

CH-2 NUTRITION IN ANIMALS

Animal Nutrition is a process of taking food by an organism and its digestion, absorption and utilisation in the body.

DIFFERENT STEPS IN THE PROCESS OF NUTRITION:--

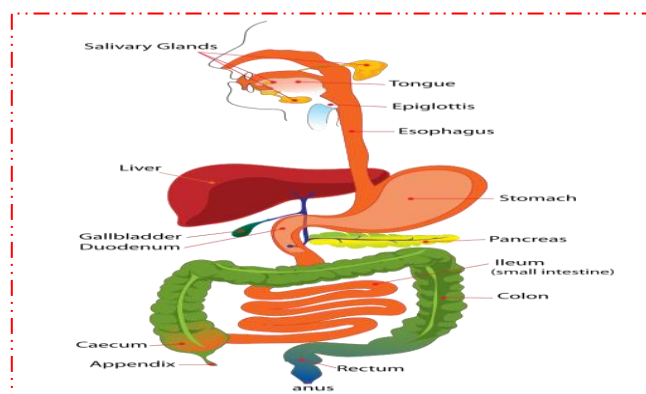
Steps involved Holozoic nutrition

- **Ingestion:** Taking in complex organic food through mouth opening.
- **Digestion:** Change of complex food into simple form by action of enzymes.
- **Absorption:** Passing of simple, soluble nutrients through blood or lymph.
- **Assimilation:** Utilization of absorbed food for various metabolic processes.
- **Egestion:** Expelling out the undigested food



DIGESTION IN HUMANS:--

Human digestive system



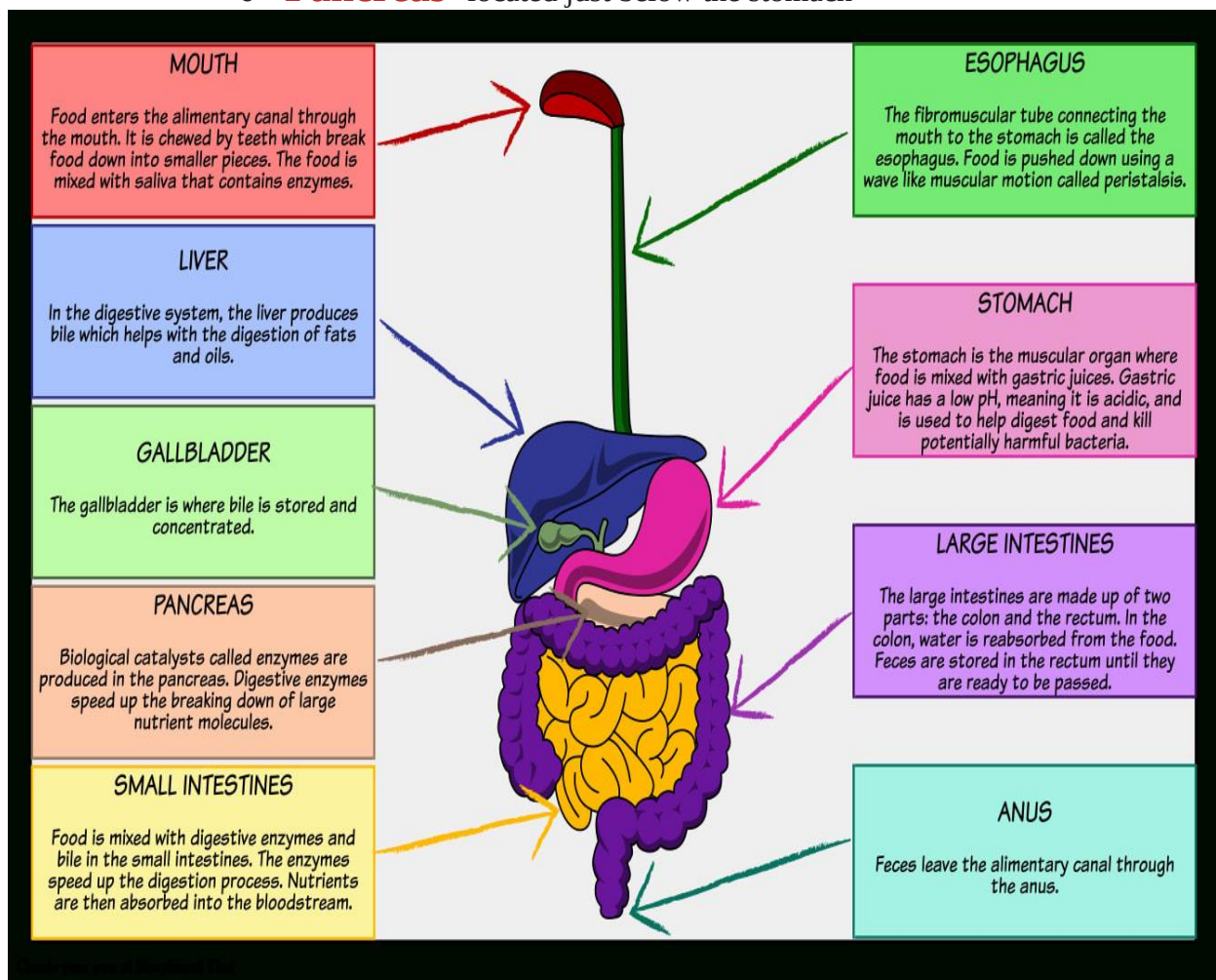
- Human digestive system consists of alimentary canal and its associated human digestive system glands.

- **Various organs of human alimentary canal in sequence are:**

- Mouth (Buccal Cavity)
- Oesophagus (food Pipe)
- Stomach
- Small intestine
- Large intestine
- Rectum
- Anus

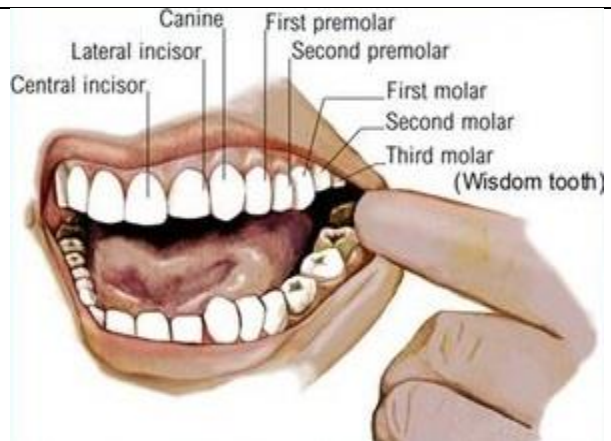
- **The glands which are associated with human digestive system are**

- **Salivary glands**- Located in mouth or Buccal Cavity
- **Liver**- It is the largest gland situated in the upper part of abdomen on the right side.
- **Pancreas**- located just below the stomach



1) Buccal Cavity:--

- We take food through our mouth and the process of taking food into the body is called **ingestion**.
- The mouth or **buccal cavity** contains teeth, tongue and salivary glands.
- Digestion begins in the mouth when we chew the food with the help of our teeth.
- The teeth cut the food into smaller pieces, chew and grind it.

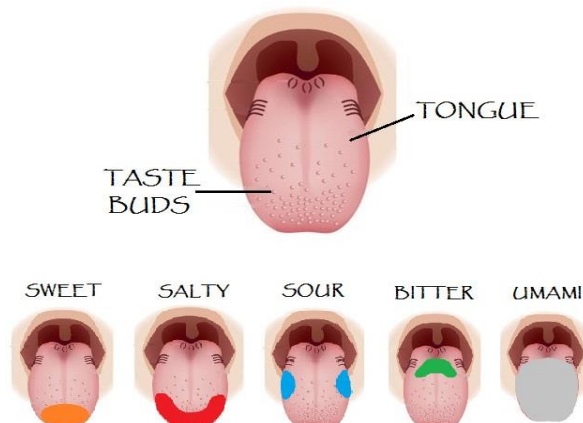


a) Teeth:-- There are four types of teeth. The incisors, canines, premolar and molars.

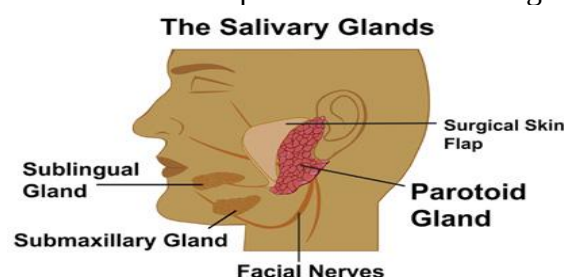
- ✓ **Incisors:--** help in biting and cutting the food.
- ✓ **Canines:--** help in piercing and tearing the food.
- ✓ **Premolar and molars:--** help in chewing and grinding the food.

b) Tongue:--

The tongue is a fleshy muscular organ attached at the back to the floor of the buccal cavity. It has several taste buds that can distinguish four types of tastes of food—**Salty, sour, bitter and sweet**.



c) Salivary glands:-- They produce **Saliva**. The saliva contains enzyme, called **amylase** that breaks down the starch present in food into sugars.



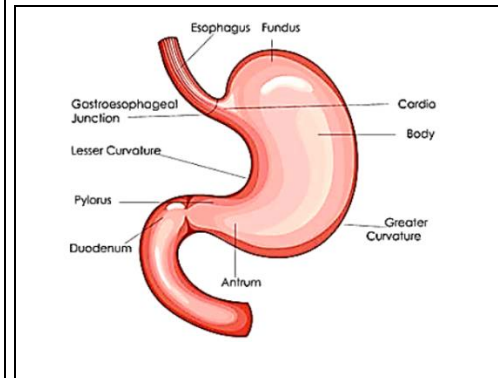


2) Oesophagus:--

- The food pipe starts from the neck region and runs until the chest area in animals.
- The food, when chewed, moves through the food pipe and reach the stomach through this path.
- The food moves in downward direction in the food pipe.

3) Stomach:--

- it is the widest part of the alimentary canal.
- It's a bag like structure in a flat j shape.
- The stomach's inner lining produces three things:
 - **Mucous:** It protects the stomach lining
 - **Hydrochloric Acid:** It kills the bacteria present inside the stomach and activates the digestive juices
 - **Digestive Juices:** They help in digestion of the food by breaking down the proteins present in the food into simple substances (olympiads)



4) Small Intestine:--

Small Intestine

- Small intestines are roughly **7** meters long
- Lining of intestine walls has finger-like projections called **villi**, to increase surface area.
- The villi are covered in **microvilli** which further increases surface area for absorption.

The Digestive System

Villi INCREASE THE SURFACE AREA

NOTE: THE VILLUS IS MADE UP OF PLASMA CELLS

CAPILLARY NETWORK

LACTEAL

FOUNDED IN THE SMALL INTESTINE

EACH CELL IN THE VILLUS HAS MICROVILLI ON ITS SURFACE

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5) Large Intestine:--

Large Intestine

- Relative short length (1.5m), but wide
- Comprised of colon & rectum
- Accessory- appendix
- Primary functions
 - Absorption of water & electrolytes
 - Absorption of vitamins (bacteria)
 - Liberated by resident bacterial flora
 - Vit B & K
 - Compaction & elimination of waste
- Indigestible material= feces
- Rectum- storage

❖ GLANDS AND THEIR SECRETIONS:--

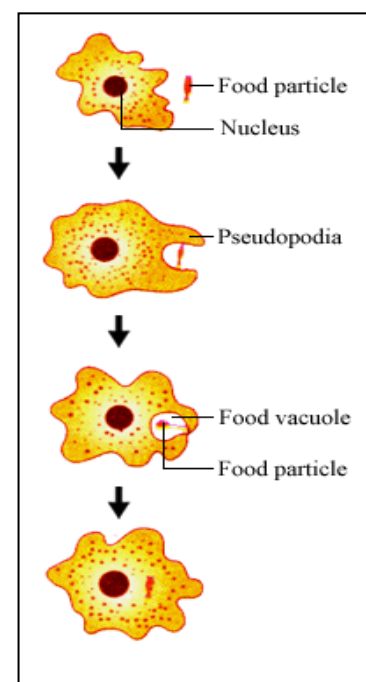
TABLE : SUMMARY OF DIGESTION ENZYMES OF VARIOUS GLANDS WITH THEIR SECRETIONS AND END PRODUCTS OF DIGESTION IN MAN

S.No.	Name of gland	Secretion	Site of action	Enzymes	Food acts upon	End product
1	Salivary glands	Saliva	Buccal cavity	Salivary amylase	Starch	Maltose
2	Gastric glands	Gastric Juice	Stomach	Pepsin	Proteins	Peptones & proteoses
				Renin	Casein of milk	Paracasein
		HCl	Stomach	—	Pepsinogen	Pepsin
3	Liver	Bile	Duodenum	—	Fats	Emulsification of fats
4	Pancreas	Pancreatic Juice	Duodenum	Amylase Trypsin Lipase	Starch & Glycogen Proteins Emulsified fats	Maltose & Isomaltose Peptones & peptides Fatty acids & glycerol
5	Intestinal glands	Intestinal Juice	Small intestine	Erepsin Maltase Sucrase Lactase Lipase	Peptones & Peptides Maltose Sucrose Lactose Triglycerides	Amino acids Glucose Glucose & fructose Glucose & galactose Monoglycerides & fatty acid
		Mucous	Large intestine	—	Lubrication of faecal matter	—

❖ NUTRITION IN AMOEBIA:--

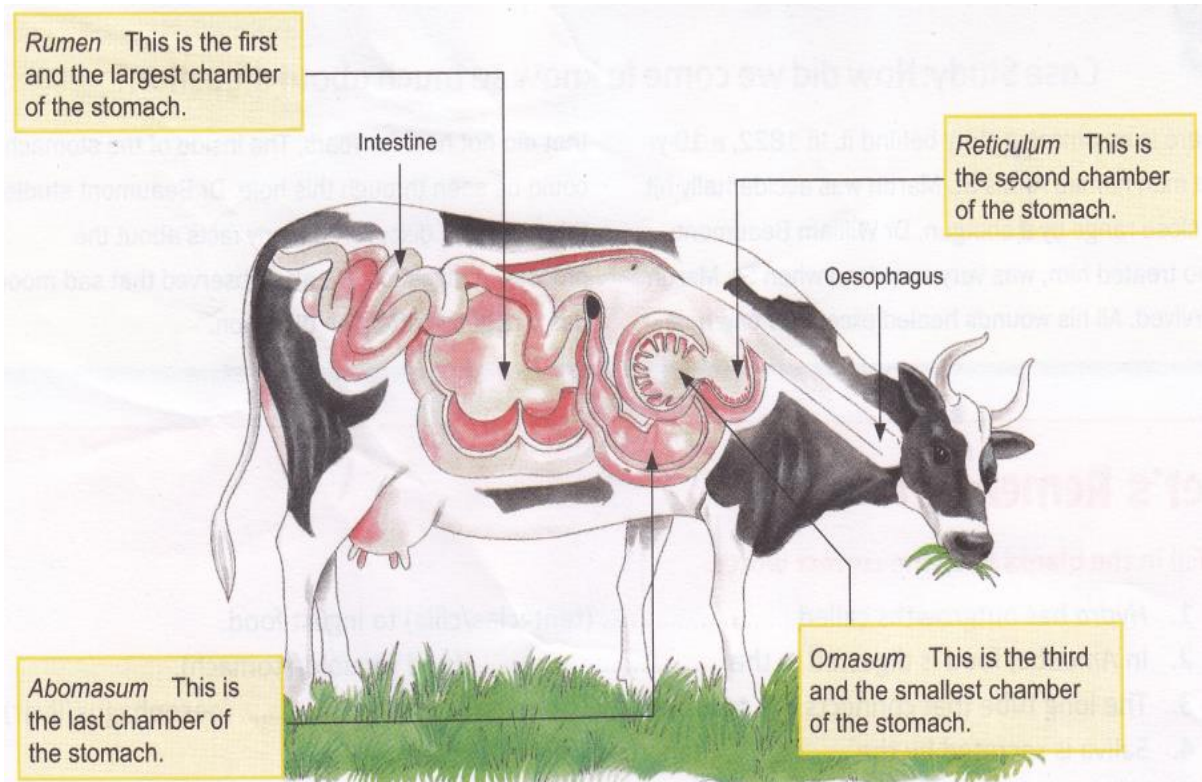
NUTRITION IN AMOEBIA

- Amoeba is a unicellular animal which feeds on microscopic animals and plants that float in a water body.
- The mode of nutrition in amoeba is holozoic.
- The process of obtaining food in amoeba is termed as phagocytosis.
- The various steps of nutrition are ingestion, digestion, assimilation and egestion.



❖ NUTRITION IN RUMINANTS:--

Certain animals such as cows, buffaloes, quickly gather their food and then move to a safer place and bring the food back into the mouth and chew it. This process of chewing the food is called **rumination** and animals are called **ruminants**.



MIND MAP :-

