

Chapter 12: Nutrition (Short Questions Answers)

What are the main functions of the oral cavity? or Give oral cavity.

The oral cavity performs several functions, the most important are the

- selection of food
- grinding or mastication
- lubrication
- digestion

What is the role of tongue in digestion in oral cavity?

Tongue being sensory and muscular organ plays the most important role in selection of food through its taste buds.

How grinding or mastication of food is useful?

This is useful because:

- the oesophagus allows relatively small pieces to pass through
- food becomes easier to digest when it is in small particles, because small pieces have much more surface for the enzyme to attack and much less solid material to penetrate.

Give the names and location of salivary glands found in man.

- sublingual glands situated below the tongue
- submaxillary glands behind the jaws
- parotid glands in front of the ears

What is saliva? What are ingredients of saliva? or what is composition of Saliva, Give their role or What is pH and composition of saliva?

Saliva is the secretion produced by salivary glands present in the oral cavity. Fresh saliva is alkaline with a pH nearly 8 quickly loses carbon dioxide and gets to pH 6. It is composed of Water and mucous, to lubricate food

- Sodium bicarbonate and some other salts, to stabilize pH
- Enzyme amylase or ptyalin, to digest carbohydrates

What is ptyalin or amylase?

Ptyalin is a carbohydrate-digesting enzyme, which digests starch and glycogen to maltose.

What is bile? Give its function.

The bile is green, watery fluid. It contains no enzymes, but its green colour is due to the bile pigments, which are formed from the breakdown of haemoglobin in the liver. The bile also contains bile salts, which act on fats, and emulsifies them.

What damage is caused by cholesterol, secreted by the liver? or What are gall stones? Mention their effect.

Cholesterol, secreted by the liver, may precipitate in the gall bladder to produce solid particles called gallstones, which may block release of bile.

What are villi?

The internal surface of ileum has many folds, which show velvety appearance due to the presence of numerous finger-like outgrowths called villi.

What is jejunum?

Jejunum is the second portion of the small intestine extending from the duodenum to the ileum. It is about 2.4 metre in length comprising about two fifth of the small intestine.

What is the difference or differentiate between appendix and appendicitis? or What is appendicitis?

Appendix is the finger like process that arises from blind end of caecum whereas appendicitis is an infection caused due to entrapment and then putrification of food in appendix.

How do diarrhoea and constipation occur or are caused? or Differentiate between diarrhoea and constipation.

If the absorption of water and salts does not take place due to infection, drug action or emotional disturbance, a condition known as diarrhoea occurs, while constipation is caused by the excessive absorption of water.

How does ingestion occur in Hydra?

When a prey such as Daphnia or Cyclops comes in contact with the trigger of nematocyst, the hollow thread of the nernatocyst turns inside out, ejects poison and the prey is paralysed or some times killed. Hydra then grasps its prey with its tentacles and pushes it into the digestive cavity through open mouth.

How does Planaria capture its prey?

Planaria engulfs the prey by protruding eversible pharynx through the mouth.

Where is partly digested food stored in cockroach?

The partly digested food is stored in the crop.

How tubular digestive system is more efficient than sac like digestive system? or Differentiate between sac like system and tube type digestion.

The tubular digestive system of cockroach is more efficient system than sac like digestive system of Hydra or Planaria, in having specialized organs or partitions for efficient digestion and absorption of food. Sac-like digestive has a single opening which is used both as mouth as well as anus.

What are the main parts of digestive system in the direction of passage of food in man?

The main parts in the direction of passage of food, are the oral or buccal cavity, oesophagus, stomach, small intestine (duodenum, jejunum and ileum), large intestine (ascending colon, transverse colon, descending colon, caecum and rectum).

What is the function of water and mucus found in saliva?

Water and mucus together make a slimy liquid which serves to moisten and lubricate the food so that it can be chewed efficiently and passed through the esophagus smoothly.

What is the function of sodium bicarbonate and other salts found in saliva?

Sodium bicarbonate and some other salts are slightly antiseptic but their main function is to stabilize the pH of food. Fresh saliva is alkaline with a pH nearly 8 quickly loses carbon dioxide and gets to pH 6.

What is peristalsis?

It consists of the wave of contraction of the circular and longitudinal muscles of digestive tract preceded by the wave of relaxation thus squeezing the food down along the canal.

What is antiperistalsis?

Sometimes peristaltic movements are reversed and food may be passed from the intestine back into the stomach and even into the mouth. This movement is called antiperistalsis.

What is hunger contraction/hunger pang? Give their reason.

Hunger contractions are peristaltic contractions which are increased by low blood glucose levels and are sufficiently strong to create an uncomfortable sensation often called a "hunger pang". Hunger pangs usually begin 12 to 24 hours after the previous meal or in less time for some people.

What is the difference between cardiac and ileocolic sphincters?

At the junction between oesophagus and the stomach there is a special ring of muscles called cardiac sphincter while at the end of ileum, there is an ileocolic sphincter that opens and closes time to time to allow a small amount of residue from the ileum to enter the large intestine.

What is the composition of stomach wall?

The stomach wall is composed of three principal layers an outer layer of connective tissue, middle layer of smooth muscles and inner layer (mucosa) of connective tissue with many glands.

What is the location and function of stomach?

The stomach is situated below the diaphragm on the left side of the abdominal cavity. It is an elastic muscular bag that stores food from meals for some time, making discontinuous feeding possible. It also partly digests the food.

Name different types of cells present in gastric glands or Enlist cells of gastric glands with their secretion in man.

Gastric glands are composed of three kinds of cells:

- mucous cells, that secrete mucus
- parietal or oxyntic cells secrete hydrochloric acid
- zymogen cells, which secrete pepsinogen

What is gastric juice? What is the composition / ingredients of gastric juice?

The secretion of different types of cells of gastric glands is collectively called gastric juice which contains mucus, hydrochloric acid and pepsinogen.

What is the function of hydrochloric acid released by gastric glands?

Hydrochloric acid is secreted in concentrated form. It adjusts the pH of stomach contents ranging from 2-3 for the pepsin to act on proteins. It also softens the food and kills many microorganisms taken in along with the food.

What is pepsin? or What is difference between pepsin and pepsinogen? or Give two ways by which pepsinogen is activated.

Pepsin is an enzyme secreted in an inactive form called pepsinogen. Pepsinogen is activated to pepsin when exposed to the acidic medium or to some already activated pepsin. Pepsin hydrolyzes protein to yield peptones and polypeptides.

What is chyme?

The muscles of stomach wall thoroughly mix up the food with gastric juice and eventually convert it to semi-solid mass called chyme.

What is the function of enzymes found in pancreatic juice? or Enlist enzymes secreted by pancreas. Give their functions. or Discuss role of trypsin in digestion.

- Amylase, also called amyllopsin, digests starch into maltose
- Lipase hydrolyzes a small percentage of fats into fatty acids and glycerol
- Trypsin splits proteins into peptones and polypeptides

What is the function of sodium bicarbonate found in pancreatic juice?

Pancreatic juice also contains sodium bicarbonate which partly neutralizes the chyme coming from the stomach. This is necessary because enzymes of the pancreas do not work well in acidic conditions.

What condition is caused due to accumulation of bile pigments?

If bile pigments are prevented from leaving digestive tract, they may accumulate in blood, causing a condition known as jaundice.

What is rectum?

Rectum is the last part of large intestine, where faeces are temporarily stored and rejected through anus, at intervals.

What is dyspepsia? Give its two symptoms.

Incomplete or imperfect digestion is called dyspepsia. This is characterized by abdominal discomfort, flatulence (formation of gas), heartburn, nausea (sickness or unsettled stomach) and vomiting.

What is the cause of dyspepsia?

Dyspepsia may occur due to excessive acidity in stomach or faulty function of stomach and intestine or insufficient quality or quantity of bile secretions.

What is the commonest cause of food poisoning?

One of the commonest causes of food poisoning is the toxins produced by bacteria, Salmonella and Campylobacter.

What is botulism? How is it caused?

A severe form of food poisoning is botulism. This is caused by toxins produced by bacteria known as Clostridium botulinum. Botulism develops by the use of improperly canned or otherwise preserved foods, especially meat.

Why some people never become fat or obese?

Some people never seem to get fat no matter how much they eat, while others lay down fat when their intake only just exceeds, their need. The explanation probably lies in the balance of hormones which, to some extent, is determined by heredity.

What is obesity?

It is the term employed when a person has abnormal amount of fat on the body. If one eats too much food than body requirement, the surplus is stored as fat so becomes overweight or obese (fat).

What are the effects of obesity?

An obese (fat) person is much more likely to suffer from high blood pressure, heart disease, diabetes mellitus, stomach disorder than a person who has normal body weight.

What is anorexia nervosa?

This term is employed to the loss of appetite due to the fear of becoming obese. Such a feeling is common in human females between the age of 12 and 21 years.

What is Bulimia nervosa?

It is neurotic disorder in slightly older girls. It is characterized by bouts (short periods) of over eating fattening food such as fried food or cream cakes.

What is piles or haemorrhoids?

Piles or haemorrhoids are masses of dilated, tortuous veins in the ano-rectal mucosa.

What is ulcer?

When the mucous layer breaks down, the digestive enzymes begin to eat away the walls of stomach or duodenum. This results in a sore called ulcer.

What is the role of gastrin? or Why our stomach produces more gastric juice if we have more proteins in our diet?

Small protein molecules stimulate some of the cells of the stomach lining which secrete a hormone known as gastrin. The gastrin diffuses into blood and is carried by the capillaries back to the stomach where it stimulates the gastric glands to secrete more gastric juice.

Differentiate between intracellular and extracellular digestion.

In intracellular, break down of food occurs within the cells by the action of enzymes. While in extracellular digestion, enzymes are secreted outside the cell into the gut cavity or lumen where digestion takes place.

Differentiate between absorption and assimilation.

Absorption is the uptake of the diffusible molecules from the digestive region across the membrane in the cell or into the blood stream. Whereas assimilation is the utilization of the products of digestion for production of energy or synthesis of cellular material.

What is the food of Amoeba?

Amoeba proteus feeds on many kinds of tiny organisms which live with it in fresh water ponds and shallow lakes. Amoeba also feeds on particulate organic matter.

Why coelenteron is called gastrovascular cavity?

The body cavity or coelenteron (of Hydra) functions as digestive cavity and at the same time water also enters and leaves the cavity through the single opening called mouth. So this type of cavity is called gastrovascular cavity.

What are nematocysts? What is their role in ingestion?

The nematocysts are the stinging cells embedded in the tentacles of Hydra and other coelenterates (cnidarians). Each nematocyst consists of a hollow thread coiled within a capsule and a tiny hair like trigger projecting outside. These paralyze the prey which is then captured by tentacles.

How does ingestion occur in amoeba?

When Amoeba comes in contact with food particle, it immediately puts out pseudopodia around it. These pseudopodia fuse together around the food particle forming the food vacuole.

How does egestion occur in amoeba?

Undigested matter is expelled from the Amoeba in the surrounding water by egestion at any point of its surface.

Name the parts of three main divisions of the digestive system of cockroach.

- **Fore-gut:** It includes mouth cavity, pharynx, crop and gizzard. A pair of salivary glands is present in the thorax region of the animal.
- **The mid-gut** is also called mesenteron stomach. The hepatic caecae open into the anterior end of the midgut.
- **The hind-gut:** Its terminal part is rectum, which opens to the exterior through anus.

How food is swallowed by you?

- The tongue moves upwards and backwards against the roof of the mouth, forcing the bolus to the back of the mouth cavity.
- The backward movement of the tongue pushes the soft palate up and closes the nasal opening at the back. At the same time the tongue forces the epiglottis into more or less horizontal position thus closing the opening of the windpipe.
- The larynx, cartilage round the top of the windpipe, moves upward under the back of the tongue.
- The glottis is partly closed by the contraction of a ring of muscles.
- The epiglottis diverts the food mass to one side of the opening and safely down the oesophagus.