Class 7 Biology Nutrition in Animals

Introduction

Introduction

Animals cannot prepare their own food like plants. They depend upon plants either directly or indirectly for food.

- **Herbivores** are those which directly eat plants.
- **Carnivores** are those which eat herbivores i.e. other animals.
- **Omnivores** are those which eat both plants and animals.

Types of animals depending on their mode of nutrition	Examples
Herbivores	
Carnivores	
Omnivores	

- Animal nutrition includes nutrient requirement, mode of intake of food and its utilization in the body.
- Each and every animal requires food for energy to perform various activities like running, walking, jumping, reading etc.
- This energy is obtained from the food they eat. In order to obtain energy, the food that they eat need to be digested and then assimilated.

Digestion is the process of breakdown of complex components of food substances into simpler form.

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Class 7 Biology Nutrition in Animals — Different modes of taking food

Different modes of taking food

Different organisms take food in various ways. Some of the modes are sucking, scraping, chewing, brewing, capturing and swallowing etc.

The table below shows different modes of taking of food by different organisms:

Name of animal	Kind of food	Mode of feeding
Bees	Nectar	Sucking
Snakes	Rats	Swallowing
Snail	Grass	Chewing
Ants	Insects	Scraping
Housefly	Decaying matter	Brewing
Lice	Blood	Sucking
Butterfly	Nectar	Sucking

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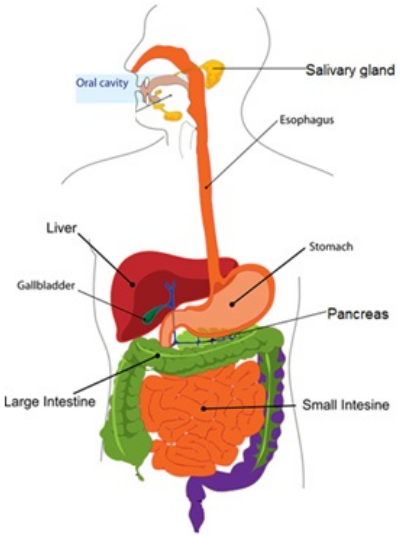
From the above table we can know different animals have different modes of taking their food.

Now we will study in detail about nutrition in humans i.e. their mode of taking food, digestion and assimilation of food and finally removal of undigested food.

Class 7 Biology Nutrition in Animals — Digestion in humans

Digestion in humans

- Humans take food through mouth, digest the food and finally the undigested food are removed from the body.
- The food passes from oral cavity and finally the undigested food is defecated through anus.



- It is a complex process involving following steps:

Ingestion
Ingestion refers to the intake of food
Ingestion takes place through Mouth

Digestion
Digestion refers to the breakdown of ingested food into simpler forms
Teeth, Stomach, Small intestine and secretion from various glands help in Digestion

Absorption
Absorption refers to the process in which digested food in absorbed in to the body fluids (Blood & lymph)
Small intestine plays a major role in Absorption

Assimilation
Assimilation refers to the process in which absorbed food is transported to different cells of the body

Egestion
Egestion refers to the process of removal of undigested food from the body
Large intestine plays a major role in Egestion

Parts of digestive tract in humans

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The digestive tract in humans starts from mouth and ends at anus. It is also called as the alimentary canal.

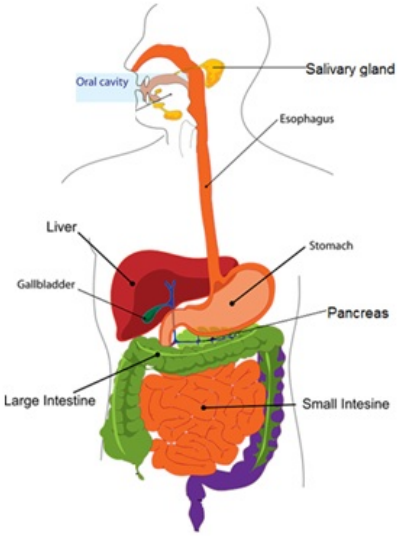

Fig: Human Digestive tract

The parts of digestive tract are:

- Mouth and buccal cavity
- Food pipe/Oesophagus
- Stomach
- Small intestine
- Large intestine
- Rectum
- Anus

There are some associated glands that secrete enzymes which help in digestion of food. These include:

- Salivary glands
- Liver
- Pancreas

The digestive tract and the associated glands together constitute**digestive system**.

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Class 7 Biology Nutrition in Animals — Mouth and Buccal cavity

Mouth and Buccal cavity

- We take the food through our mouth.
- **Ingestion**: It is the process of taking food into the body.
- **Salivary glands**: Our mouth has three pairs of salivary glands. They secrete saliva.
- **Saliva**: Saliva acts upon starch and break down into sugars.

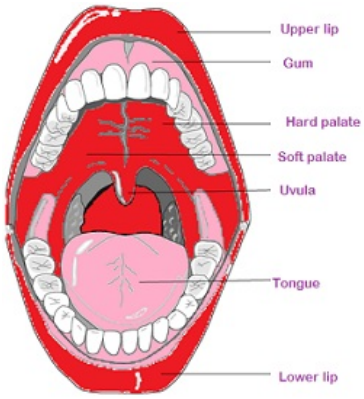

Fig: Mouth showing teeth and tongue

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Class 7 Biology Nutrition in Animals — Teeth and its types

Teeth and its types

- Teeth help in chewing our food.
- Each tooth is placed in separate sockets in the gums.
- There are different types of teeth which perform different functions.
- There are two sets of teeth, one set is called **milk teeth which** grow during infancy and they fall between age of six to eight years.
- Second set of teeth is called **permanent teeth which** replace milk teeth and they remain throughout our life. They fall during old age.

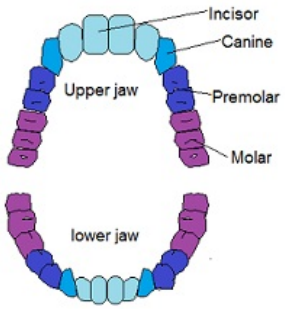

Fig: Different types of teeth

Types	Functions	Number in each jaw
Incisors	Cutting and biting	4
Canine	Piercing and tearing	2
Premolars	Chewing and grinding	4
Molars	Chewing and grinding	6

Tooth decay:

- Improper cleaning of teeth leads to growth of harmful bacteria which produce acids from the left over food present in our mouth, which damages our teeth leading to tooth decay.
- We can avoid it by brushing teeth twice a day, rinsing our mouth properly after meals, avoiding uptake of sweets, dental floss etc.

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Class 7 Biology Nutrition in Animals Experiment to show the effect of saliva on starch

Experiment to show the effect of saliva on starch

- Two test tubes were taken and were labeled A and B.
- In test tube A one teaspoon full of boiled rice was kept.
- In test tube B one teaspoon full of boiled rice which were chewed for 3-5 minutes were kept.
- 3-4 ml of water was added to both the tubes.
- Then 2-3 drops of iodine solution was added to both test tubes A and B.

Observation:

- The test tube A shows blue – black colour whereas test tube B does not show this colour.

Conclusion:

- Since test tube B has boiled rice which were chewed for 3-5 minutes, the saliva present in mouth has acted upon starch to break down into sugars. So it does not show any colour in presence of iodine solution.
- Boiled rice in test tube A has not been exposed to saliva, so starch is present which is indicated by blue-black colour on addition of iodine solution.

Tongue

- Tongue is a fleshy muscular organ which is free at its front end and is attached at the back of the floor of buccal cavity.
- It can move in all directions.

Functions:

- It mixes saliva with food while chewing.
- It plays an important role while talking.
- The taste of the food can be known due to different taste buds present in our tongue.
- It helps in swallowing our food.

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Class 7 Biology Nutrition in Animals Experiment to identify the position of taste buds

Experiment to identify the position of taste buds in tongue of humans

- Four different solutions were made – sugar solution, salt solution, solution of neem leaf juice and lemon juice.
- Four clean ear buds were taken which were dipped inside the above solutions separately.
- These buds were then rubbed on different areas of tongue separately.

Observation:

- The bud dipped in sugar solution taste sweet at the tip of the tongue.
- The bud dipped in salt solution tastes salty at the area just behind the tip of the tongue.
- The bud dipped in lemon juice tastes sour at the two sides of the tongue.
- The bud dipped in neem juice tastes bitter at the back portion of the tongue.

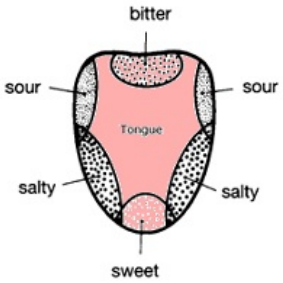

Fig: Different taste buds located on tongue

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Oesophagus

Oesophagus

- Oesophagus is also called the food pipe.
- It runs along the neck and the chest.
- The food from mouth after swallowing passes into oesophagus and is pushed down to stomach by a special movement called peristalsis.
- This peristaltic movement takes place through out the alimentary canal which pushes the food in downwards direction.
- At some times the stomach is not ready to take up food causing vomiting, where food is expelled out from the oesophagus to mouth by reverse peristaltic movement.

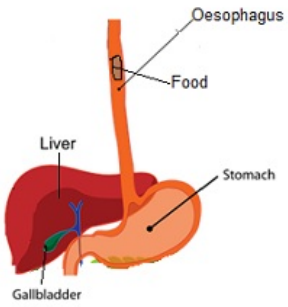

Fig: Food passing through oesophagus into stomach

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Stomach

Stomach

- Stomach is a flattened U shaped thick walled bag and widest part of the alimentary canal.
- It receives food from oesophagus at one end and pushes the food down into small intestine at the other end.

Fig: Stomach

Functions of stomach:

- The inner lining of stomach secretes mucous, hydrochloric acid and digestive juices.
- Mucous protects the lining of stomach.
- HCl makes the medium acidic so that digestive enzymes can perform their functions.
- Mainly protein digestion occurs in stomach.
- HCl also kills the bacteria that may have enter along with the food we eat.
- The digestive juices break down proteins into smaller substances.

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Class 7 Biology Nutrition in Animals — Small intestine

Small intestine

- Small intestine is the longest part of alimentary canal which is highly coiled and about 7.5 metres long.
- It secrets intestinal juice. It also receives bile juice from liver and pancreatic juice from pancreas.

Functions of small intestine:

- The intestinal juice secreted by small intestine completes the digestion of carbohydrates, proteins and fats present in food mainly in the lower part of small intestine.

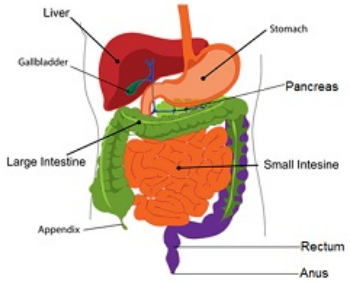

Fig: Showing Small intestine and surrounding organs

Liver:

- It is a reddish brown gland situated on the right side in the upper part of the abdomen.
- It is the largest gland of our body.

Functions of liver:

- It secretes bile juice which play an important role in digestion of fats.

Gall bladder:

- Bile juice is stored in a sac like structure called gall bladder.

Pancreas:

- It is a cream coloured gland located just below stomach.

Functions of pancreas:

- It secretes pancreatic juice which acts upon carbohydrates, proteins and convert them into simpler form.

End products of digestion:

- Proteins get converted into amino acids.
- Fats get converted into fatty acids and glycerol.
- Carbohydrates get converted into simple sugars like glucose.

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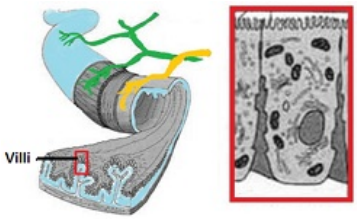
Class 7 Biology Nutrition in Animals — Absorption in small intestine

Absorption in the small intestine

- Absorption is the process by which digested food passes through the blood vessels in the wall of intestine.
- The inner wall of small intestine has finger like projections called villi which increases the surface area for absorption of food.



- The digested food is then transported to different organs of the body through blood vessels.

Assimilation:

- It is the process by which digested food that are absorbed by walls of intestine are carried out to different organs of the body through blood vessels to build complex substances such as proteins that is required by our body.
- The energy that is required by our body is obtained by breaking down of glucose in the cells by the help of oxygen.
- The unabsorbed and undigested food passes into large intestine.

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Large intestine

Large intestine

- It is wider and shorter than small intestine which is about 1.5 metre length.

Function:

- It absorbs water and some salts from the undigested food that comes from small intestine and thus the semi-solid waste material [faeces] formed passes into
- This process of removal of faeces [semi-solid waste material] from rectum through anus from time to time, is termed as Egestion

Diarrhoea:

- Diarrhoea refers to the condition in which there is frequent passing of watery stools is called diarrhea.
- It is very common in children, mainly in India.
- Excessive water and salts from the body is lost.

Causes:

- Indigestion
- Infection
- Food poisoning

Treatment:

- ORS should be given to restore the lost water and salts from the body.

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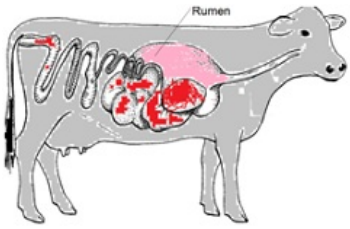
Digestion in grass eating animals

Digestion in grass eating animals

- Grass eating animals like cows, buffaloes are called**ruminants** because they have a separate part of stomach called rumen .They quickly swallow the grass and is stored in rumen where it is partially digested forming **cud**.
- **Rumination** is the process by which cud returns to the mouth in small lumps and then the animal chews it.
- Grass contain cellulose which is digested by special bacteria present in a sac like structure located between small intestine and large intestine.



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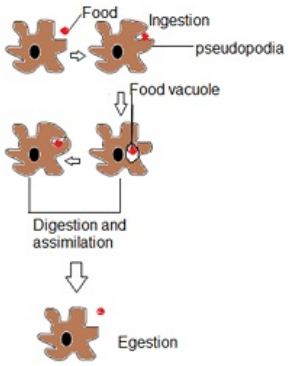
Class 7 Biology Nutrition in Animals Mode of feeding and digestion in amoeba

Mode of feeding and digestion in amoeba

- Amoeba is a microscopic single-celled organism found in pond water which has a cell membrane, a round, dense nucleus and many bubble like vacuoles.
- The shape of amoeba is variable.
- It has tiny finger like projections called **pseudopodia** or false feet for movement and capture of food.
- It eats tiny organisms by spreading out its pseudopodia around its food particle and then engulfing it.
- The food gets trapped inside **food vacuole**, into which digestive juices are secreted and convert them into simpler substances.
- The digested food is then absorbed which is required for growth, maintenance and multiplication.
- The undigested food is expelled out by vacuole.



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