

# **LESSON NOTE FOR WEEK TWO (2)**

**SUBJECT TEACHER:** Mr. Princewill Wilson

**TOPIC:** THE DIGESTIVE SYSTEM I

## **CONTENT**

- Definition of the Digestive System, Digestion and Alimentary canal.
- the various parts of the digestive system:
- the function of the various parts of the digestive system

### **Definition of Digestive System**

**The digestive system** is a series of connected organs whose purpose is to break down, or digest, the food we eat. **Digestion** is the breaking down of complex food substances into simple, soluble and diffusible form by mechanical and chemical means.

Digestion generally involves two phases: **a mechanical phase** and **a chemical phase**. In the mechanical phase, teeth break down large pieces of food into smaller pieces. In the chemical phase, digestive chemicals called enzyme break apart individual molecules of food to yield molecules that can be absorbed and distributed throughout the body.

### **Definition of Alimentary Canal**

This is a tubular passage between the mouth and the anus, including the organs through which food passes for digestion and elimination as waste. The alimentary canal is also called the digestive tract or gut. In most holozoic animals, digestion and absorption of food take place in the alimentary canal or gut. A simple unicellular animal does not have an alimentary canal.

### **Description and Functions of the Parts of the Mammalian Alimentary Canal**

#### **Mouth and Teeth**

In human, the incisors, canines, premolar and molar are teeth used to masticate the food into particles which expose it to large surface area for the action of the enzymes.

#### **Tongue**

The tongue tastes the food, helps in the movement of the food in the mouth to allow turning and mixing of the food with saliva and in forming food into bolus to allow swallowing.

## **Saliva**

The saliva lubricates the food, allows easy chewing or movement of food in the mouth for swallowing, contains enzyme-ptyalin which digests cooked starch to maltose and is slightly alkaline which is medium for action of ptyalin. The chewed food in the mouth is then swallowed.

## **Pharynx**

It is next to the mouth. In earthworm and Planaria, it is muscular. In man it is short and wide. The pharynx leads to the trachea and the esophagus. It is used for passing food materials into the oesophagus or gullet.

## **Esophagus/gullet**

This is a narrow, straight, long; tube passing through the thoracic region and the diaphragm into the stomach. Digestion does not take place here. But it is used for passing food substances into the stomach by a wave-like muscular contraction and relaxation called **peristalsis**. This type of movement occurs throughout the human alimentary canal.

## **Stomach**

In some animals, the lower part of the esophagus may be modified to form the crop as in insects and birds. The stomach is primarily a storage organ. In birds, insects and grasshopper and earthworm, the stomach modified into a grinding organ called **gizzard**. The gizzard is normally muscular with small sharp stones which masticate the food before it is further digested in the intestine. The gizzard is possessed by some vertebrates e.g. birds and some invertebrates e.g. insects and earthworms which lack teeth in their mouth. Ruminants stomach are modified into four chambered or compartments namely, **rumen**, **reticulum**, **psalterium** and **abomasums**.

In human, the wall of the stomach secretes **gastric juice**. This contains **hydrochloric acid** which prevents the food in the stomach from being decay and **two enzymes- rennin and pepsin**. **Rennin curdles milk**, while **pepsin converts protein in the food into peptones**. Food may remain in the stomach for 3-4 hours at the end it is converted to a semi-liquid paste called **chyme**. Note that food is regulated into the stomach from the gullet by a muscle called **cardiac sphincter**, while chyme is regulated to the small intestine by another muscle called **pyloric sphincter**.

## **The Small Intestine**

Most digestion, as well as absorption of digested food, occurs in the **small intestine**. Over a period of three to six hours, peristalsis moves chyme through the **duodenum** (first section of the small intestine) into the next portion of the small intestine, **the jejunum**,

and finally into the **ileum**, the last section of the small intestine. A watery residue of indigestible food and digestive juices remains unabsorbed. This residue leaves the ileum of the small intestine and moves by peristalsis into the large intestine, where it spends 12 to 24 hours before defecation.

During this time, the liver secretes bile into the small intestine through the bile duct. Bile breaks large fat globules into small droplets, which enzymes in the small intestine can act upon. Pancreatic juice, secreted by the pancreas, enters the small intestine through the pancreatic duct. Pancreatic juice contains enzymes that break down sugars and starches into simple sugars, fats into fatty acids and glycerol, and proteins into amino acids. Glands in the intestinal walls secrete additional enzymes that break down starches and complex sugars into nutrients that the intestine absorbs. Structures called **Brunner's** glands secrete **mucus** to protect the intestinal walls from the acid effects of digestive juices.

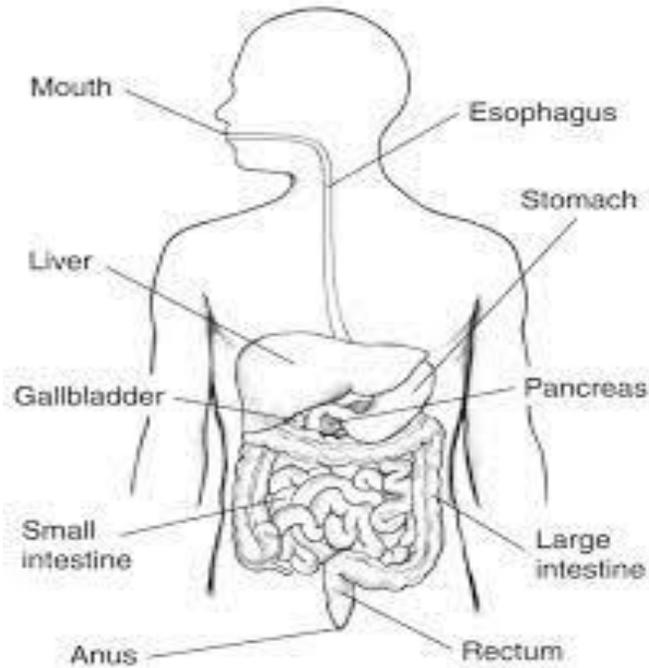
**The small intestine's capacity for absorption is increased by millions of finger-like projections called villi.** Simple sugars and amino acids pass through the capillaries to enter the bloodstream. Fatty acids and glycerol pass through to the lymphatic system.

### **The Large Intestine**

The large intestine serves several important functions, namely:

1. **It absorbs water:** About 6 liters (1.6 gallons) daily—as well as dissolve salts from the residue passed on by the small intestine.
2. **In addition, bacteria in the large intestine promote the breakdown of undigested materials and make several vitamins, notably vitamin K,** which the body needs for blood clotting.

The large intestine **moves its remaining contents towards the rectum, The rectum stores the faeces**—waste material that consists largely of undigested food, digestive juices, bacteria, and mucus—until elimination. Then, muscle contractions in the walls of the rectum push the faeces toward the anus. When sphincters between the rectum and anus relax, the faeces pass out of the body.



## **ASSIGNMENT**

1. Explain the different types of alimentary canals.
2. What is digestive system?
3. List and explain the various organs in the digestive system of man.
4. Make a well labeled diagram of the digestive system.