Review 04

Processing of food

- Mechanical
  - Mouth—chewing; increases surface area of food for digestion
  - Stomach—churning; mixes food as liquefaction proceeds
  - Small Intestine—peristalsis (muscle contraction) continues mixing and moves food along as digestion/absorption proceed
- Chemical
  - Non-enzymatic:
    - Mouth—Saliva [salivary glands]—liquefaction of food
    - Stomach—Hydrochloric acid [stomach]
    - Gall Bladder—Bile [liver]
  - Enzymatic
    - Mouth—Salivary Amylase [in the saliva]
    - Stomach—Pepsin [from the mucosa]
    - Small Intestine:
      - examples from the pancreas
        - Trypsin, Lipase, Amylase
      - examples from the duodenal mucosa
        - Maltase, Lactase, Sucrase

Control over digestion--digestion doesn't just happen!

- nervous input
  to mouth (salivary glands) and stomach
  colorectal reflex
- hormonal control (see text, p. 672)
  - → gastrin: inc. gastric juice secretion into stomach
  - → secretin: causes pancreas to release alkaline fluids into small intestine; liver to increase bile production
  - → cholecystokinin: causes pancreas to release digestive enzymes; gall bladder to release bile into small intestine

Absorption

- alcohol in <u>mouth and stomach</u>
- water, all along the way with heavy extraction in <u>small and large intestines</u>
  - × saline cathartics
  - × water intoxication

Review 04, con't

- organic nutrients (aa's, sugars, FA's & monoglycerides, most vitamins) in small intestine: folds, villi, microvilli
  - × nutrients carried into columnar epithelial cells
    - ✓ water soluble nutrients & fatty acids <10-12 C long moved through epithelial cells into blood supply, where circulated
    - ✓ fatty acids > 10-12 C long remanufactured into triglycerides, packaged with cholesterol and proteins, moved via exocytosis out of epithelial cells, picked up by lymphatic system (via lacteals) and circulated back to blood
- salts/minerals, various vitamins in small and large intestine

Elimination of wastes

- large intestine.....dehydration and compaction of fecal pellet
  - × fecal pellet ≈ 75% water; 25% solids
  - × brown color due to bile pigments (formed during breakdown of hemoglobin)
- rectum.....storage for elimination
- anus.....sphincter muscle which controls posterior opening to tract