OESOPHAGUS-

Two apertures are fund in central part of Buccopharyngeal cavity.

- Ventral or lower aperture is called Glottis which is related to the Larynx. Which is guarded by
- The Dorsal and upper aperture is called gullet which open into oesphagus.
- Oesophagus is simple uniform tube which runs downward and pierces the diaphragm and finally opens into stomach.
- Longitudinal folds are found on the inner surface of Oesophagus.
- In it's lumen Digestive glands are absent, only mucous glands are present here.
- Voluntary muscles are found on the upper 2/3 part of Oesophagus while involuntary muscles are found in lower 1/3 part of oesophagus.
- The length of oesophagus depends on length of neck so the longest Oesophagus is present in Giraffe.

STOMACH

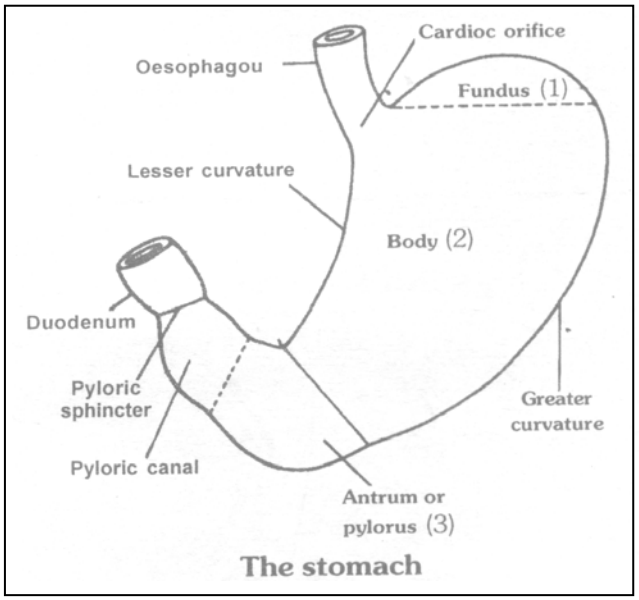
It is situated on left side of abdominal cavity. It is the widest part of alimentary canal. It is a bag like muscular structure, J shaped in empty condition.

The stomach is divided into three parts (Fundus, Body, Pylorus or anturum).

It has two orifieces (opening)

(i) **Cardiac orifice** is joined by lower end of the oesophagus.

(ii) **Pyloric orifice** opens into the duodenum. Mucous membrane of the stomach is thick, In empty stomach numerous longitudinal folds are found called rugae. They disappear when stomach is distended. Stomach is covered by layer of peritoneum. Fat tissues and lymph tissue deposits on the peritoneum. Such type of peritoneum are called Ommentum. Left curved surface of stomach is called greater momentum. Right curved surface of stomach is called lesser momentum.



The stomach

Gastric Glands :- These are numerous microscopic, tubular glands formed by the epithelium of the stomach. The following types of cells are present in the epithelium of the gastric glands.

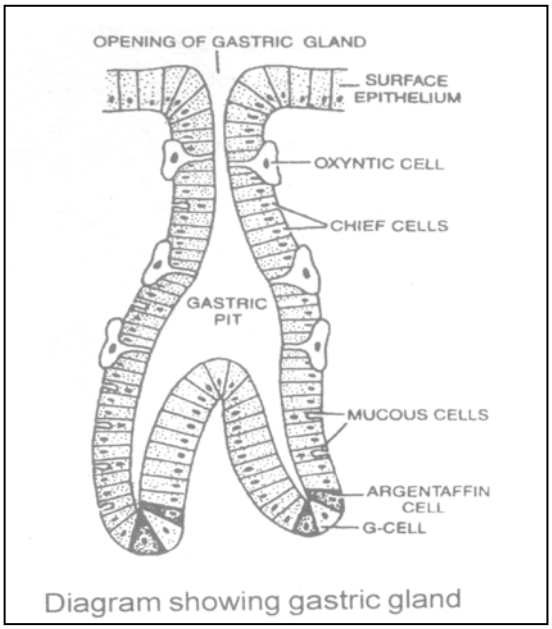


Diagram showing gastric gland

(i) Chief cells or Peptic cells (= Zymogen cells) ar usually basal in location and secrete gastric digestiv enzymes as proenzymes or zymogens; pepsinoge and prorennin. The chief cells also produce sma amount of gastric amylase and gastric lipas Gastric amylase action is inhibited by the highly aci condition. Gastric lipase contributes little t digestion of fat. Prorennin is secreted in youn mammals. It is not secreted in adult mammals.

(ii) Oxyntic cells (= Parietal cells) are large and ar most numerous on the side walls of the gastri glands.

They are called oxyntic cells because the stain strongly with eosin dye. They are called parietal cells as they lie against the basement membrane. They secrete hydrochloric acid and Castle intrinsic factor.

(iii) **Mucous cells** (= Goblet cells) are present through out eh surface epithelium and secrete sucus. The epighelium of gastric glands also has the following two parts of cells: Endorine cells are usually present in the basal parts of the gastric glands. These are argentaffin cells and G-cells. Argentaffin cells produce serotonin (its precursor is 5- hydroxyl-tryptamine, 5- HT), somatostatin and histamine. Gastrin Cells (G-cells) are present in the pyloric region and secrete and storethe hormone gastrin.

Serotonin is avasoconstrictor and sitmulates the smooth muscles. Somatostatin suppresses the release of hormones from the digestive tract. Histamine dialates the walls of blood vessels. Gastrin stimulates the gastric glands to release the gastric juice.

Intestine (6 to 9 meters) –

It is divided into two part

(i) Small intestine (ii) Large intestine

(i) **Small Intestine –** Small intestine is differentitated into three part

(i) Duodenum (ii) Jejunum (iii) Ileum

Duodenum (10 inch) is the initial part of small intestine. Duodenum is shortest, widest and the fixed part of the small intestine. Its structure is like English word C or U.

For absorption of digested food a very large surface area is required. Therefore some adaptations are present here.

(a) Great length of the intestine.

(b) The presence of deep folds in submucosa is called plicae circularlis, Valvulae coniventae or valves of kerkring, villi and microvilli.

Large intestine (Large in diameter) – Large intestine is differentiated into parts caecum, colon and rectum.

In rabbit the dilated last terminal part of ileum is called sacculus rotundus. It is connected with the caecum through an ileo caecal valve.

The lower end of the ileum opens on the Posteromedial aspect of the caeco-colic junction. The Ileocaecal opening is guarded by Ileocaecal valve. Caecum is a large blind sac. It is situated in the right Iliac fossa. It is 6 cm long and 7.5 cm broad.

About 2cm below the ileocaecal orifice, a worm like structure arises from the caecum called as vermiform appendix. Its length varies from 2 to 20 cm. It is a vestigial organ.

- **In Rabbit** Some symbiotic bacteria such as Clostridium, cello-bioparus and symbiotic protozoa such as Antidinium are found in vermiform appendix. These symbiotic organisms secrete the cellulose enzyme which digests the cellulose in caecum.

Caecum is well developed in rabbit and other mammals but is vestigial in human.

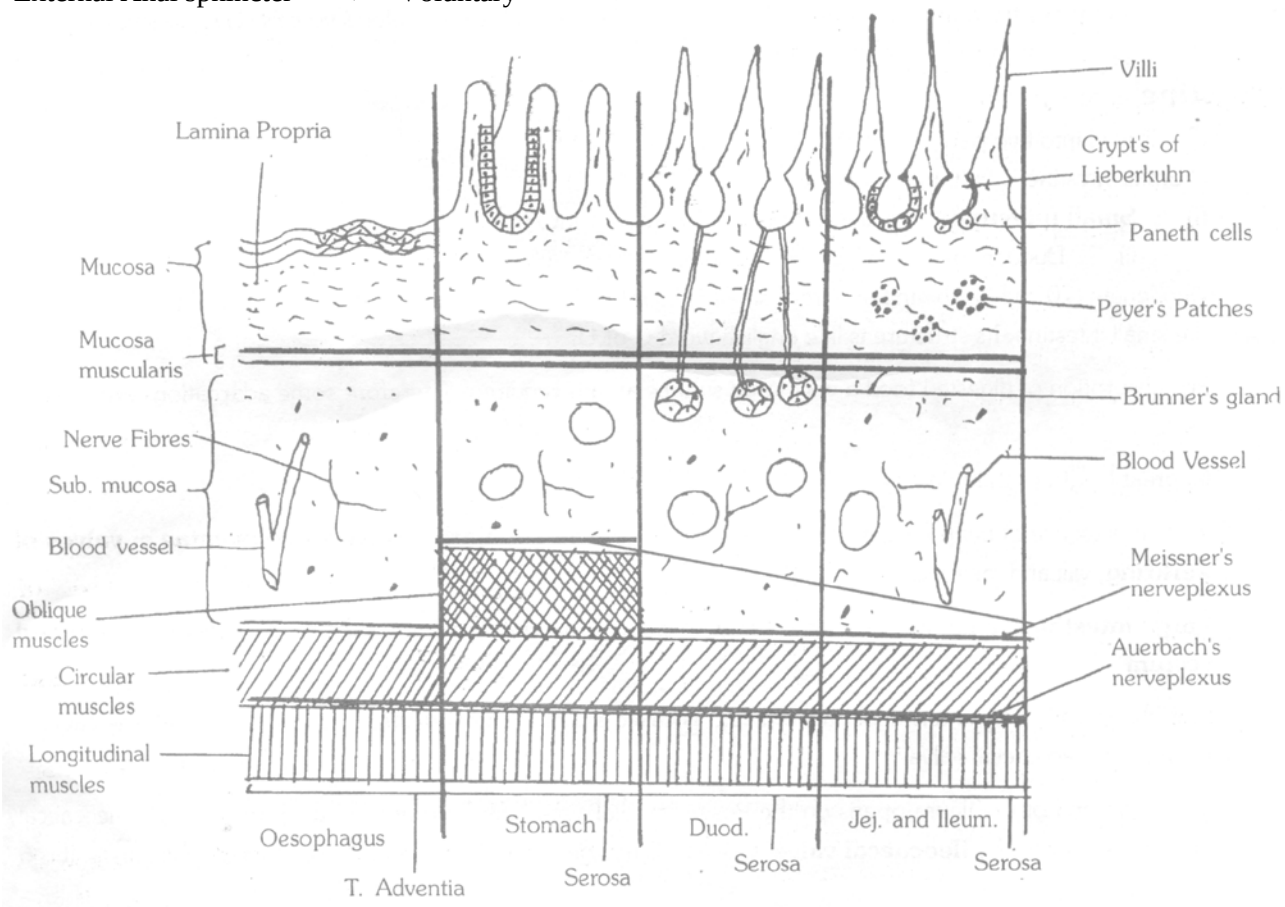
COLON

- Caecum continues in **colon.**
- Colo is the middle part of large intestine.
- The longistudinal muscle coat forms three ribbon like bands called Taeniae coli.
- Due to the presence of taeniae, pouch like structure develops in Lumen of colon called as Haustra.
- This colon then continues in a uniform tube called Rectum. (Storage chamber for faeces)

- Rectum open into a small bag like structure called anal-canal.
- In rabbit, rectum is beaded shape in appearance.
- Anal canal opens outside by anus. Anus is controlled by anal sphincter. Two types of anal sphincter
- are found at the opening of anus.
- Two types of spincter muscles are found in Anal canal.

Internal Anal sphincter ⟶ Involuntary

External Anal sphincter ⟶ Voluntary



Histology of Alimentary Canal

Wall of alimentary canal is made up of four layer (outer to inner)

(1) Serosa: It is outer most layer of gut, it is called tunica adventia in oesophagus, serosa is made up of visceral peritoneum while tunica adventia is made up of white fibrous connection tissue.

(2) Muscle layer: It is formed by circular innere layer and longitudinal outer layer of smooth muscle. Thickest layer is found in stomach (maximum persistalis) and thinnest layer in rectum (minimum peristalsis).

(3) Sub mucosa: It is loose connective tissue layer with blood lymph vessels and nerves.

(4) Mucosa: It is the inner most layer of gut which contains the secretory and absorptive cells.

It is differentiated into 3 parts.

1. Outer part:- Called mucosa muscularis.

☛ It is made up of longitudinal circular muscles.

- But these muscles are vestigial.
- They provide support to the folds of alimentary canal.

2. Middle part:- Called lamina propria.

- It is made up of reticulate and fibrous connective tissue.

3. Innermost part:- Called mucosal layer.

- In oesophagus this layer is made up of non keratinized stratified squamous epithelium.
- Except oesophagus this layer is single layer thick.
- This layer makes the lining of lumen of Alimentary canal.
- This layer makes the folds of alimentary canal.
- Folds of oespohagus are less developed.
- Folds of stomach are finger shaped.
- Folds of small intestine are conical shaped called Villi.
- Small slit like space is found at the base of villi.
- These spaces are called crypts of Lieberkuhn
- Villi of Duodenum are small blunt.
- Villi of Jeiunum and Ileum are long and pointed.
- Maximum villi are found Jejunum.

Brunners Gland:-

- They are small spherical multicellular glands.
- They open into crypts of lieberkuhn with the help of fine tubules.
- These glands are found in the submucosa and mucosa of ducdenum.
- They synthesize and secrete the non enzymatic secretion of intestinal juice. J

Paneth Cells:-

- These cells are found in mucosal layer of cypts of lieberkuhn of jejunuem.
- They are unicellular glands.
- They synthesize and secrets enzymes of intestinal Juices.
- The secretory substances of brunners glands and paneth cells are combindly called intestinal juice or succus entericus.

Peyer's patches:-

- They are small lymph nodes which are found in the mucosa of small intestine (Jejunum and Ileum more in number).