DEPARTMENT OF NUTRITION AND DIETETICS

HUMAN PHYSIOLOGY

I B.SC NUTRITION AND DIETETICS

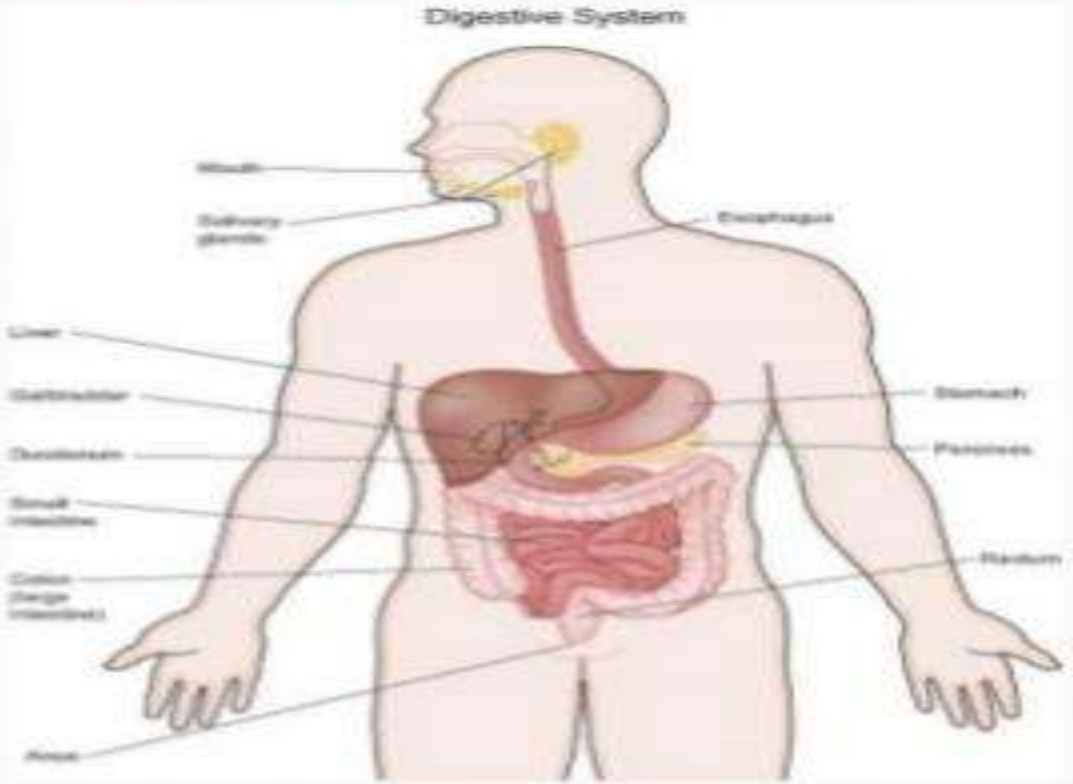
SUBJECT INCHARGE: G.K.GOMATHI

DIGESTIVE SYSTEM

HUMAN PHYSIOLOGY

Introduction

- The digestive system is used for breaking down food into nutrients which then pass into the circulatory system and are taken to where they are needed in the body.



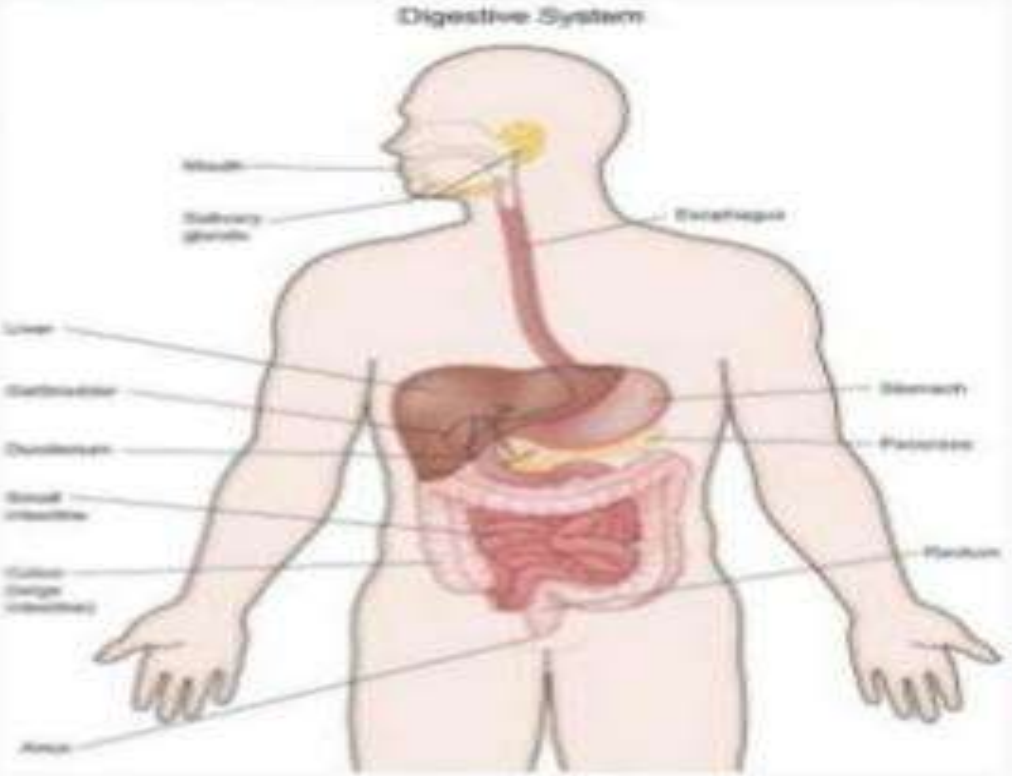
Functions of the Digestive System

- Ingest food
- Break down food into nutrient molecules
- Absorb molecules into the bloodstream
- Rid the body of indigestible remains

Introduction

- There are four stages to food processing:

1. Ingestion: taking in food
2. Digestion: breaking down food into nutrients
3. Absorption: taking in nutrients by cells
4. Egestion: removing any leftover wastes

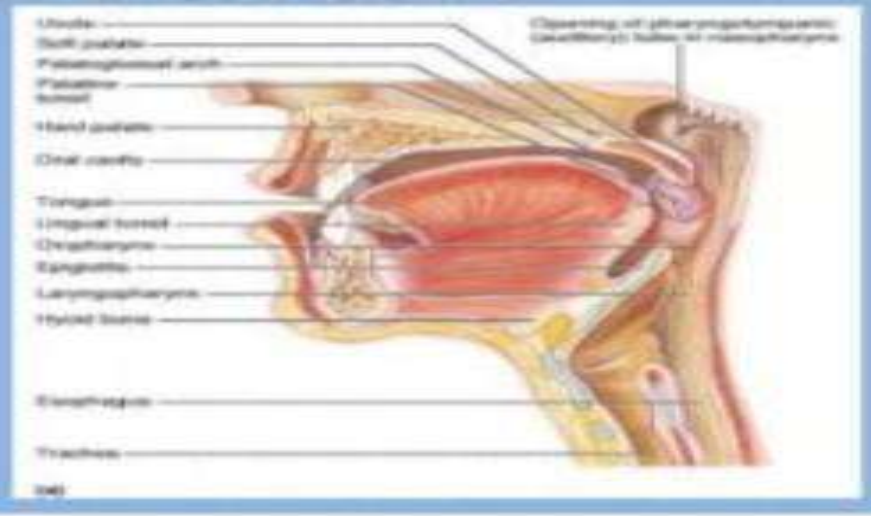


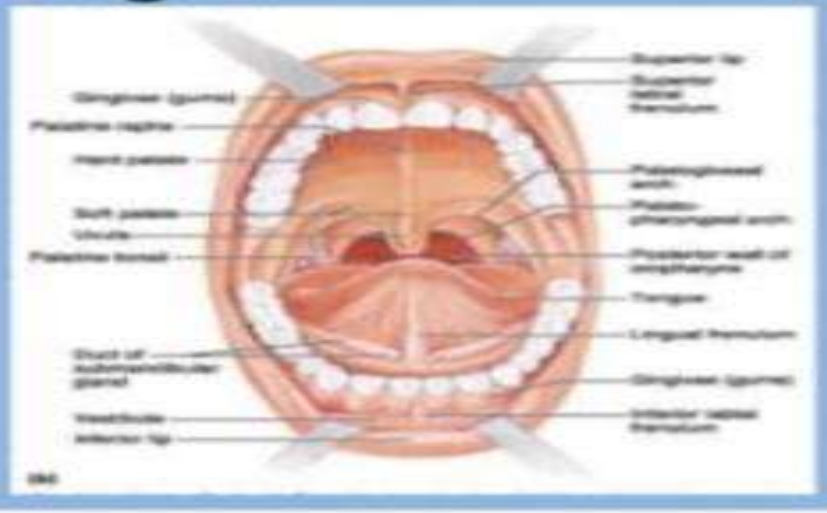
Digestion

- Types
  - Mechanical (physical)
    - Chew
    - Tear
    - Grind
    - Mash
    - Mix
  - Chemical
    - Enzymatic reactions to improve digestion of
      - Carbohydrates
      - Proteins
      - Lipids

Mouth

- Teeth mechanically break down food into small pieces. Tongue mixes food with saliva (contains amylase, which helps break down starch).
- Epiglottis is a flap-like structure at the back of the throat that closes over the trachea preventing food from entering it.



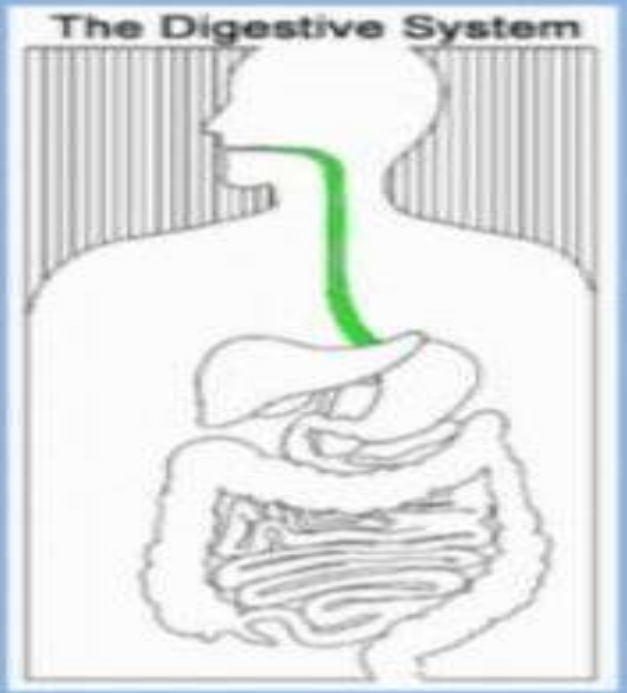


Esophagus

- Approximately 10" long
- Functions include:

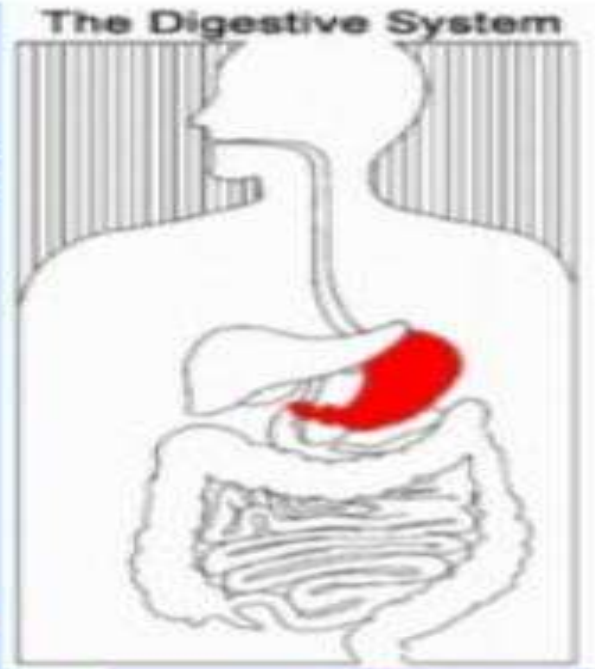
1. Secrete mucus
2. Moves food from the throat to the stomach using muscle movement called peristalsis

- If acid from the stomach gets in here that's heartburn.



Stomach

- J-shaped muscular bag that stores the food you eat, breaks it down into tiny pieces.
- Mixes food with digestive juices that contain enzymes to break down proteins and lipids.
- Acid in the stomach kills bacteria.
- Food found in the stomach is called chyme.



Small Intestine

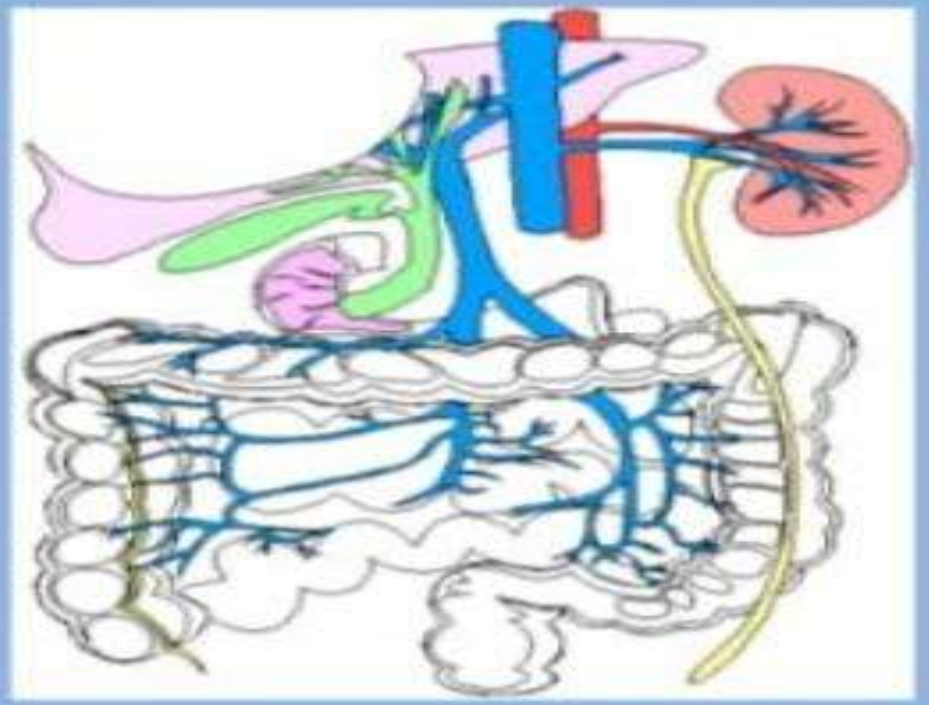
- Small intestines are roughly 7 meters long
- Lining of intestine walls has finger-like projections called villi, to increase surface area.
- The villi are covered in microvilli which further increases surface area for absorption.

Small Intestine

- Nutrients from the food pass into the bloodstream through the small intestine walls.

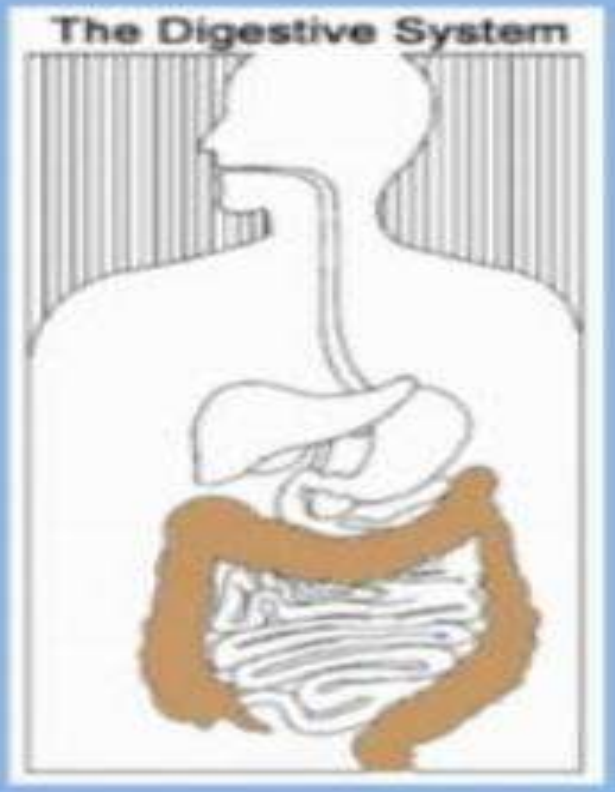
- Absorbs:
  - 80% ingested water
  - Vitamins
  - Minerals
  - Carbohydrates
  - Proteins
  - Lipids

  - Secretes digestive enzymes



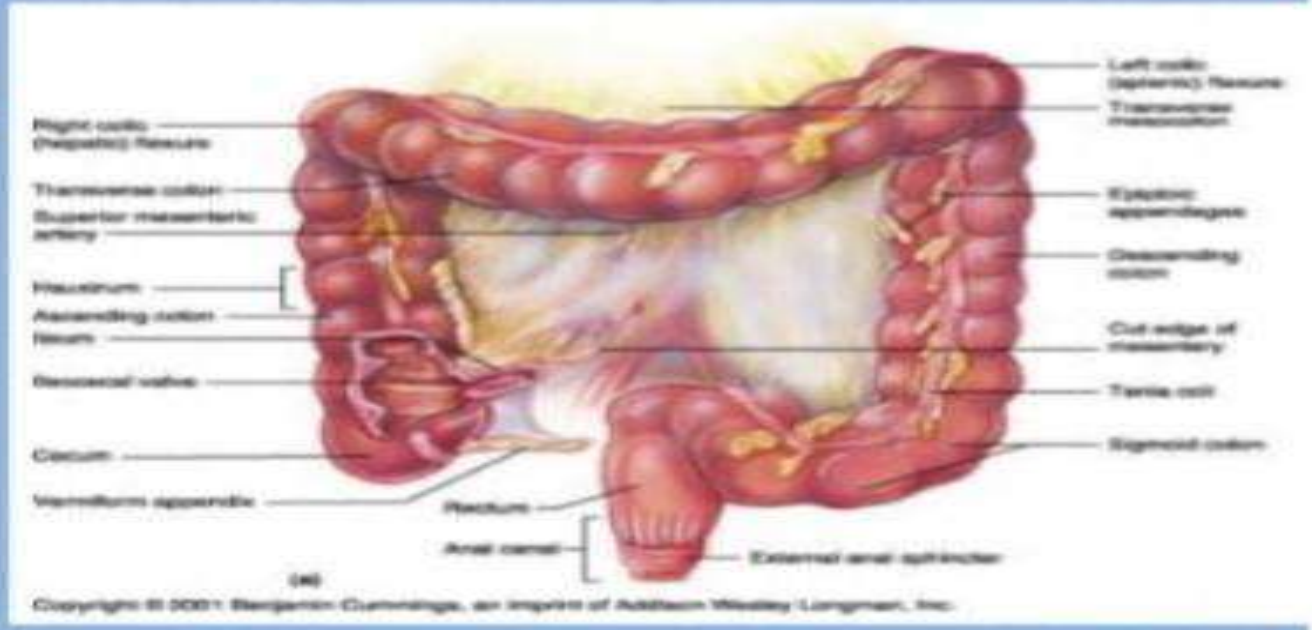
Large Intestine

- About 5 feet long
- Accepts what small intestines don't absorb
- Rectum (short term storage which holds feces before it is expelled).



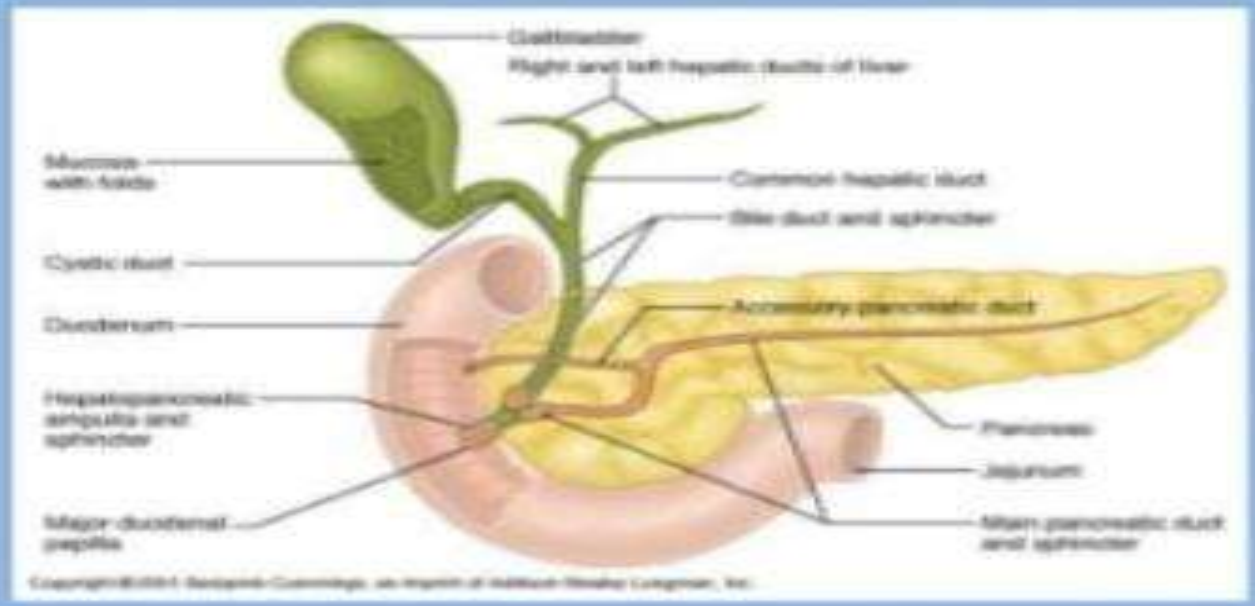
Large Intestine

- Functions
  - Bacterial digestion
    - Ferment carbohydrates
    - Protein breakdown
  - Absorbs more water
  - Concentrate wastes



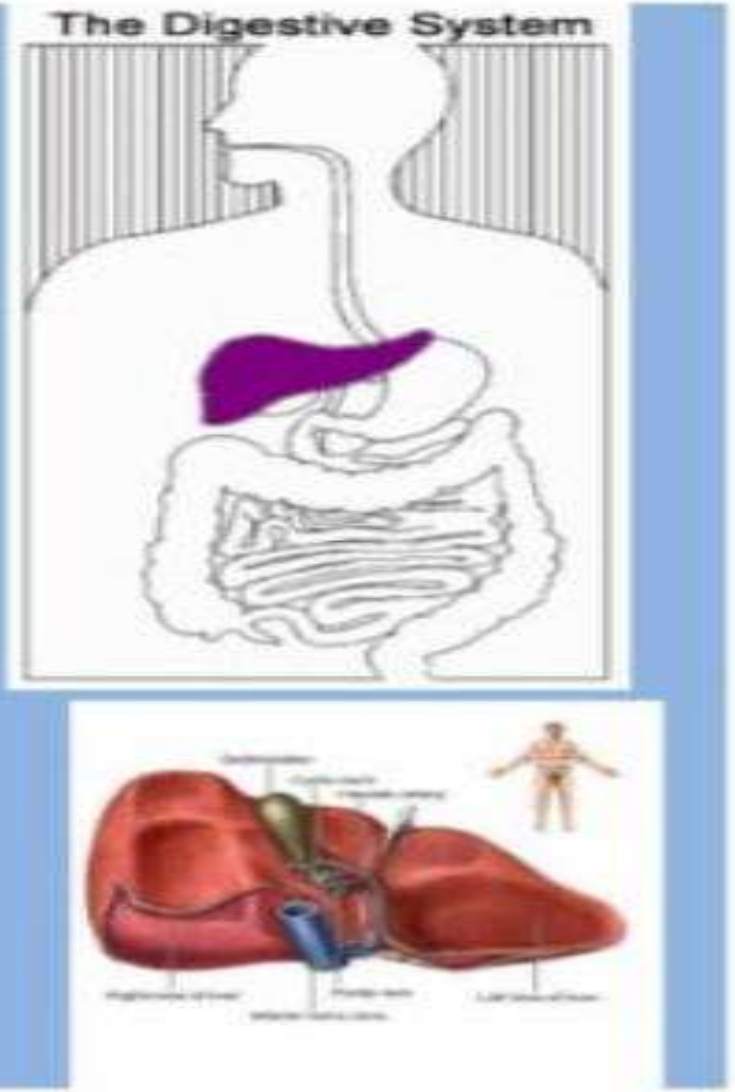
Accessory Organs

- Not part of the path of food, but play a critical role.
- Include: Liver, gall bladder, and pancreas



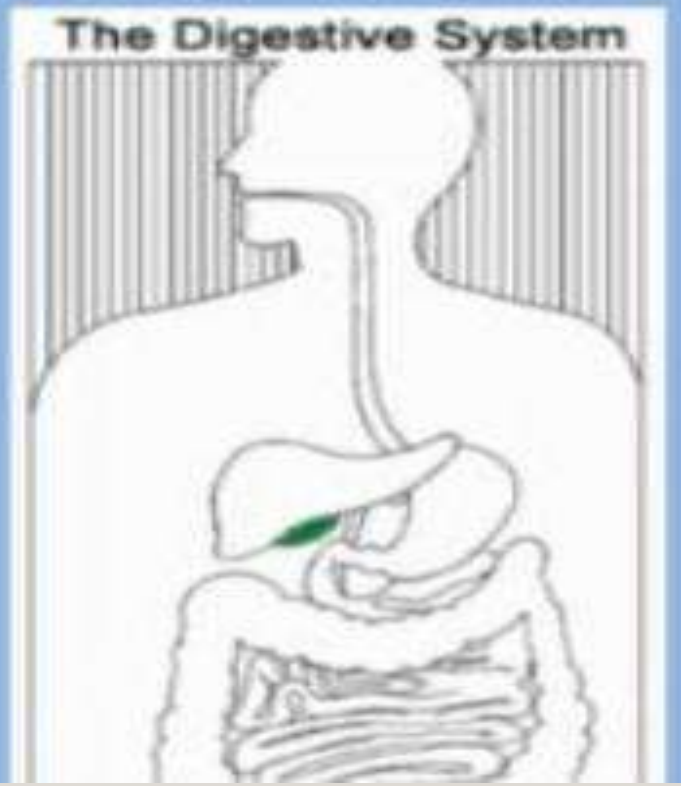
Liver

- Directly affects digestion by producing bile
  - helps emulsify fat
  - filters out toxins and waste including drugs and alcohol



Gall Bladder

- Stores bile from the liver, releases it into the small intestine.
- Fatty diets can cause gallstones



Pancreas

- Produces digestive enzymes to digest fats, carbohydrates and proteins
- Regulates blood sugar by producing insulin