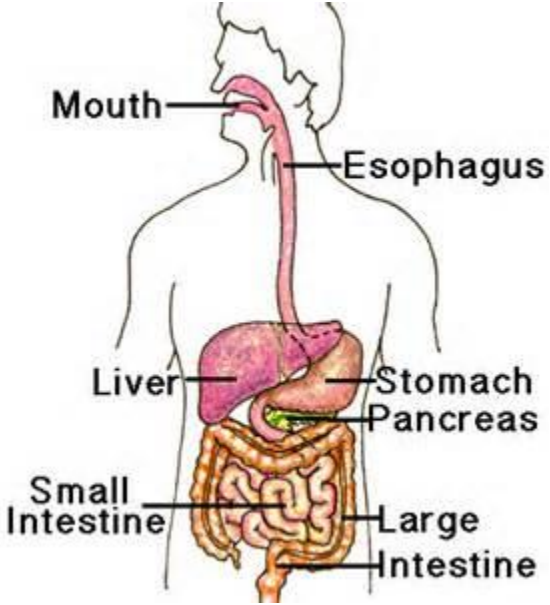
Animal Nutrition & Digestion

Cole Keiper
Cole Kruse
Alyson Van Winkle

Structure

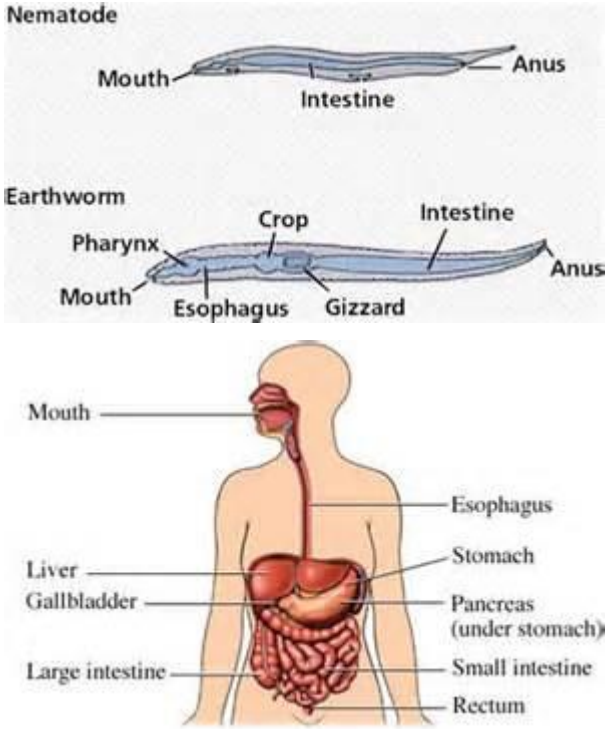


The function of the digestive system is to convert food into energy while disposing of the leftover waste products through digestion.

Order of Digestion:

- Ingestion-act of eating
- digestion-food is broken down into smaller molecules
- absorption-cells absorb the smaller molecules
- elimination-the undigested materials (waste) is excreted

Evolution of system



The digestive system changes to adjust to individual needs.

<u>Intestines:</u> carnivores have a shorter colon than herbivores since it doesn't need to digest plants

<u>Mutualistic:</u> herbivores have fermentation chambers where microorganisms digest cellulose

<u>Teeth:</u>

- carnivores- sharp teeth,
- herbivores- dull, broad teeth
- omnivores- mullers to chew with

Nutrition

Definition: The process of providing or obtaining proper nourishment necessary for health and growth

Vitamins: organic molecules with diverse functions required in our diet in small amounts.

- Water-soluble: Absorbed in the intestine, passed directly to the blood and are carried to the tissues where they will be used. When overused, they are usually harmless.
- Fat-soluble: Stored in the body for long periods of time and overuse can lead to toxicity in animal's body fat. Must be taken in moderation.

Minerals: chemical elements required by living organisms besides carbon, nitrogen, hydrogen, and oxygen.

- Found in organic nutrients and are required in small amounts. Excessive amounts throw off homeostatic balance. EX: high blood pressure-salt

Nutrition

Undernourishment: disintegrates the body due to lack of chemical energy provided to the body

- body eats away at itself

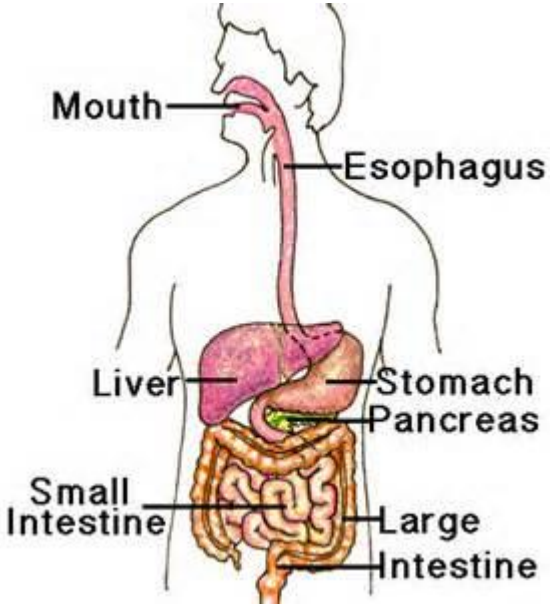
Malnourishment: causes deformities, diseases and can lead to death

- long-term absence from the diet of one or more nutrients.

Overnourishment: consumption of more calories than the body needs for normal metabolism.

- causes obesity

Digestive organs



Mouth: Where ingestion occurs. Saliva is released containing enzyme amylase which aids in breaking down food.
Esophagus: Food travels through esophagus to reach stomach.
Stomach: Some nutrient absorption by active transport or diffusion into bloodstream. Gastric juices, hydrochloric acid and pepsin mix with ingested food to make chyme.
Small Intestine: Break down of food continues as pancreas produces solution with digestive enzymes. Bile, stored in gall bladder, breaks down fats and lipids
Large Intestine(colon): Digestion continues as the colon captures water that entered the canal. Leads to rectum which stores feces until eliminated from the body through the anus.

Homeostatic Mechanisms

- ATP generation is based on the oxidation of energy.
- Fats liberate twice the amount of energy than the amount liberated from a carbohydrate or protein
- Primary storage for energy in humans is the liver and muscle cells
- Excess energy is stored as glycogen. When glycogen depots are filed, the excess is stored as fat.
- Human body generally expends liver glycogen first, then draws on muscle glycogen and fat

Homeostatic Mechanisms

- Satiety Center: network of neurons the relay and integrates information from the digestive system to control appetite (located in the brain)
- OB gene: required to produce satiety factor
  - produces hormone called leptin(lepto=thin)
- DB gene: required to respond to the factor
  - encodes the leptin receptor

Leptin Visual Aid

http://youtu.be/rhObSu7y2_A
(2:12-6:48)

Diseases of Digestive System

Lactose Intolerance: Inability to digest lactose. Can cause abdominal bloating and diarrhea.
Irritable Bowel Syndrome: Intestinal disorder causing pain in the belly. Can cause diarrhea and constipation.
Crohn's disease: A chronic inflammatory bowel disease that affects the lining of the digestive tract. Can cause arthritis and weight loss.
Peptic Ulcer: Sore that develops on the lining of the esophagus, stomach, or small intestine. Can cause vomiting and heartburn.

Works Cited

- Campbell, Neil A., and Jane B. Reece. *AP Edition Biology*. 8th ed. New York: Benjamin/Cummings, 2008. Print.
- "Datasets." *Homepage*. Web. 19 Feb. 2015. <http://www.genedb.org/Homepage>.
- "Review Digestion." *Review Digestion*. Web. 19 Feb. 2015. <http://hes.ucfsd.org/gclaypo/review_digestion.html>.