DIGESTION

Part 2: Mechanical and Chemical Digestion

MECHANICAL DIGESTION

Outcome:

-B11-2-02: Describe the processes of mechanical digestion that take place at various sites along the alimentary canal. (GLO: D1) Include: chewing in the mouth, peristalsis along the tract, muscle contractions in the stomach, and emulsification by bile in the small intestine

MECHANICAL DIGESTION

- Remember, this is the physical actions that mash, cut, tear, and churn food into smaller pieces.
- The main goal is to increase surface of food, or tear it into smaller pieces.

LOCATIONS OF MECHANICAL DIGESTION

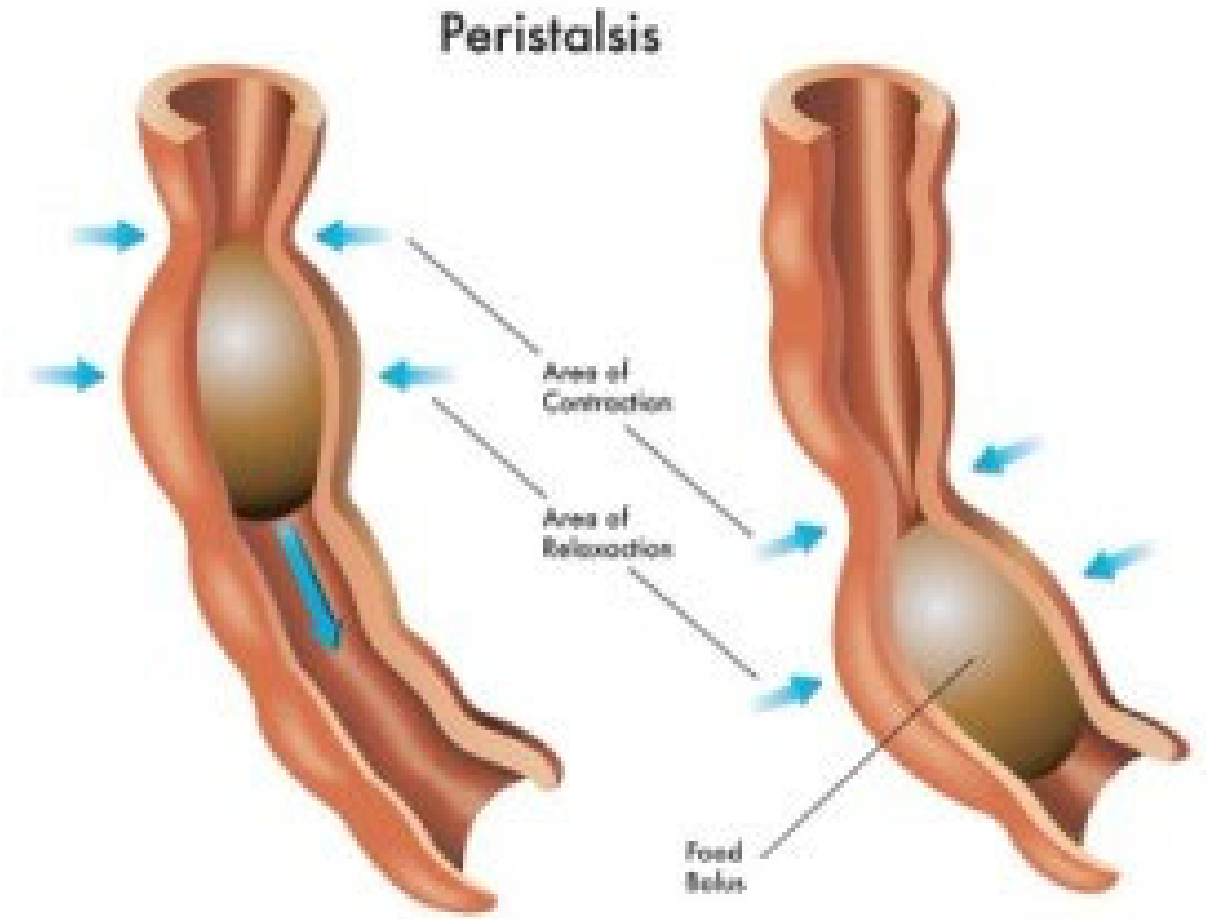
1. Mouth

- Mastication (or chewing) is the first step to digestion.
- Purpose is to increase surface area to allow enzymes to break down food more efficiently.
- Bolus is formed and then swallowed.
  - Bolus = ball-like mixture of food and saliva that forms in the mouth.

LOCATIONS OF MECHANICAL DIGESTION

2. Esophagus

- Food is physically moved through the esophagus by peristalsis
- Muscle contractions move bolus towards the stomach.



LOCATIONS OF MECHANICAL DIGESTION

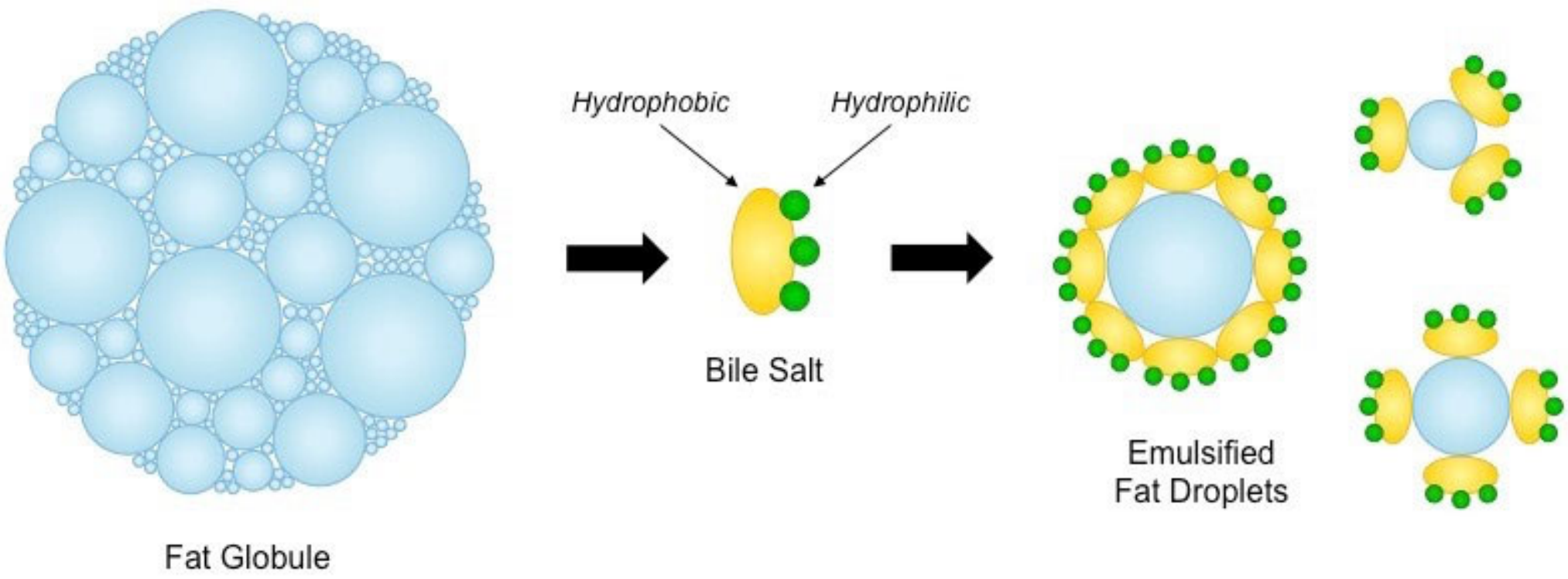
3. Stomach

- Muscles in the stomach allow for a "churning" movement to occur, helping to physically squeeze and mix the boluses with the digestive juices.
- The rough rugae folds of the stomach also help to physically break up the pieces of food.

LOCATIONS OF MECHANICAL DIGESTION

4. Small Intestine

- Segmentation is the contraction of muscles in the intestines that causes a greater mixing of the partially digested food and digestive juices.
- Bile emulsifies fats, so that pancreatic lipases can more easily digest the fats.


Hydrophobic
Hydrophilic
Bile Salt
Emulsified
Fat Droplets
Fat Globule

SECRETIONS AND CHEMICAL DIGESTION

Outcomes:

- B11-2-03: Identify functions of secretions along the digestive tract. (GLO: D1) Include: to lubricate and to protect

- B11-2-04: Identify sites of chemical digestion along the alimentary canal, as well as the type of nutrient being digested. (GLO: D1) Include: starch in the mouth; proteins in the stomach; and carbohydrates, lipids, and proteins in the small intestine

- B11-2-05: Explain the role of enzymes in the chemical digestion of nutrients and identify factors that influence their action. (GLOs: D1, E2) Examples: pH, temperature, coenzymes, inhibitors, surface area…

CHEMICAL DIGESTION

- Remember, this is the break down of food into micromolecules by enzymes.
- Enzymes are big players, but secretions are also important
- Main role of secretions are to lubricate and protect

HOW ENZYMES WORK

- See internet search handout.