

CHAPTER 2: FOOD THROUGH DIGESTIVE TRACT.

Q1) What is digestion?

→ Digestion is the process of converting complex food materials into simple absorbable forms.

Q2) Describe four types & structure of teeth:

→ Four types of teeth:

- i) Incisor (8) - To bite and cut the food.
- ii) Canine (4) - For tearing the food.
- iii) Premolar (8) - For chewing the food.
- iv) Molar (12) - For chewing the food.

- Structure of teeth:

- Enamel: White in colour, the hardest part, dead tissue.
- Dentine: Living tissue which forms tooth.
- Pulp: Soft connective tissue seen in the pulp cavity. Blood vessels, lymph ~~vessels~~ ducts, & nerve fibres are also seen.
- Cementum: Calcium containing connective tissue that holds the tooth in the socket of the gum.

Q3) Explain the process of Digestion.

- The structure & arrangement of teeth is suitable to masticate the food we eat. The tongue helps teeth to masticate food material & mix them with saliva.
- The taste buds in the tongue help in the sensation of taste.
- There are three pairs of salivary glands in the mouth. The saliva secreted from the salivary glands contains mucus & enzymes like salivary amylase & lysozyme.
- Lysozyme, to an extent, helps to destroy the germs that enter the body through food. Salivary amylase partially converts starch ~~starch~~ to maltose, a form of sugar.
- Partially digested food enters oesophagus through the pharynx. Food reaches the stomach by the wave like movement of the walls of oesophagus. These movements are called peristalsis.
- The slightly digested food in the mouth reaches the stomach, where further digestion takes place.
- The strong peristalsis in the stomach converts food into a paste form. The special circular muscles present in the posterior part of the stomach retain food for a specific period.
- Different components in the gastric juice, secreted by the glands in the stomach wall ~~do~~ also play a very imp. role in the process of digestion.
- Gastric juice
 - Pepsin enzyme - converts protein to peptone
 - Mucus → Protects the stomach wall from the actions of digestive juices.
- Human small intestine is about five to six metres long. It is ~~found~~ found in the abdomen in the form of multiple folds & coils. Hence, food moves very slowly through the small intestine.

◦ The completion of digestion & beginning of absorption of food takes place in small intestine. From the stomach, the food in paste form enters the duodenum through a common duct. The enzymes in these juices act upon the partially digested food & enhance the process of digestion.

◦ Liver: Enzymes are absent in the bile secreted by liver. It helps in digestion by breaking down fats into smaller particles & making food alkaline.

◦ Pancreas: Secretes pancreatic juice. Bile & the pancreatic juice reach the duodenum through a common duct.

◦ When food moves forward from duodenum, it gets mixed with the intestinal juice secreted by the glands in the small intestine.

◦ Different enzymes are present in the intestinal juice secreted by the glands in the small intestine, some of which convert maltose, lactose & sugar into simpler form like glucose, fructose & galactose. Another set of enzymes converts peptides to amino acids.

Q4) Explain the process of Absorption.

→ The absorption of simple nutrients begins in the small intestine. Villi are small finger like projections seen in the walls of the intestine. These increase the surface area of absorption of nutrients to a great extent within the small intestine.

◦ Villi are covered with a single layer of cells. They also contain blood capillaries & lacteals, the lymph capillaries. Water soluble simple nutrients are absorbed into the blood.

• The cells in the wall of blood capillaries & lacteals play a role in this process. There are certain processes working behind the movement of molecules in & out of the cell:-

i) Osmosis: Movement of water from a region of higher conc. to a region of lower conc. across a semi permeable membrane. (Absorption of water).

ii) Diffusion: Movement of water from a region of high conc. to a region of lower conc. (Absorption of fatty acids & glycerol to the lymph lacteal occur by diffusion).

iii) Facilitated diffusion: Diffusion of certain molecules with the help of protein molecules in the cell membrane. (Absorption of glucose / fructose & amino acid occurs by facilitated diffusion).

iv) Active transport: Absorption of glucose & other salts against the conc. gradient by utilizing energy.

• The digestive wastes left after the absorption of nutrients move towards the large intestine. Certain bacteria residing in the large intestine produce substances like vitamin K. Absorption of these substances also takes place in large intestine.

• Subsequently, the digestive wastes stored in the rectum are eliminated out through the anus.

• The process of digestion is completed through various complex processes & requires about 4-5 hrs.