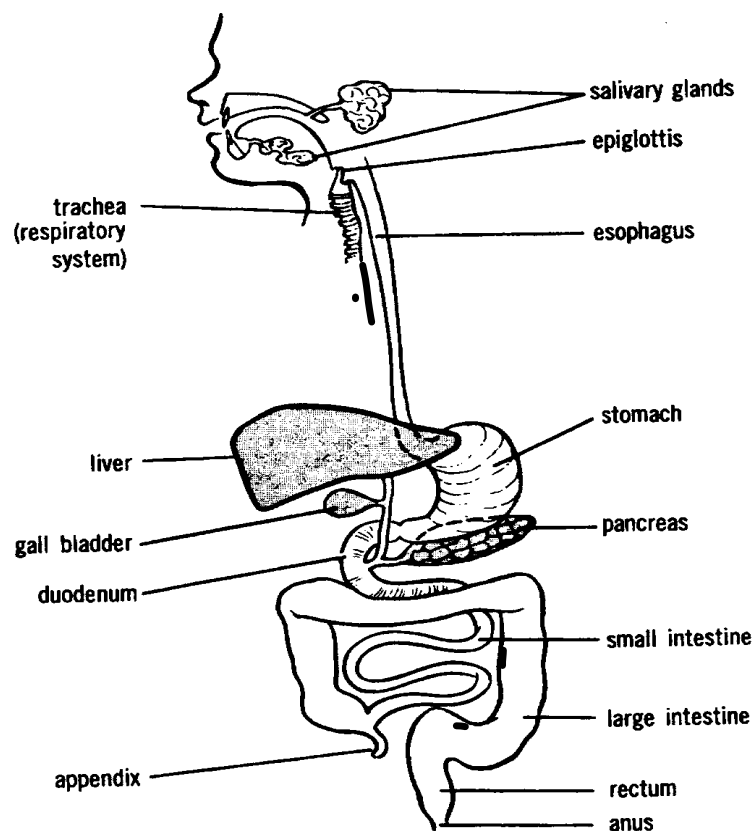


Human Digestive System

- Food passes through the digestive tube in the following order: Mouth-→ Pharynx-→ Esophagus-→ Stomach-→ Small Intestine-→ Large Intestine-→ Rectum-→ Anus (Alimentary Canal)
- Several glands secrete digestive enzymes and juices into the digestive tube.



<http://www2.sunysuffolk.edu/pickenc/Digestive%20System%20Overview%202.mov>

1. MOUTH: (oral cavity)

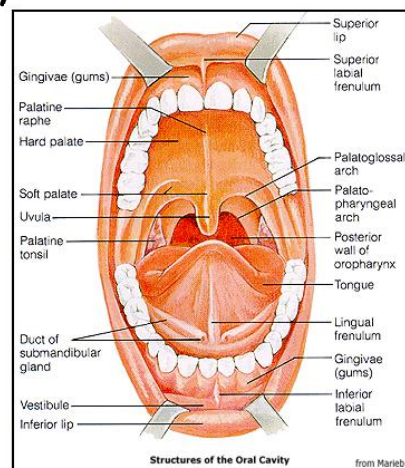
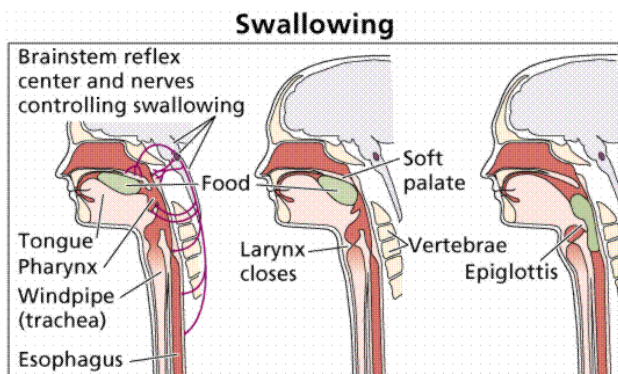
- Ingestion
- Mechanical digestion- teeth cut, tear and grind food to increase surface area
- Chemical digestion- Food is lubricated--> saliva
-hydrolysis

A. Salivary glands. Secretes saliva, which contains digestive

- enzyme Salivary Amylase, (ptyalin)

starch (polysaccharide)-> maltose (disaccharide).

B. Tongue: Food particles form a bolus=food mass and is pushed by the tongue to the pharynx.

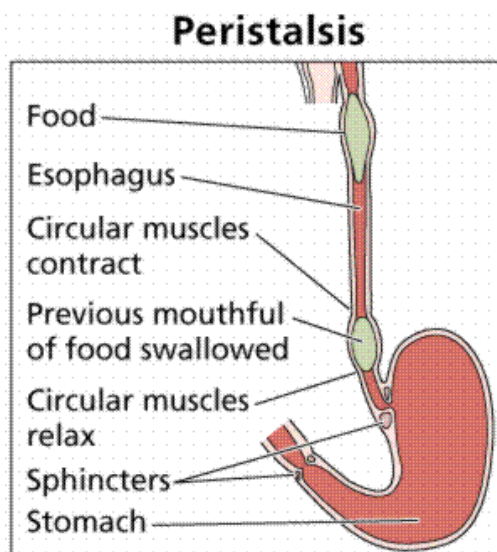


2. PHARYNX: Throat, swallow.

A. **Epiglottis:** flap of tissue that closes over trachea to prevent food from entering trachea (prevent choking)

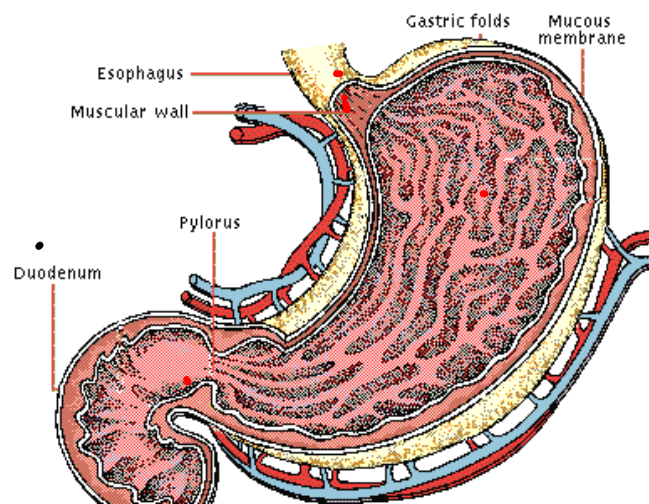
3. ESOPHAGUS:

- Connects mouth to stomach (cardiac sphincter at the end)
- Lining secretes mucus
- Movement of food is aided by alternate waves of relaxation and contraction in the muscular walls. This is called Peristalsis. *



4. STOMACH:

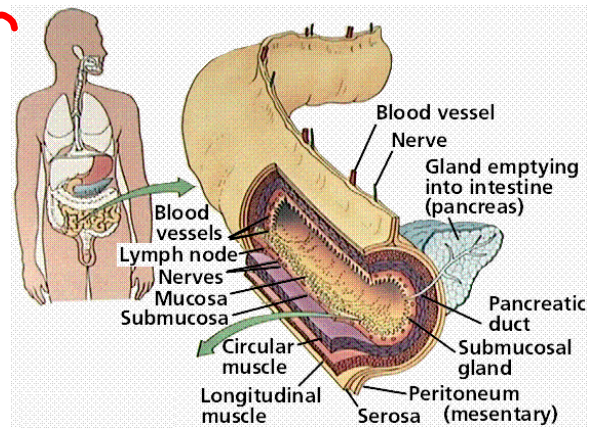
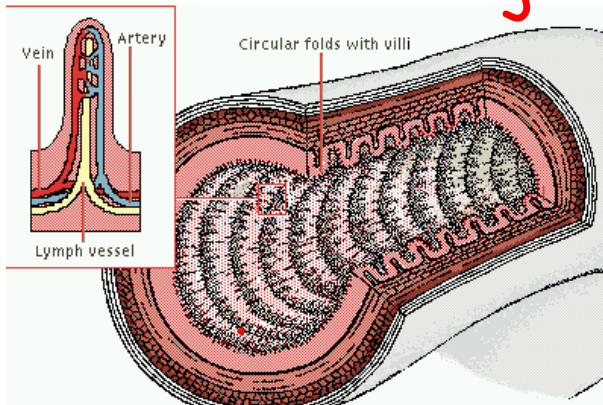
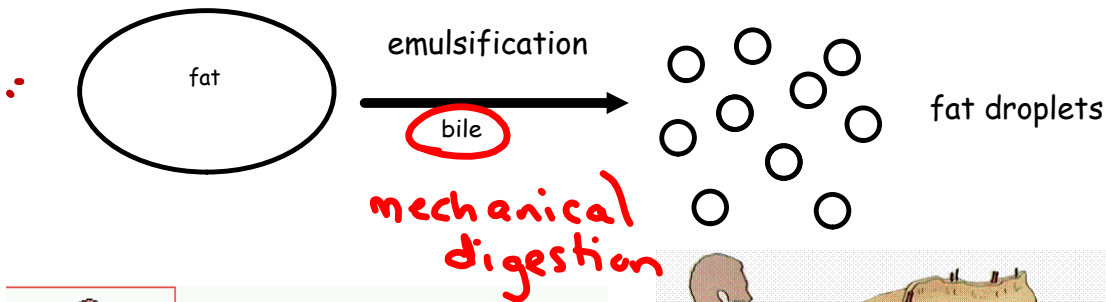
- Muscular pouch for temporary storage (holds 2L)
- Chemical digestion
- Bolus is mixed with gastric juices secreted by glands, which are stimulated by hormone- gastrin
 1. **Pyloric glands**: secrete mucus (covers and protect the stomach lining from ulcers)
 2. **Gastric glands**: secrete acidic gastric juice -HCl (activates pepsin and kills bacteria. pH 1-2) and **enzyme Pepsin**: helps break down protein- \rightarrow amino acids (**Gastric Protease**)
- Bolus \rightarrow liquid called **chyme**, which passes through the pyloric sphincter (controls the passage of food from stomach into small intestine)



5. SMALL INTESTINE:

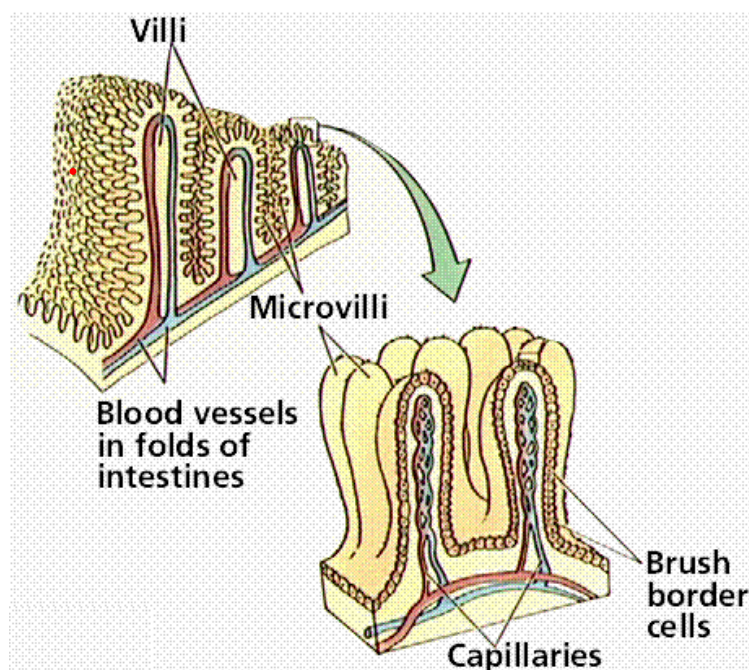
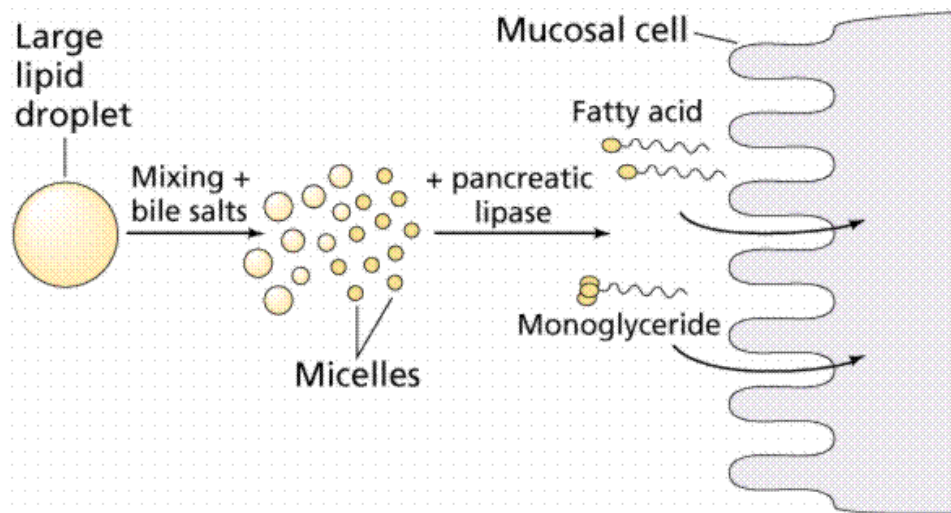
- Coiled tube 6.5m long.
- Most chemical digestion and all absorption
- Basic (Ph~8)
- Chyme is mixed with **BILE** from Liver and **PANCREATIC JUICE** from Pancreas and **INTESTINAL JUICE** from glands in the intestine
- Lined with villi to increase surface area
- Peristalsis mixes the chyme, breaks down particles and speed up absorption.
- 3 main parts:
 - 1) duodenum- most digestion
 - 2) jejunum- where absorption takes place
 - 3) ileum- fat digestion is completed here

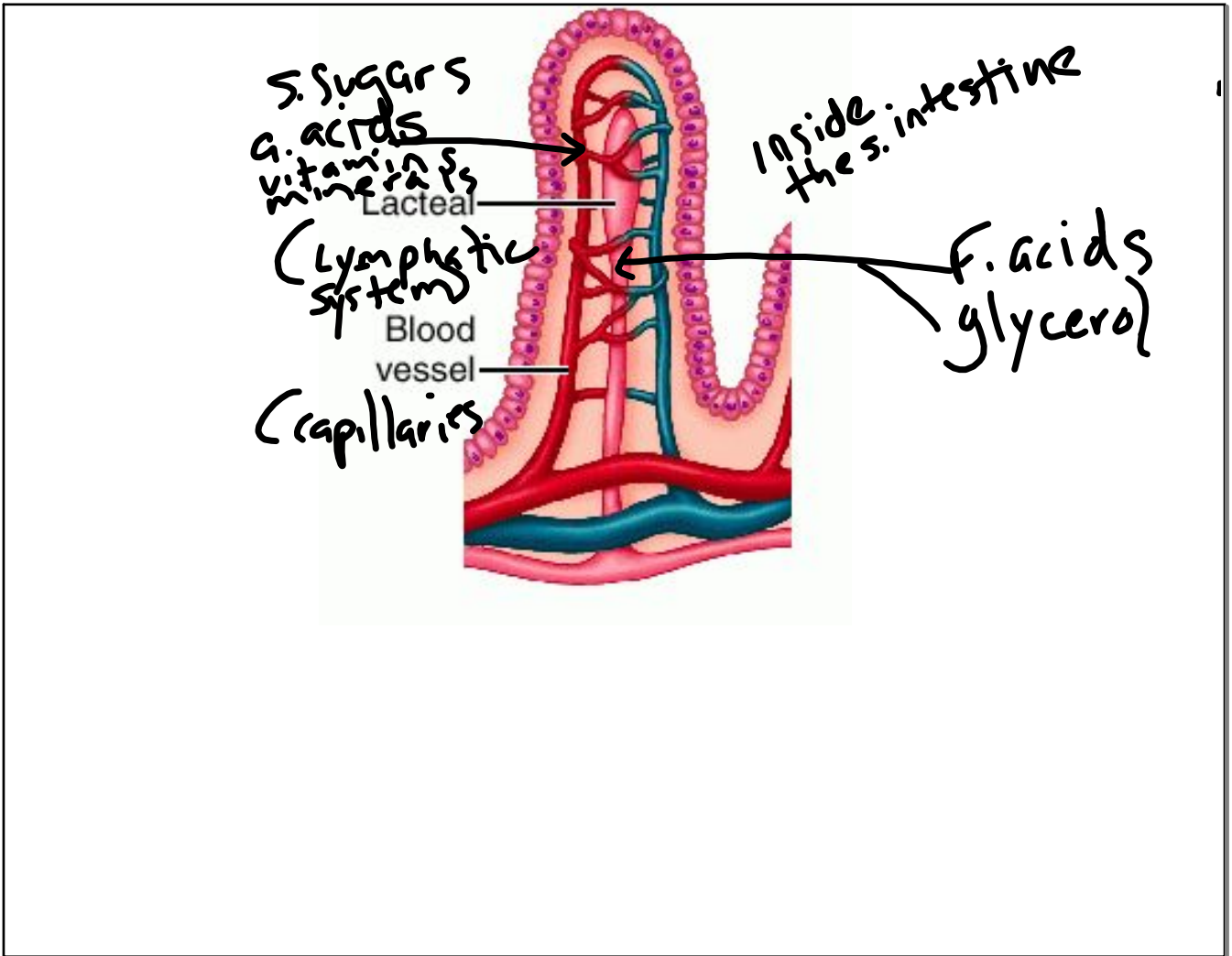
<http://www.youtube.com/watch?v=VQrtYap84zA>



Absorption in the Small Intestine

- The lining of the small intestine contains villi, which increases surface area to increase absorption. Capillaries and small lymphatic vessels (lacteals) extend into the villi.
- Fatty Acids and Glycerol -> villi into the lacteals and is transported in the lymph. → **Circ. System**
- Monosaccharides and Amino Acids -> villi into the capillaries and are transported to the liver (stored) from here they are distributed by blood.





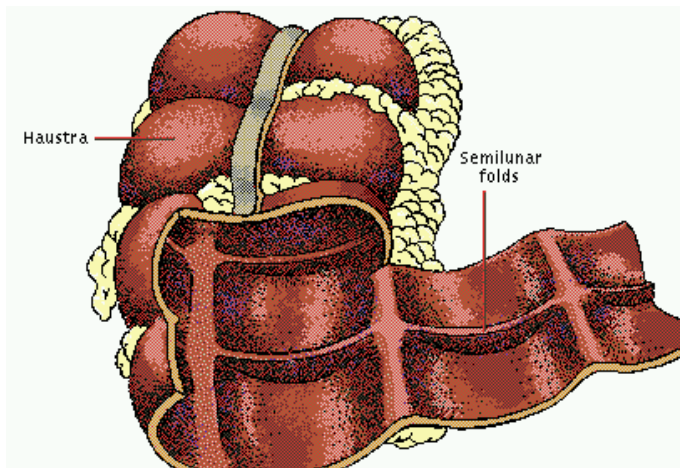
6. LARGE INTESTINE:

- Water and minerals are reabsorbed \times (back into blood)
- Bacteria live here and make vitamin K (for clotting)
- Feces form: roughage (fiber) undigested material
- Components include (ascending/transverse/descending) colon, cecum, appendix (Vestigial organ- appendicitis), and rectum

7. **Rectum**: Temporary storage of feces

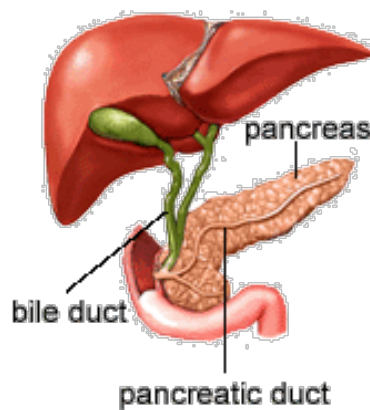
(elimination)

8. **Anus**: Egestion of feces



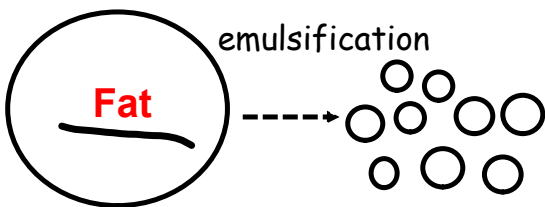
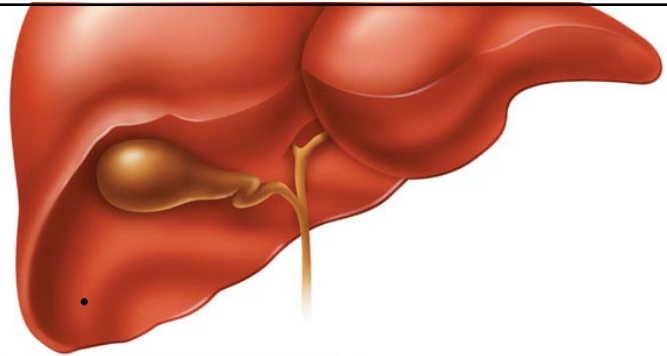
AIM: WHAT ARE THE Accessory Organs of Digestion

- 1) Salivary Glands 2) **Liver** 3) **Gall Bladder** 4) **Pancreas**



1) Liver

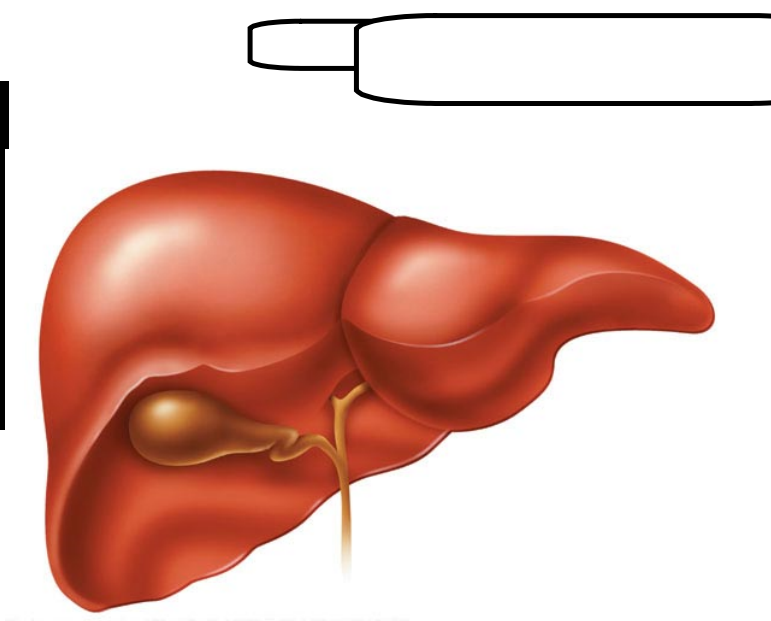
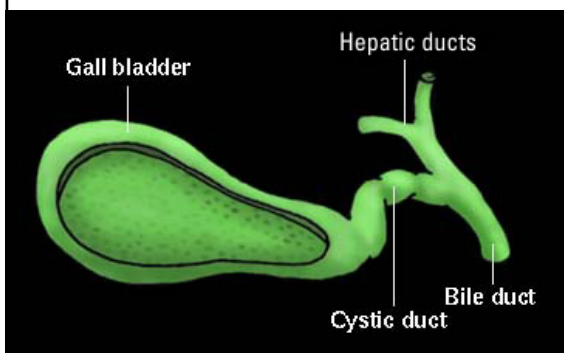
- secretes **bile**
- **emulsification: bile** mechanically breaks up fat molecules into smaller droplets

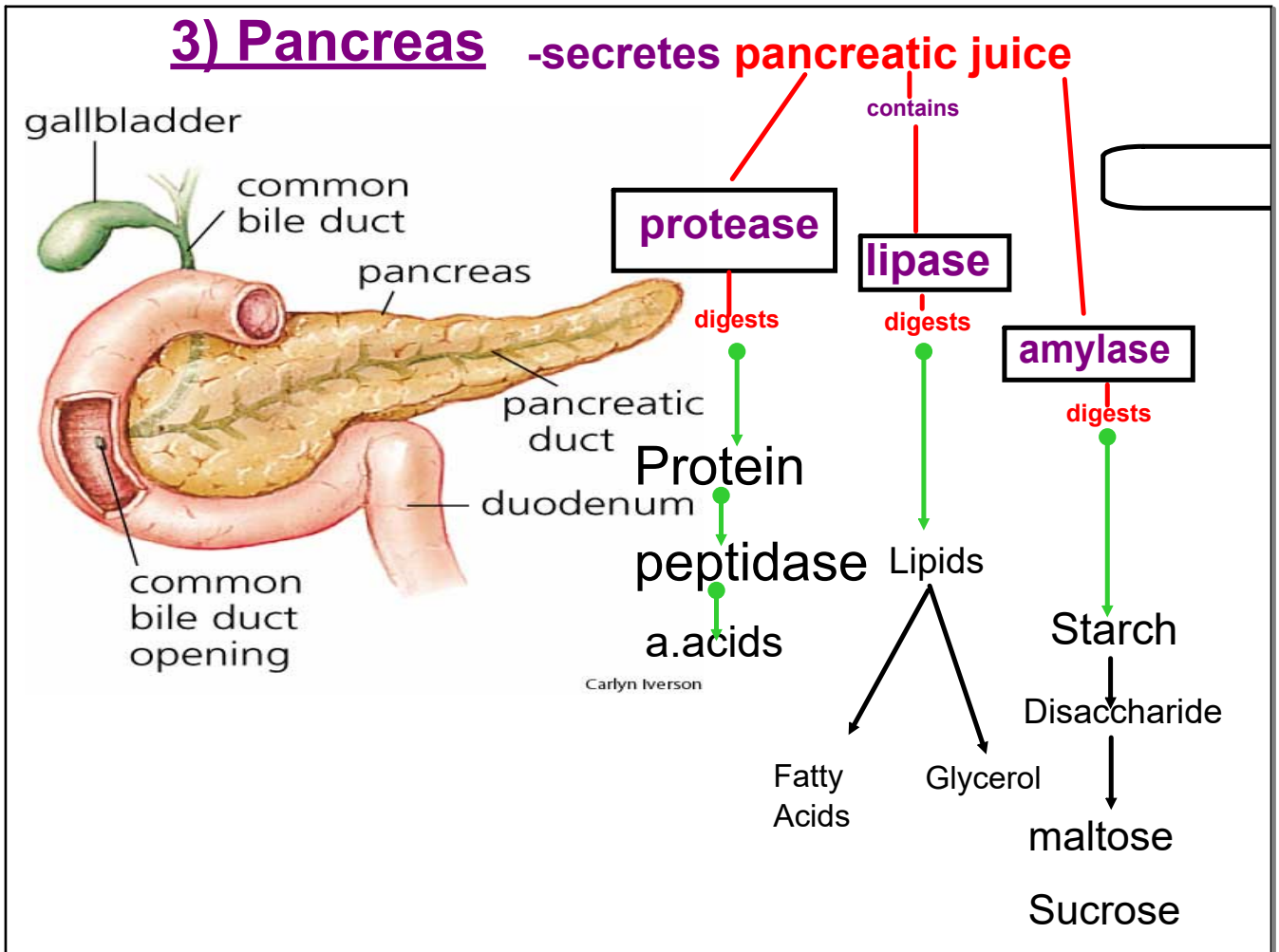


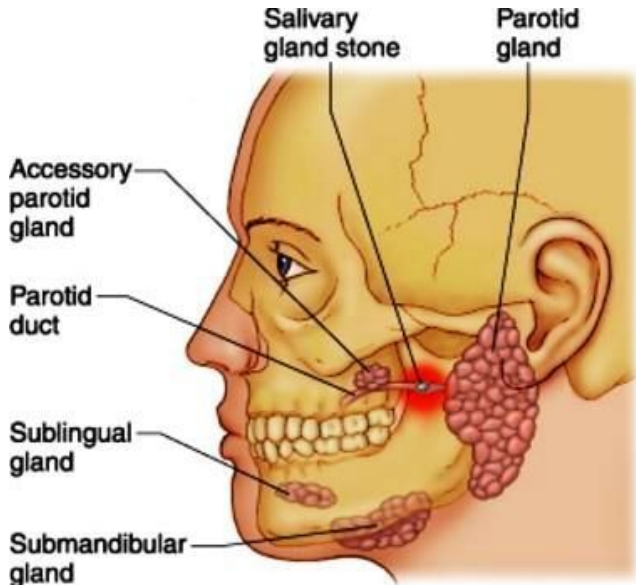
Why break up the fat into smaller droplets?

↑ surface area for chemical digestion [Hydrolysis] of lipids - so lipase has an ↑ surf. area to do its job [break down lipids into F. Acids & Glycerol]

2) Gall Bladder:
Stores the bile produced in the Liver. Bile passes through a duct into the small intestine







Salivary Glands-

- produce saliva
- Salivary amylase digests starch into disaccharides
- Mucus lubricates food

Malfunctions of Digestive System

- Ulcer: A sore(erosion) in the lining of the alimentary canal
- caused bacteria stomach/s.intestine
- Constipation: A condition in which too much water is removed from the feces and emptying the large intestine/rectum is difficult. (L.intestine)
- Diarrhea: a condition in which not enough water is removed from the feces and there is increased peristaltic action. (increased watery feces)
- Appendicitis: Inflammation of appendix due to an infection (bacteria)
- Gallstones: A condition in which cholesterol and/or calcium concentrations in the bile get too high causing them to form "stones" in your Gall bladder
- Heartburn: Acids from the stomach go to esophagus creating a burning sensation.
- Lactose Intolerance - indiv. cannot digest Lactose. (pains in dig. tract)
missing Lactase (enzyme)

Lactose_Intolerance.asf

Attachments

Digestive System Overview 2.mov

Lipids__Fats_and_Oils.asf