Section 1: Mechanical Digestion in the Mouth

Digestion begins the moment food enters the mouth. Before your body can absorb any nutrients, the food must undergo physical and chemical changes. The physical breakdown of food into smaller particles without changing its chemical structure is called **mechanical digestion**.

The **teeth** perform the first stage of mechanical breakdown through chewing, or mastication. Different types of teeth have specialized roles: sharp incisors and canines bite and tear food apart, while flat premolars and molars crush and grind it down. This physical crushing does not change the molecules of the food. Instead, it dramatically increases the total surface area of the food particles, allowing digestive fluids to reach and coat the food much more efficiently.

Meanwhile, the **tongue** acts as a powerful muscular organ that coordinates the entire chewing process. It constantly shifts food between teeth, mixes the crushed pieces with lubricating saliva, and presses the mixture against the hard roof of the mouth (the palate). The tongue rolls and compresses this chewed food into a smooth, moist, rounded ball known as a **bolus**. Once the bolus is fully formed, the tongue pushes it toward the back of the throat (the pharynx) to be safely swallowed.

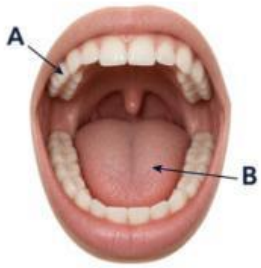


Diagram Identification: Examine the oral cavity diagram above. Identify the structure indicated by each letter.

Structure A: _____ **Structure B:** _____

1. How does chewing help prepare food for digestion?

A. It breaks food into smaller pieces, exposing more surface area.

B. It changes starch directly into protein.

C. It absorbs nutrients through the teeth.

D. It breaks all food molecules into sugars.

2. What is the tongue's role in forming a bolus?

A. It breaks starch into smaller sugar molecules.

B. It shapes chewed food into a moist ball and moves it toward the throat.

C. It absorbs nutrients from food before swallowing.

D. It releases acid to digest proteins.

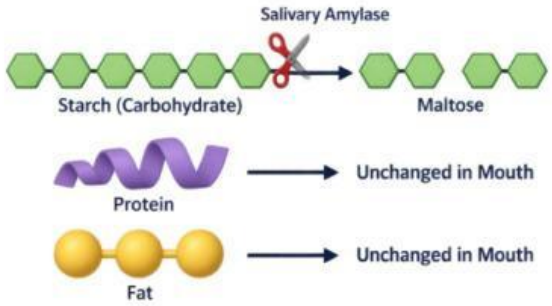
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Section 2: Chemical Digestion and Saliva

While teeth and the tongue carry out mechanical breakdown, the mouth also begins the process of **chemical digestion**. Chemical digestion involves breaking complex nutrient molecules into smaller, simpler chemical units through enzymatic reactions. This process is made possible by three pairs of **salivary glands** that secrete a fluid called **saliva** directly into the oral cavity.

Saliva is mostly water, which dissolves soluble food molecules and helps you taste what you eat. It also contains mucus, which coats and moistens dry food particles so they slide smoothly down the esophagus without causing damage. Most importantly, saliva contains specialized proteins called **enzymes**, primarily **salivary amylase**. Amylase targets complex **carbohydrates**, particularly **starch**, breaking down long chemical chains of glucose into shorter, double-sugar molecules called maltose.

It is equally important to understand what saliva does *not* digest. Saliva contains no enzymes that break down proteins or fats (lipids). Although meat, dairy, and oils are crushed mechanically by teeth, their chemical bonds remain completely intact while inside the mouth. The chemical digestion of proteins and fats does not begin until the food reaches the stomach and small intestine.



1. How do mechanical and chemical digestion work together in the mouth?

A. Teeth break chemical bonds, while saliva grinds food.

B. Saliva absorbs food, while teeth form new nutrients.

C. Chewing exposes more food surface, allowing enzymes to act on it.

D. Chewing and enzymes both break food into pieces without changing molecules.

2. Which statement describes chemical digestion in the mouth?

A. Salivary amylase begins breaking down proteins and fats.

B. Saliva breaks down fats, while starch remains unchanged.

C. Teeth chemically break down starch without help from saliva.

D. Salivary amylase begins breaking down starch; proteins and fats are digested chemically later.

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