CLASS X	LIFE PROCESSESS
BIOLOGY	INTRODUCTION AND NURTITION IN ANIMALS

Life processes are those processes which is necessary to maintain life in an organism. If processes like nutrition, circulation, respiration, excretion etc does not take place, then we won't be able to survive.

Basic life processes are : Nutrition, Respiration, Transportation, Excretion etc.

Nutrition

Life Processes require energy which is provided by nutrition.

Nutrition:

Nutrition is the process of intake of nutrients (like carbohydrates, fats, proteins, minerals, vitamins and water) by an organism as well as the utilization of these nutrients by the organism.

Food is an organic substance.

The simplest food is glucose also called simple sugar.

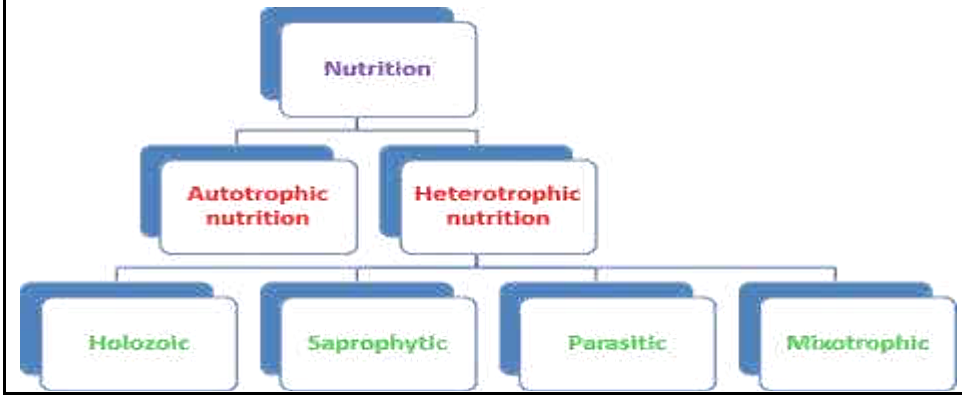
A more complex food is starch. It is made from glucose.

The general name of substances like glucose and starch is 'carbohydrates'.

Nutrient: A nutrient can be defined as a substance which an organism obtains from its surroundings and uses it as a source of energy or for the biosynthesis of its body constituents.

Example: carbohydrates and fats are the nutrients which are used by the organism mainly as a source of energy. Proteins and mineral salts are nutrients used by organism for the biosynthesis of its body constituents like skin, blood, etc.

Modes of Nutrition:



Mode of nutrition means method of obtaining food by an organism.
There are mainly two modes of nutrition:

- **Autotrophic mode of nutrition**
- **Heterotrophic mode of nutrition**

Autotrophic mode of nutrition: ('auto' means 'self' and 'trophe' means 'nutrition')
Autotrophic nutrition is that mode of nutrition in which an organism makes (or synthesizes) its own food from the simple inorganic materials like carbon dioxide and water present in the surroundings (with the help of sunlight energy).
Those organisms which can make their own food from carbon dioxide and water are called autotrophs.
Example: all green plants, autotrophic bacteria.
Autotrophs make their food by photosynthesis.

Heterotrophic mode of nutrition: ('heteros' means 'others' and 'trophe' means 'nutrition')
Heterotrophic nutrition is that mode of nutrition in which an organism cannot make (or synthesizes) its own food from simple inorganic materials like carbon dioxide and water, and depends on other organisms for its food.
Those organisms which cannot make their own food from inorganic substances like carbon dioxide and water, and depends on other organisms for their food are called heterotrophs.
Example: all the animals (man, dog, cat, lion, etc.), most bacteria and fungi.

Autotrophic nutrition	Heterotrophic nutrition
(i). Food is prepared from CO_2, water and sunlight	(i). Food is obtained from other organisms.
(ii). Chlorophyll is required.	(ii). Chlorophyll is not required.
(iii). All green plants and some bacteria have this type of nutrition.	(iii). All animals and fungi have this type of nutrition.
(iv). Food is generally in day time.	(iv). Food can be obtained at all time.

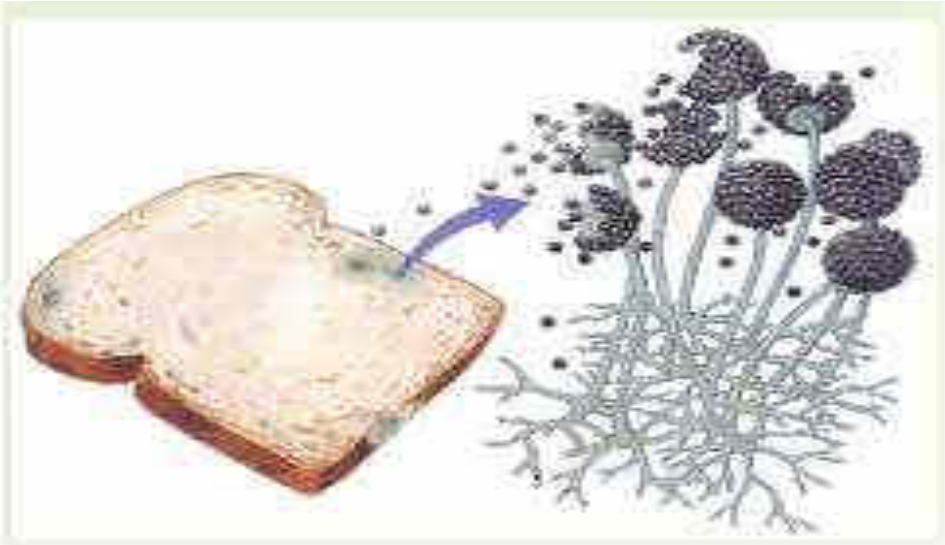
Types of Heterotrophic Nutrition:

Heterotrophic mode of nutrition is of three types:

- Saprotrophic (saprophytic) nutrition
- Parasitic nutrition
- Holozoic nutrition

Saprotrophic nutrition:

Saprotrophic nutrition is that nutrition in which an organism obtains its food from decaying organic matter of dead plants, dead animals and rotten bread, etc.
The organisms having saprotrophic mode of nutrition are called saprophytes.
Saprophytes are the organisms which obtain food from dead plants (like rotten leaves), dead and decaying animal bodies, and other decaying organic matter.
Example: Fungi (liker bread moulds, mushrooms), and many bacteria.



Parasitic nutrition:

The parasitic nutrition is that nutrition in which an organism derives its food from the body of another living organisms without killing it.
A parasite is an organism (plant or animal) which feed on another living organism called its host.
Example: some animals like Plasmodium and roundworms, a few plants like Cuscuta (amarbel) and several fungi and bacteria.

Leeches

Ticks

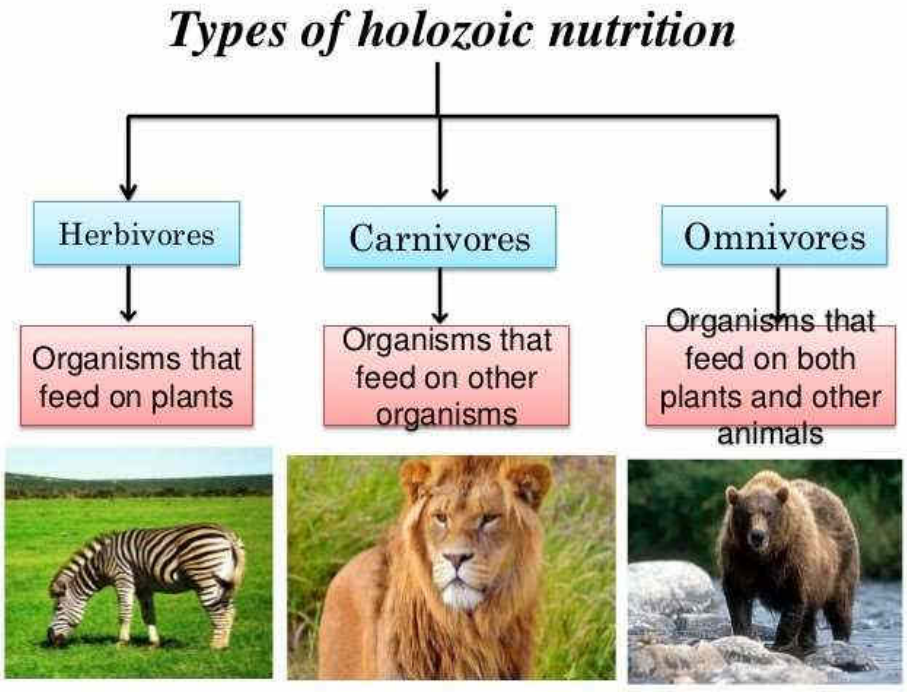
Lice

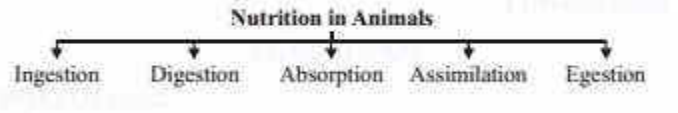
Cuscuta

Holozoic nutrition:

The holozoic nutrition is that nutrition in which an organism takes the complex organic food materials into its body by the process of ingestion, the ingested food is digested and then absorbed into the body cells of the organism.

Example: human beings and most of the animal.

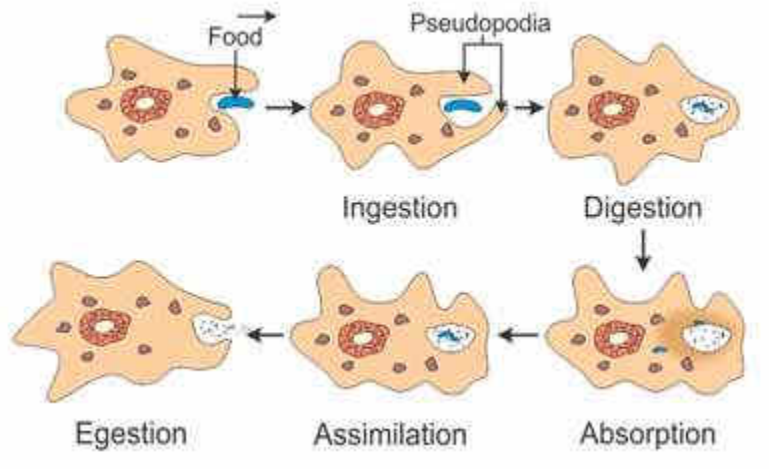




Nutrition in Amoeba:

Amoeba is a unicellular animal. Amoeba eats tiny (microscopic) plants and animals as food which float in water in which it lives. The mode of nutrition in Amoeba is holozoic.
The process of obtaining food by Amoeba is called phagocytosis ('Phagocytosis' means 'cell feeding').

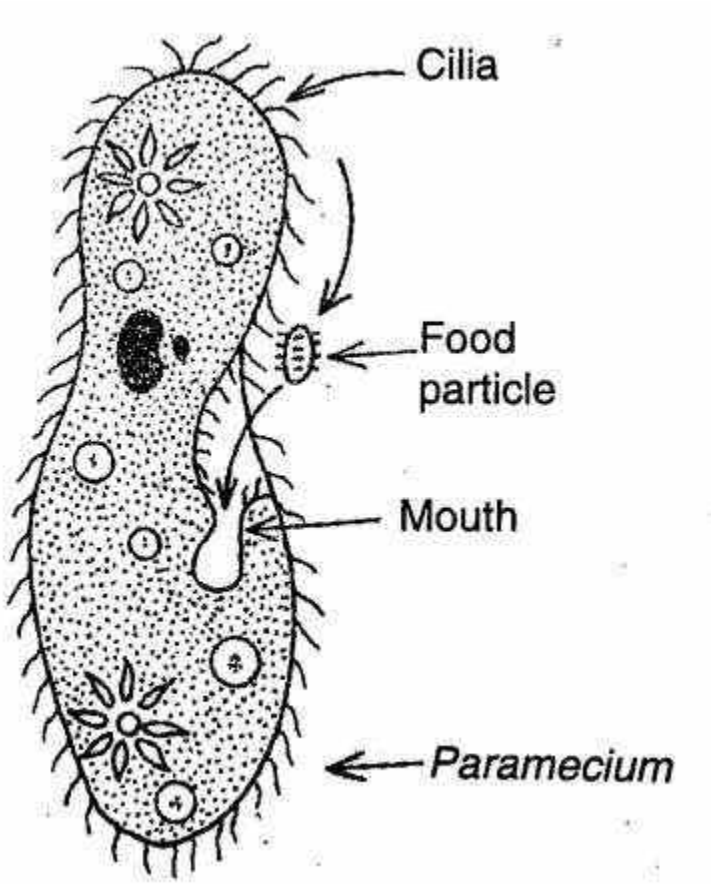
The various steps involved in the nutrition of Amoeba are : ingestion, digestion, absorption, assimilation, and egestion. All the processes of nutrition are performed by the single cell of Amoeba. This is described below.



Nutrition in Paramecium :

Paramecium is also a tiny unicellular animal which lives in water. Paramecium uses its hair like structures called cilia to sweep the food particles from water and put them into its mouth.
The Paramecium has thin, hair-like cilia all over its body. The cilia move back and forth rapidly in water.
When the cilia present around the mouth region of Paramecium move back and forth, they sweep the food particles present in water into the mouth of Paramecium.

This is the first step in the nutrition of Paramecium which is called ingestion. Ingestion is followed by other steps such as digestion, absorption, assimilation and egestion (as explained in the case of Amoeba).
Paramecium puts the food particle into its mouth with the help of cilia.



Nutrition in Complex Multicellular Animals:
In the complex multicellular animals like man (humans), grasshopper, fish and frog, etc., all the processes involved in nutrition are performed by a combination of digestive organs. This combination of digestive organs is called digestive system. We will now describe all the processes in the nutrition of complex multicellular animals by taking the example of nutrition in human beings. Please note that a long tube running from mouth to anus of a human being (or other animals) in which digestion and absorption of food takes place is called alimentary canal. Alimentary canal is also called 'gut'.
(**WRITE IN COPY WHAT EVER ASKED BY THE SUBJECT TEACHER**).

MCQs on Heterotrophic Nutrition

1. Absorptive heterotrophic nutrition is exhibited by
(a) fungi
(b) algae
(c) pteridophytes
(d) bryophytes

2. The mode of nutrition in which one organism obtains nutrition from other organisms is known as
(a) symbiosis
(b) autotrophic nutrition
(c) saprophytic nutrition
(d) heterotrophic nutrition

3. Heterotrophic nutrition is
(a) oxidation of glucose
(b) breakdown of glucose into energy
(c) utilization of energy obtained by plants
(d) all the above

4. The parasitic fungus which destroys wheat plant is
(a) lice
(b) leech
(c) cuscuta
(d) Puccinia

5. Assertion: mode of nutrition in higher animals is heterotrophic
Reason: Animals can use different trophic levels for heterotrophic nutrition
(a) if the assertion is true but reason is false
(b) if both assertion and reason are true and reason is correct explanation of assertion
(c) if both assertion and reason are false
(d) if both assertion and reason are true but reason is not correct explanation of assertion

6. The mutualistic association between certain fungi and roots of vascular plants are known as

(a) haustoria
(b) mycelium
(c) rhizoids
(d) mycorrhizae

7. What is the mode of nutrition in bacteria?
(a) heterotrophic
(b) autotrophic
(c) autotrophic and heterotrophic
(d) none of the above

8. Digestion of food in amoeba occurs in
(a) cytoplasm
(b) nucleus
(c) food vacuole
(d) none of the above

9. The mode of nutrition in fungi
(a) saprotrophic or parasitic
(b) only parasitic
(c) only saprotrophic
(d) none of above

10. A stable ecosystem is maintained with the interaction of
(a) predators
(b) prey
(c) animals-human
(d) predator-prey
EXTRA OBJECTIVE FOR EXTERNAL EXAMS .

THIS CONTENT IS PREAPRED FROM HOME.