3. ____ Food is churned and mixed with gastric juices.
4. ____ Starch is broken down by saliva.
5. ____ Food moves into the small intestine.
6. ____ Swallowing causes the epiglottis to close over the windpipe as food is forced into the esophagus.
7. ____ Chemical digestion of fats, proteins, and carbohydrates are aided by bile from the liver and pancreatic fluid from the pancreas.

© Original Artist
Reproduction rights obtainable from
www.CartoonStock.com



LACTOSE INTOLERANCE

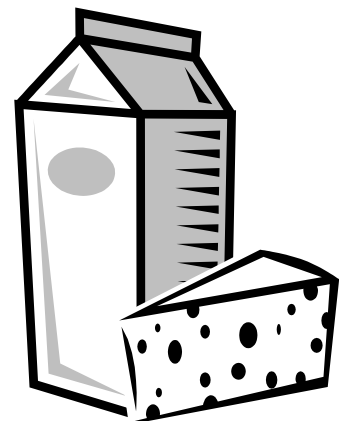
Lactose is a sugar found in milk and other dairy products. Lactose is broken down in the small intestine by an enzyme called lactase. Almost all babies produce lactase in their digestive systems. As some children become older, however, their digestive systems stop producing lactase.

People without the enzyme lactase are said to be lactose intolerant. Their digestive systems cannot digest lactose. As a result, the sugar passes from the small intestine into the large intestine. A high concentration of lactose in the large intestine causes water to move from the body into the large intestine. At the same time, bacteria in the large intestine feed on the lactose. When the bacteria break down this type of sugar, they produce various gases as waste. The combination of water and gases causes the large intestine to swell, which results in cramps and diarrhea.

There is no cure for lactose intolerance, but there are ways that people who have this condition can reduce their symptoms. One way is by avoiding dairy foods. Another way is by taking chewable tablets that contain the enzyme lactase. These will allow a lactose-intolerant person to digest lactose for a period of a few hours.

Directions: Answer the following questions.

1. A very small number of babies are lactose intolerant. Lactose intolerance is much more serious in a baby than in an adult. Why do you think this is so?
2. Why does the large intestine swell when lactose-intolerant people consume food with lactose?
3. Many grocery stores sell lactose-reduced milk. How do you think lactose-reduced milk is made?
4. Susan can drink one glass of milk without having any symptoms, but if she drinks two glasses, she gets painful cramps. Do you think her body produces lactase? Explain.



VOCABULARY

Directions: Use the terms below to fill in the blanks in the sentences that follow.

mucus	digestive system	digestion	stomach	saliva
villi	physical change	esophagus	small intestine	enzymes
bile	chemical change	pancreas	gall bladder	hydrochloric acid
liver	salivary glands	appendix	large intestine	

1. Changing food into a usable form is called _____.
2. _____ speed up the rate of chemical change.
3. _____ helps digest carbohydrates in the mouth.
4. _____ helps break down fats.
5. The tube that connects the mouth to the stomach is the _____.
6. _____ are located under the tongue and behind the jaw.
7. The _____ is an organ that makes three different enzymes.
8. The _____ stores bile.
9. Most digestion and absorption of food takes place in the _____.
10. The _____ removes water from undigested food.
11. The _____ is a small fingerlike part located where the small and large intestines meet.
12. The breaking of food into small pieces is _____.
13. Protein digestion begins in the _____.
14. Bile is made in the _____.
15. Fingerlike parts on the lining of the small intestine are called _____.
16. _____ turns food into a form that cells can use.
17. The _____ is a group of organs that take food and change it into a form the body can use.
18. The chemical _____ is made by the stomach.
19. _____ protects the stomach and intestinal linings.

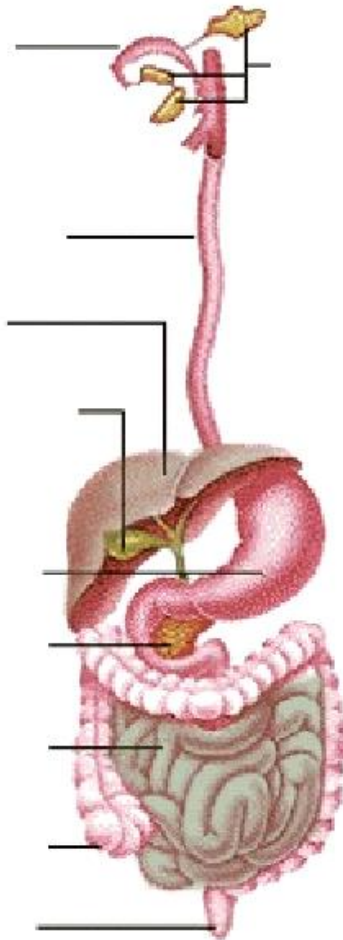
Digestive System

Organs (main and accessory)	Order in the system	Function

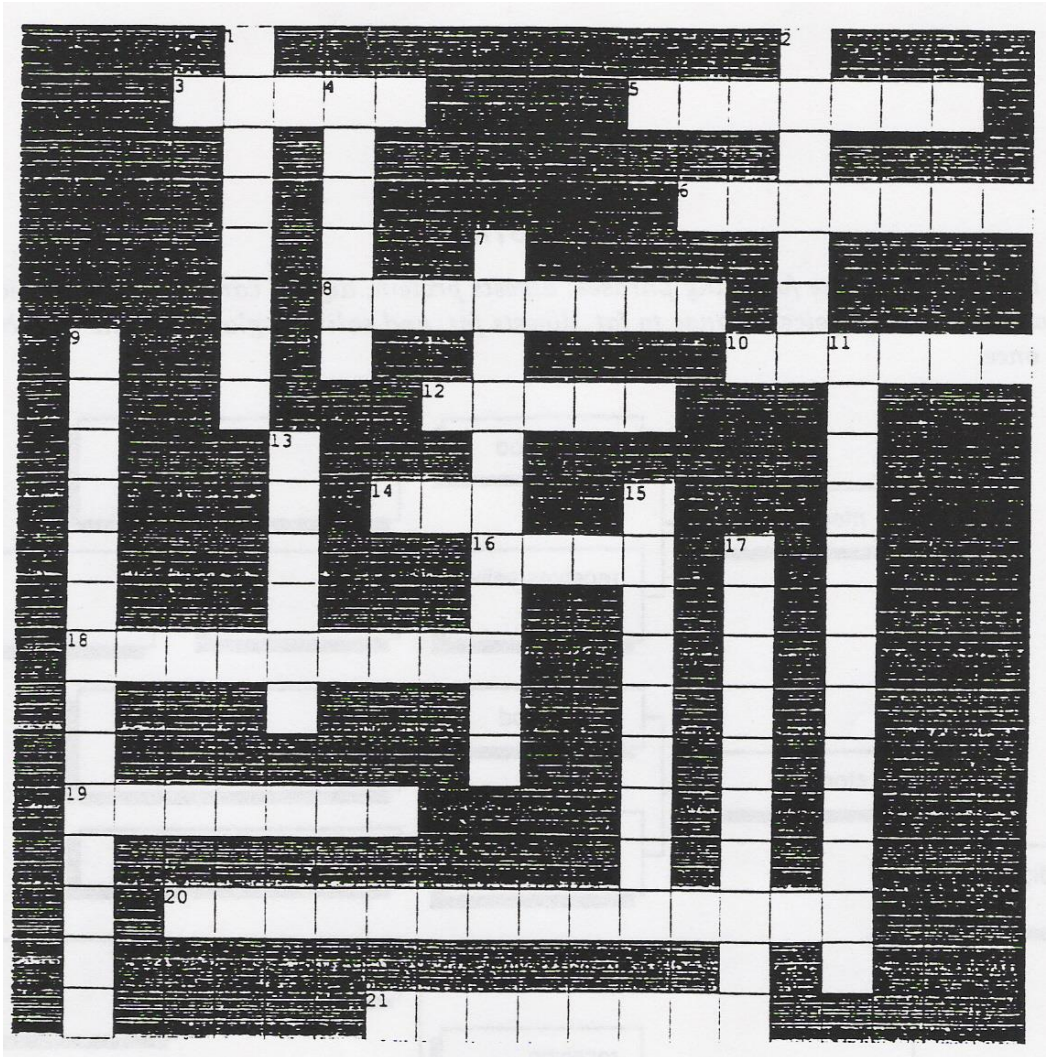
Absorption of Food

Directions: Fill in the blanks with the correct information and label the diagram below

1. Digested food is absorbed through _____, which are located in the _____ . These structures are important because they help to increase _____ .
2. By the time the food is ready to leave the small intestine, it is basically free of _____ . Undigested substances include _____ and _____ .
3. After leaving the small intestine, the undigested food passes into the _____ where most of the _____ in the food is absorbed. Here also, _____ make vitamins such as K and two B vitamins.
4. Solid waste is stored in a short tube called the _____ . These solid wastes are then eliminated from the body through an opening called the _____ .



Crossword Review



Across:

3. makes bile
5. enzyme in saliva that changes starch to sugar
6. nutrient needed for structure of cells and for enzymes
8. inorganic nutrients needed to control various body functions
10. stores wastes until excreted
12. fingerlike projections in small intestine for absorption
14. nutrient needed for energy storage, protection & insulation
16. opening from which solid wastes are excreted
18. chemicals in food
19. place where digestion of proteins begins
20. where most of the digestive processes take place
21. makes 3 different enzymes and adds them to the small intestine

Down:

1. organic nutrients to control various body functions
2. energy needed to raise 1 kg of water 1* C
4. protein that helps to control chemical reactions
7. muscular contractions to push food along GI tract
9. absorbs water from undigested food
11. body's first source of energy
13. enzyme that helps digest protein in your stomach
15. location of the epiglottis
17. building blocks of proteins

KEY TERMS: REVIEW

Directions: Answer the questions with the appropriate key term and use the circled letters to determine the hidden word. Be sure to define the key term as well.

1. What is the triangular organ that lies between the stomach and the first part of the small intestine and produces enzymes that help break down starches, proteins, and fats?

_____○_____

2. What is a thick, slippery substance produced by the body that makes food move more easily through the digestive system?

_____○_____

3. What nutrient acts as a helper molecule in many different chemical reactions within the body?

_____○_____

4. What is the process by which nutrient molecules pass through the wall of the digestive system into the blood?

_____○_____

5. What was developed by nutritionists to classify foods into major groups and tell how many servings from each group to eat?

_____○_____

6. What is the organ that stores bile until it is needed in the small intestine?

_____○_____

7. What is a protein that speeds up chemical reactions in the body?

_____○_____

8. What is a fat that is usually solid at room temperature and is found in meat and dairy products?

_____○_____

Key Term: _____

Definition: _____
