

# **MODULE 5**

## **AIM**

The aim of this module is to provide students with the introduction to digestion of food.

## **CONTENTS AND OBJECTIVES**

- ✓ Mechanical and chemical digestion
- ✓ Moistening and breakdown of food
- ✓ Swallowing and movement of food
- ✓ Breakdown in stomach and small intestine
- ✓ Water absorption in large intestine
- ✓ Absorption in small intestine

# DIGESTION OF FOOD

- Our body derives energy from the food that we eat.
- In order for the food to be properly absorbed and used by the body, it first needs to be broken down mechanically and then chemically into smaller pieces.

The process of digestion is divided into:

## 1. Mechanical digestion

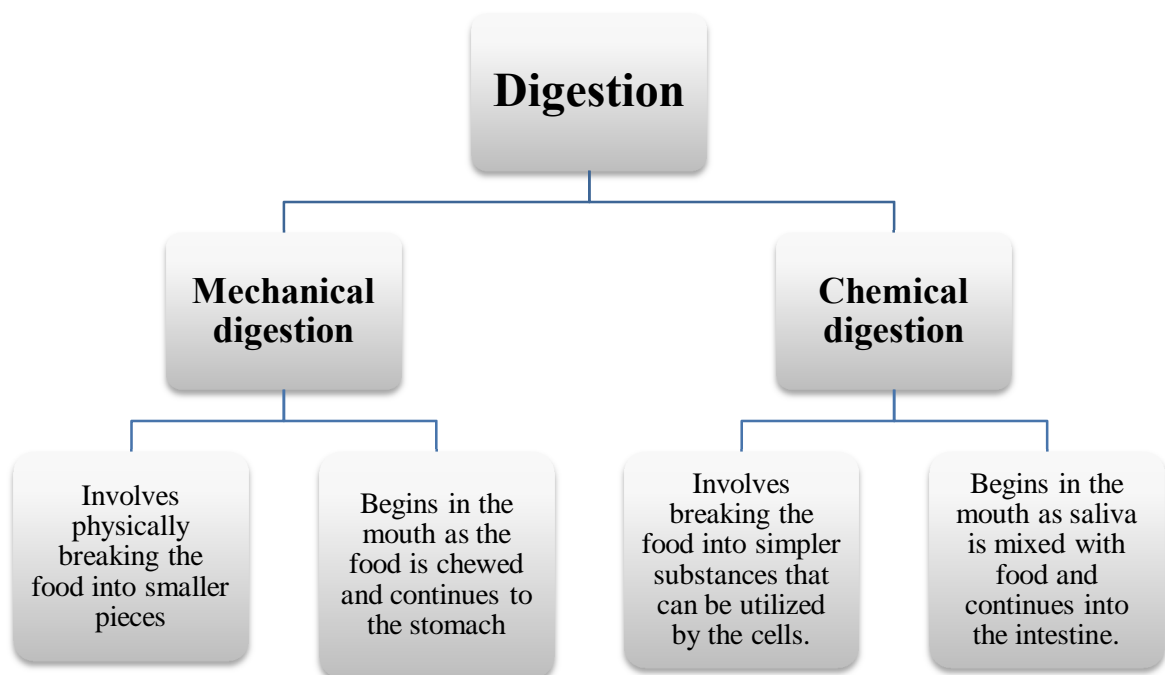
It includes breaking down of food into smaller pieces.

This process begins in the mouth and continues into stomach.

## 2. Chemical digestion

Chemical digestion makes it easier for the body to absorb food.

This process begins in the mouth and continues into the intestine.



## MOISTENING AND BREAKDOWN OF FOOD

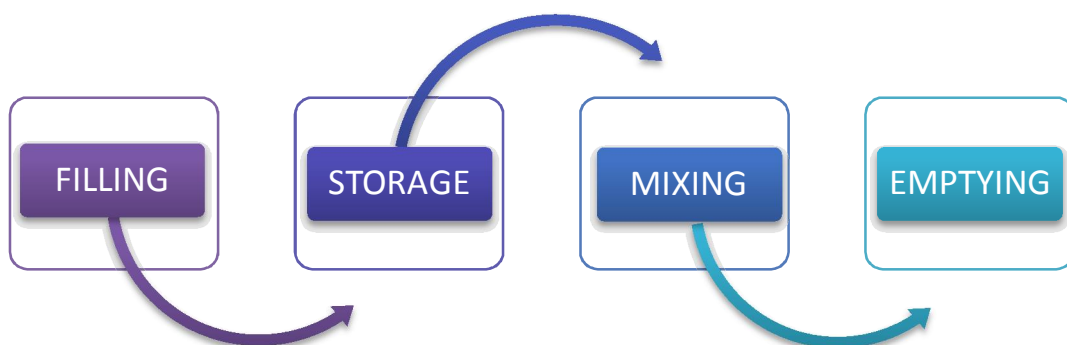
- As soon as the food is taken in, the flow of saliva begins in mouth.
- The oral cavity has two main functions-
  1. Mastication of food
  2. Facilitation of swallowing
- Mastication of food is done by the teeth and tongue.
- Saliva helps to moisten the food into a bolus and makes it easier to swallow.

## SWALLOWING AND MOVEMENT OF FOOD

- Swallowing of food is facilitated when the muscles of tongue and mouth move the bolus into pharynx. This process is termed as deglutition.
- The bolus is prevented from entering into trachea (wind pipe) by epiglottis (a small flap of skin which closes over the pharynx).
- The bolus moves further down into oesophagus by the waves of muscle movement called peristalsis and reaches the stomach.

## BREAKDOWN IN STOMACH AND SMALL INTESTINE

- The four aspects of movement of food into the stomach are:

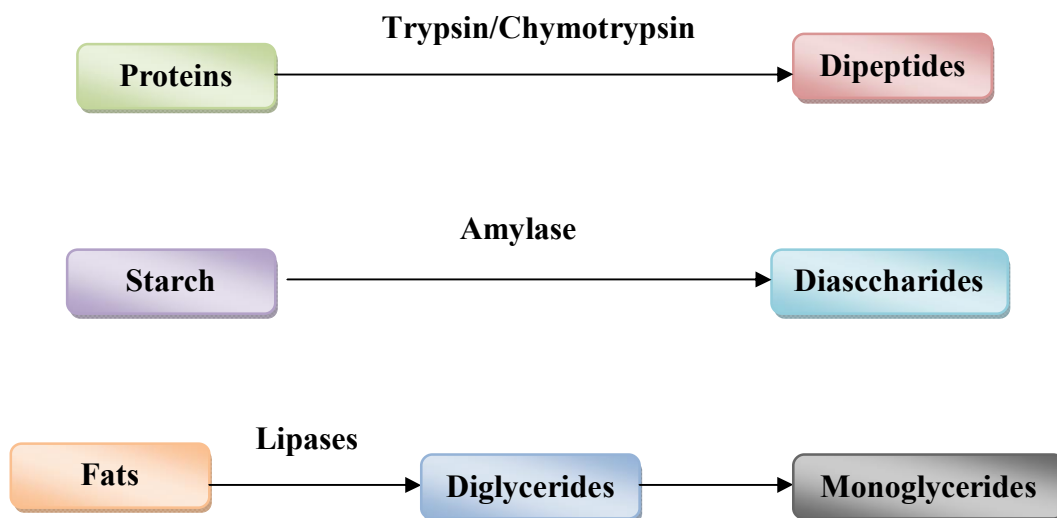


- Mixing of bolus with the gastric juices occurs once it reaches the stomach.
- The bolus gets converted into a slimy material called **chyme**.

- The stomach lining cells secrete highly acidic gastric juice. The major types of cells in gastric glands are:

TYPE OF CELL	SECRETION	FUNCTION
<b>Mucus neck cells</b>	Mucus	Helps in lubrication and protection of mucosal epithelium.
<b>Peptic/chief cells</b>	Pepsin	Converts proteins into peptides.
<b>Parietal/oxyntic cells</b>	HCl	Provides acidic pH to fight off the pathogens.

- The chime is finally prepared for its entry into the first segment of the small intestine i.e., duodenum.
- The muscular movements generated in the small intestine help in thorough mixing of chyme with the intestinal secretions.
- The bile and pancreatic juice are also released in the duodenum to facilitate digestion.
- The intestinal mucosal epithelium has **goblet cells** which secrete mucus.
- Secretion of the goblet cells along with the brush border cells constitutes the intestinal juice or **succus entericus**. This juice has a variety of nzymes like maltase, dipeptidase, lipase, etc.



- The simple substances thus formed are absorbed in jejunum and ileum.

### WATER ABSORPTION IN LARGE INTESTINE

- In the large intestine, there is re-absorption of water and certain minerals.
- This results in the formation of faeces which the passes out through the anus.

### ABSORPTION IN THE SMALL INTESTINE

- The end product of digestion cross the intestinal epithelium to reach the blood and lymph during the process of absorption. In this way the nutrients can be distributed throughout the body.
- The simpler nutrients include monosaccharides, amino acids, fatty acids, etc.
- Although the stomach also has some absorption capability. However, due to its poor surface area, very little absorption takes place in the stomach.
- The small intestine is the main organ where absorption occurs.
- Due to its large surface area (because of the folds structure of the epithelium forming microvilli), the small intestine is able to absorb nutrients readily.
- The absorbed substances ultimately reach the tissues which utilize them for their own activities. This process is known as assimilation.

