

Chapter 2

Nutrients in Animals

Different Ways of Taking Food

- The process of taking in food and its utilization in the body by an animal is called animal nutrition. All animals require food for energy, growth, and repair of damaged body parts.
- Our food contains the following components: Carbohydrates, fat, proteins, vitamins, minerals, and roughage.
- Carbohydrates are complex substances, these complex substances cannot be utilized by our body in this form. So, they are broken down into simpler substances. The breakdown of complex components of food into simpler substances is called digestion.

◆ Mode of Feeding in different Animals:

Column I	Column II
Ant	Chewing
Humming-bird	Sucking
Snake	Swallowing
Eagle	Tearing
Snail	Scraping

* Tip: Starfish feeds on animals that are covered by hard shells of calcium carbonate. After opening the shell, the starfish pops out its own stomach through its mouth and eats the soft body of the prey inside the shell. The stomach (containing the prey) then goes back into the body. The food is digested slowly by the starfish.

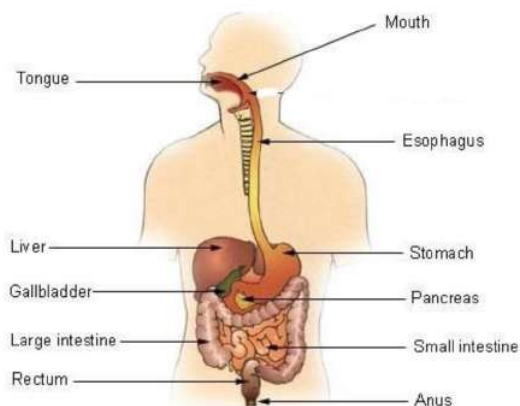


Digestion in Humans

Nutrition in animals takes place in five steps:

- (a) Ingestion – The process of taking food into our body is called ingestion.
- (b) Digestion – The process in which the food containing large, insoluble substances is broken into small, water-soluble substances is called digestion.
- (c) Absorption – The process in which the digested food passes through the intestinal wall into the bloodstream is called absorption.
- (d) Assimilation – The process in which the absorbed food is taken in by the body cells and used for energy, growth, and repair is called assimilation.
- (e) Egestion – The process in which the undigested food is removed out from the body.

◆ Digestion in Humans:



The alimentary canal (digestive tract) consists of the following organs: Buccal Cavity (Mouth), Oesophagus (food pipe), Stomach, Small Intestine, Large intestine, Rectum, and Anus.

(a) Buccal Cavity (Mouth):

- The digestion of the food starts in our mouth.
- The buccal cavity contains the tongue, teeth, and salivary glands.

◆ **Teeth:**



We have four different types of teeth: Incisors, Canines, Premolar, and Molar.

Type of teeth	No of teeth in lower jaw	No. of teeth in upper jaw	Total No. of teeth	Function
Incisors	4	4	8	Cutting and biting
Canines	2	2	4	Piercing and tearing
Premolar	4	4	8	Chewing and grinding
Molar	6	6	12	Chewing and grinding

◆ Salivary Gland:

- It is located in the buccal cavity.
- It secretes a watery liquid called saliva.
- Saliva is a digestive juice that helps to digest the starch present in the food partially.
- The partially digested food is swallowed by the tongue and goes down into the oesophagus (food pipe).

(b) Oesophagus (food pipe):

Oesophagus carries the slightly digested food from the mouth to the stomach. The food coming from the mouth moves down through oesophagus by the process of peristalsis.

* Tip: During vomiting, the food moves in the opposite direction, from the stomach to mouth by the process of anti-peristalsis in the food pipe (oesophagus).

(c) Stomach:

The stomach is a thick-walled bag-like structure. The inner lining of the stomach secretes:

- Mucous – It protects the lining of the stomach.
- Hydrochloric acid – It kills bacteria that enter the stomach with food and makes the medium in the stomach acidic (acidic medium is necessary for the proper action of digestive juices on proteins).
- Digestive juices – It breakdown the proteins into simpler.

(d) Small Intestine:

The small intestine is a highly coiled and tube-like structure. It is about 7.5 m long in an adult. The partially digested food enters into the small intestine from the stomach. It is the site for the complete digestion of food.

The secretion from the liver and pancreas goes to the small intestine.

- Liver secretes bile juice, which is stored in the gall bladder (sac-like structure). Bile plays an important role in the digestion of fats.
- Pancreas secretes pancreatic juice which acts on carbohydrates and proteins and changes them into simpler forms.
- The partly digested food now reaches the lower part of small intestine where the intestinal juice completes the digestion of all components of food.

In the small intestine:

→ The carbohydrates get broken into simple sugar like glucose.

→ Proteins are broken into amino acids.

→ Fats are broken into fatty acids and glycerol.

Absorption of Digested Food in Small Intestine

- The inner walls of the small intestine have thousands of finger-like outgrowths, these are called villi.
- The villi increase the surface area for absorption of digested food.
- The digested food materials are now transported via blood vessels to different parts of the body. This food is used for energy, growth and repair. This is called **assimilation**.

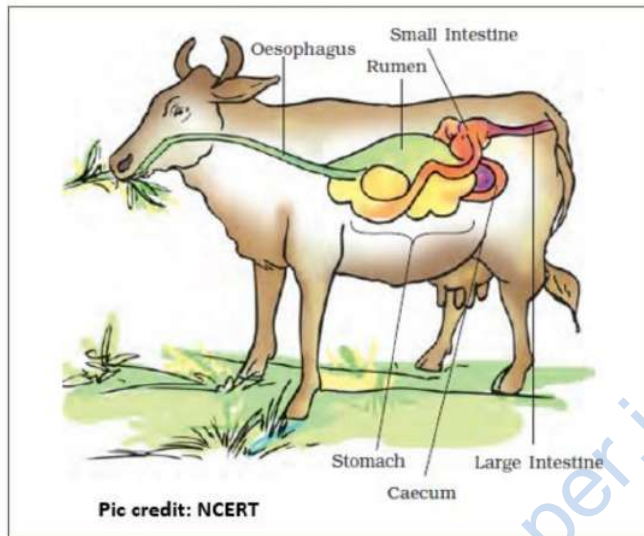
(f) Large Intestine:

The large intestine is about 1.5 m long. It is smaller and wider than the small intestine. It absorbs salts and water from undigested food. The remaining waste passes into the rectum and is removed out from the body through the anus. This is called egestion.

Digestion in Grass-Eating Animals

- Grass-eating animals (like cows, buffaloes, goats, etc.) are called ruminants.
- They quickly swallow the grass and store it in a separate part of the stomach called the rumen. Here the food gets partially digested (called cud).
- After some time this cud is brought back from the stomach to the mouth and chewed again. This process is called rumination.

- Grass is rich in cellulose. Ruminants have cellulose digesting bacteria in their rumen.

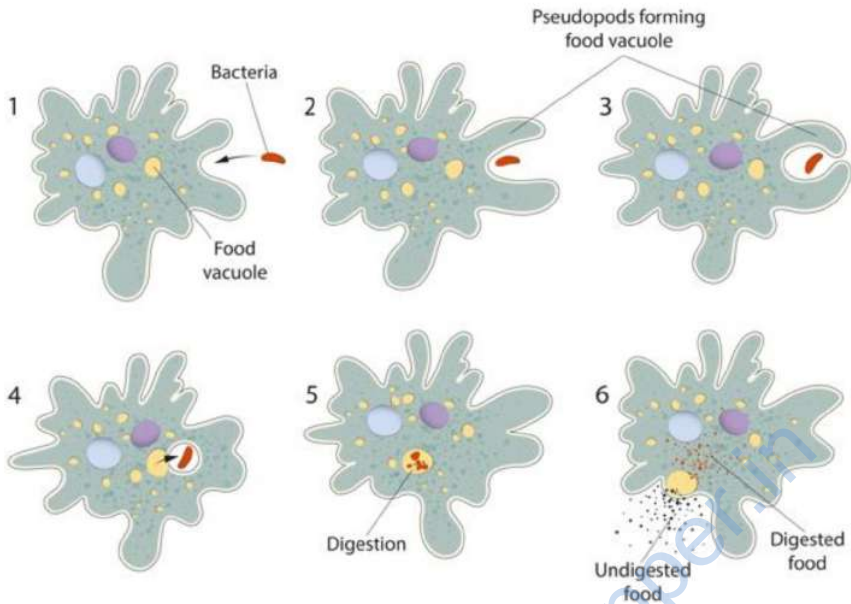


* Tip: Humans cannot survive by eating only grass because and humans cannot digest cellulose as we do not have cellulose digesting bacteria in our stomach.

Feeding and Digestion in Amoeba

- Amoeba is a single-celled, microscopic organism.
- It has one or more finger-like projections called pseudopodia or false feet for movement and capture of food.
- The food captured by the pseudopodia is digested by the food vacuole.
- Amoeba secretes digestive juices in the food vacuole which help in the digestion of food particles.

Nutrition



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