



**SUBJECT: BIOLOGY**

**CLASS X: CHAPTER: LIFE PROCESSES**

**TOPIC- LIFE PROCESSES (HETEROTROPHIC NUTRITION)**

**Guidelines:**

**Dear Students**

- Refer to the following content for the chapter.
- These notes will help you understand the concept of the lesson.
- Do the assignment questions in the Biology notebook.

**Heterotrophic nutrition:**

Nutrition which is obtained from other organisms that could be plants or other animals is known as Heterotrophic nutrition. There are three types of heterotrophic nutrition:

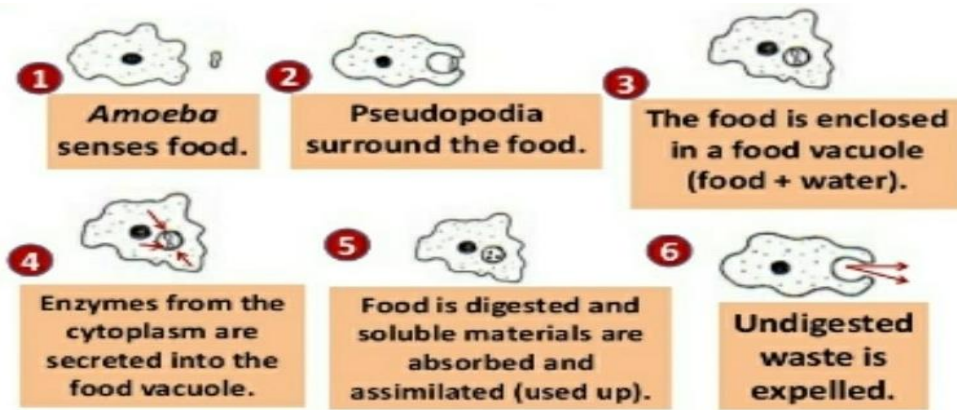
Holozoic, Saprophytic and Parasitic

**Comparison chart between three types of heterotrophic nutrition:**

	<b>Holozoic nutrition</b>	<b>Saprotrophic nutrition</b>	<b>Parasitic nutrition</b>
1.	The organism feeds by ingesting solid organic matter which is then digested and absorbed within its body.	The organism feeds on dead and decaying matter. Digestive enzymes are released on the substrate and when nutrients are broken down, the simplest form is taken up.	Organisms obtain nutrients from other living organisms by depending on the body of the host and causing harm to the host.
2.	Host is not required	Host is not required	Host is required
	Examples: humans, animals and insectivorous plants.	Examples: Some Bacteria and all fungi	Examples: Lice, tapeworms, Leech, Cuscuta (a parasitic plant)

**Nutrition in Amoeba**

Amoeba, a **unicellular organism**, feeds on bacteria, planktons, microscopic algae and other unicellular organisms. Food is taken by the entire surface. The process of obtaining food by amoeba is called **phagocytosis**. The process of nutrition is shown diagrammatically below:



Kindly refer to the link shared below for better understanding of the process of nutrition in Amoeba. It will enable you to experience and visually interpret the process.

[https://www.youtube.com/watch?v=5\\_4Y0tTHqyk](https://www.youtube.com/watch?v=5_4Y0tTHqyk)

**Process of nutrition in Paramecium:**

Kindly refer to the link shared below for better understanding of the process of nutrition in Paramecium. It will enable you to experience and visually interpret the process.

<https://www.youtube.com/watch?v=4h9IxxqmBKo>

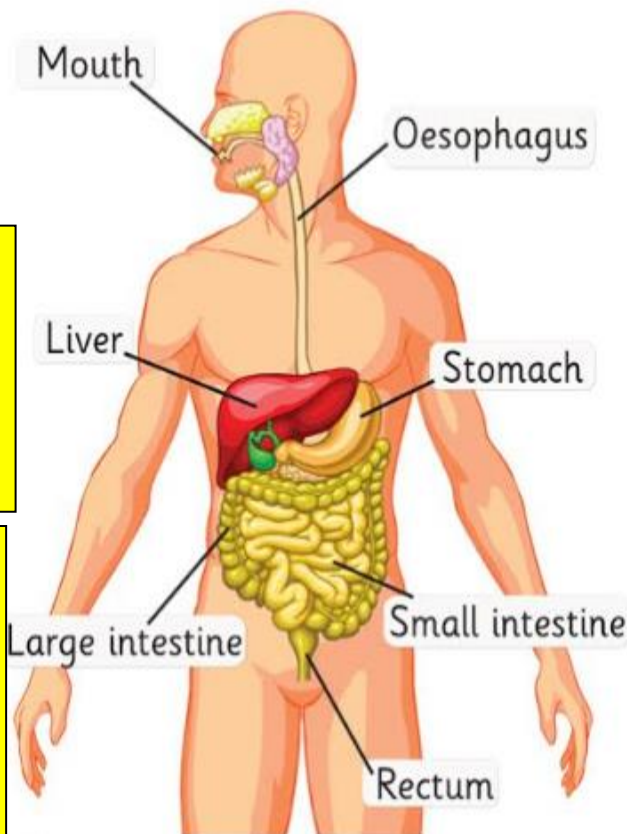
**Nutrition in Human Beings:**

Human Beings are complex organisms; hence they need different organs to carry on their life processes. Human digestive system consists of alimentary canal which includes mouth, pharynx, oesophagus, stomach, small intestine, large intestine and anus.

The process of nutrition in Human Beings is shown below:

**Mouth:** **Teeth** chew food in the presence of saliva which has **salivary amylase** to break down starch into **Maltose** (sugar). **Tongue** – Helps in tasting food and rolling it into a ball.

**Oesophagus:** Propels food particles by **peristaltic** movements from pharynx to stomach.



**Liver:** Produces **bile juice**, which helps in **Emulsification of fats**- large fat molecules are converted to small globules so that they are easily transported in the blood.

**Stomach:**

- Structure: J shaped muscular sac
- Three components: HCL, mucus and pepsin
- Stores and mixes food
- Chemical digestion of food by enzymes and HCL (creates acidic medium facilitating the action of pepsin)
- Regulates food delivery to small intestine.

Gall bladder	Pancreas
Stores bile which gets secreted into duodenum of small intestine	Secretes enzymes (amylase, trypsin, lipase) and bicarbonate into small

**Small intestine:**

- Duodenum- Its first portion receives secretions from liver, gall bladder, pancreas
- Digests proteins, fats and carbohydrates
- Role- absorption of nutrients by increasing the surface area by the infoldings called **Villi**, richly supplied by blood vessels that help in absorbing nutrients.

**Large intestine:**

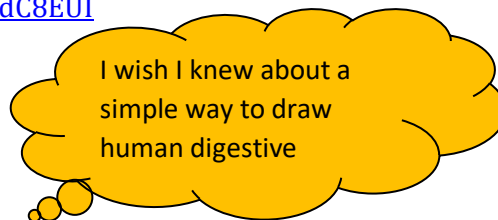
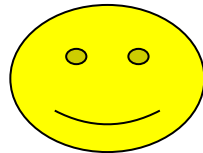
Structure: wider than small intestine but shorter in length.  
Absorbs remaining water from undigested waste and forms faeces.

**Rectum:** Expandable sac that stores faeces and is a part of large intestine.

**Anus:** Opening through which faeces are eliminated from the body.

the link shared below for better understanding of the process in Human beings. It will enable you to experience visual interpretation of the process.

<https://www.youtube.com/watch?v=Og5xAdC8EUI>



Here's the solution: An easy way to draw human digestive system:

<https://www.youtube.com/watch?v=fINdCcuSWCA>

What are the main steps in the process of

## Steps of Nutrition:

- **Ingestion** is the task of taking in of food.
- **Digestion** is necessary for breaking down food particles into nutrients that are used up by the body as a source of energy, for cell repair and growth.
- **Absorption** is the uptake of nutrients in the simplest form by blood and then transporting it to different cells in the body. **(does not occur in unicellular forms)**
- **Assimilation** is the utilisation of absorbed nutrients by the cells of our body.
- **Egestion** is the elimination of undigested waste.

## Key words:

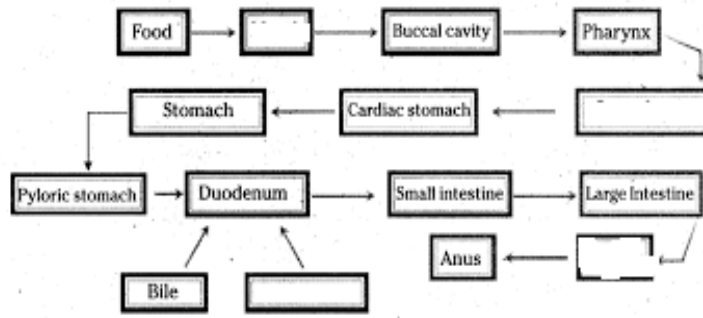
Heterotrophic	Ingestion	Peristaltic	Phagocytosis	Digestion	Villi	Absorption
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## Summary:

- The human digestive system breaks down food to release energy essential for the body to carry out its activities.
- The process of nutrition takes place in 5 major steps i.e. ingestion, digestion, absorption, assimilation and egestion.
- The food is ingested by the alimentary canal and is propelled through the body for further processing.
- The autonomous nervous system controls the peristalsis, contraction and relaxation of muscles within the alimentary canal wall.
- The food is passed to the stomach, small intestine where it is digested, and the nutrients are absorbed with the help of Villi ( finger like projections)
- Water, electrolytes and vitamins are absorbed by the large intestine, and the waste is defecated.

## ASSIGNMENT:

- Q1. The small intestine of herbivores is longer than that of carnivores. Analyse.
- Q2. Absorption of digested food occurs mainly in small intestine. Enumerate upon the structural design of the small intestine that favours absorption.
- Q3. Fill up the incomplete boxes in the given flow chart with respect to the human digestive system.



Q4. State the functions of liver and pancreas.

Q5. What will happen if:

- a) HCL is not secreted in the stomach
- b) Mucus is absent in the stomach
- c) Saliva does not have salivary amylase
- d) Only one type of teeth is present in human beings
- e) No bile is produced by the Liver

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