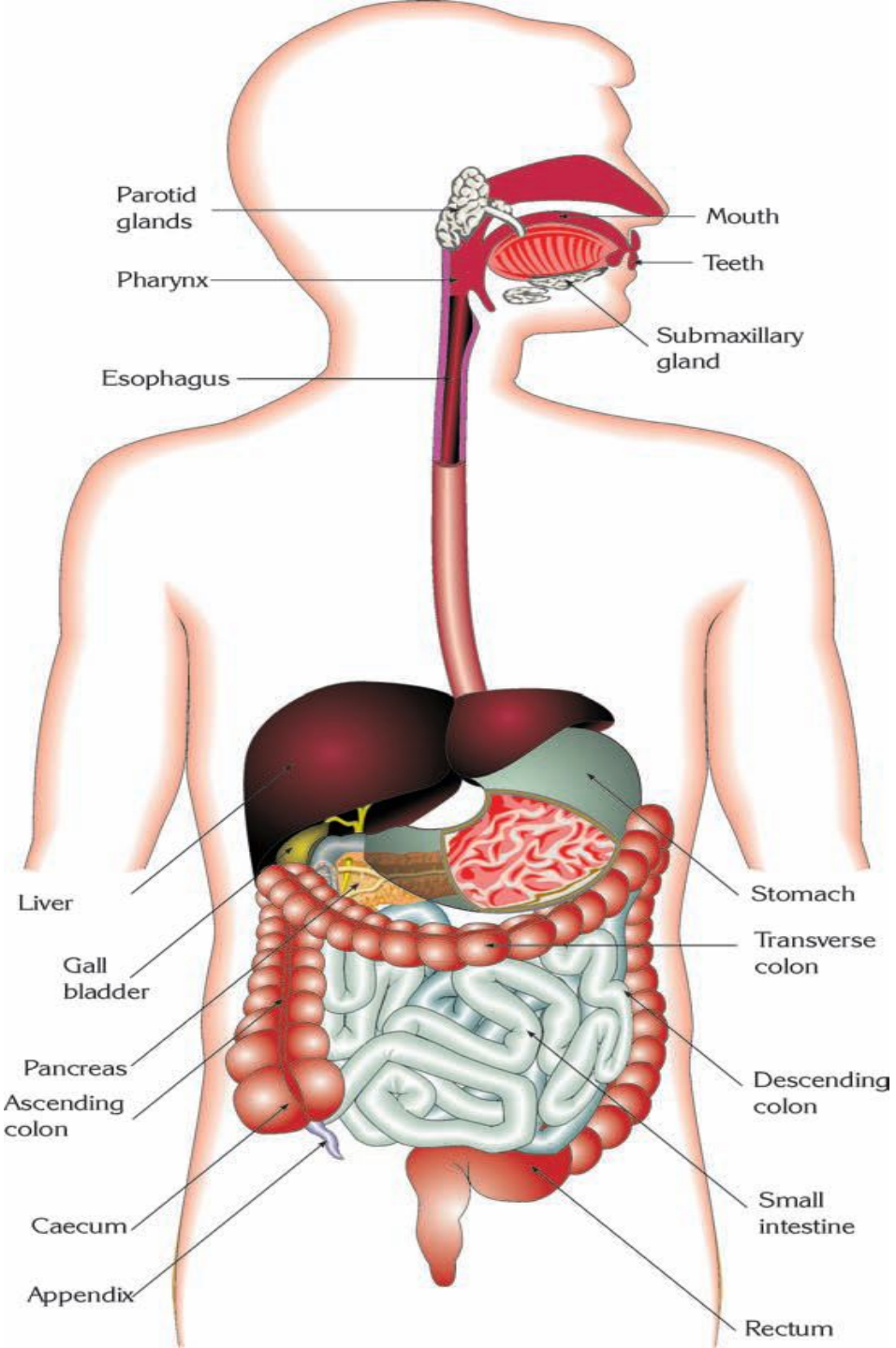
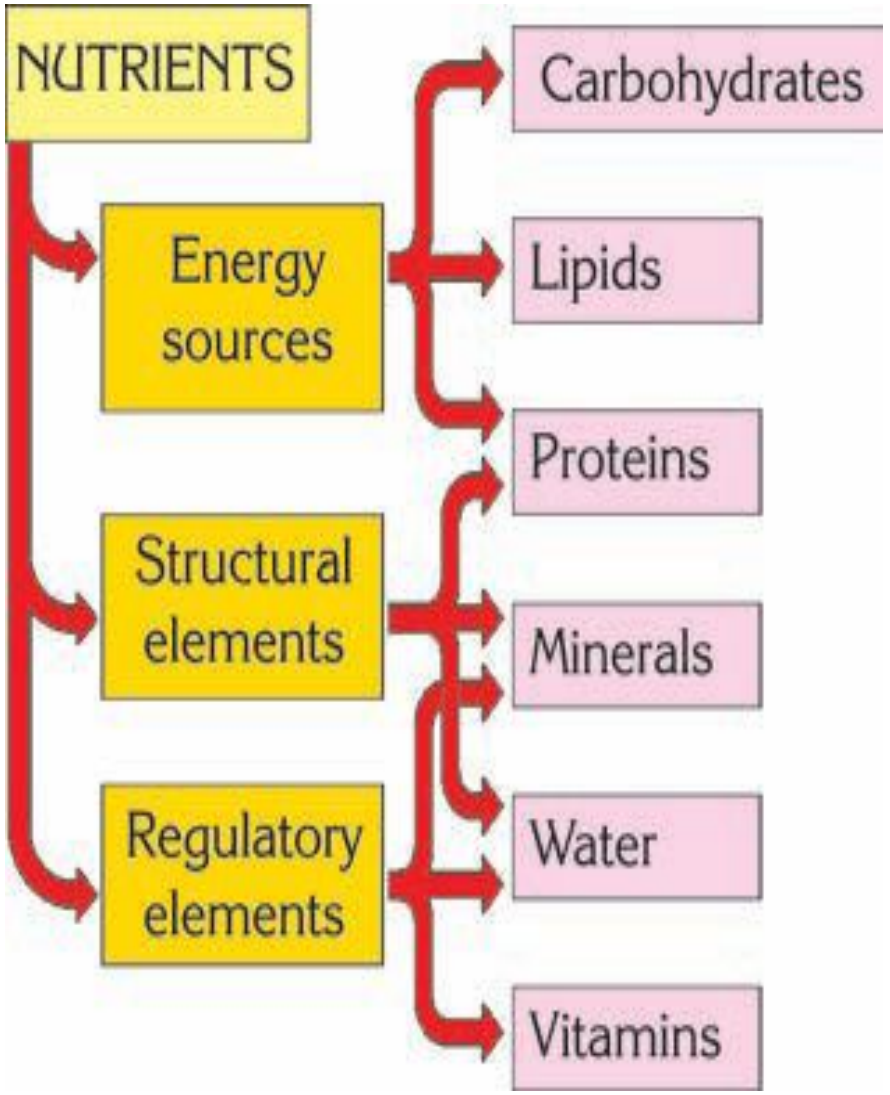
Human Digestive system (HDS) – Digestion and Organs of digestive system

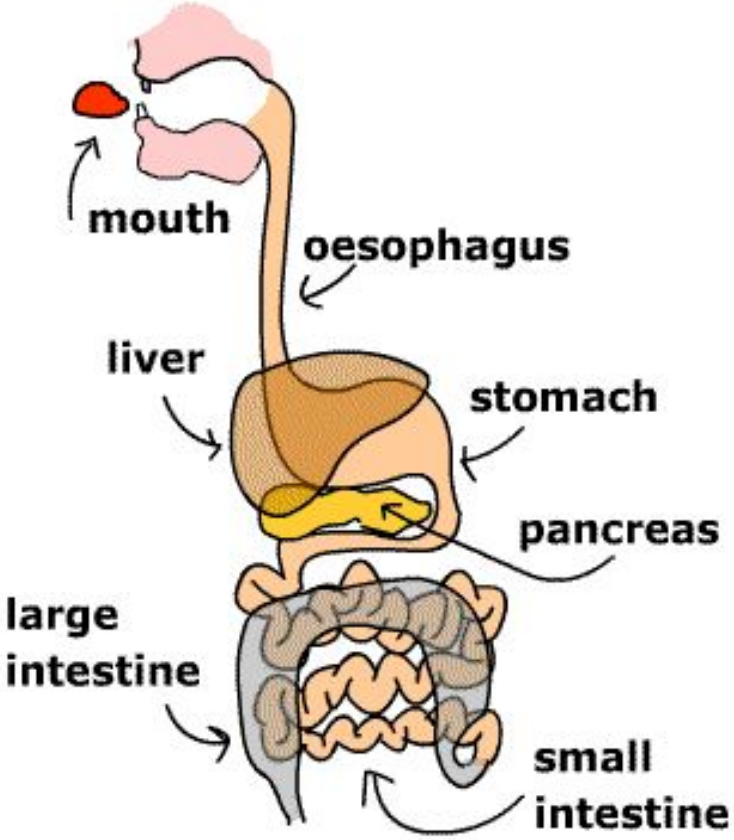


NUTRIENTS and DIGESTIVE SYSTEM

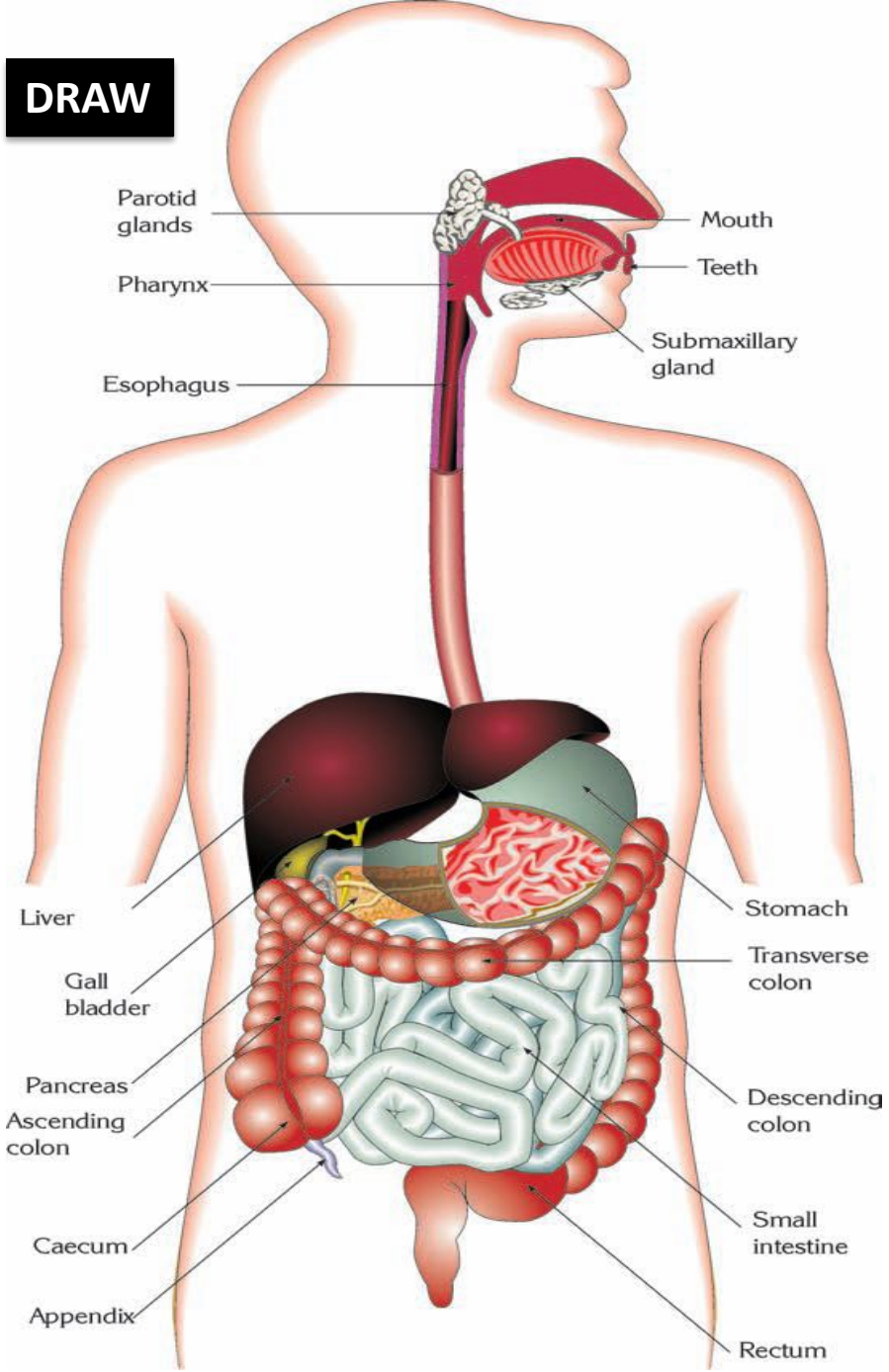
- The energy that food provides is necessary for the continuity of life on earth
- Food can be divided into six groups:
- - carbohydrates
- - lipids
- - proteins
- - vitamins
- - minerals
- - water



Digestion

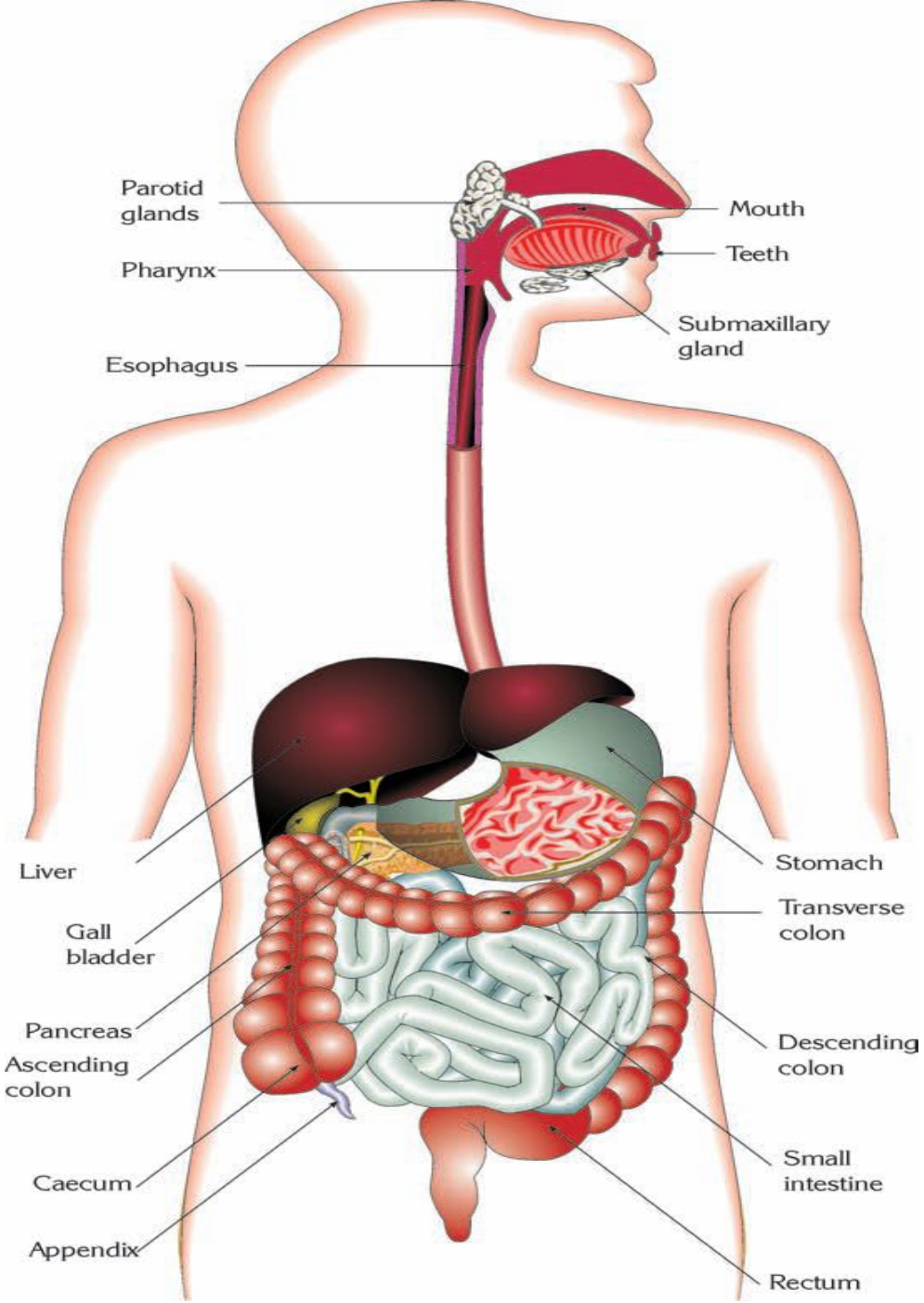

mouth
oesophagus
liver
stomach
pancreas
large intestine
small intestine

DRAW



Digestive system organs

- The digestive tract is comprised of the
- - mouth
- - pharynx
- - esophagus
- - stomach
- - small intestine
- - large intestine



Digestive system

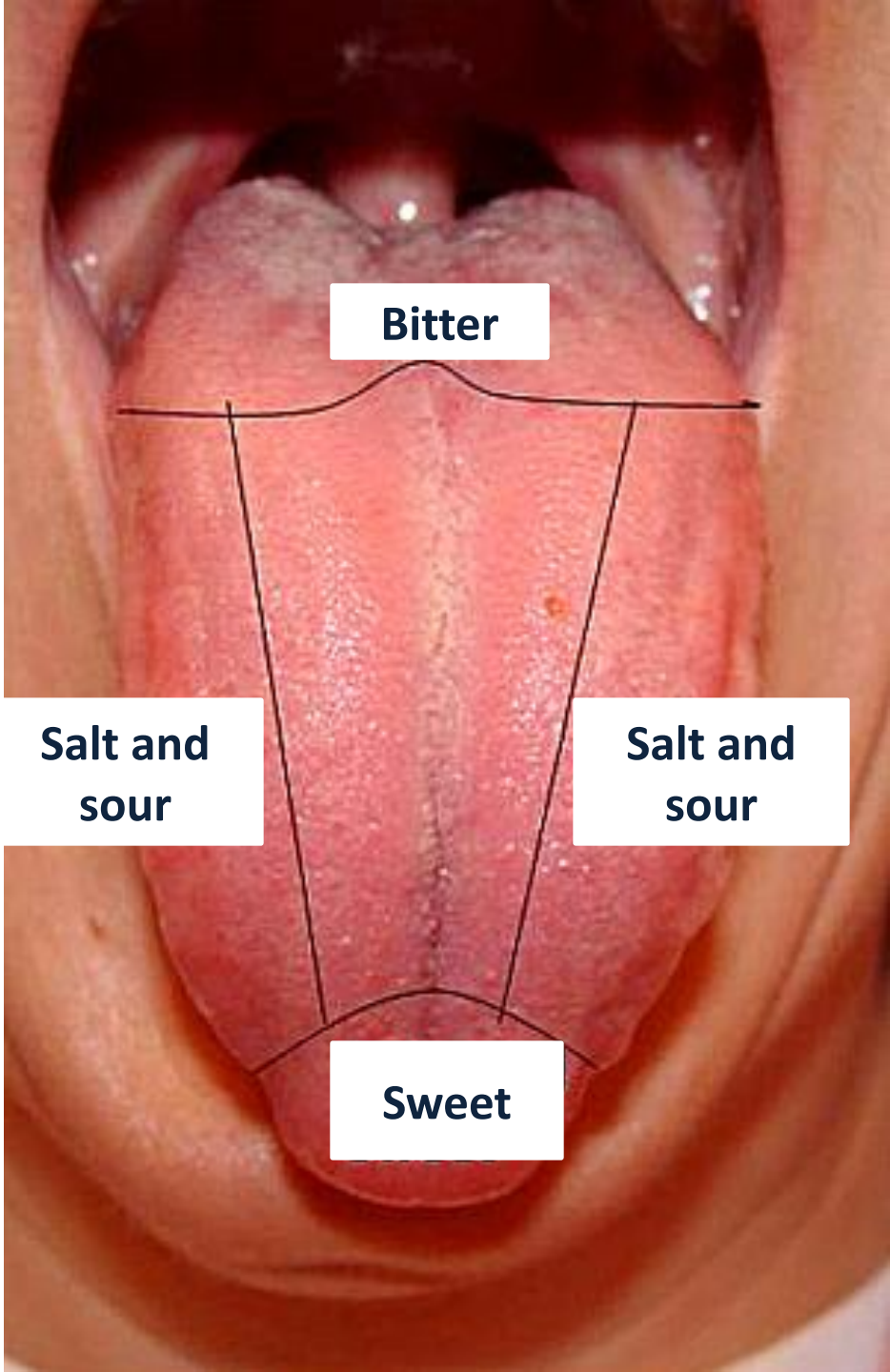
- The major glands which secrete substances are
- **- salivary glands**
- **- glands of the stomach**
- **- glands in the intestinal wall**
- **- pancreas**
- **- liver**

MOUTH

- The structures found in the mouth are
- **- the teeth**
- **- salivary glands**
- **- the tongue**
- Function of teeth is to grind food into small particles and to mix it with digestive secretions

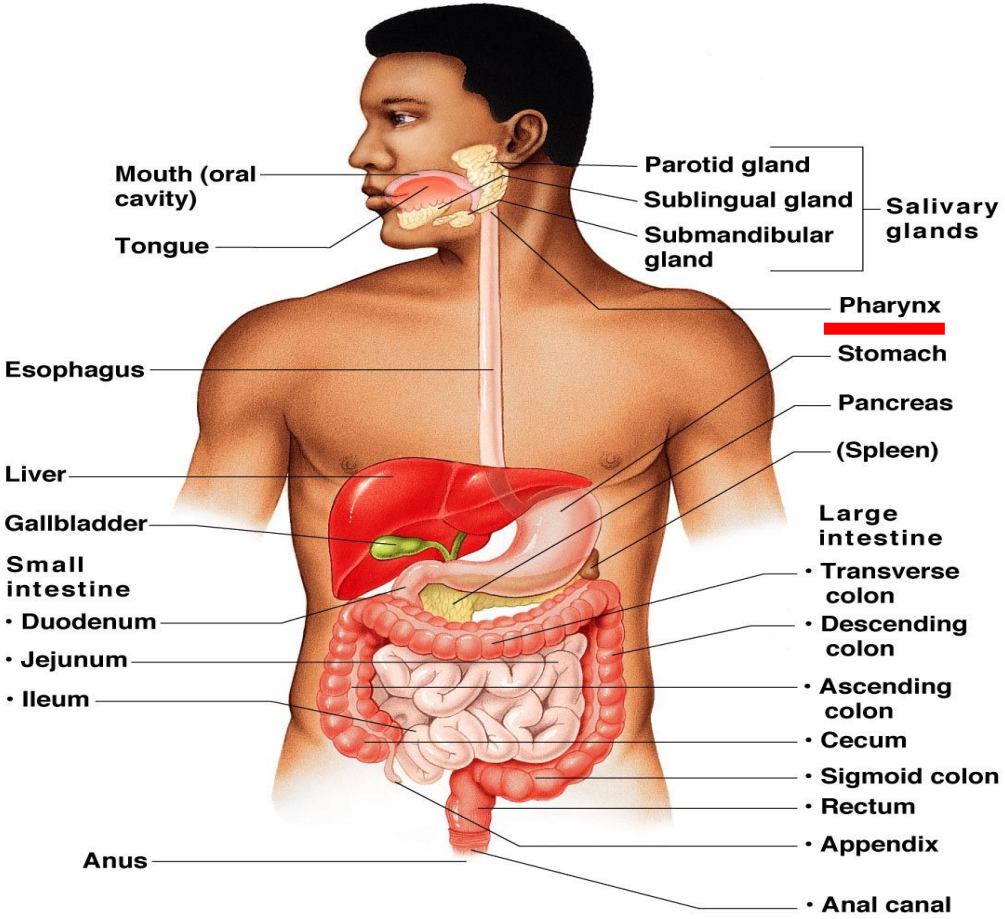
Tongue regions

- Sweet foods are tasted at the tip of the tongue
- Bitter foods are tasted at the rear
- Sour and salty foods are simultaneously tasted on both sides of the tongue



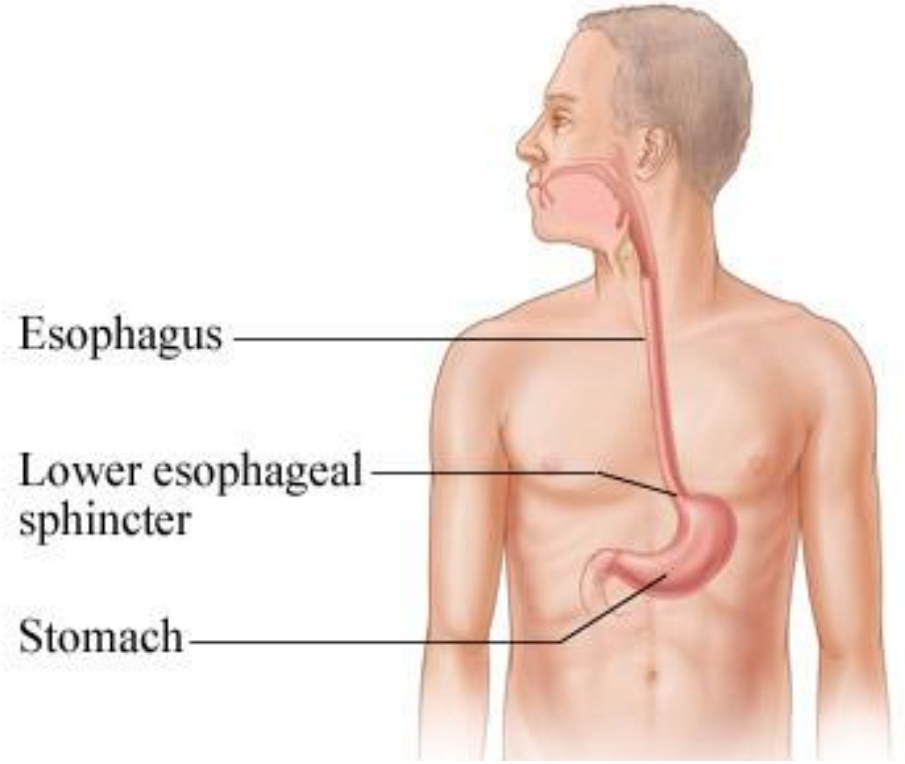
Pharynx

- The pharynx is a cavity located directly behind the mouth, in front of the esophagus and trachea



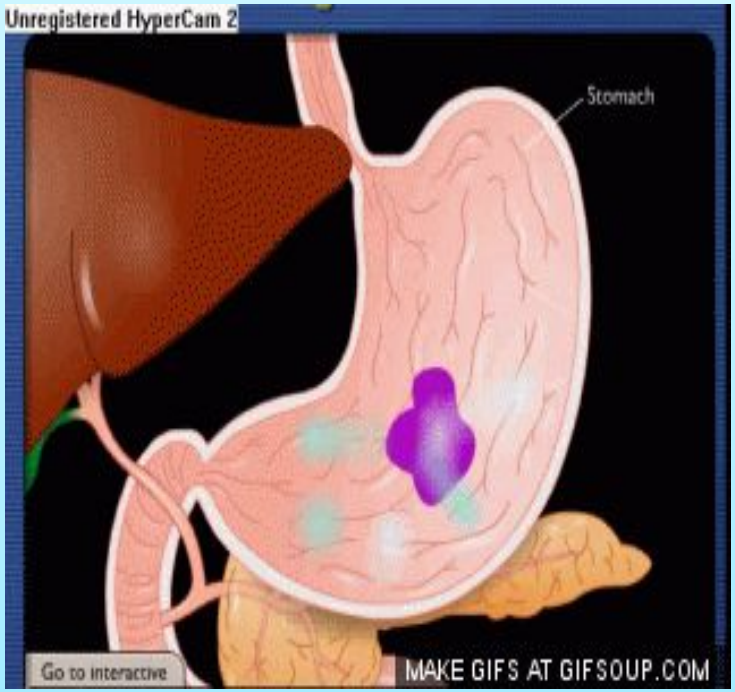
Esophagus (25 cm)

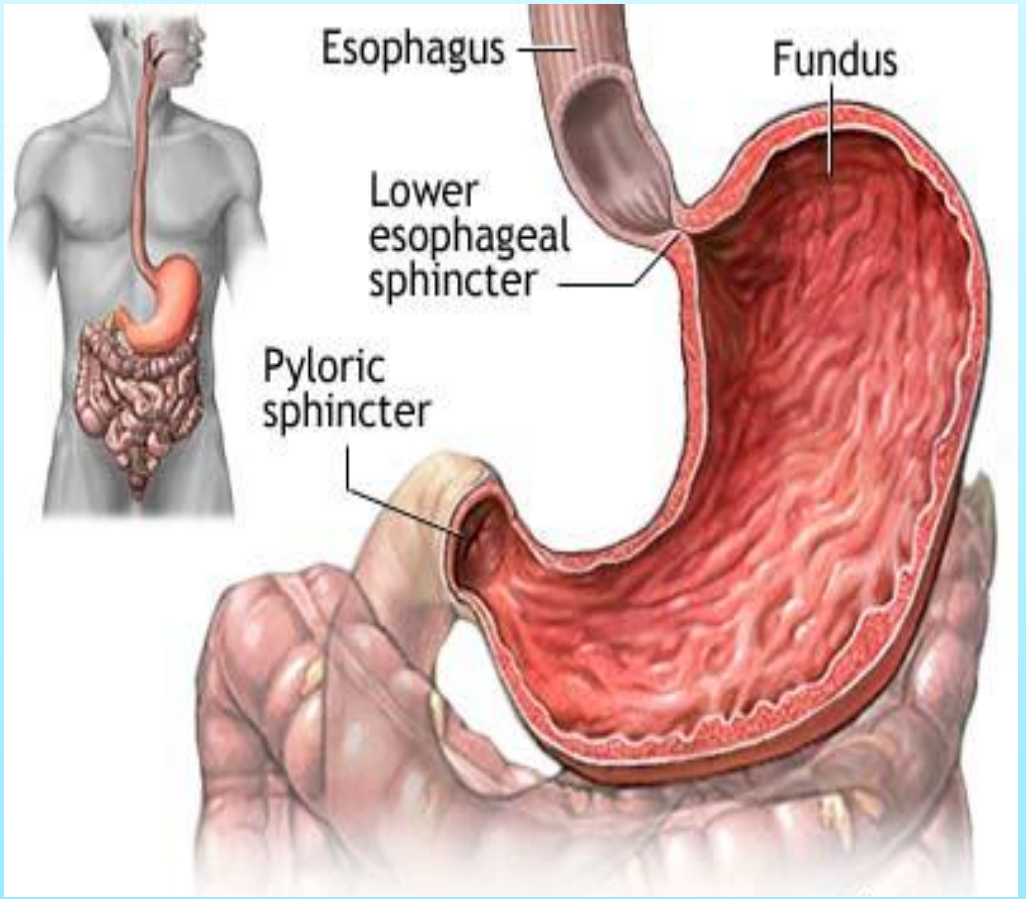
- The esophagus is a pipe
- It passes from the pharynx to the stomach
- A rhythmic contraction of the digestive tract is called **peristalsis**, pushes the food
- Peristalsis begins in the esophagus



Stomach

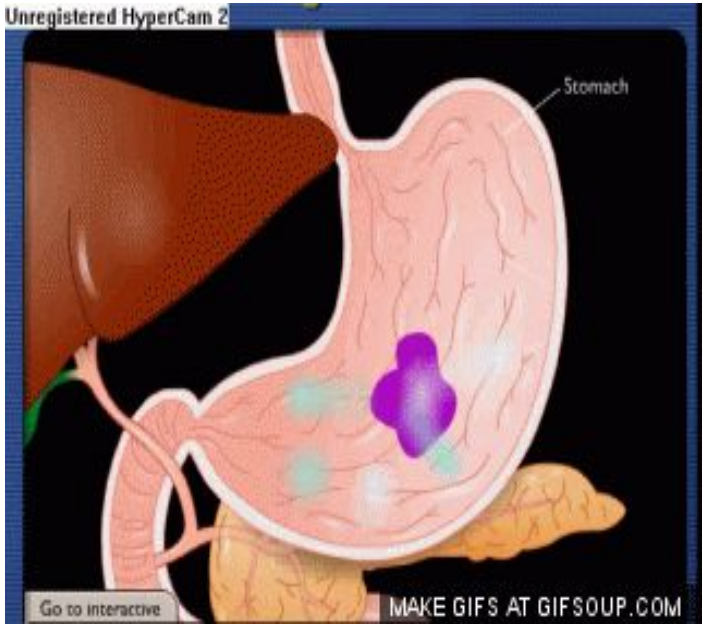
- The largest portion
- **Cardiac sphincter,** a valve through which food enters the stomach
- **Pyloric sphincter** - it regulates the movement of ***chyme*** (a soupy liquid) into the duodenum

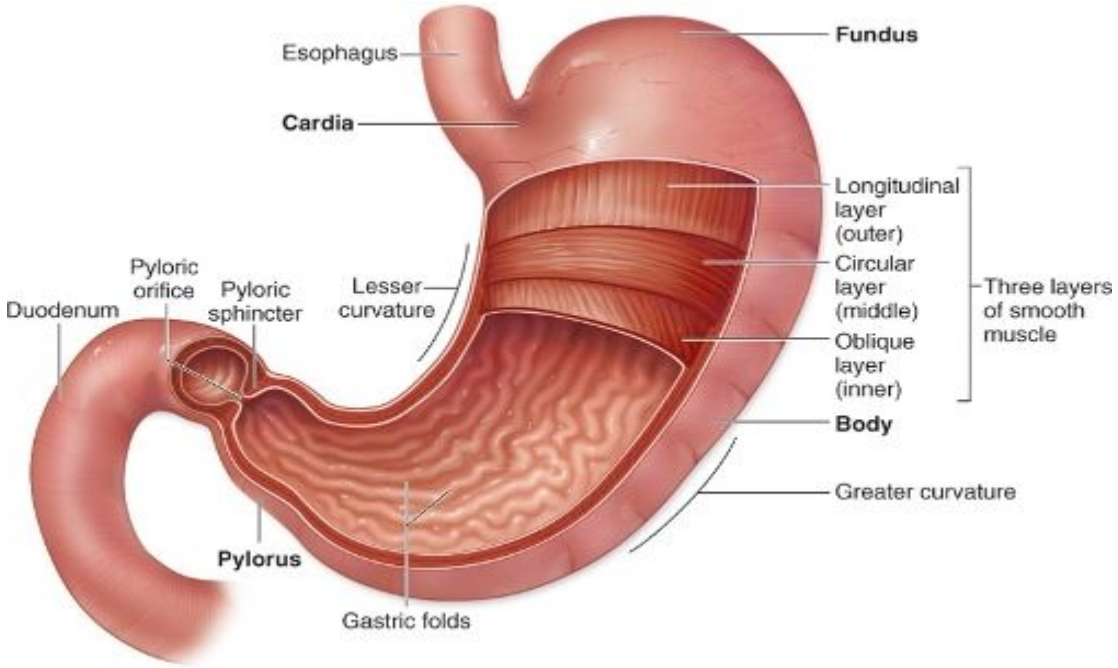




- The stomach is composed of three layers of <u>smooth muscle</u>
- They regulate the movement of stomach
- Stomach has a **mucosal layer** (слизистая оболочка)
- Mucosal layer has <u>gastric glands</u>

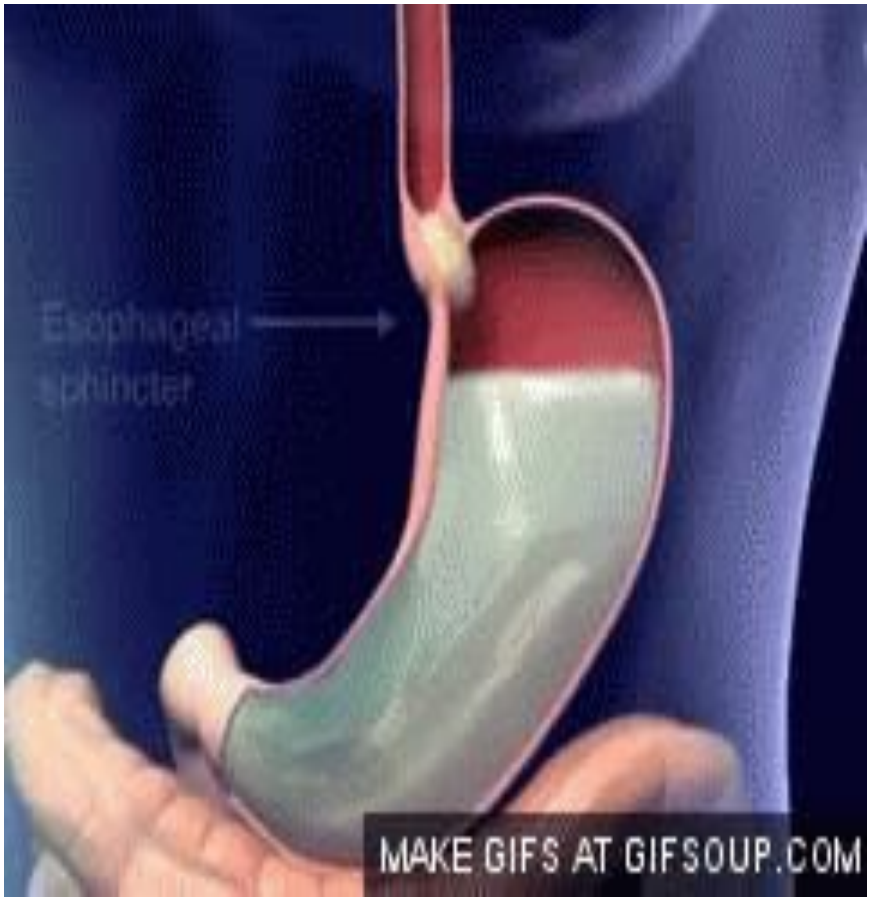
Stomach

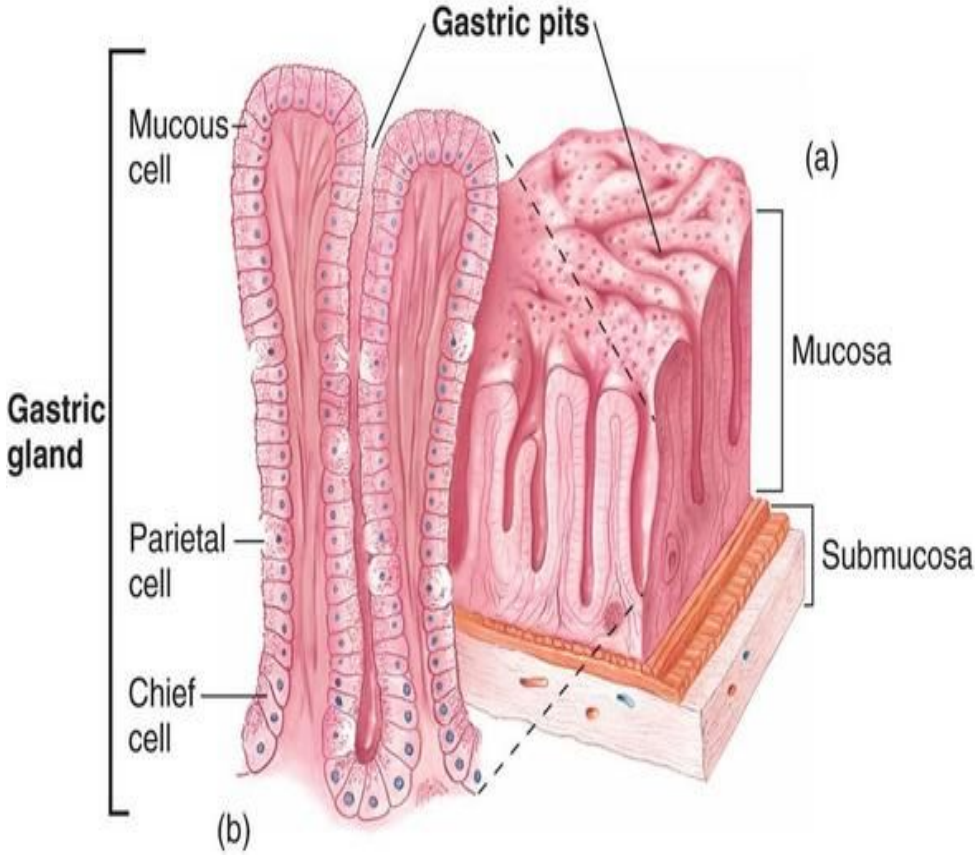




Stomach

- Gastric glands produce
- <u>- hydrochloric acid (HCl)</u>
- <u>- pepsinogen</u> (enzyme) into the gastric juice, where it is converted to pepsin by HCl acid



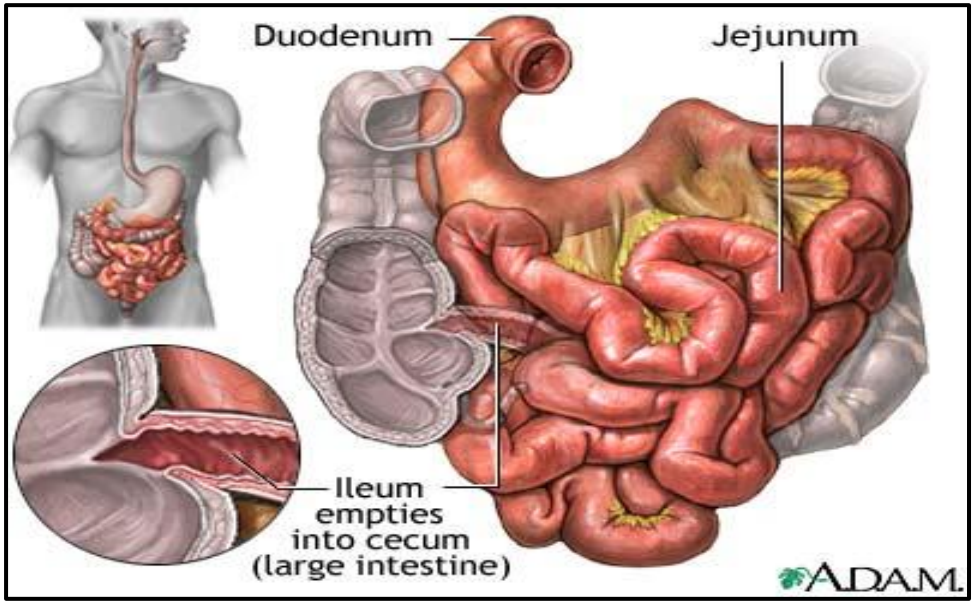


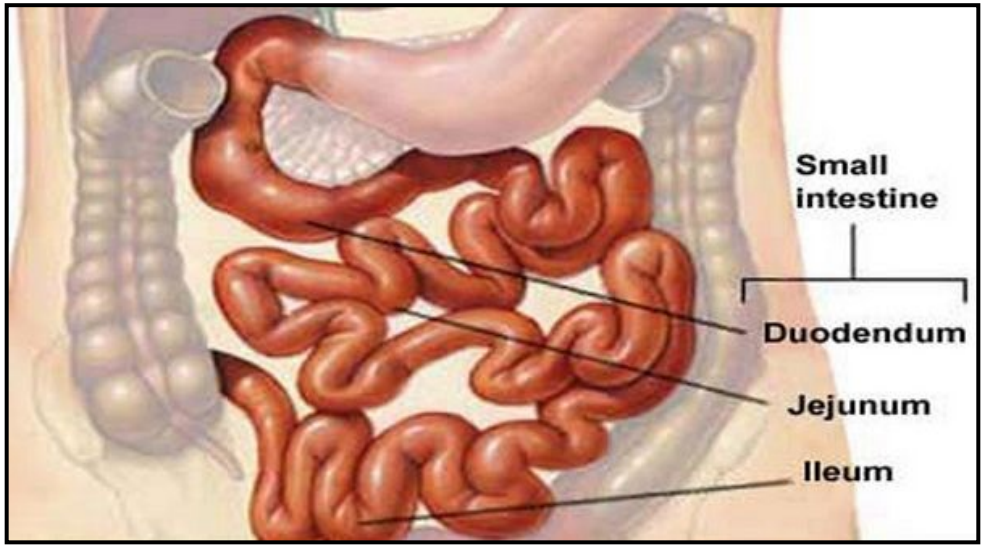
Small Intestine (6 m)

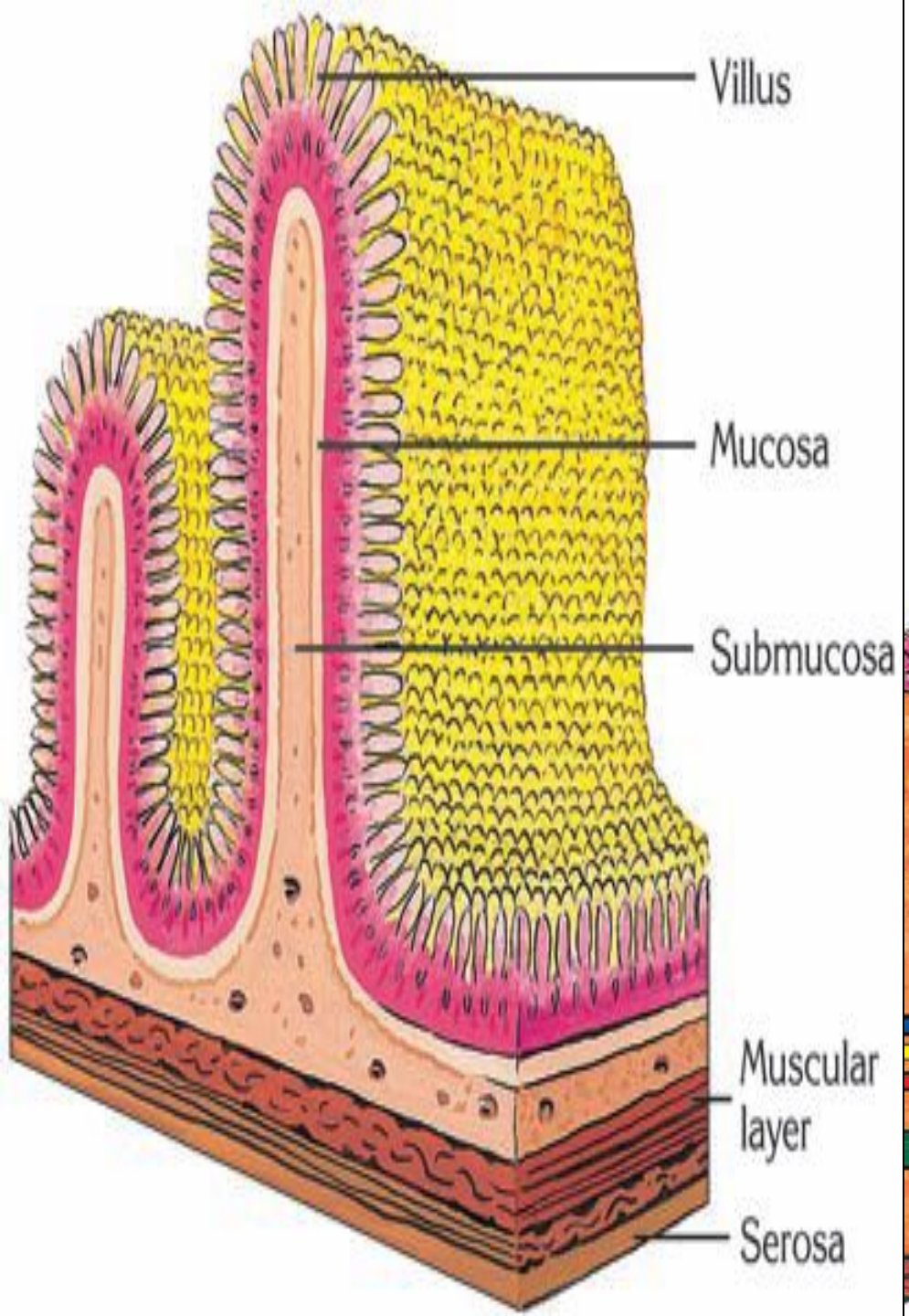
- It has 3 segments:
- - duodenum (25 cm)
- - jejunum
- - ileum

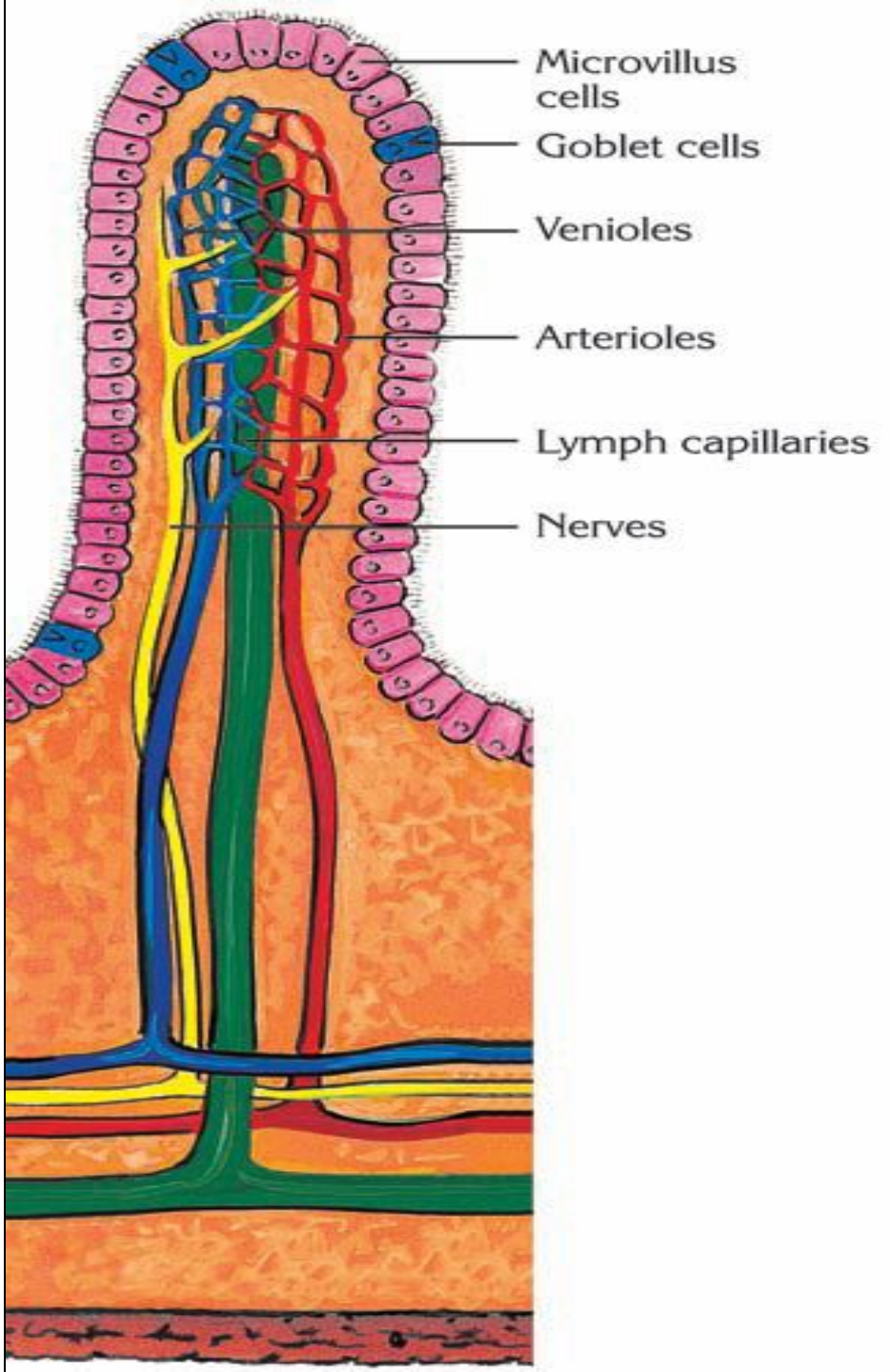
Villi – 4 millions

- Function of the **jejunum** is the absorption of nutrients into the blood, because this part of small intestine has **villi**



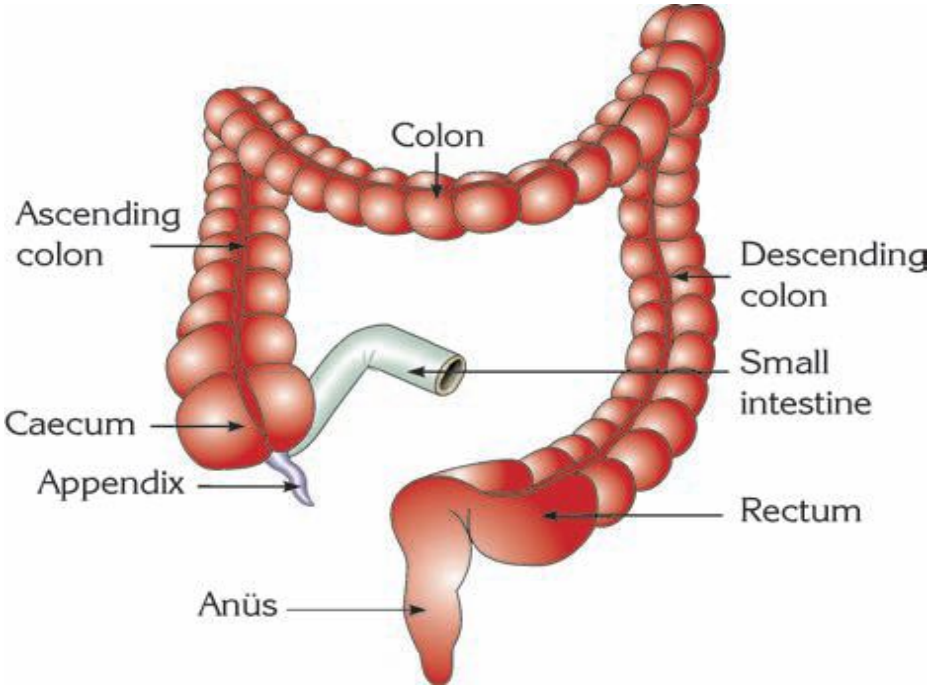


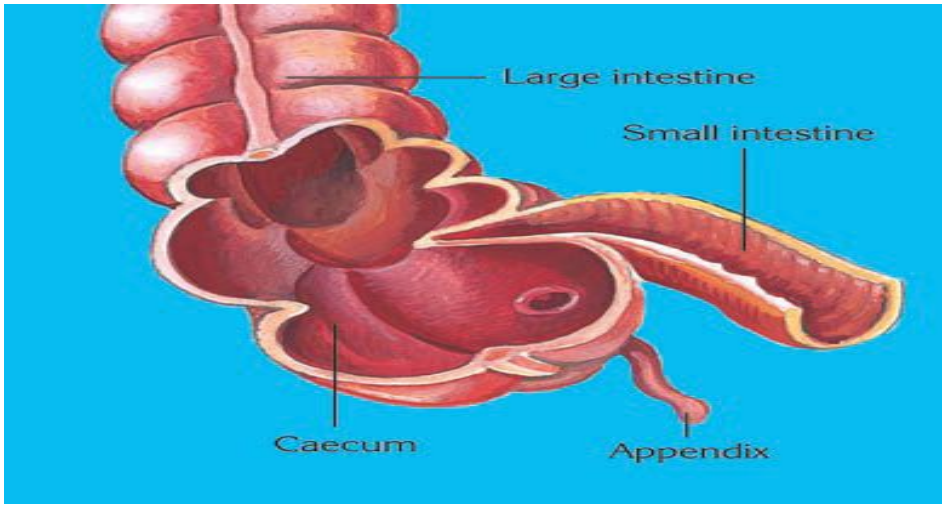

Villus
Mucosa
Submucosa
Muscular layer
Serosa


Microvillus cells
Goblet cells
Venioles
Arterioles
Lymph capillaries
Nerves

Large Intestine (1.5 to 2 meters in length)

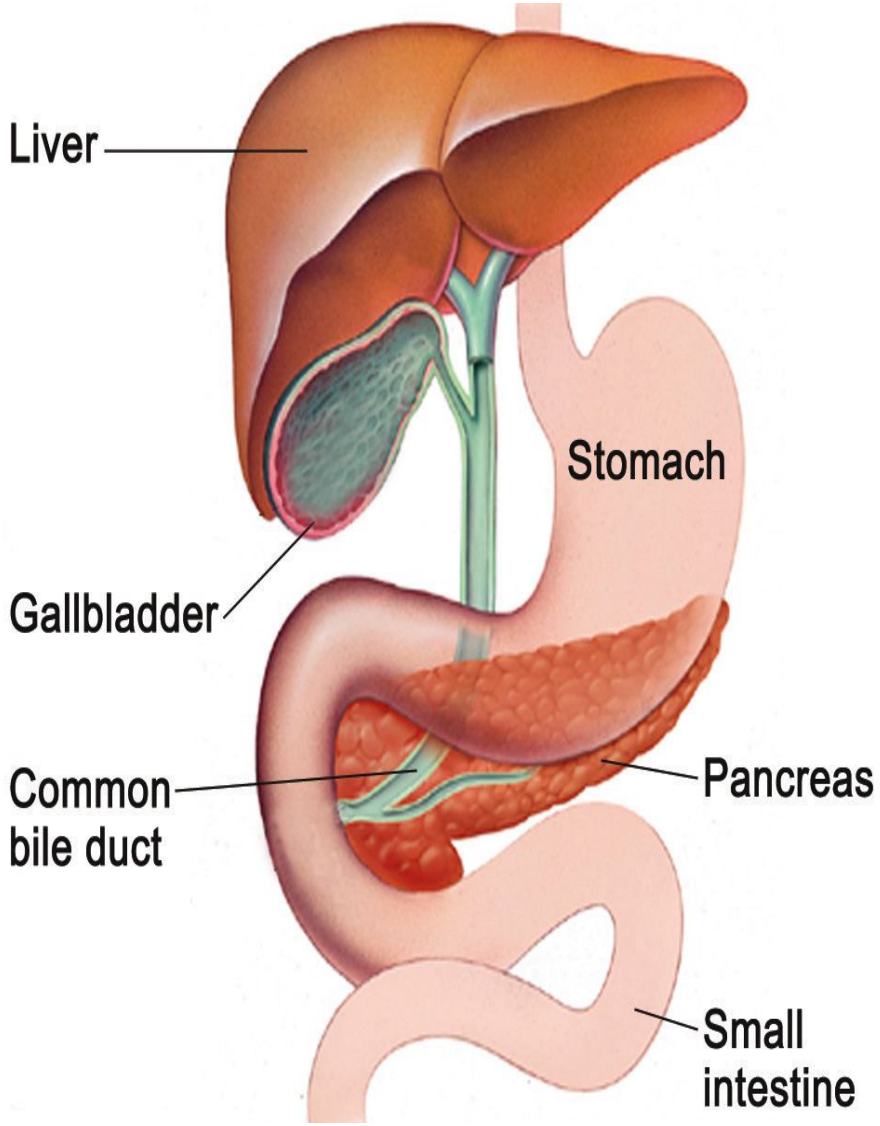
- It has 3 segments:
- **- caecum**
- **- colon**
- **- rectum**
- The **appendix**, a projection of the caecum
- This organ may become inflamed causing severe pain
- In such cases, it must be surgically removed





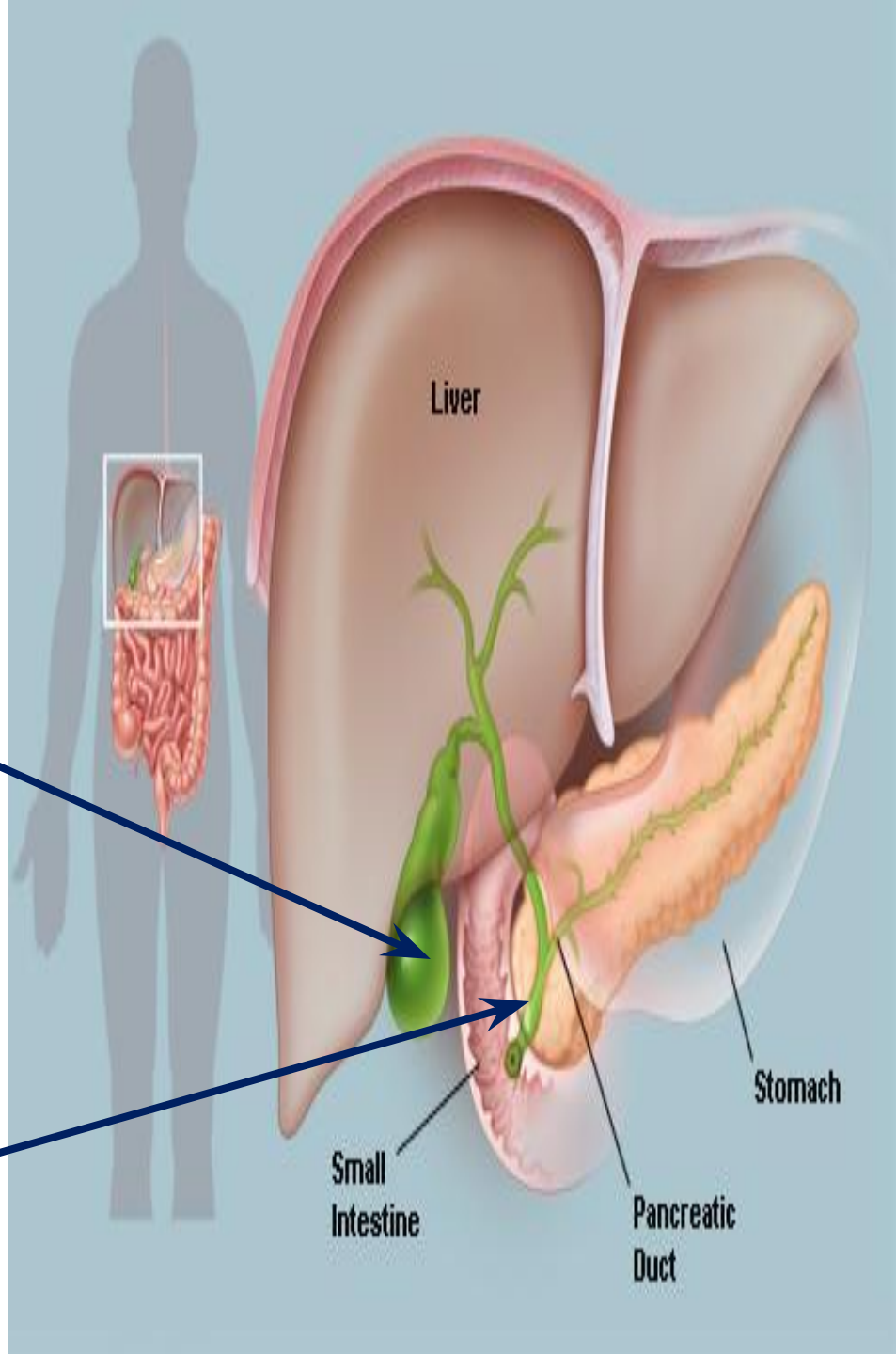
Pancreas

- Mixed gland
- It's secretions have basic characteristics – neutralizes acidic (HCl) condition which comes from stomach
- It opens into small intestine
- Hormones – glugacon and insulin



Liver

- The liver is the largest organ of the body and gland
- It contains the **gall bladder**
- <u>Bile duct</u> leading from the gall bladder transmits bile salts, which break down fats in the duodenum



Functions of the liver

- Formation and secretion of bile
- Regulation of blood sugar level
- Formation of fibrinogen and thrombogen, which are active during blood clotting
- Detoxification of substances (ex, alcohol is broken down in liver)
- Stores Fe, Cu ions and vitamins A, D, E and K