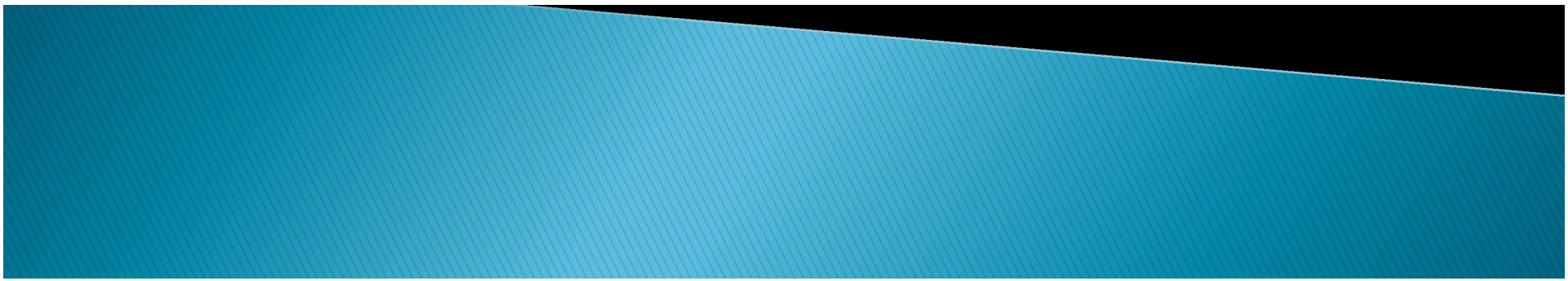
CHAPTER - 1

NUTRITION IN PLANTS



TEACHING – AID

- Key points
- Answers in very short
- Answers in short
- Long ques/ans
- Diagrams
- Flow chart
- Activity

1) Nutrients :-

The components of food like carbohydrates, fats, proteins vitamins and minerals are called nutrients.

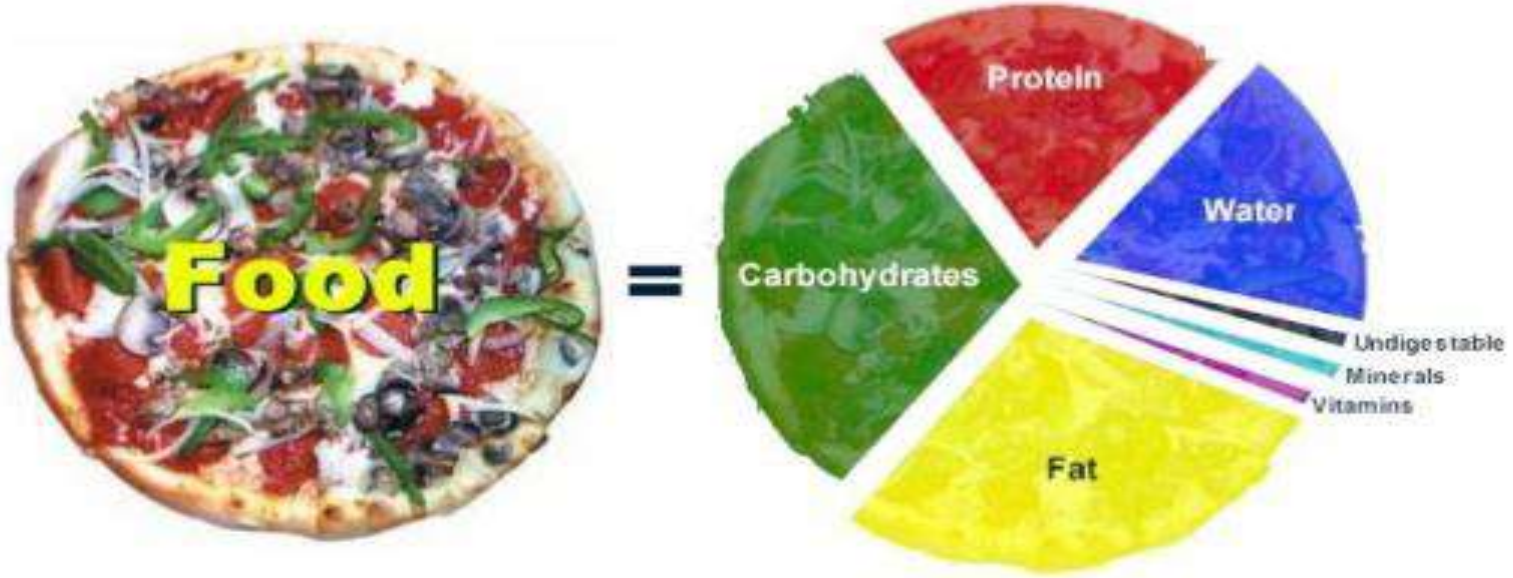
Nutrients help living organisms :-

i) To build their bodies.

ii) To grow.

iii) To repair the damaged parts of their bodies.

iv) To provide energy to carry out life processes.



2) Nutrition :-

The mode of taking food by an organism and its utilization in the body is called nutrition.

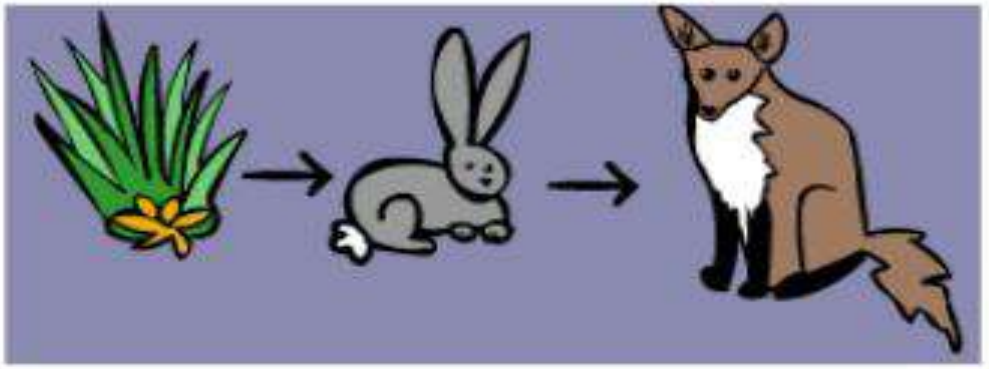
3) Modes of nutrition :- There are two main modes of nutrition in living organisms. They are autotrophic nutrition and heterotrophic nutrition.

i) Autotrophic nutrition :- is nutrition in which organisms can prepare their own food.

Organisms which can prepare their own food are called autotrophs.

ii) Heterotrophic nutrition :- is nutrition in which organisms get their food directly or indirectly from plants.

Organisms which get their food directly or indirectly from plants are called heterotrophs.



4)Photosynthesis - Food making process in plants :-

Photosynthesis is the process by which plants prepare their on food by using sunlight, water, carbon dioxide and chlorophyll.

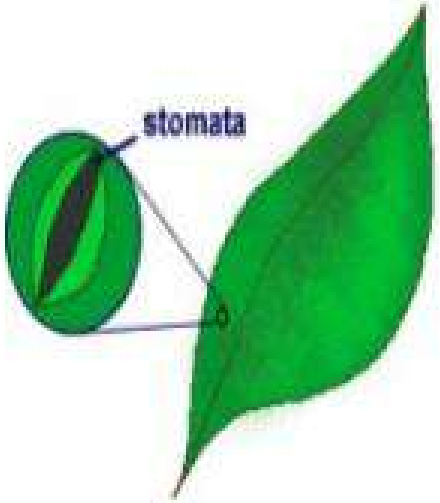
Photosynthesis take place in the leaves.

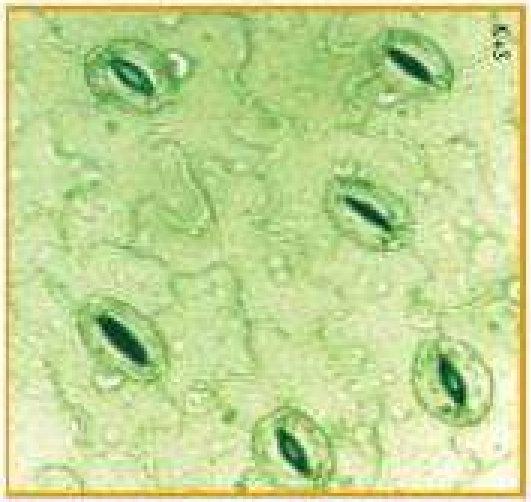
i) Sunlight is obtained from the sun.

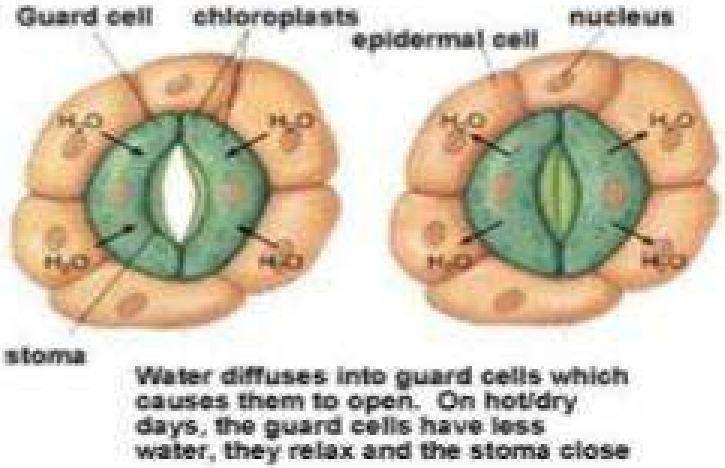
ii) Water is absorbed by the roots and transported to the leaves.

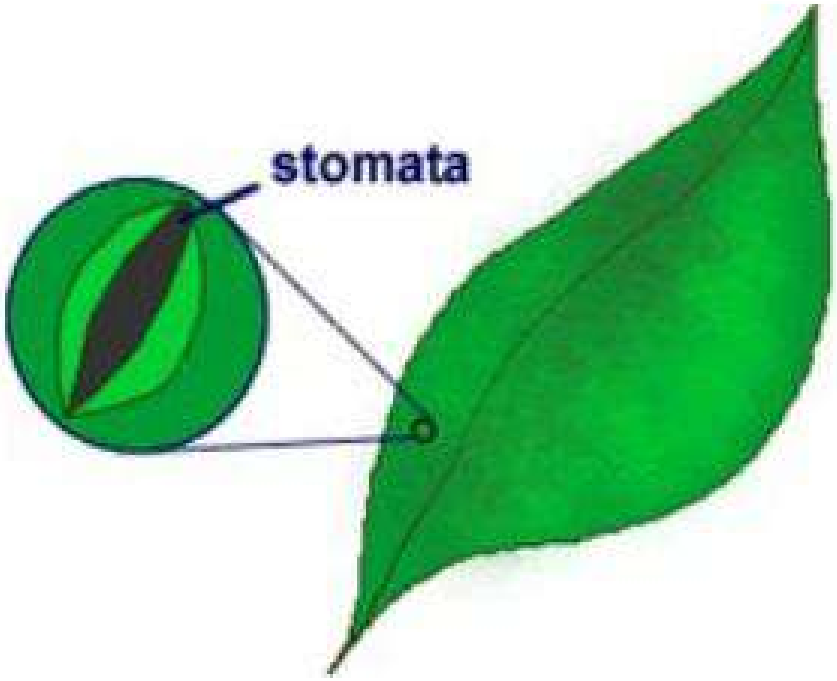
iii) Carbon dioxide is taken from the air through small pores in the leaves called stomata.

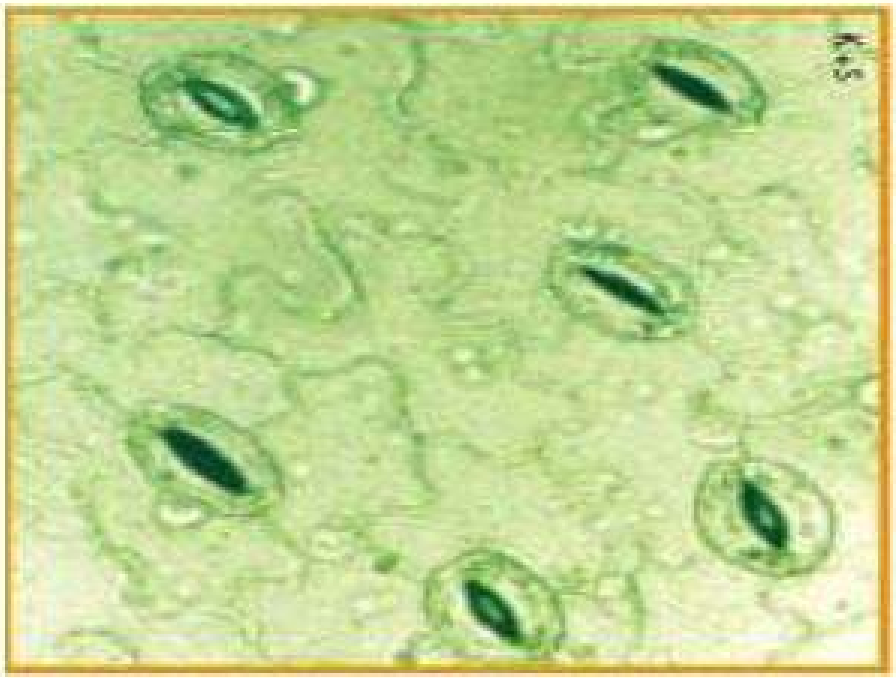
iv) Chlorophyll are the green pigments present in the leaves.

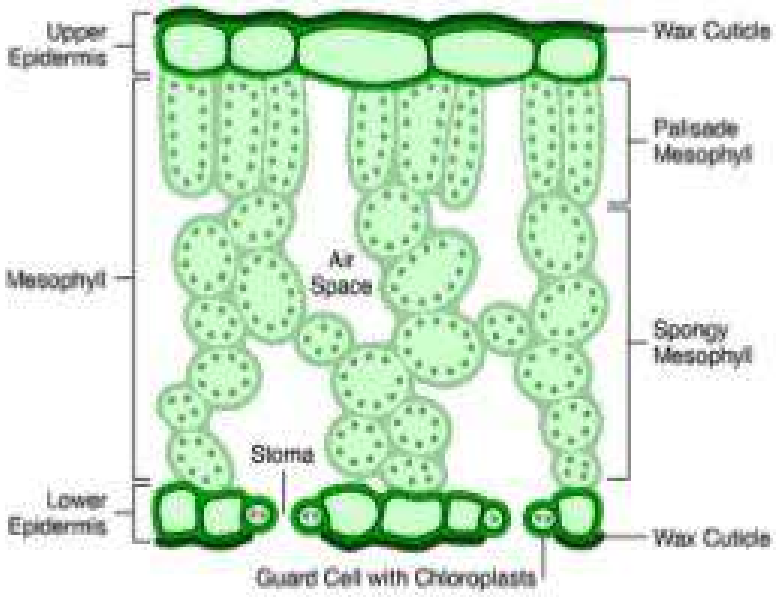


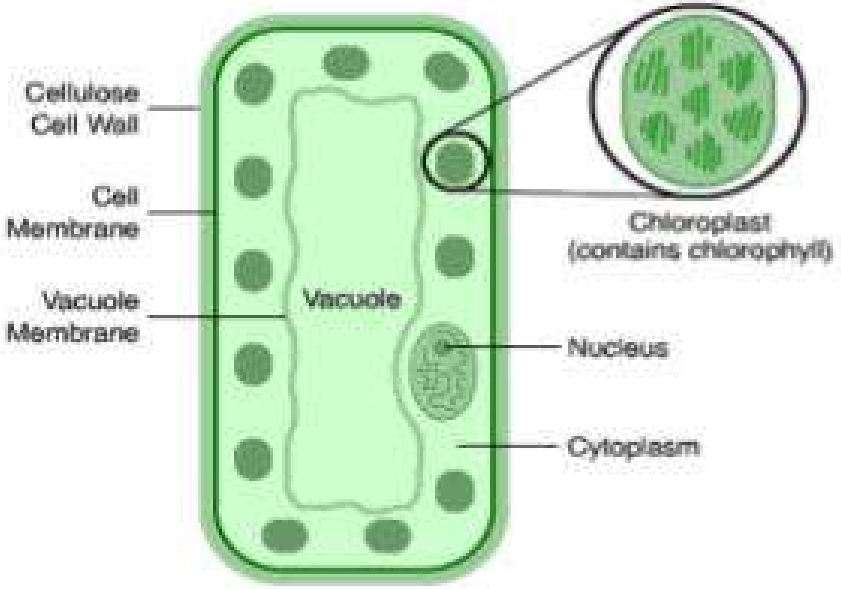





stomata



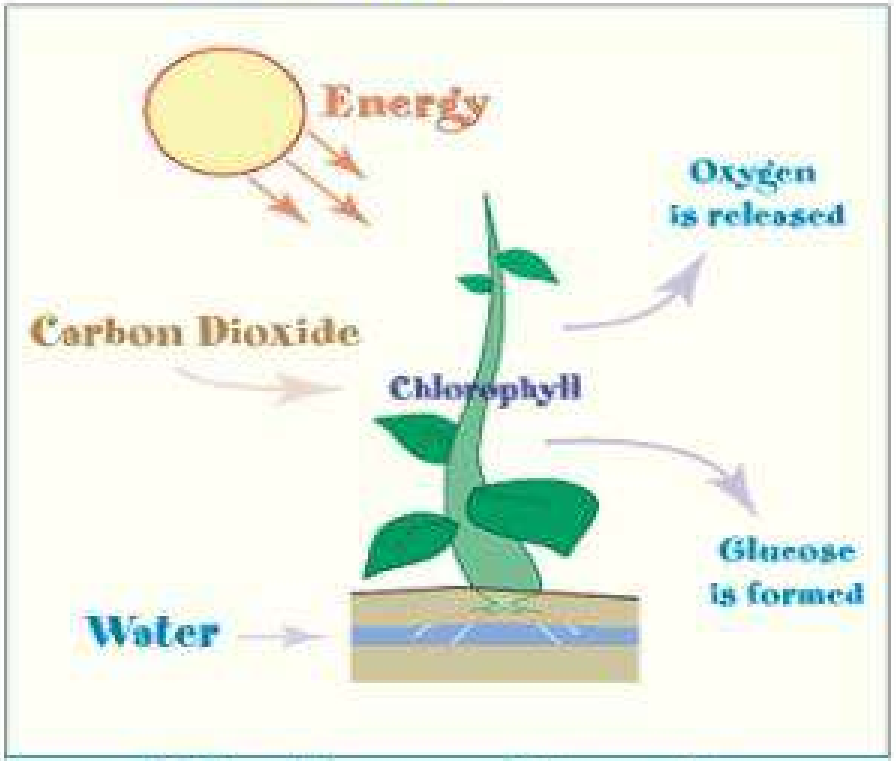

Upper Epidermis
Wax Cuticle
Palisade Mesophyll
Mesophyll
Air Space
Spongy Mesophyll
Stoma
Lower Epidermis
Wax Cuticle
Guard Cell with Chloroplasts


Cellulose Cell Wall
Cell Membrane
Vacuole Membrane
Vacuole
Chloroplast (contains chlorophyll)
Nucleus
Cytoplasm

Chlorophyll uses the energy from sunlight to prepare food by using water and carbon dioxide. The food prepared is carbohydrate which is then converted into starch. During photosynthesis oxygen is released.

Equation of photosynthesis :-

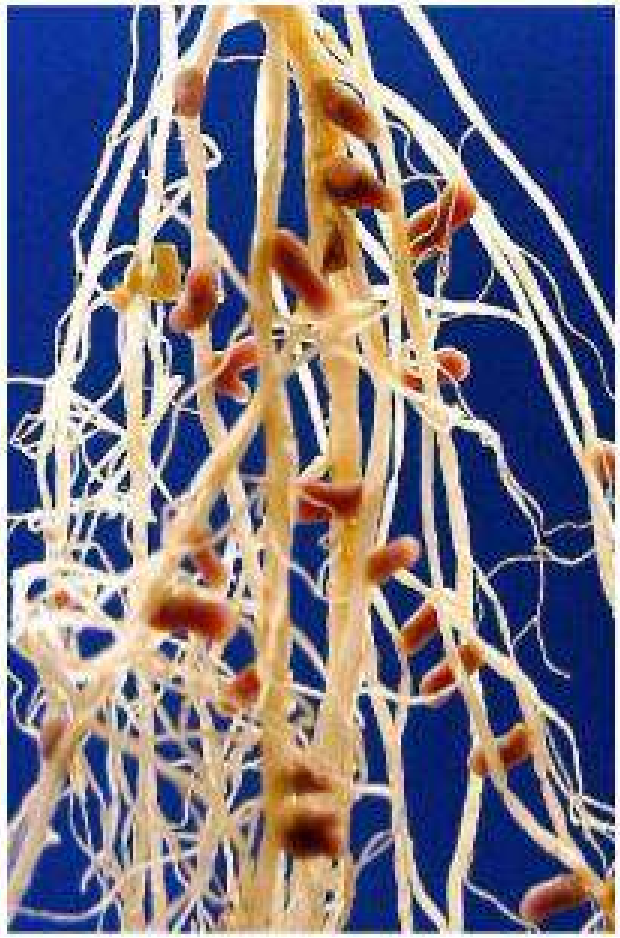
$$\text{Carbon dioxide} + \text{Water} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{Carbohydrate} + \text{Oxygen}$$



Photosynthesis

5) Synthesis of proteins :-

The soil has some bacteria which convert nitrogen from the air into usable nitrogen in the soil. Farmers also add fertilisers containig nitrogen into the soil. Plants absorb this nitrogen from the soil along with water and other constituents to prepare proteins and fats.



6) Other modes of nutrition in plants :-

i) Parasitic plants :- are plants which do not have chlorophyll and cannot prepare their own food. They get their food from other plants called host . Eg :- Cuscuta (Amarbel)

- ii) **Insectivorous plants :-** are plants which feed on insects. Eg:- Pitcher plant. The leaf of the pitcher plant is modified into a pitcher. The end of the pitcher has a lid which can open and close. When an insect enters the pitcher, the lid closes. The insect is then digested by digestive juices inside the pitcher.

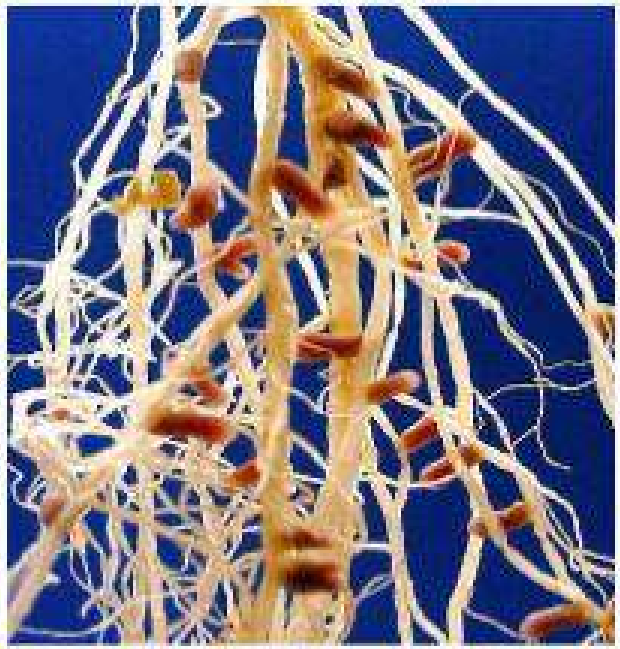
- iii) Saprotrophs :- are plants which do not have chlorophyll and cannot prepare their on food. They get their food from dead and decaying organic matter. Eg :- mushroom, bread mould etc. They produce digestive juice on the dead and decaying organic matter and convert it into a solution and then absorb the nutrients from the solution.

iv) Symbiotic relationship :- Some plants live together and share shelter and nutrients. Eg :- lichens. In lichens, an alga and a fungus live together. The fungus provides shelter, water and minerals to the alga. The alga provides food to the fungus which it prepares by photosynthesis.

7) How nutrients are replenished in the soil :-

Plants absorb nutrients from the soil. So the nutrients in the soil decreases. So farmers add manures and fertilisers to the soil to increase the nutrients in the soil.

The bacterium called rhizobium which lives in the roots of leguminous plants like grams, peas, beans etc. converts nitrogen from the air into soluble form in the soil and makes the soil rich in nitrogen. In return the plant provides food and shelter to the bacteria. So they have a symbiotic relationship.



CHAPTER - 2

NUTRITION IN ANIMALS

1) Animal nutrition :-

The mode of taking food by an organism and its utilisation in the body is called nutrition.

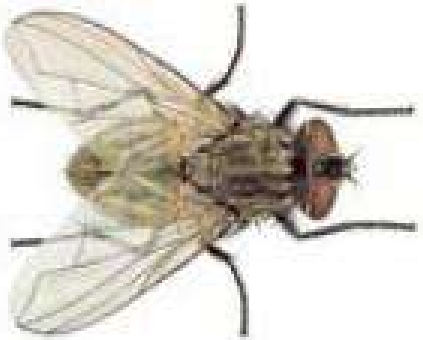
Animals get their food directly or indirectly from plants.

Animal nutrition :- includes nutrient requirement, mode of taking food and its utilisation in the body.

Digestion :- The process by which complex food substances are broken down into simpler substances is called digestion.

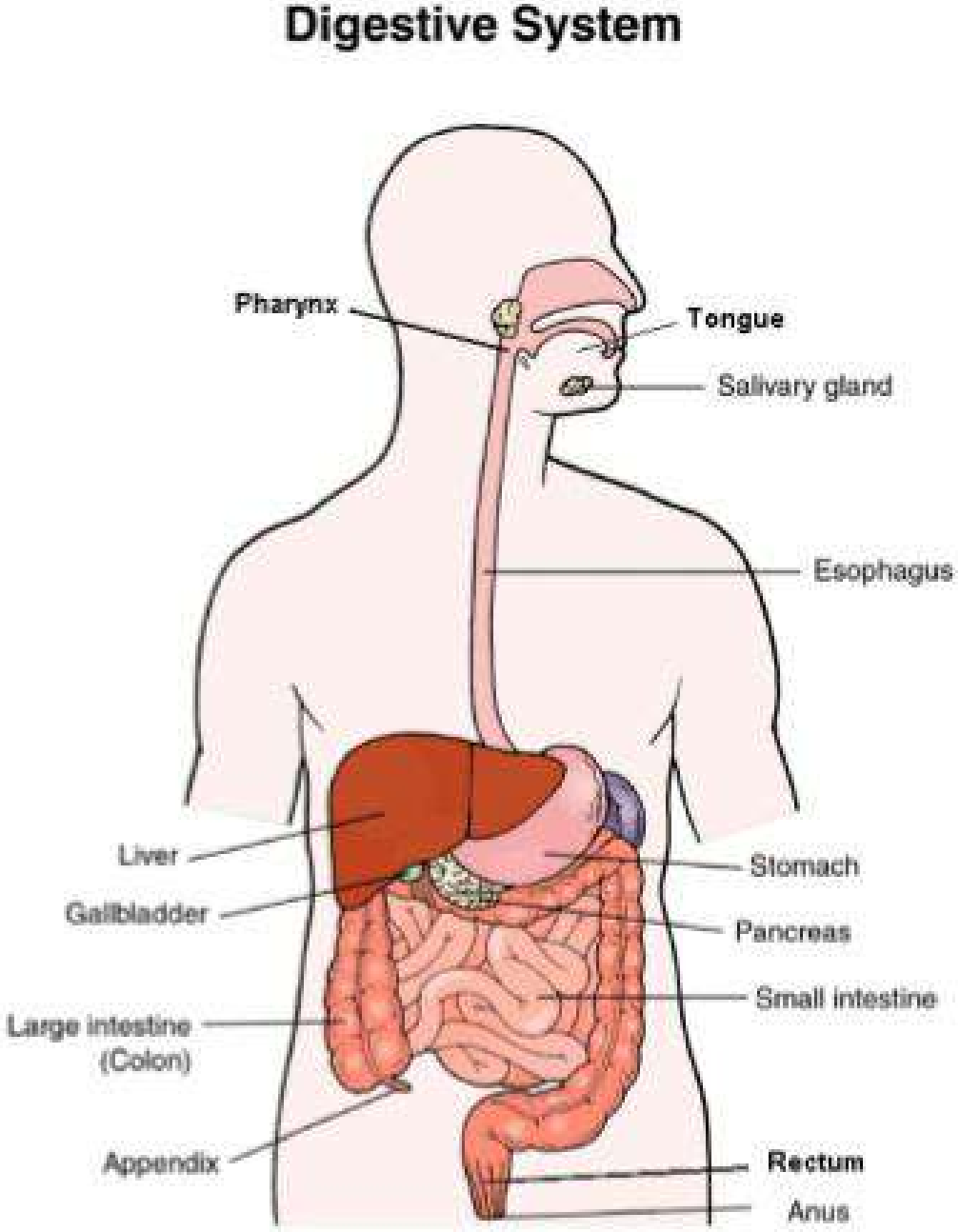
2) Different ways of taking food :-

Name of animal	Kind of food	Mode of feeding
Snail	Grass	Chewing
Ant	Insects	Scrapping
Eagle	Flesh	Swallowing
Humming bird	Nectar	Sucking
Lice	Blood	Sucking
Mosquito	Blood	Sucking
Butterfly	Nectar	Sucking
House fly	Decaying matter	Brewing



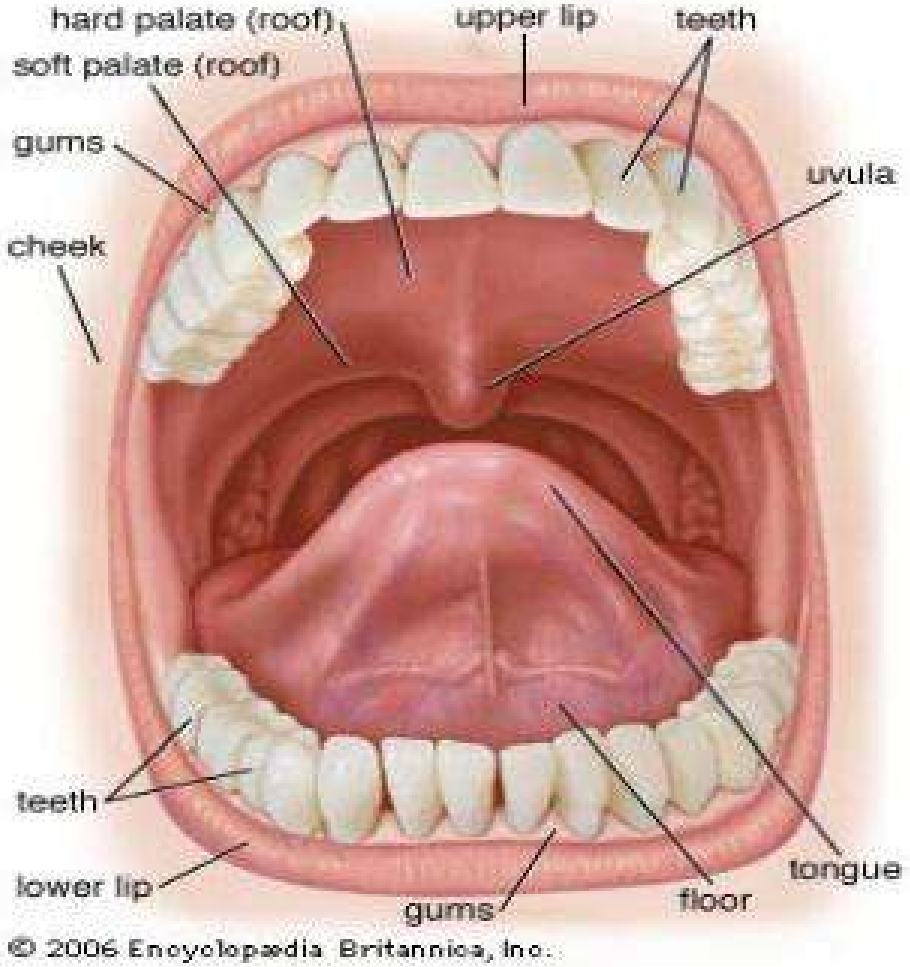
3) Digestion in humans

The main parts of the alimentary canal are :- buccal cavity (mouth), oesophagus (food pipe), stomach, small intestine, large intestine, rectum and anus. The main glands are :- salivary glands, liver and pancreas. The alimentary canal and the glands together is called the digestive system.



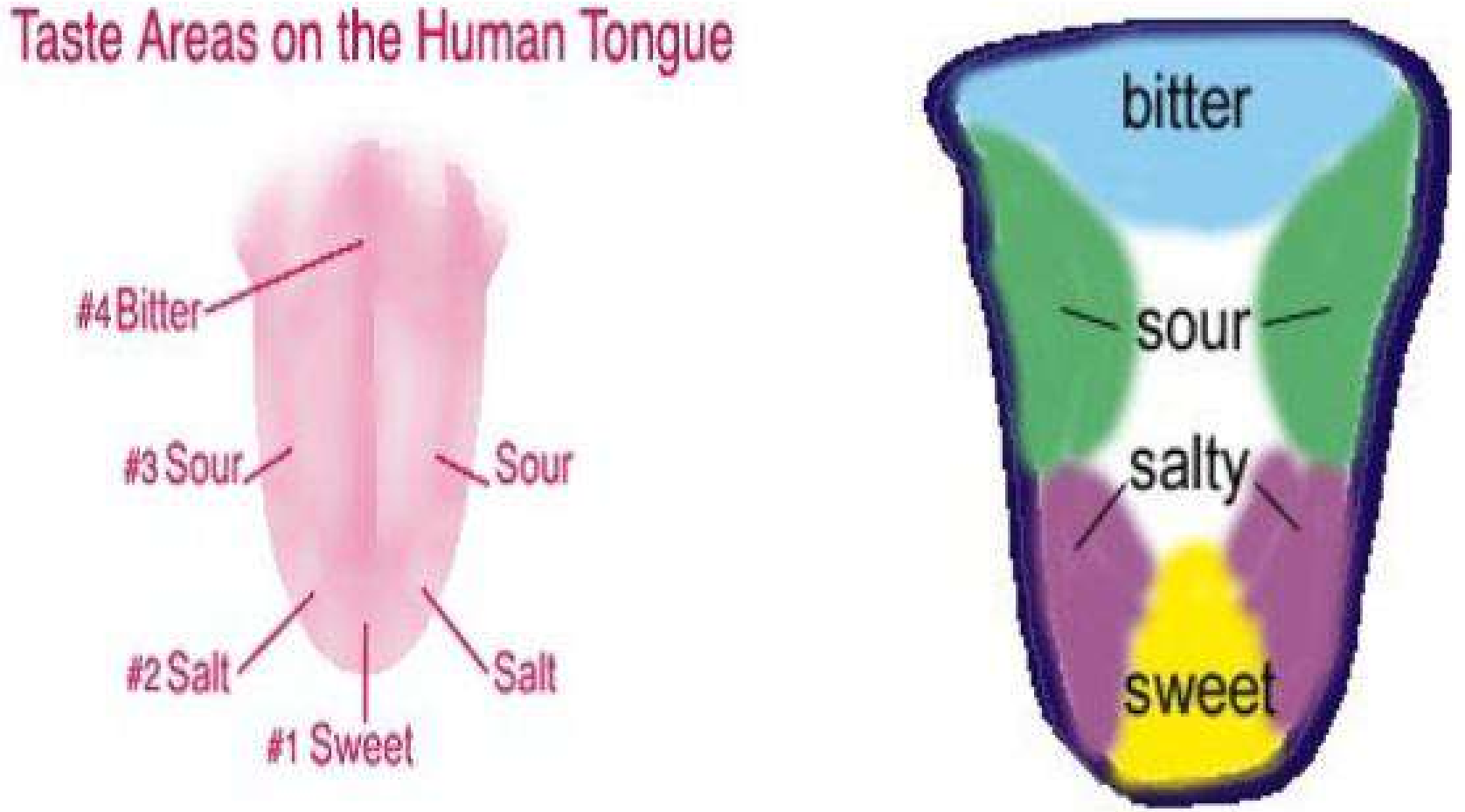
i) The mouth and buccal cavity :-

Food is taken into the body through the mouth. This process is called ingestion. In the mouth the food is broken down into smaller pieces by the teeth. The mouth has salivary glands which secrete saliva. The saliva breaks down starch into sugars. The tongue helps to mix the food with saliva and swallow the food.



Tongue :-

The tongue has taste buds to detect different tastes of food. The different regions of the tongue detect different tastes.



Teeth :-

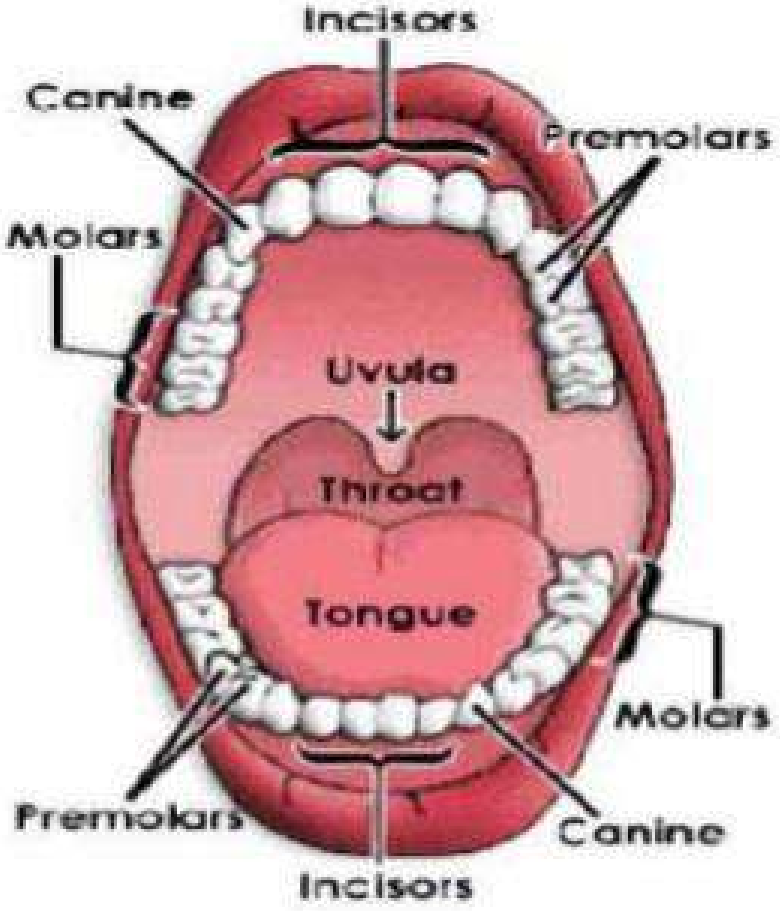
There are four types of teeth. They are incisors, canines, pemolars and molars.

Incisors :- help in biting and cutting the food.

Canines :- help in piercing and tearing the food.

Premolars and molars :- help in chewing and grinding the food.

Type of teeth	Number of teeth		Total
	Lower jaw	Upper jaw	
Incisors	4	4	8
Canines	2	2	4
Premolars and molars	10	10	20



ii) The food pipe (oesophagus) :-

The food pipe passes along the neck and chest. The swallowed food is pushed down by the movement of the walls of the food pipe into the stomach.

iii) The stomach :-

The stomach secretes digestive juices, hydrochloric acid and mucous. The digestive juices breaks down proteins. Hydrochloric acid makes the medium acidic and kills bacteria which enter along with the food. Mucous protects the walls of the stomach from the acid.

iv) The small intestine :-

The small intestine is a long coiled tube. It receives secretions from liver and pancreas. It also secretes digestive juices.

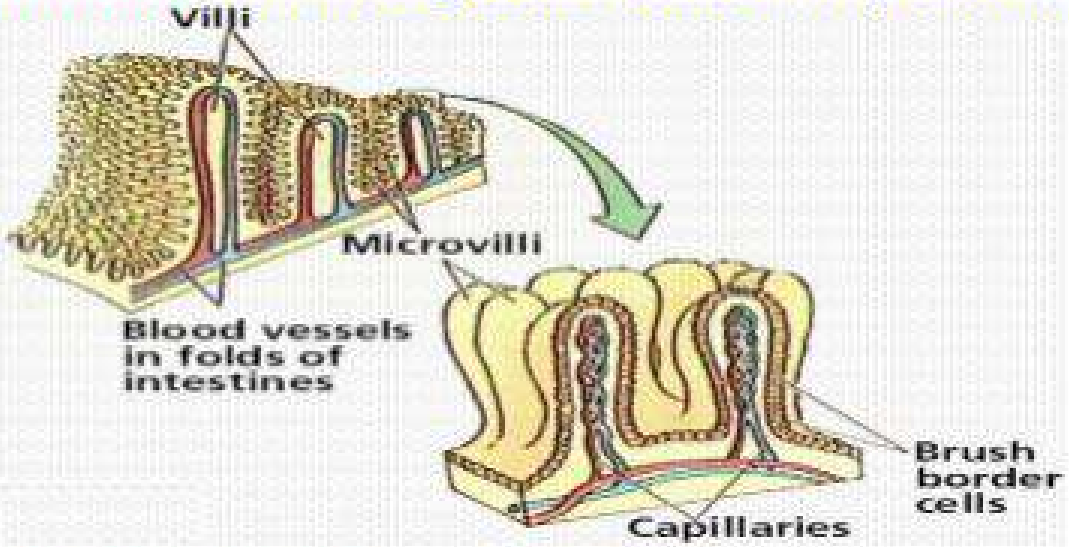
The liver is the largest gland in the body. It secretes bile juice which is stored in the gall bladder. It breaks down fats.

The pancreas secretes pancreatic juice which breaks down carbohydrates and proteins.

The intestinal juice completes the digestion of starch into glucose, fats into fatty acid and glycerol and proteins into amino acids.

Absorption of digested food in the small intestine :-

The digested food is absorbed by the walls of the small intestine. This process is called absorption. The small intestine has several finger like projections called villi having blood vessels. The villi helps to increase the surface area for absorption. The absorbed materials are carried by the blood to the different parts of the body and used by the body. This is called assimilation. The undigested food then passes into the large intestine.

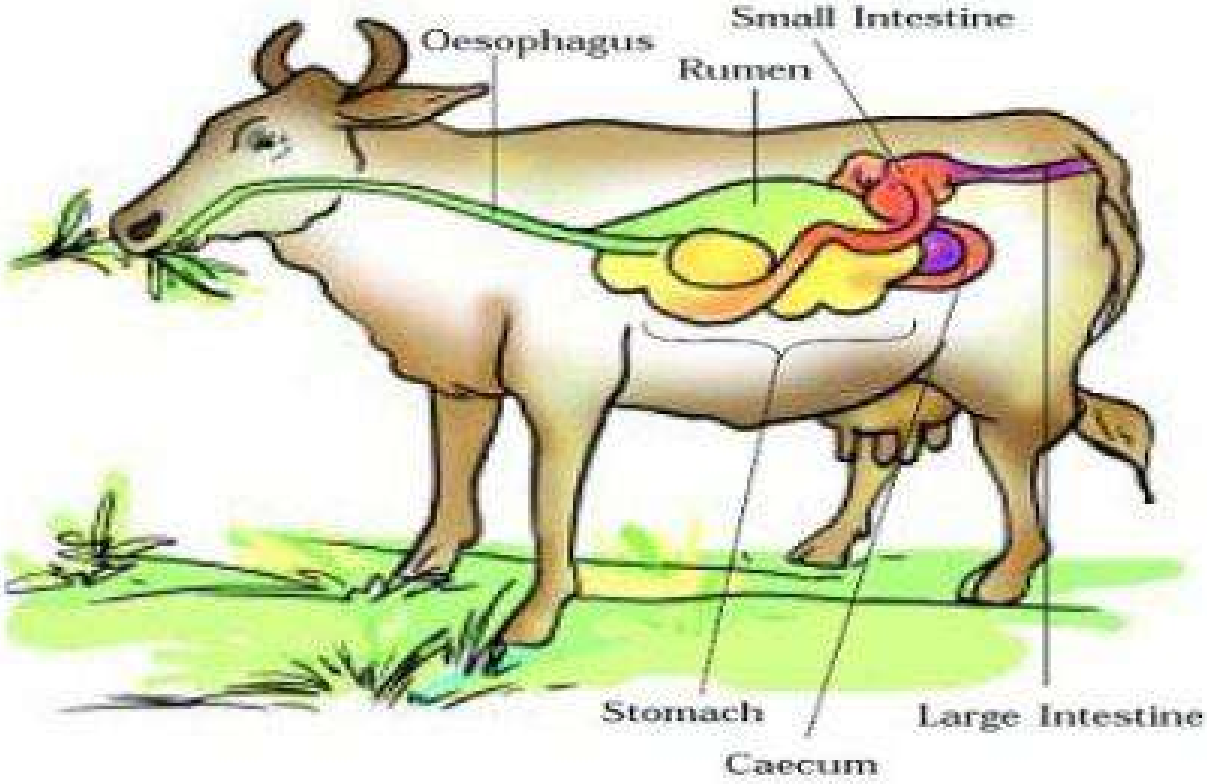


v) The large intestine :-

In the large intestine water and some salts are. The remaining waste then passes to the rectum and remains there as faeces. It is removed through the anus from time to time.This process is called egestion.

4) Digestion in grass eating animals (Ruminants) :-

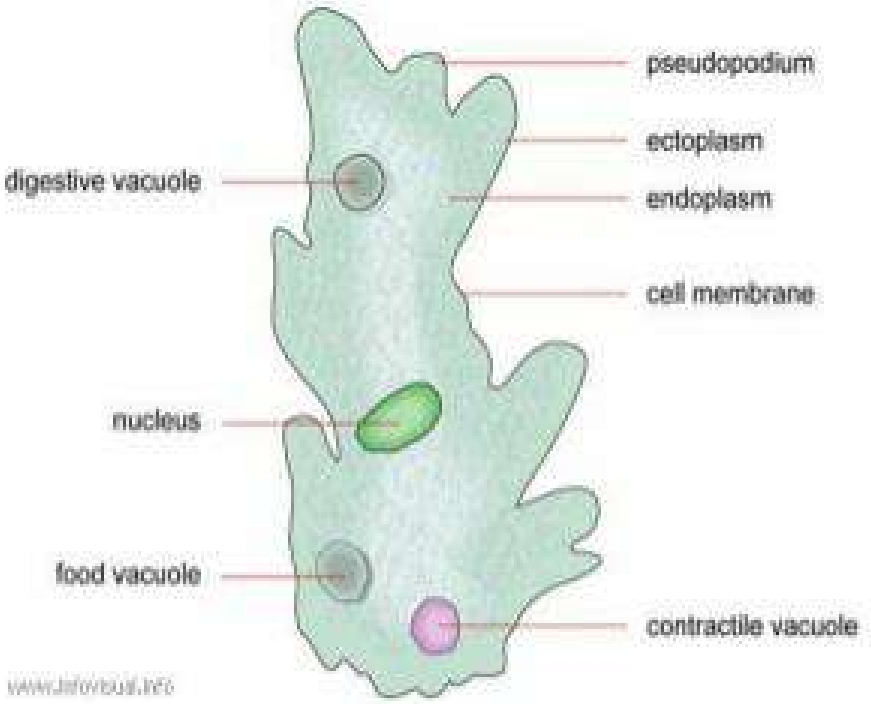
Grass eating animals like cows and buffaloes quickly swallow the grass and store it in a separate part of the stomach called rumen. Here the food is partly digested and is called cud. Then the cud is brought back to the mouth in small lumps and chewed. This process is called rumination. The chewed food then passes into a sac like structure between the small intestine and large intestine. The cellulose in the grass is digested with the help of some bacteria.

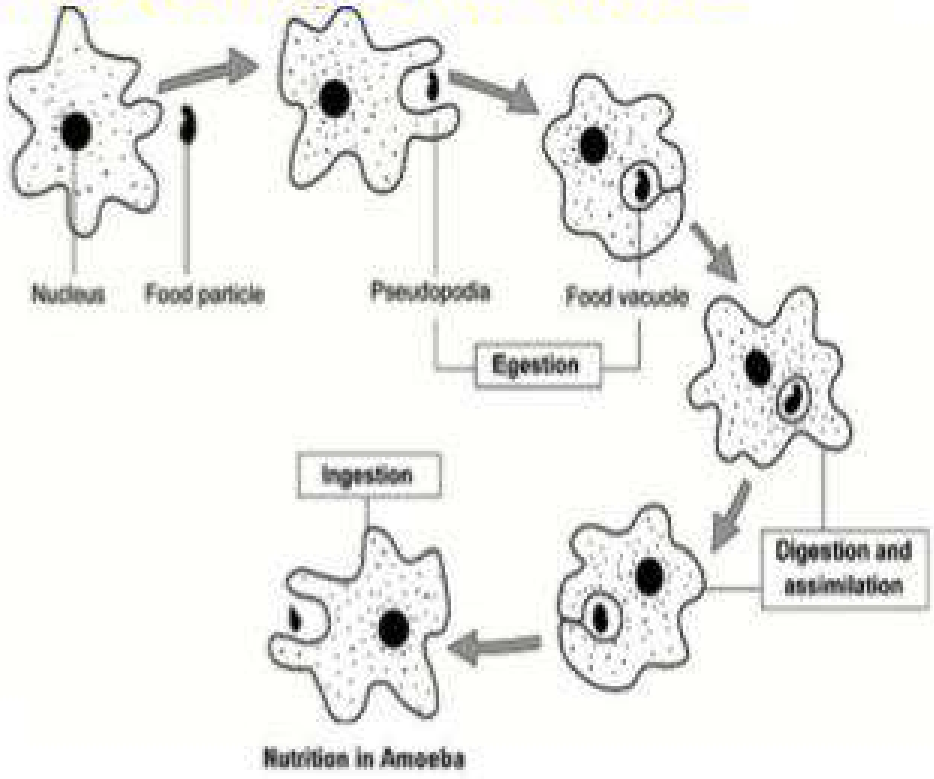


5) Feeding and digestion in amoeba :-

Amoeba is a single celled organism found in pond water. The cell has a cell membrane, cytoplasm and a nucleus. The cytoplasm has many bubble like vacuoles. The cell has finger like projections called pseudopodia or false feet which helps it to move and capture food.

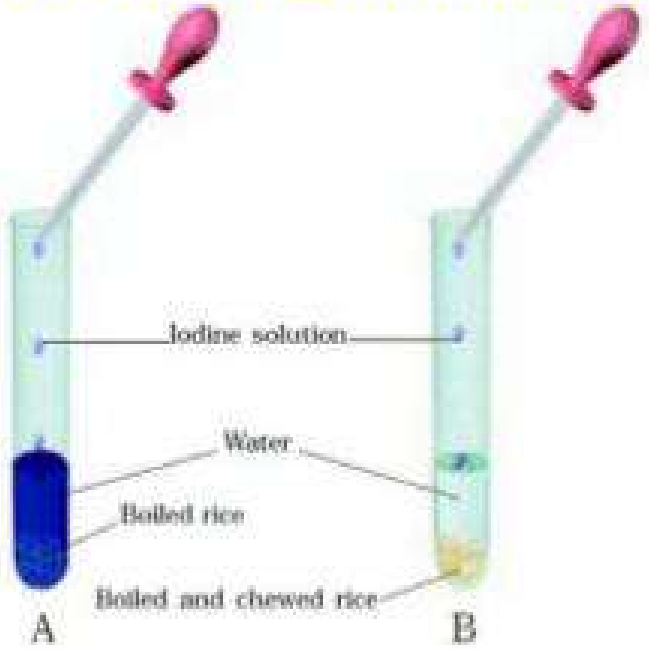
When amoeba comes near food particle, pseudopodia is produced around the food particle. The food particle is trapped in a food vacuole. In the food vacuole the food is digested by digestive enzymes and absorbed. The undigested waste is then sent out by the vacuole.





Effect of saliva on starch :-

Take two test tubes. In one test tube put some boiled rice. In the other test tube but some boiled rice after chewing for 3 – 5 minutes. Add some water to both the test tubes. Then pour 2 – 3 drops of iodine solution in each test tube. The boiled rice turns blue black due to presence of starch. The chewed rice does not turn blue black because the saliva converted the starch into sugar.

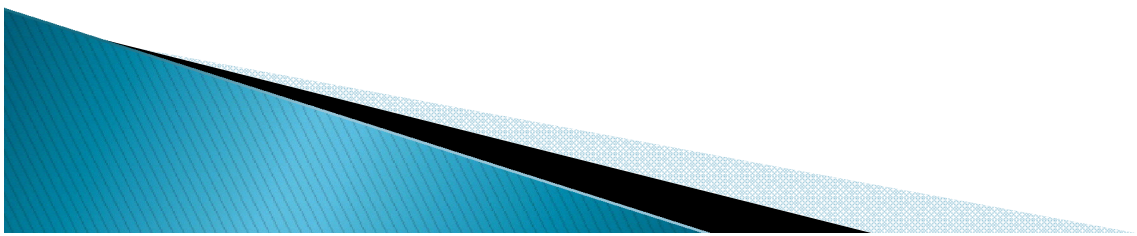


Recapitulation

- Asking them question related to the topic or make them to solve the worksheet.
- Recapitulation of topic.
- Oral drilling of key terms.

Weekly Test

- Key terms
- Define the terms
- Answer in one word
- Answer in one sentences
- Answer in brief



Remedial

- Additional Measure taken for slow learner
- Extra class can be conducted.
- Give them more general example to understanding.
- Again show them video and boost them to do well