



Nutrition and Food Processing in Digestive Tract

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Figure 2: Steps of food processing

Stages of food processing in digestive tract

- **Ingestion** is the entering of food into the digestive tract.
- **Digestion** is the physical and chemical breakdown of food.
- **Absorption** is the entering of nutrients into cells.
- **Elimination** (excretion) is the removal of undigested food.

Digestion

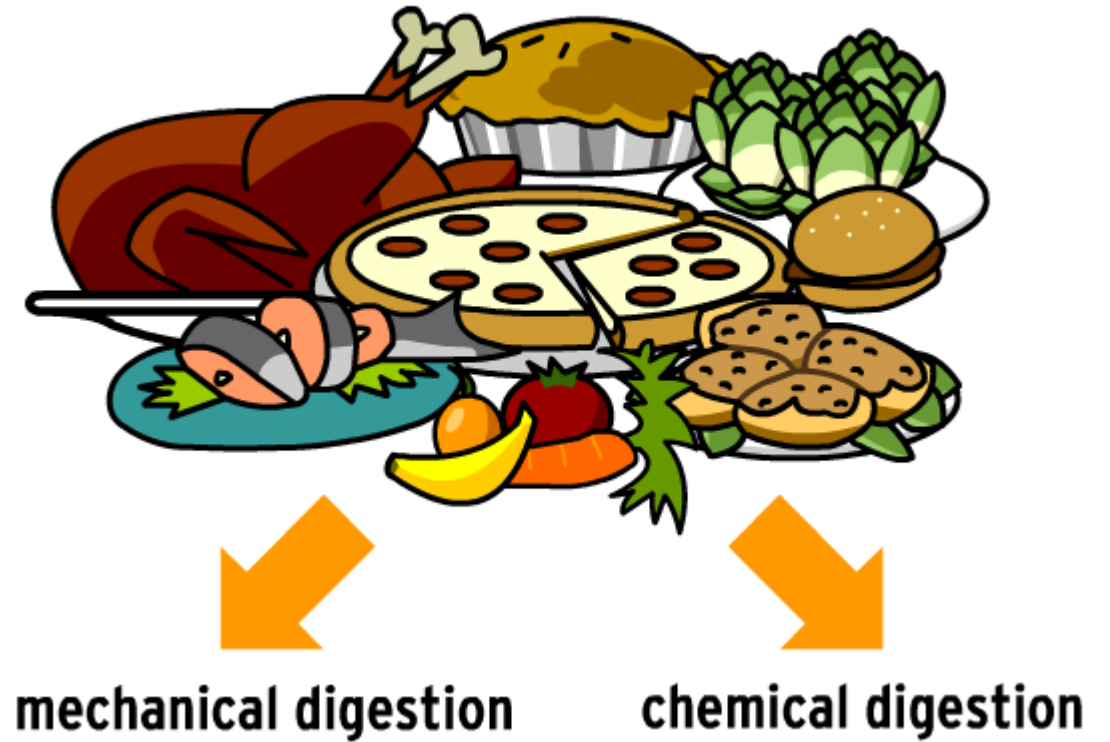
- The physical and chemical breakdown of nutrients is called **digestion**.
- This process involves breaking down big molecules in food into smaller ones. When we eat, the food is too large, so we have to chew and break it down into smaller pieces.
- There are four main types of these smaller molecules in our bodies: **carbohydrates, lipids, proteins, and nucleic acids**.
- Our bodies need food to be turned into these smaller molecules so we can use them for energy and growth.

Biological macromolecule	Building blocks
Carbohydrates	Monosaccharides (simple sugars)
Lipids	Fatty acids and glycerol
Proteins	Amino acids
Nucleic acids	Nucleotides

Table 1: Major biological macromolecules and their building blocks

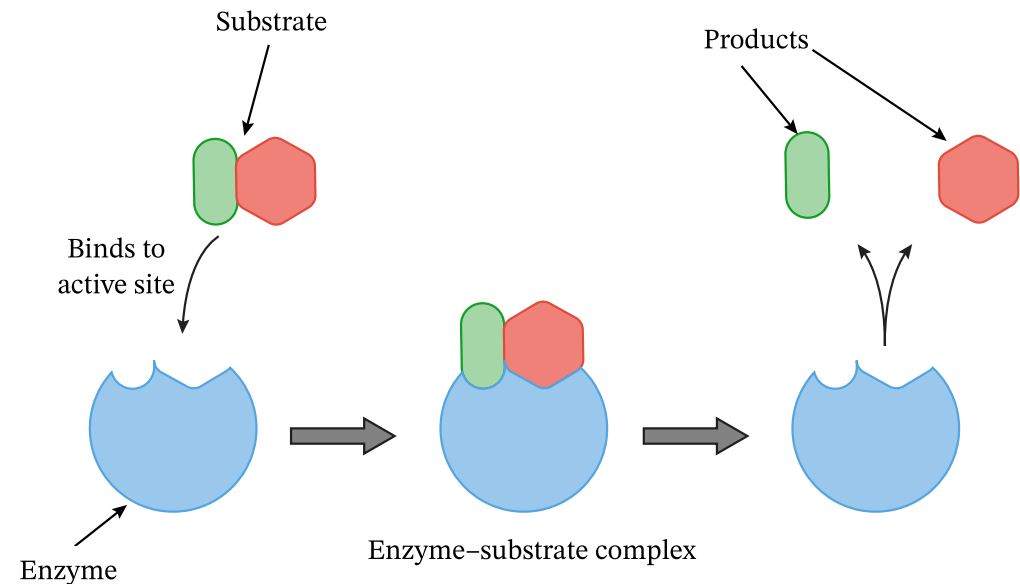
Digestion

- 1. Chemical digestion
- 2. Mechanical digestion



Chemical digestion

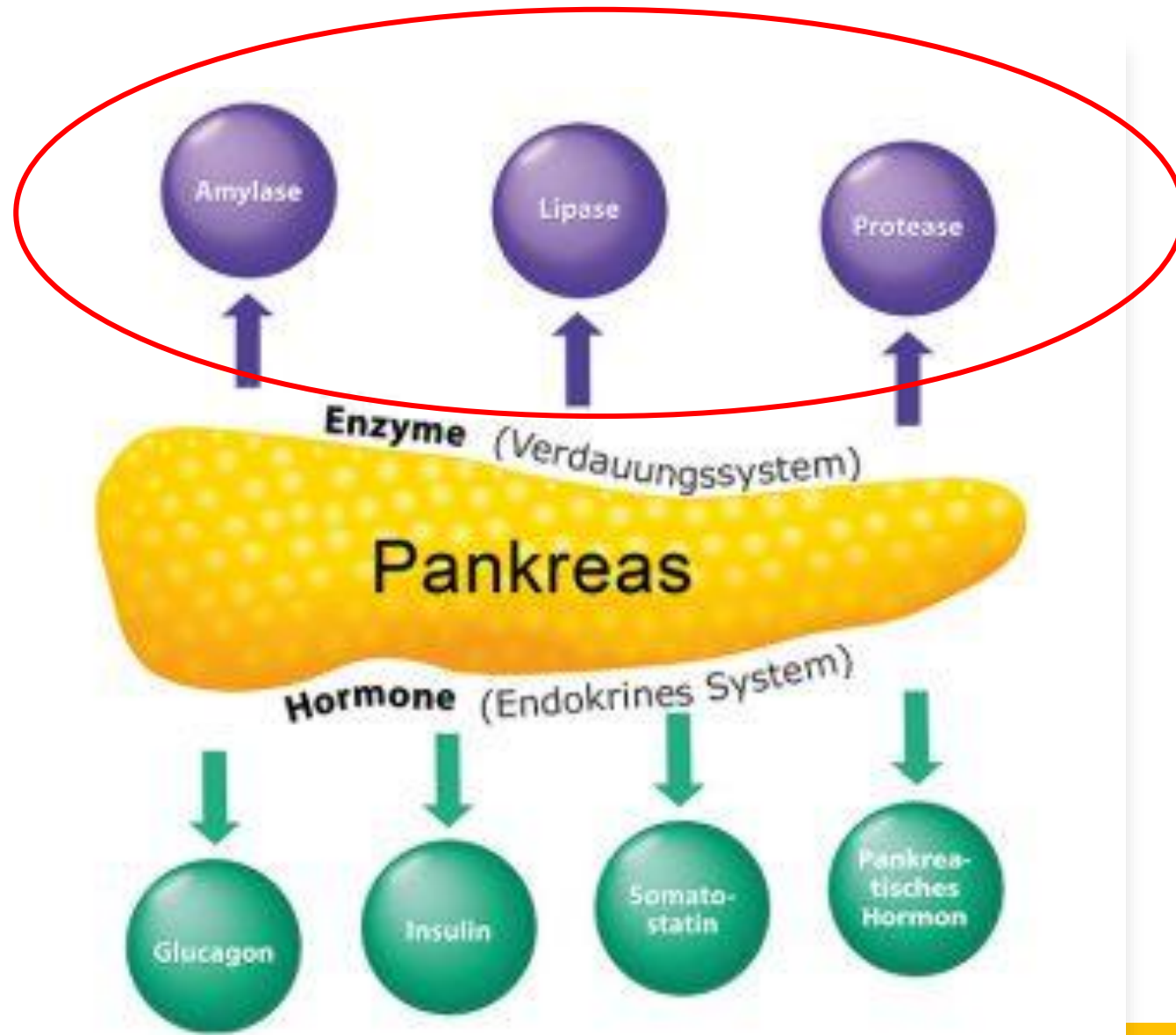
- Chemical digestion requires **enzymes (in saliva)** that are secreted by the digestive tract or by glands that lie nearby.
- Enzymes involved in breaking bonds are often named with the suffix **–ase** added to their substrate. For example, the enzyme that breaks down **maltose(a type of sugar)** is named as **maltase**, the enzyme that breaks down **lipids** to monomers is named as **lipase** and so on...



Chemical Digestion - Enzymes

Chemical digestion can't occur without the help of enzymes. Enzymes are molecules (proteins) that break down food into small molecules.

- **Lipase** – breaks down lipids (fats)
Made in pancreas
- **Protease** – breaks down proteins
Made in pancreas
- **Amylase** – breaks down carbohydrates
Made in mouth and pancreas



Mechanical digestion

- Mechanical digestion involves the **physical breakdown of food** into smaller particles.
- This is done by the **chewing of food in the mouth and the physical mixing of food** in the stomach and small intestine.

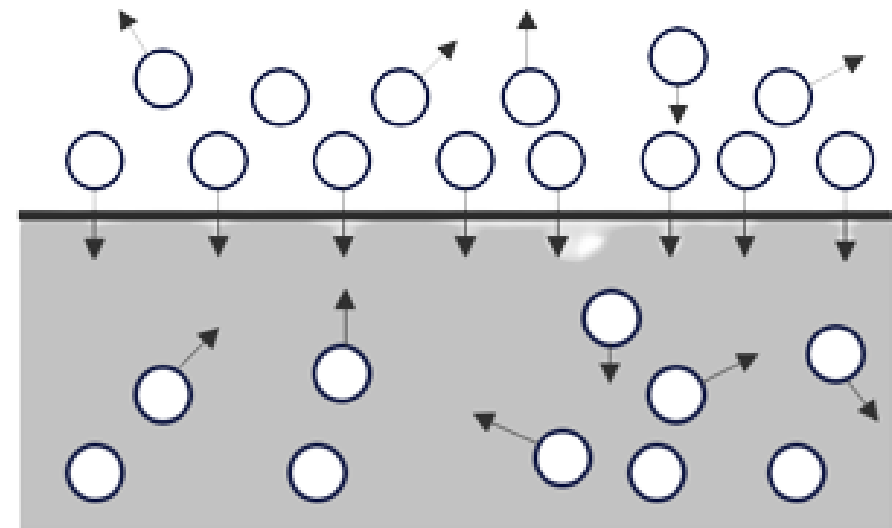
Mouth

- **Mechanical digestion takes place** - teeth
- **Chemical digestion**
 - **Amylase Enzyme** present in our saliva
- 11 cm long



Absorption

- After **digestion**, tiny pieces of food like sugars and amino acids are **absorbed** into the bloodstream. This process allows nutrients to be delivered throughout your body to fuel your cells and keep you growing strong!



Absorption

Disorders of digestive tract - Anorexia

- Anorexia nervosa, commonly known as anorexia, is an eating disorder where a person has an **extremely low body weight, is very afraid of gaining weight, and sees their weight in a distorted way.** People with anorexia really want to control their weight and shape, and they go to extreme measures that can seriously disrupt their lives.



Disorders of digestive tract - Constipation

- Constipation usually means having trouble going to the bathroom, like passing fewer than three stools in a week or finding it hard to poop. It's something that happens quite often. Not eating enough fiber, drinking fluids, or getting exercise can all lead to constipation.



Constipation
can be cured

Disorders of digestive tract - Diarrhea

- Diarrhea happens when your stool is watery and not solid. You might find yourself needing to go to the bathroom more frequently. Diarrhea is a frequent issue that typically lasts for 1 or 2 days and usually resolves on its own. If it persists for more than 2 days, it could indicate a more serious issue.



GASTROINTESTINAL DISEASE



Loss of appetite



Swollen belly



Nausea and Vomiting



Heartburn



Abdominal pain



Indigestion

Animation about digestive system

<https://www.youtube.com/watch?v=1UvuBYUbFk0>

<https://www.youtube.com/watch?v=j1YUy47HxEw>