NORTH POINT SENIOR SECONDARY BOARDING SCHOOL
ARJUNPUR

CLASS – 7

SUBJECT- SCIENCE (BIOLOGY)

CHAPTER: NUTRITION IN ANIMALS

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A few glands are also associated with the alimentary canal. These are the salivary glands, the liver and the pancreas. These glands secrete digestive juices which convert complex food substances into simpler ones.

The alimentary canal and the associated glands together constitute the ***digestive system.***

Food is taken into the body through the mouth. *This process of taking food into the body is called* ***ingestion.***

Do you know?
We eat about 500 kg of food per year.

2.3.1 Mouth

The mouth contains the **tongue**, **teeth** and **salivary glands**. It is interesting to know that digestion begins in the mouth itself. The teeth help in breaking bigger food particles into smaller pieces by the process of **chewing** or **mastication**. This is a mechanical process.

Saliva

- It is the watery substance secreted by salivary glands in the mouth.
- It contains 99% water. It also contains digestive enzymes.
- 1.7 litres of saliva is produced each day.

The tongue helps in mixing saliva with the food. **Saliva** is the watery substance that is present in the mouth. It is secreted by the three pairs of salivary glands (Fig. 2.5). The juices present in saliva help in chemical digestion of starch into sugars. After the food is broken down into smaller pieces and mixed with saliva, it is swallowed down the digestive system and enters the **food pipe** or **oesophagus**.

Salivary Glands

Salivary glands in mammals produce saliva. They also secrete amylase, an enzyme that breaks down starch into glucose. In other organisms such as insects, salivary glands are often used to produce biologically important proteins like silk or glues.

Saliva is an alkaline digestive juice. It moistens our mouth and helps to protect our teeth from decay.

Before we go further, let us learn more about the teeth and the tongue.

Teeth: Teeth are located in our jaws (lower and upper) in the mouth cavity. They are fixed to the gums. Based on the structure and function, teeth are of four types: **incisors**, **canines**, **premolars** and **molars** (Fig. 2.6). Table 2.1 on the next page gives the type and number of teeth in humans.

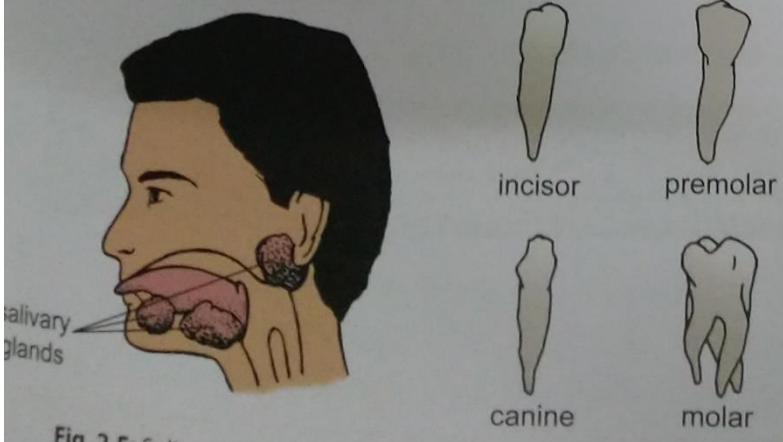


Fig. 2.5: Salivary glands in humans

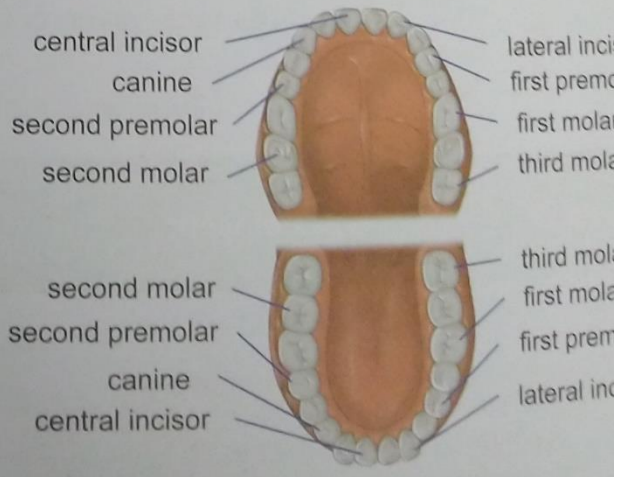


Fig. 2.6: Different types of teeth in humans and their arra

S. No.	Types of teeth	Number of teeth		Total number of teeth	Function
		Lower jaw	Lower jaw		
1.	Incisors (teeth located in front)	4	4	8	Cutting and biting food
2.	Canines (sharp teeth on either side of incisors)	2	2	4	Piercing and tearing food
3.	Premolars (on either side of canines)	4	4	8	Chewing and grinding foo
4.	Molars (on either side of premolars)	6	6	12	Chewing and grinding foo

Dentition
It is the arrangement of teeth in the jaws.

Thus, there are 16 teeth in each jaw, with a total of 32 te in the mouth cavity. However, in young people, there a total of 8 molars in all. The second set of 4 molars deve at the age of 18 or more. These are called the **wisdom te**

Activity 2.3 (Study)

To study the type and number of teeth in humans

Stand in front of a mirror and count your teeth with the help of your index finger. Take care to wash hands before starting this activity.

- You will be able to feel the different types of teeth. Note down their number.
- Also, examine the teeth of your friends. Note down the number of different types of teeth in your frie mouth.
- Now, eat an apple. Try to find out which teeth are used for (i) biting and cutting, (ii) piercing and te and (iii) chewing and grinding the apple.

Record your observation in the table given below.

Type and number of teeth in humans

S. No.	Types of teeth	Number of teeth		Total
		Lower jaw	Upper jaw	
1.	Biting and cutting teeth			
2.	Piercing and tearing teeth			
3.	Chewing and grinding teeth			

Temporary Milk Teeth and Permanent Teeth

At birth, a human infant has no teeth. The first teeth appear after six months or so and fall off between 6 to 8 years of age. These are called **milk teeth** and they are temporary. There are 20 milk teeth.

Milk Teeth
The first set of 20 temporary teeth in a baby are milk teeth.

Milk teeth are replaced by permanent teeth at around the age of 6. Permanent teeth are 32 in number.

Tooth Decay

Have you heard your elders complaining about toothache or a cavity in their tooth? To prevent this, you are advised to brush your teeth every morning and also before going to bed at night.

There are certain bacteria present in our mouth and these are not harmful to us. When food is eaten, small amounts are left in between the teeth. If teeth are not cleaned after eating, many harmful bacteria present in the mouth start acting on the sugars in the leftover food. Acids are also released by the bacteria. These acids dissolve the minerals present in the teeth and thus damage the teeth. This damage to the teeth is called **tooth decay**. If not taken care of in time, **cavities** may form in the teeth.

What promotes tooth decay?

Consumption of sweets, chocolates, soft drinks and other sugar products are responsible.

What can be done to prevent tooth decay?

1. Avoid eating sugar products like sweets, chocolates and soft drinks in too much quantity.
2. Clean your teeth with a brush and dental floss at least twice a day. Rinse the mouth with clean water after every meal.

Tongue: Tongue, a fleshy muscular organ, is attached at the back and free at the front. It can be moved in all directions. It performs the following functions:

- It helps in mixing the chewed food with saliva.
- It helps in swallowing food.
- It helps to detect different tastes of food, with the help of **taste buds**.

Taste buds present on the tongue can detect four basic tastes—salty, sour, sweet and bitter (Fig. 2.7). These tastes can be identified in different areas on the surface of the tongue.

Fig. 2.7: Location of taste buds on the to

Classroom Discussion

Which taste will you not be able to id
if you burn your tongue from the ti

2.3.2 Oesophagus (Food Pipe)

The swallowed food passes from the mouth to the stomach through a passage or pipe called the **food pipe** or **oesophagus**. The food pipe runs along the neck and the chest.

Food is pushed down by the movements of the wall of the food pipe (Fig. 2.8). No digestion takes place here.

At times, the food is not accepted by the stomach. This results in vomiting.

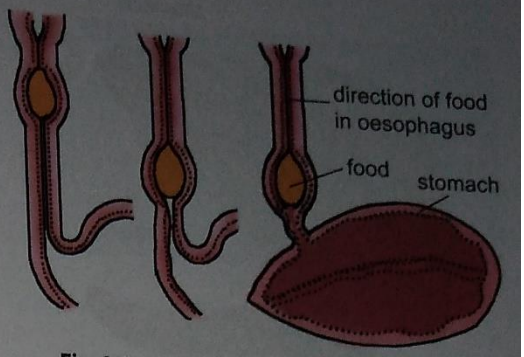


Fig. 2.8: Movement of food in oesophagus

2.3.3 Stomach

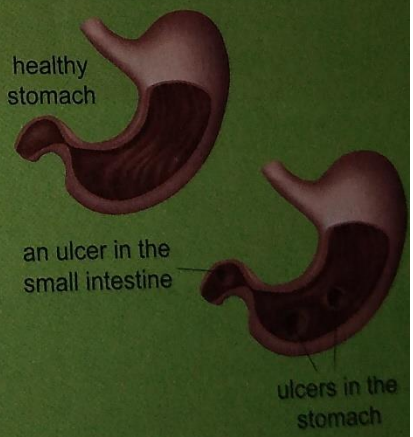
Stomach is a thick-walled flattened bag present in the upper abdomen. It is the widest part of the alimentary canal and receives food from the food pipe.

The inner lining of the stomach secretes mucus, hydrochloric acid and digestive juices performing the following functions:

- The **mucus** protects the inner lining of the stomach.
- The **acid** kills bacteria which enter along with the food and also makes the medium acidic, so that the digestive juices can act.
- The **digestive juices** help to breakdown the **proteins** into simpler substances.
- The partially digested food from the stomach goes into the small intestine.

Do you know?

In certain abnormal cases, excess hydrochloric acid is produced and parts of the stomach wall get damage. This results in stomach ulcers.



2.3.4 Small Intestine

Small intestine is a highly coiled, about 7.5 metres long tube. Digestion of all types of food is carried out and completed here. Absorption of digested food also takes place in the small intestine. The absorbed food is passed into the blood system, through which the nutrients reach all parts of the body.

Digestion in small intestine is carried out with the help of

- secretions from the liver and pancreas.
- digestive juices secreted by the small intestine.

Liver: Liver, the largest gland in the body, is a reddish-brown gland located in the upper part of the abdomen on the right side. It secretes bile juice which helps in the digestion of fats. Bile juice is stored in a sac called the **gall bladder** (Fig. 2.9).

Key Fact

Small intestine, in fact, is larger length (about 7.5 metres) than t large intestine (about 1.5 metres

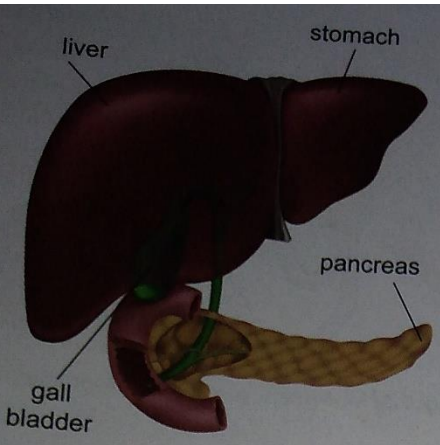


Fig. 2.9: Location of associated glands—liver and pancreas

Pancreas: This gland is cream-coloured and located just below the stomach (Fig. 2.9). The pancreatic juice acts on proteins, starch and fats and changes them into simpler forms.

As a result of digestion in the small intestine, all components of food are broken down into simpler forms as given below:

- Carbohydrates are broken down into simpler sugars such as glucose.
- Fats are converted into fatty acids and glycerol.
- Proteins are converted into amino acids.

Absorption in small intestine: The inner wall of the small intestine has a number of finger-like outgrowths called **villi** (singular villus). The villi increase the surface area for absorption of the digested food.

The villi have a network of very fine blood vessels (called **capillaries**). The food substances are absorbed by the villi and then transported through the blood vessels to different organs of the body. In the body, the absorbed food is incorporated into cell components. This is called **assimilation**.

The food that remains undigested and unabsorbed enters the large intestine.

2.3.5 Large Intestine

The large intestine is shorter in length (about 1.5 metres) but wider than the small intestine.

No digestion occurs here. Its main function is to absorb water from the undigested food material.

2.3.6 Rectum

The undigested waste from the large intestine passes into the rectum and is stored here as semi-solid faeces.

2.3.7 Anus

The faecal matter is passed out through an opening called the anus. The process is called **egestion**.

Appendix

- A small structure present at the junction of small intestine and large intestine (see Fig. 2.4).
- Plays no part in digestion but can become infected and swollen, causing **appendicitis**.

Do you know?

Within the colon a typical person harbours more than 400 distinct species of bacteria.

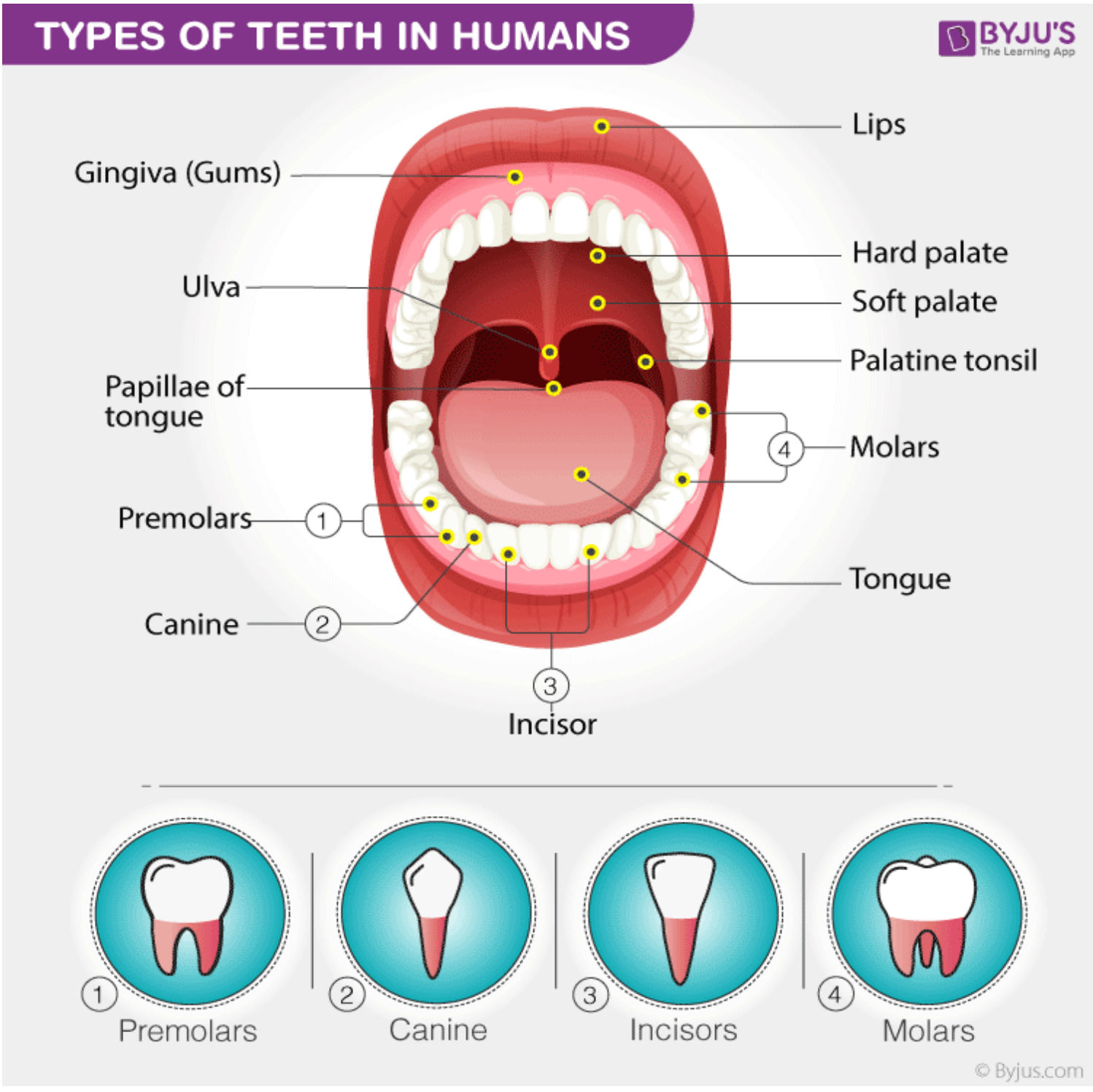
Cellulose

s one of the many polymers found nature. Wood, paper and cotton ntain cellulose.

2.4 NUTRITION IN GRASS-EATING ANIMALS

Food of grass-eating animals (herbivores) consists of plant materials, particularly grass. Grass is rich in a specific carbohydrate called **cellulose**. Humans and many other


TYPES OF HUMAN TEETH
Incisor
Canine
Premolar
Molar


TYPES OF TEETH IN HUMANS
BYJU'S
The Learning App
Lips
Gingiva (Gums)
Hard palate
Ulva
Soft palate
Palatine tonsil
Papillae of tongue
4
Molars
Premolars
1
Tongue
Canine
2
3
Incisor
1
Premolars
2
Canine
3
Incisors
4
Molars
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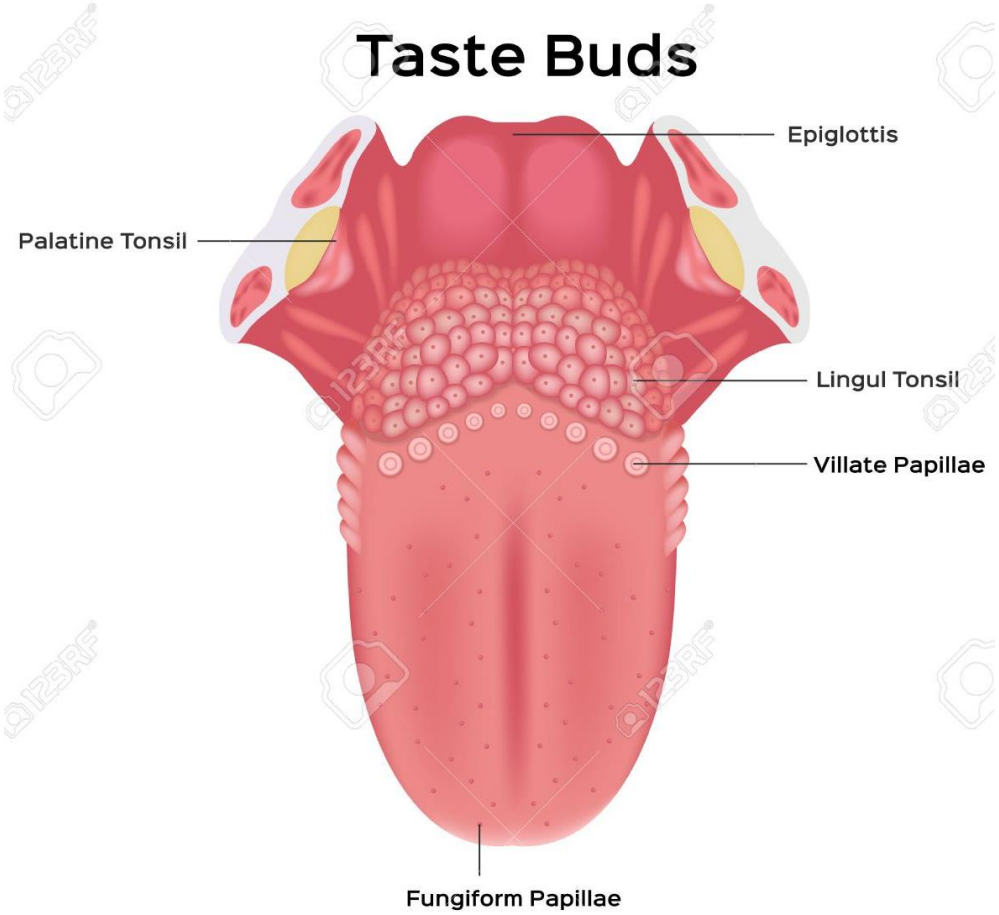
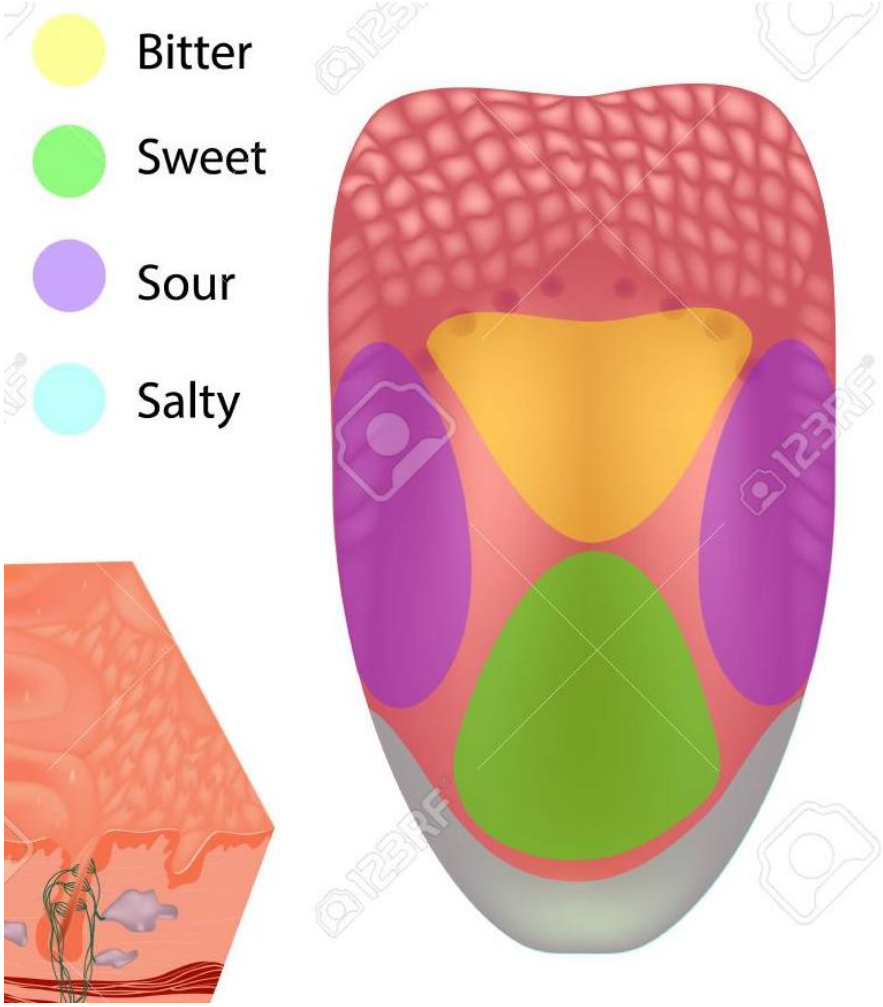
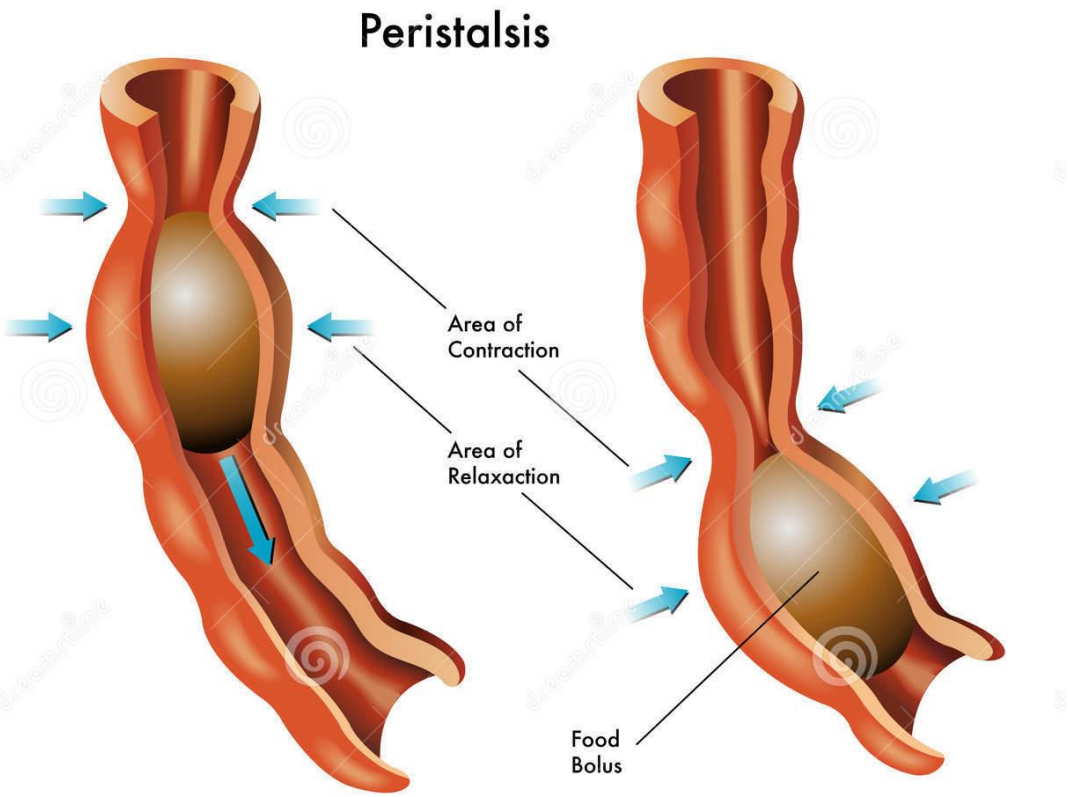
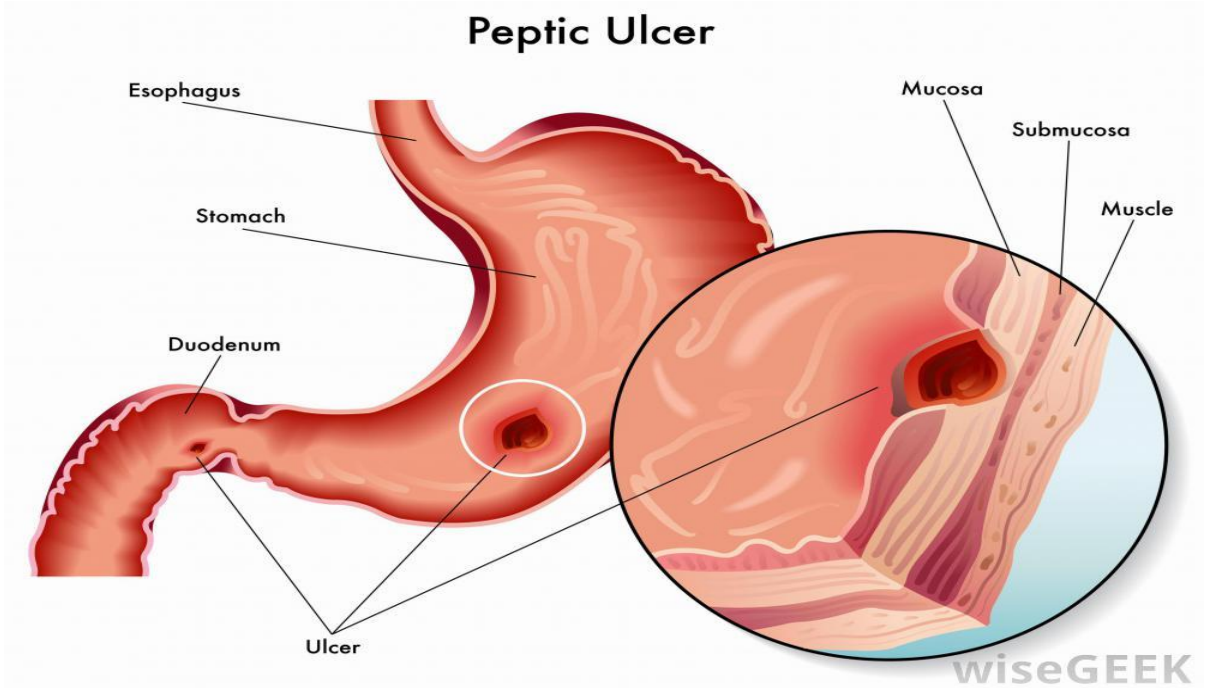
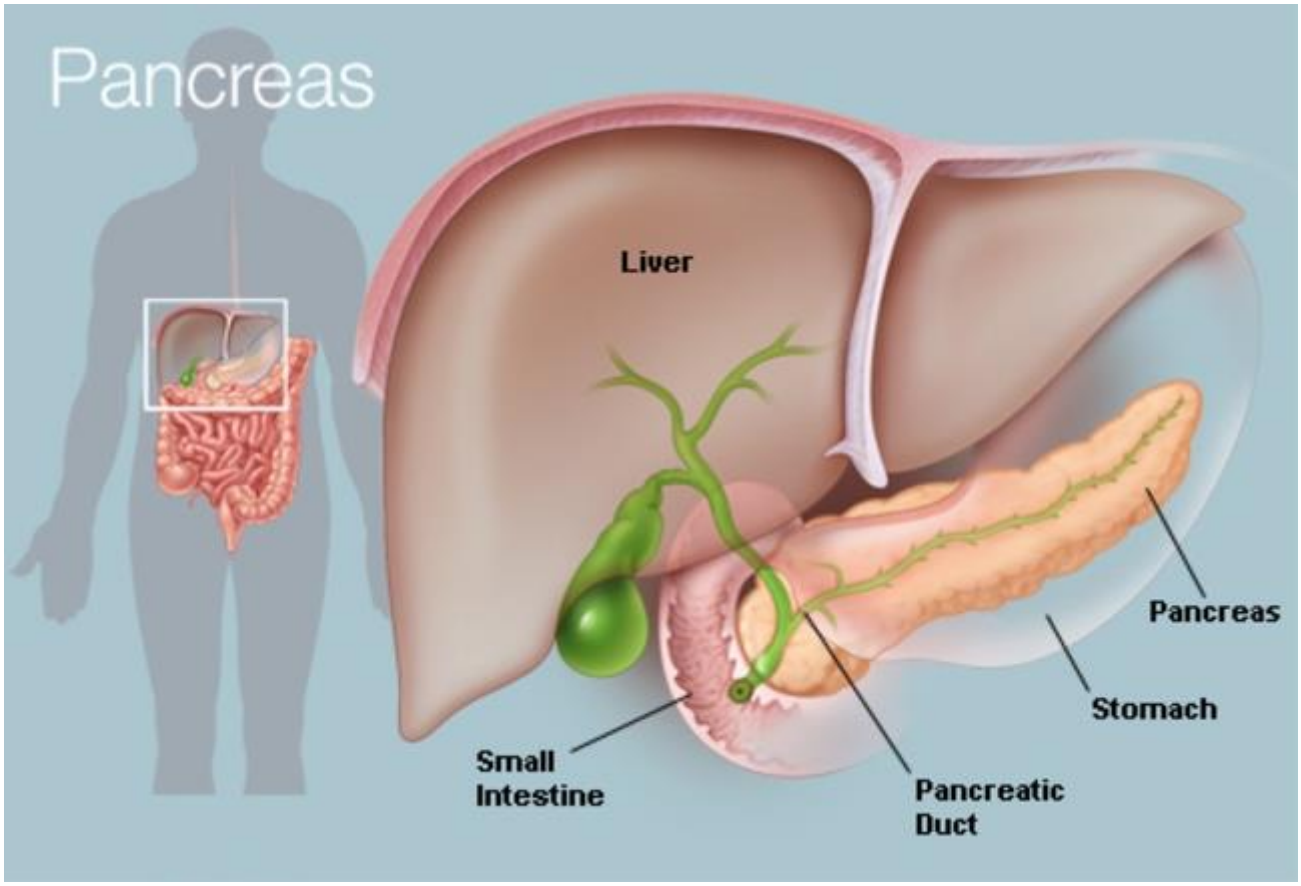
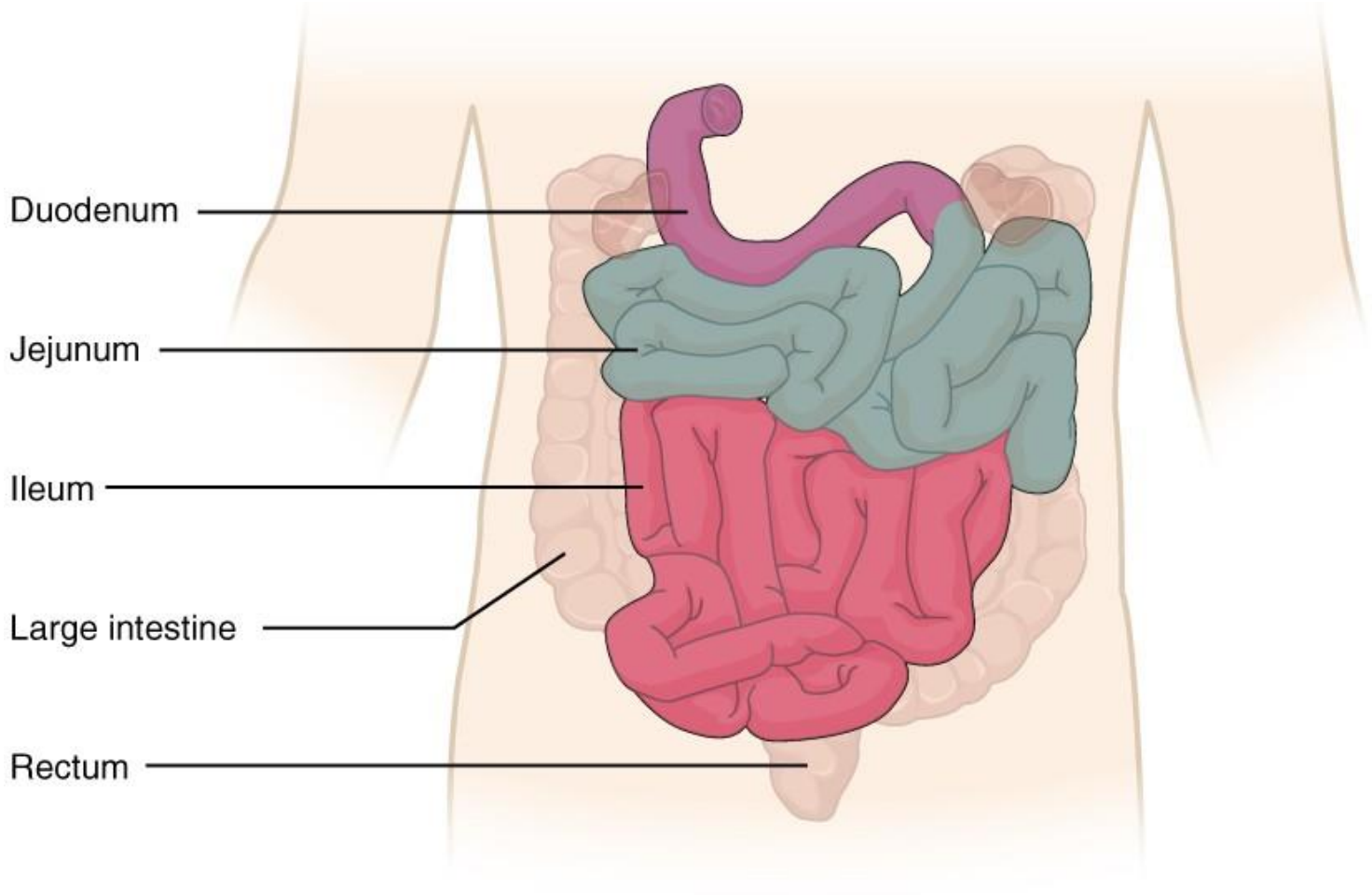

Taste Buds
Epiglottis
Palatine Tonsil
Lingul Tonsil
Villate Papillae
Fungiform Papillae

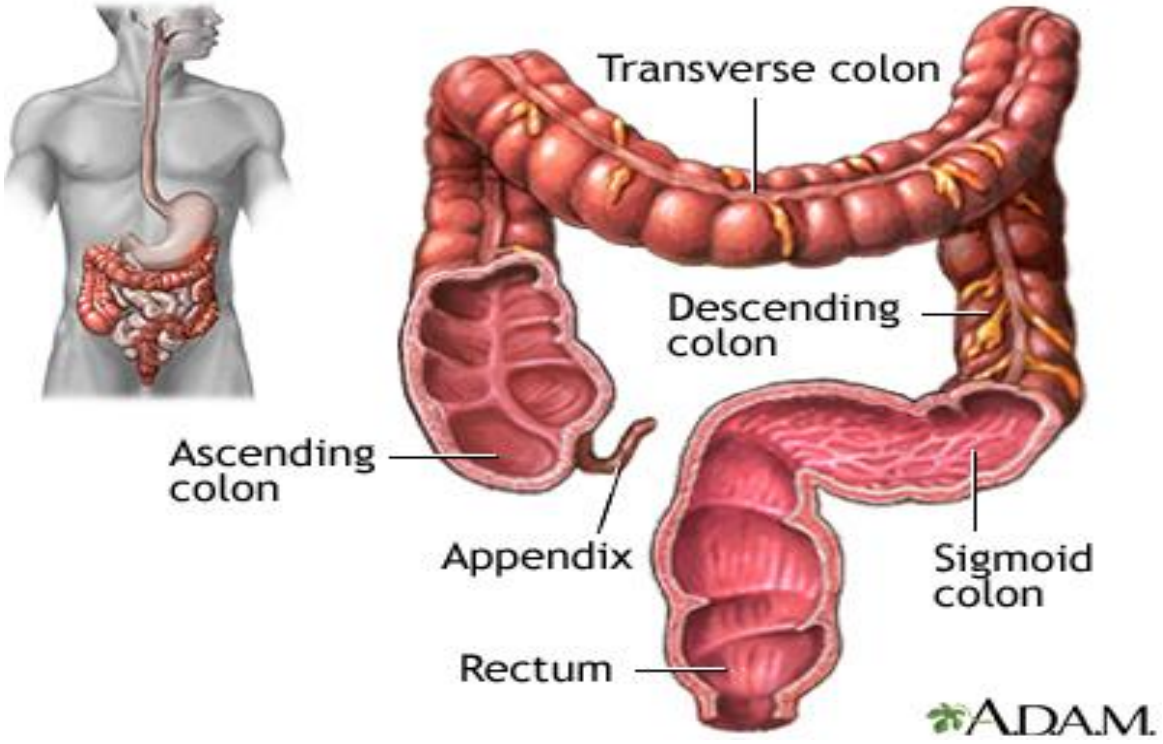

Bitter
Sweet
Sour
Salty


Peristalsis
Area of Contraction
Area of Relaxaction
Food Bolus


Peptic Ulcer
Esophagus
Stomach
Duodenum
Ulcer
Mucosa
Submucosa
Muscle
wiseGEEK


Pancreas
Liver
Pancreas
Stomach
Small Intestine
Pancreatic Duct


Duodenum
Jejunum
Ileum
Large intestine
Rectum



ASSIGNMENT 2 (NUTRITION IN ANIMALS)

1. NAME THE ORGANS WHICH ARE PRESENT IN ALIMENTARY CANAL.
2. NAME THE TWO COMPONENTS OF DIGESTIVE SYSTEM.
3. WRITE THE DIFFERENT PARTS OF MOUTH AND STATE THEIR FUNCTION.
4. WHAT ARE MILK TEETH AND HOW ARE THEY DIFFERENT FROM PERMANENT TEETH?
5. HOW DOES THE CAVITY FORM ?
6. DRAW A DIAGRAM TO SHOW THE LOCATION OF TASTE BUDS ON THE TONGUE AND WRITE THE FUNCTIONS PERFORMED BY TONGUE.
7. DESCRIBE THE DIFFERENT TYPES OF TEETH , THEIR NUMBERS AND STATE THEIR FUNCTION.