Name:_____ Date:_____

Digestive Enzymes: Lock & Key Digestion

Reading Review: How Digestive Enzymes Work

Chewing food and churning stomach acid are vital steps, but chemical digestion is all about the work of **enzymes**. Enzymes act like a **lock and key**: each enzyme has a specific three-dimensional shape designed to bind and break down only one specific substrate.

Mouth (Saliva): *Salivary amylase* specifically breaks down carbohydrates (starches). It cannot break down proteins because its active site only fits carbohydrates.

Stomach: *Pepsin* breaks down proteins into shorter peptide chains. Pepsin cannot break down carbohydrates because its specific substrate is protein.

Small Intestine: Most chemical digestion happens here! Key enzymes include:

- *Pancreatic amylase* - continues carbohydrate breakdown into simple sugars
- *Trypsin* - continues breaking down proteins
- *Lipase* - catalyzes the breakdown of lipids and fats
- *Lactase* - breaks down lactose (milk sugar)
- *Maltase* - breaks down maltose (malt sugar)
- *Nuclease* - catalyzes the breakdown of nucleic acids (DNA and RNA)

Large Intestine: There are **no digestive enzymes** in the large intestine. Digestion is completed in the small intestine; the primary job of the large intestine is absorbing excess water.

Part 1: Enzyme Matching

Match each enzyme in **Column A** to its correct role or substrate in **Column B**. Write the letter of the matching description in the space provided.

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Column A: Enzyme	Match	Column B: Role / Substrate
1. Salivary amylase		**A.** Catalyzes the breakdown of lipids and fats in the small intestine.
2. Pepsin		**B.** Breaks down lactose, a sugar found in dairy products.
3. Lipase		**C.** Secreted in saliva; begins the breakdown of carbohydrates.
4. Trypsin		**D.** Catalyzes the breakdown of nucleic acids into smaller units.
5. Lactase		**E.** Continues the chemical breakdown of proteins in the small intestine.
6. Nuclease		**F.** Produced in the stomach; begins the breakdown of dietary proteins.

Part 2: Multiple Choice Questions

Read each question carefully and select the best answer.

1. Why is salivary amylase unable to digest dietary proteins?

☐ A) Proteins are only found in the large intestine.

☐ B) Amylase operates only at freezing temperatures.

☐ C) Saliva contains acids that destroy proteins instantly.

☐ D) Enzymes are substrate-specific; amylase fits only carbohydrates.

2. In which organ does the vast majority of chemical digestion occur?

☐ A) Mouth

☐ B) Stomach

☐ C) Small intestine

☐ D) Large intestine

3. What is the primary role of the large intestine in the digestive system?

☐ A) Absorbing excess water

☐ B) Secreting enzymes to break down fats

☐ C) Producing pepsin to digest fibers

☐ D) Breaking down nucleic acids

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4. Which enzyme initiates the breakdown of proteins in the acidic environment of the stomach?

☐ A) Maltase

☐ B) Pepsin

☐ C) Pancreatic amylase

☐ D) Lipase

5. If a person consumes dairy products containing lactose, which enzyme must their body produce to digest this sugar?

☐ A) Trypsin

☐ B) Nuclease

☐ C) Salivary Amylase

☐ D) Lactase

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