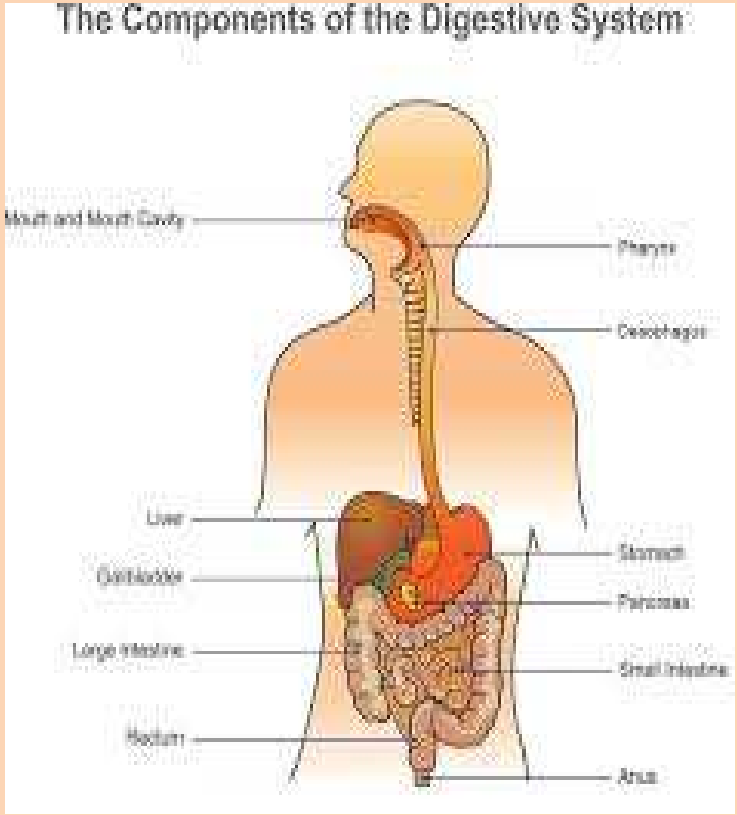
CLASS X / BIOLOGY / PERIOD 3

NUTRITION IN MULTICELLULAR ANIMALS

Nutrition in Human also takes place in 5 steps:

1. Ingestion
2. Digestion
3. Absorption
4. Assimilation
5. Egestion



1. Ingestion: In humans, food is ingested through the mouth, with the help of hands.

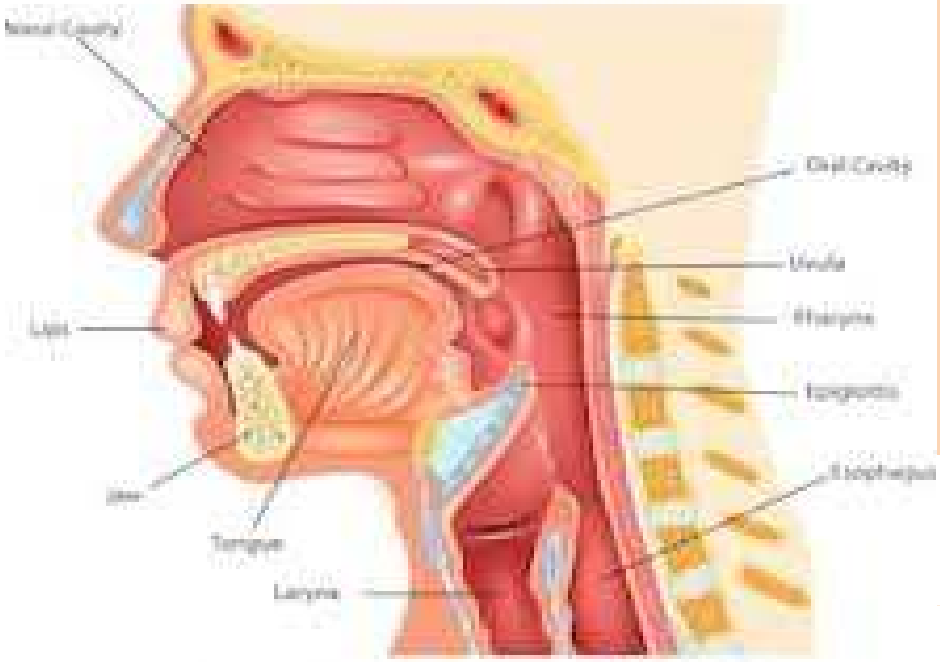
2. Digestion:

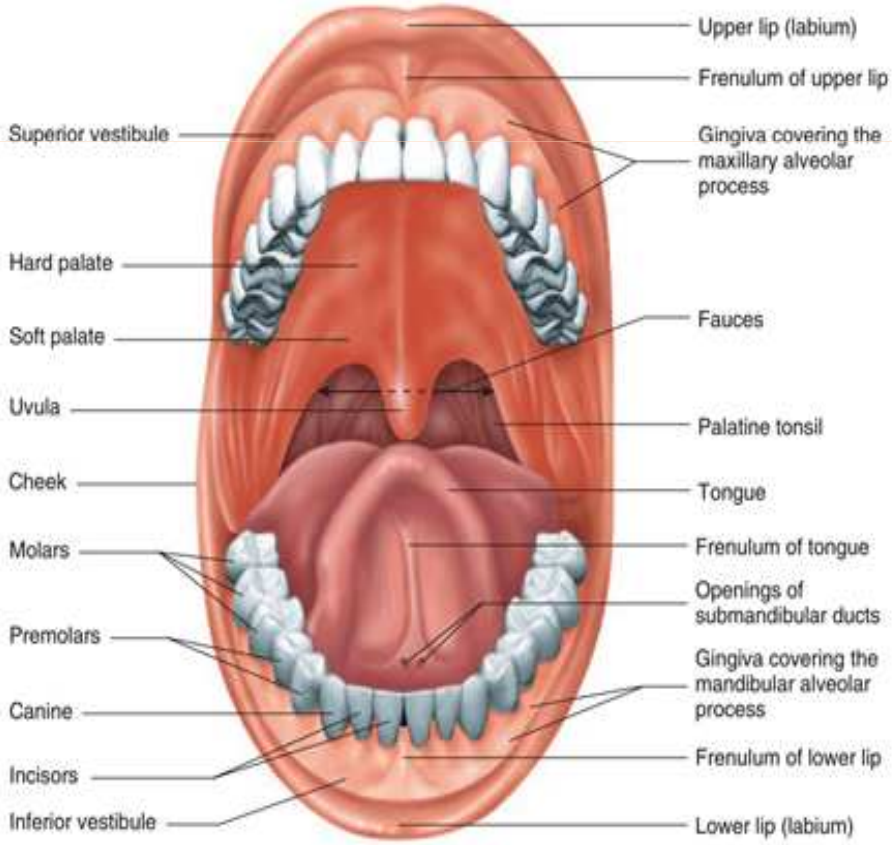
Mouth:

- Digestion of food starts from the mouth itself. Mouth opens into a chamber or cavity which is known as the buccal cavity.
- Buccal cavity contains teeth, tongue and salivary glands.
- The food is cut and grind by teeth and being broken into small pieces.
- Thus, teeth help in physical digestion.
- The salivary glands in our mouth secrete saliva.

Functions of Tongue : At the floor of the buccal cavity, a muscular tongue is present that helps in mixing saliva with the food.

HUMAN DIGESTIVE SYSTEM





➢Functions of Saliva : It makes the food moist and is easy to swallow.

➢These ***Salivary Glands*** help in chemical digestion by secreting enzymes.

➢The human saliva contains an enzyme calls ptyalin or salivary amyl**ase** which digests starch into malt**ose** sugar.

➢Thus, digestion of carbohydrate starts from the buccal cavity itself.

➢The buccal cavity opens into the pharynx which leads to a long tube, called Oesophagus.(Food Pipe)

Oesophagus:

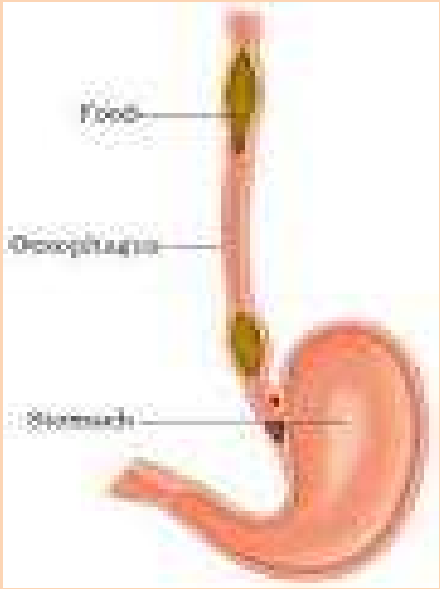
❖The wall of the oesophagus are highly muscular.

❖The partially digested food in the mouth in swallowed with the help of the tongue and goes down through the oesophagus into a J-shaped stomach placed on the left side of the abdomen.

❖When slightly digested food enters the oesophagus, its wall starts a series of contraction and expansion movements. These movements are called peristaltic movements.

❖These movements push the food from the oesophagus into the stomach and from there in the intestine.

❖No digestion takes place in the oesophagus



Stomach:

✓ The stomach has branched and tubular glands present in its wall. The secretions of these glands are collectively called gastric juice.

✓ The gastric juice contains hydrochloric acid, protein-digesting enzymes called pepsin and mucus.

FUNCTIONS OF HYDROCHLORIC ACID

✓The hydrochloric acid creates an acidic medium which facilitates the action of the enzymes, pepsin.

✓ In the acidic medium, pepsin (protein digesting enzymes) breaks down the proteins into peptones.

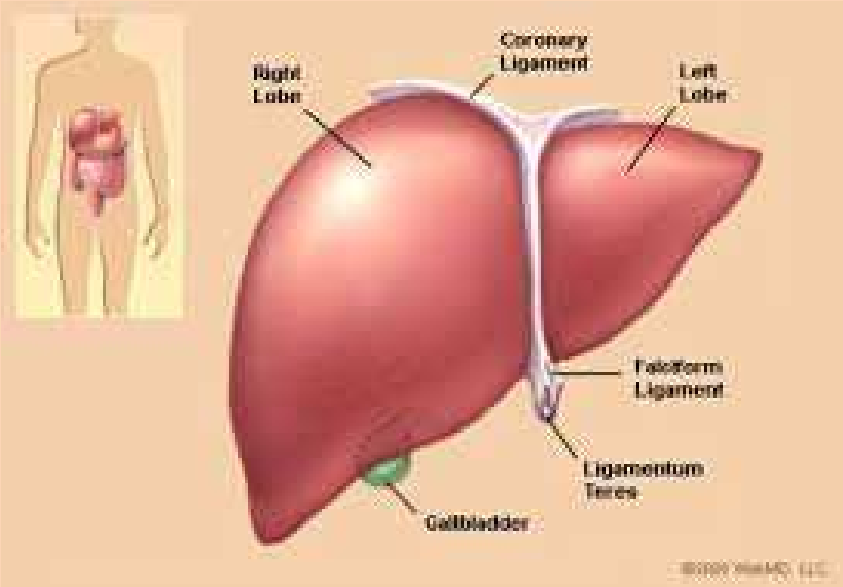
✓ Thus, protein digestion starts in the stomach.

✓ Another function of hydrochloric acid is that it kills many kinds of bacteria in the food that reach the stomach.

FUNCTIONS OF MUCUS : The mucus helps to protect the inner lining of the stomach from the action of the acid under normal conditions.

✓The exit of food from the stomach is regulated by a sphincter muscle which releases small amount of the partly digested food into the small intestine.

ROLE OF LIVER



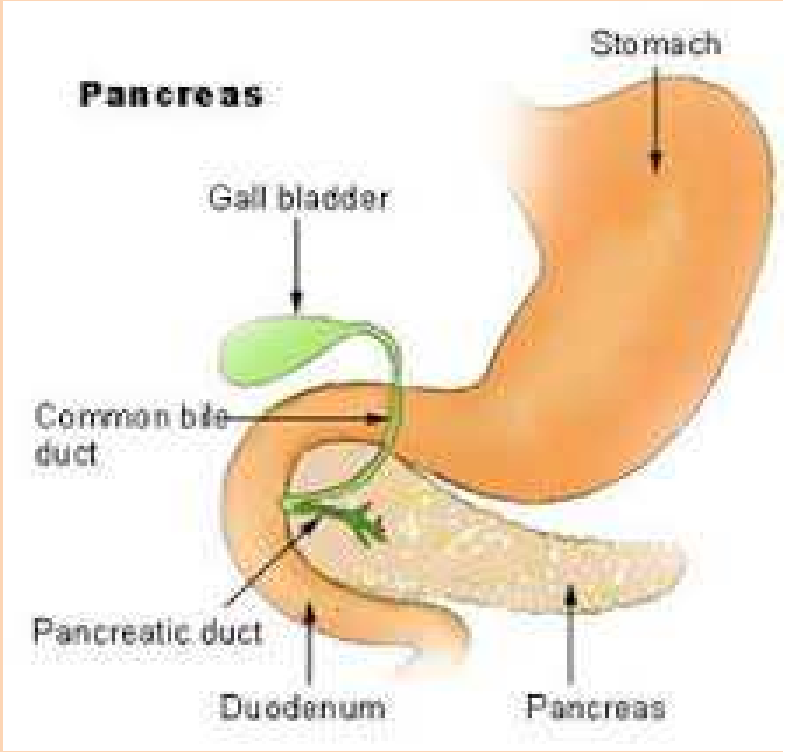
Liver secretes bile which contains bile pigments and bile salts. Bile is alkaline and contains salts which help to emulsify the fat present in the food. The bile secreted by the liver is normally stored in the gall bladder.

Bile performs two functions:

i) The food coming from the stomach in acidic and has to be made alkaline so the pancreatic systems can act on it.

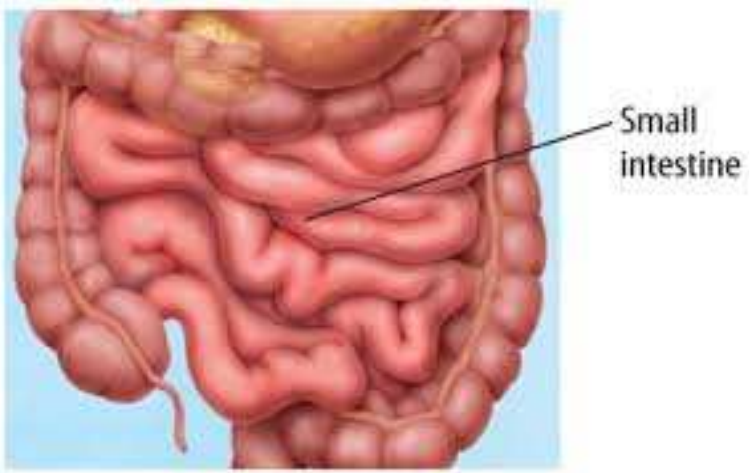
ii) The bile salts break down the fat present in the food into smaller globules. This increase the efficiency of enzymes to act and digest the food.

ROLE OF PANCREAS



- Pancreas is the biggest gland in our body which lies parallel to and beneath the stomach.
- The pancreas secretes pancreatic juice which contains digestive enzymes like trypsin and lipase.
- The enzymes, trypsin digests proteins.
- The enzyme, lipase break down emulsified fats.

Small Intestine:



⇒ The small intestine is not really small, it is about 6.5 metres long.

⇒ So, it is the longest part of the alimentary canal which is fitted into a compact space because of extensive coiling in our belly.

⇒The length of the small intestine differs in various animals depending on the types of food they eat.

⇒The small intestine in human is the site of complete digestion of foods like carbohydrates, protein and fats,

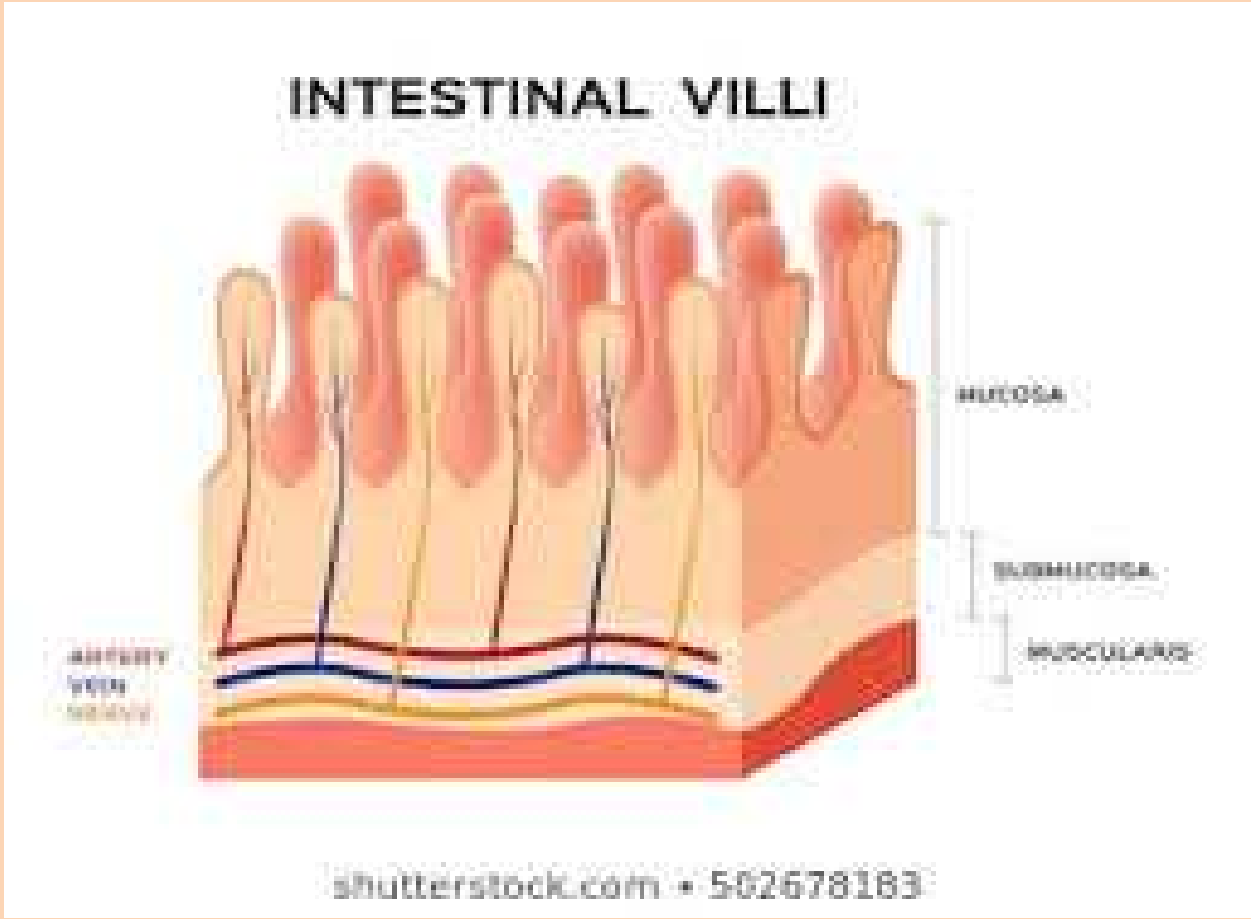
❑The wall of the small intestine contains glands which secrete intestinal juice. The intestinal juice contains a number of enzymes. These enzymes complete the digestion of the food converting proteins into amino acids, complex carbohydrates into glucose and fats into fatty acids and glycerol.

3. ABSORPTION

After digestion, the digested food molecules (soluble sugar, amino acids, fatty acids and glycerol) are taken up by the walls of the small intestine. This is called absorption.

The inner surface of the small intestine has millions of tiny finger-like projections called villi.

The presence of villi gives the inner walls of the small intestine a larger surface area. On the large surface area of the small intestine, absorption of food takes place quickly and goes into the blood through the blood vessels in villi.


INTESTINAL VILLI
MUCOSA
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4. ASSIMILATION

- The blood carries digested food to all parts of the body, where it gets assimilated into the cell.
- The body cells use assimilated food for obtaining energy as well as for growth and repair.
- During the process of respiration, assimilated food is oxidised to produce energy.
- The digested food that is not used by our body is immediately stored in the liver in the form of glycogen.
- This glycogen can be utilised as a source of by the body in times of need.

5. EGESTION

All parts of food which we eat cannot be digested by our body. Some of the food, which cannot be absorbed by the small intestine remains undigested.

The undigested food passes from the small intestine into a wide tube called large intestine.

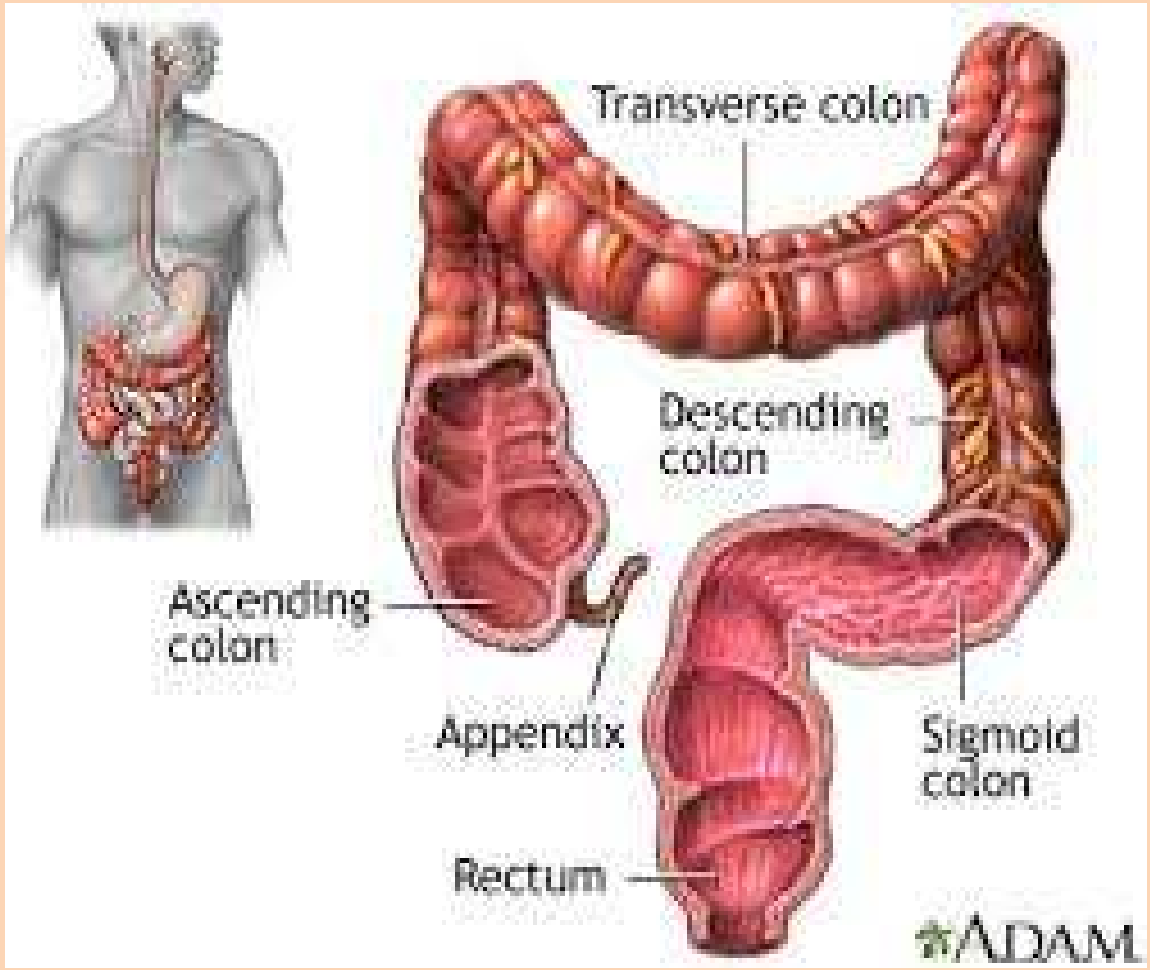
The first part of the large intensive is called colon.

Wall of colon absorb most of the water present in the undigested food.

Thus, the undigested part of the food becomes almost solid.

The solid undigested food enters into the last part of the large intestine called rectum, where it stay for some times and then passes out from our body through anus as faeces.

Thus, faeces contain undigested solid food. The exit of this waste materials is regulated by the anal sphincter.


Transverse colon
Descending colon
Ascending colon
Appendix
Sigmoid colon
Rectum
A.D.A.M.