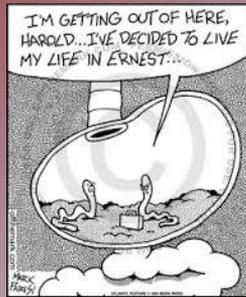


## THE DIGESTIVE SYSTEM



### • FUNCTIONS OF THE DIGESTIVE SYSTEM

- helps the body obtain energy
- consists of **11** organs, each with its own special function
- these organs break down food into **raw materials, energy and waste**
- energy is transported to all of the cells so that the cells can carry out basic bodily functions
- wastes leave the body after the digestive process is finished
- raw materials are transported to cells and used to make compounds necessary for growth, maintenance and repair
- two types of digestion:
  - a) physical digestion
    - = **breaking of food particles into smaller pieces**
  - b) chemical digestion
    - = **breaking of chemical bonds within food molecules**

### • STAGE I – INGESTION

#### ➤ The Mouth

- digestion starts with 3 organs:
  - : tongue
  - : six salivary glands
  - : teeth
- when you eat something, the teeth break up the food the salivary glands produce saliva which moistens the food & contains **AMALASE** which begins starch digestion
- the tongue further breaks down the food by swishing it around in the mouth
- when you are done chewing, you swallow and your tongue pushes the food into the esophagus
- the action of swallowing causes the **epiglottis** to cover the opening to the trachea, preventing food from entering the lungs



#### ➤ The Esophagus

- muscles on the walls of the esophagus contract in a wave-like motion (**PERISTALSIS**) pushing the food down into the stomach



### • STAGE II – DIGESTION

#### ➤ The Stomach

- 'churns' and 'burns' the food
  - the churn is the muscles moving the food around in the stomach to **crush it further**
  - the burn is the gastric juices causing **chemical breakdown**
  - the gastric juices are 3 enzymes: **pepsin, rennin, and lipase**
  - HCl is also present to lower pH in the stomach to a sufficient level for **fiber breakdown** and **protein digestion**
  - muscular **SPHINCTERS** at the top and base of the stomach prevent backflow



#### ➤ The Pancreas

- produces insulin to regulate sugar usage within the body
- also produces **pepsin & HCl** neutralizers which are added to the stomach

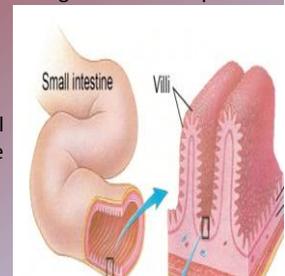
### • STAGE III – ABSORPTION

#### ➤ The Small Intestine

- food that enters the small intestine has been reduced to a brown liquid called **CHYME** with a near neutral pH
- the small intestine is about **10m** long and is made up of 3 parts: **duodenum**

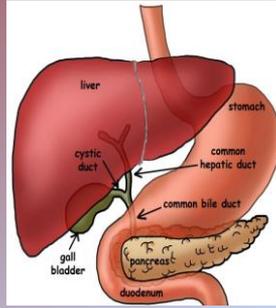
**jejunum**  
**ileum**

- small finger-like projections called **VILLI** coat the inner wall of the intestine, increasing the surface area for absorption
- water aids in lubrication and movement of the material through the small intestine



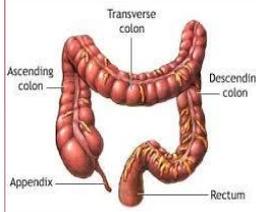
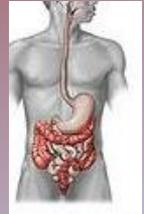
### ➤ The Liver and Gall Bladder

- the liver produces and stores **BILE** which emulsifies fats (**breaks larger droplets of fat into smaller ones**) in the small intestine
- the gall bladder, attached to the liver, stores bile until it is delivered to the small intestine



### ➤ The Large Intestine

- made of 4 sections which 'frame' the abdominal cavity: **ascending colon**  
**transverse colon**  
**descending colon**  
**rectum**



- the large intestine reabsorbs **water** back into the body, leaving only wastes which are stored in the rectum until they are eliminated from the body

### • STAGE IV – EGESTION

- the spent food and other wastes (dead cells) are called **FECES** and are excreted out of the body through the anus
- The digestive system interacts mainly with 2 other systems:
  - **the circulatory system**
  - **the excretory system**

