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SYSTEMS: Human Digestive System

CHAPTER ANALYSIS



3 KEY CONCEPTS

- Explain the importance of the digestive system
- Identify the main parts of a digestive system and how they work together to perform a function
- Describe how the digestive system helps in digestion of food and the part played by enzymes in digestion



2 ADVANCED CONCEPTS

- Infer that the end products of digestion are used for cellular processes like respiration, growth and tissue repair
- Show an awareness of the importance of hygiene habits and food handling practices in preventing food-borne diseases



DIGESTIVE SYSTEM





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Our body needs substances in food to live, such as **carbohydrates**, **proteins**, **and fats**.

Nutrients	Why we need them	Sources
Carbohydrates	Provide our body with energy	 Starch: rice, bread, cereals Sugars (glucose, sucrose): ripe fruit, sweets & soft drinks
Proteins	 Used for growth and repair of damaged tissues in our body Provide energy when there are insufficient carbohydrates and fats 	 Animal protein: fish, meat, egg, cheese Plant protein: soya beans, nuts
Fats	 Provide our body with energy Keep our body warm 	ButterMargarineCooking oil

Nutrients in food (eg. Starch, proteins and fats) are large molecules that are too big to pass through the cell membranes of cells. They need to be broken down into smaller molecules in a process called **digestion**.

Definition: Digestion is the breaking down of large food molecules into smaller molecules in the body.

<u>ORGANS</u>



The digestive system is made up of a long continuous tube called the **alimentary canal.** Food enters through the mouth and waste substances exit through the anus as feces.

ENZYMES

Enzymes produced by the body help to break down large molecules into smaller molecules, and speed up the process of digestion.

Class of enzyme	Action
Carbohydrase	Large carbohydrate molecule -> simple sugars
Protease	Large protein molecule -> amino acids
Lipase	Large molecule of fat -> glycerol & fatty acids





ROLES OF ORGANS



Mouth

- Action of *chewing* grinds food into smaller pieces
 - Increases surface area of food which allows it to be digested faster
- Carbohydrase (enzyme) in saliva breaks down starch into maltose
- No digestion of proteins and fats

Stomach

- Gastric juice produced mixes with the food
- Complex proteins are broken down by proteases (enzyme)
- No digestion of carbohydrates or fats

Small intestine

- Process of digestion is completed here
 - (Carbohydrase) Maltose -> glucose
 - (Protease) Simple proteins -> amino acids
 - (Lipase) Molecule of fat -> glycerol & fatty acids
- Digested food diffuses through the walls of the small intestine into the blood vessels around it (absorption)

Large intestine

ORGANS

- · Contains food that cannot be digested
- Water removed and taken back into the body
- Undigested food passes out of the body through the anus as feces

KEY CONCEPT

REMOVAL OF WASTE



CARBON DIOXIDE FROM RESPIRATION

Cells carry out respiration to release energy from food and produce carbon dioxide as a waste product

CO2 passed to the

CIRCULATORY SYSTEM

EXCESS AMINO ACIDS FROM DIGESTION

Excess amino acids are formed from excess protein. These amino acids are broken down into smaller molecules

> Waste molecules passed to the

CIRCULATORY SYSTEM

RESPIRATORY SYSTEM Carbon dioxide is carried to the lungs and removed from the body

EXCRETORY SYSTEM

The waste molecules are carried to the kidneys and removed from the body through the urine

REMOVAL OF WASTE



FOOD-BORNE DISEASES





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Food-borne diseases are caused by consuming contaminated food or drinks. Bacteria are the most common causes of food-borne diseases.

Symptoms

- Diarrhoea
- Fever
- Vomiting
- Stomach cramps
- Dehydration

Prevention

- Good hygiene habits
 - Wash raw fruits and vegetables before eating them
 - Wash your hands thoroughly before and after handling raw food
 - Refrigerate food
 - Cook food thoroughly
 - Cover food with a food cover or plastic wrap

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