

Class 07 Chapter 01 Nutrition in Animals

Food contains not only energy but also the raw materials needed for body's growth, maintenance and repair. Mostly animals take in solid food. This mode of nutrition is called **holozoic nutrition**.

Nutrition includes five steps

1. Ingestion : The process of taking food into the body is called ingestion.
2. Digestion: The process of breaking down of complex food into simple soluble form with the help of enzymes is called digestion.
3. Absorption : The process by which the digested food passes into the blood vessels of the wall of the intestine is called absorption.
4. Assimilation: The process in which the absorbed food is utilized in cells is called assimilation.
5. Egestion : The removal of undigested food through anus is called egestion

NUTRITION IN AMOEBIA

Amoeba is a unicellular organism. It feeds on microscopic organisms. It takes in solid food through its body surface. So the mode of nutrition is holozoic.

Whenever the food touches the body surface of amoeba, it engulfs the food with the help of pseudopodia (false feet) and forms the food vacuole. The food is digested with the help of enzymes inside the food vacuole.

The digested food reaches the entire cell by diffusion. Amoeba uses the food for getting energy, making proteins for growth, etc.

The undigested food is thrown out of the body through its body surfaces.

NUTRITION IN HUMANS

Human digestive system consists of mouth, oesophagus, stomach, small intestine, large intestine and anus.

We **ingest the food** into mouth cavity through mouth. Mouth cavity contains teeth, tongue and salivary glands.

Teeth help us to cut the food into small pieces, chew and grind it.

Salivary Glands: There are three pairs of salivary glands in our mouth. These glands secrete a watery fluid called saliva. It makes the food wet so that we can easily swallow it.

Saliva contains an enzyme called **amylase which helps in the digestion of starch into sugar**. Hence Digestion of food begins in the mouth.

Tongue: The tongue is an organ of taste. It helps to mix the food with saliva and make it wet. Mixing of digested food with saliva is called **mastication**. It also helps in rolling and pushing the food while swallowing.

Oesophagus : It is a tube which connects mouth and stomach. It is also known as food pipe. It helps to pass the food from the mouth to the stomach by rhythmic contraction and relaxation called **peristalsis**.

Stomach: Stomach is a bag-like structure where the food is further digested. The wall of stomach secretes digestive juice called gastric juice which contain enzyme pepsin and rennin as well as hydrochloric acid, and mucus . Mucus prevent action of HCl on stomach wall. HCl kill bacteria present in food and makes the food acidic which help further digestion of protein by pepsin and rennin. Pepsin and rennin help to digest protein. The semi digested food is called **chyme**.

Small Intestine: It is a very long tube and is about 7 metre in length. The small intestine is divided into the duodenum, jejunum, and ileum. Much of the small intestine is covered in projections called villi that increase the surface area of the tissue available to absorb nutrients from the gut contents.

The small intestine is much longer than the large intestine. So why is it called “small”? If you compare small and large intestines, you will **see the small intestine is smaller in width than the large intestine.**

In small intestine the food is mixed with bile juice, pancreatic juice and intestinal juice.

Liver secretes bile juice that is stored in gall bladder. Bile juice contain bile salt which make food alkaline. These break down large fat globules into smaller globules so that the pancreatic enzymes can easily act on them. This process is known as emulsification of fats.

Pancreas: Pancreas release pancreatic juice into small intestine. Pancreatic juice contain **amylase**, trypsin, lipase

Proteins is digested into amino acids by pancreatic trypsin and fats is digested into fatty acids and glycerol by Pancreatic lipase. Pancreatic amylase breaks down some carbohydrates (starch) into glucose.

The small intestine are covered with tiny projections **called villi**. Villi contain very tiny blood vessels. Nutrients are absorbed into the blood through these tiny vessels.

Large Intestine: It is about 1.5 metre in length and helps in absorbing water and remove undigested food.

Anus: The undigested food (faecal matter) is eliminated through anus and this process is called egestion.

RUMINANTS: Ruminants are grass eating animals : The stomach of a ruminant is divided into four chambers. As soon as the ruminant swallows the food, it enters the first chamber called rumen where it gets partially digested (converted to cud). From here, the food enters the second chamber reticulum from where it again reaches the mouth for chewing. The process of chewing the cud is called rumination. The food is again swallowed, and now it enters the third and the fourth chamber called omasum and abomasum for complete digestion. From here, it enters the small intestine for the absorption of nutrient.

Grass is rich in cellulose which is a kind of carbohydrate. Herbivorous animals can digest it. The other animals and humans cannot digest cellulose. There is a sac-like structure called **caecum** between the small and large intestine in ruminants. This sac contains some bacteria which produce an enzyme called cellulase which digest the cellulose.

Feeding and Digestion in Amoeba

The Amoeba is a microscopic organism which is made up of only one cell

- The Amoeba has a cell membrane, cytoplasm, a nucleus which is round and dense and small vacuoles which are like bubbles present all over it.
- The Amoeba is capable of changing its shape and position on its own.
- Whenever it wants to intake the food the pseudopodia or finger-like projections come out of its body. The pseudopodia engulf the food in and the food gets stored in the food vacuoles.
- Then it secretes some digestive juices inside the vacuoles that help in its digestion of the food.
- The Amoeba then absorbs the digested food and uses it for fulfilling different life processes such as multiplication and growth.
- The Amoeba also secretes out waste products or undigested food out of its body.