

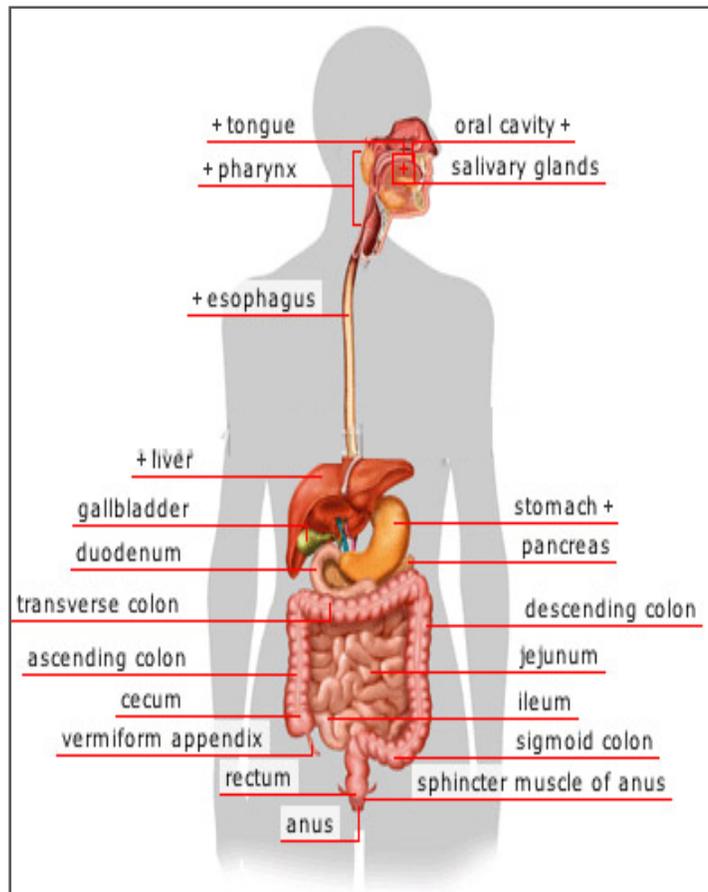
Digestion in Humans

The breakdown of complex components of food into simpler substances is called digestion. The digestive tract and the associated glands together constitute the digestive system. The process of digestion include

- + Ingestion
- + Digestion
- + Absorption
- + Assimilation
- + Egestion

The human digestive system or the alimentary canal can be divided into various compartments:

- (1) The buccal cavity
- (2) Foodpipe or oesophagus
- (3) Stomach
- (4) Small intestine
- (5) Large intestine ending in the rectum and
- (6) The anus



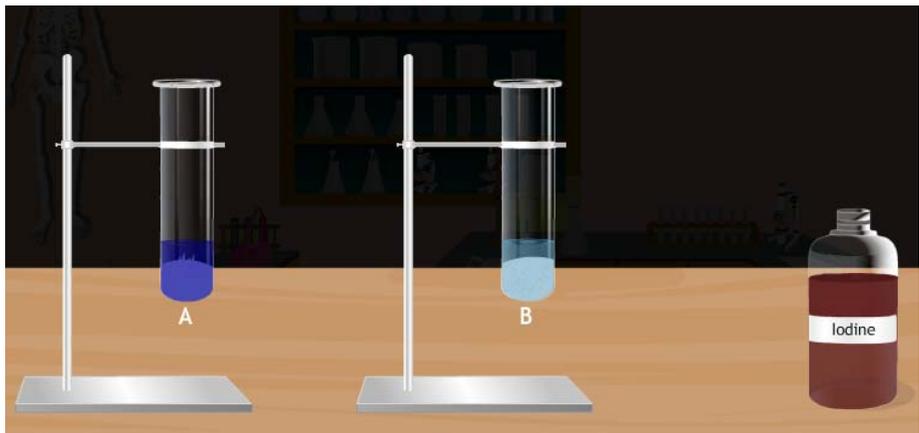
The mouth and buccal cavity

Human Digestive System

- ❖ The food enters the body through the mouth and this process is called as **ingestion**.
- ❖ The salivary glands in the buccal cavity secrete saliva having enzymes which breaks the complex starch molecules into simple sugars.
- ❖ The food is chewed by the teeth which breaks it mechanically into smaller pieces.
- ❖ Humans have two sets of teeth, the milk teeth and the permanent teeth. The teeth are of four types namely the incisors, canines, pre molars and the molars.
- ❖ The tongue is a fleshy muscular organ attached at the back to the floor of the buccal cavity. It mixes saliva with the food during chewing and helps in swallowing food and has taste buds that detect different tastes of food.

Activity

Take two test tubes. Label them 'A' and 'B'. In test tube 'A' put one teaspoonful of boiled rice; in test tube 'B' keep one teaspoonful of boiled rice after chewing it for 3 to 5 minutes. Add 3-4 mL of water in both the test tubes now pour 2-3 drops of iodine solution



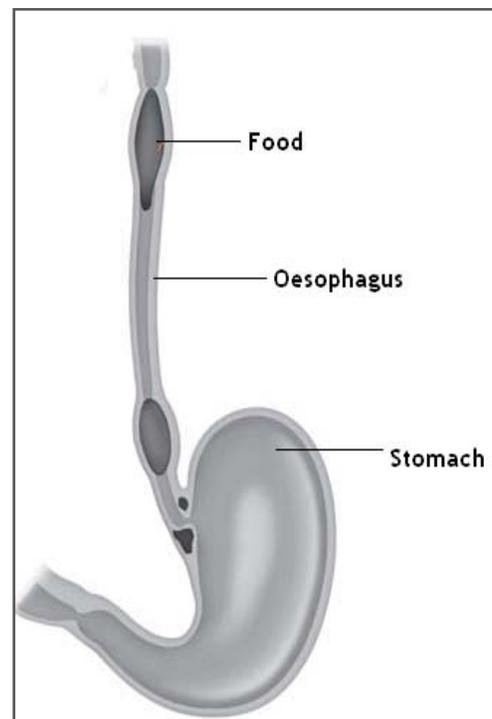
in each test tube and observe. The chewed rice will not turn blue black by the addition of iodine unlike the unchewed rice. The saliva breaks down the starch into sugars due to which the chewed rice didn't show test for starch.

The food pipe/ Oesophagus

- ❖ The food is passed to the food pipe which runs down the neck. The food is pushed to the stomach by the movement of the walls of the oesophagus.
- ❖ A flap like structure called epiglottis folds over the glottis while swallowing the food to prevent it from entering the trachea.

The stomach

- ❖ The food then reaches stomach a flattened U shaped bag like structure leading to the small intestine.
- ❖ The stomach has an acidic environment due to the presence of hydrochloric acid to kill the microbes entering the stomach with food.



Stomach and Oesophagus

- ❖ The inner walls are surrounded by the mucous layer which protects the stomach from acidic medium.
- ❖ Stomach also secretes digestive juices and enzymes which act on proteins and simplify it.

The small intestine

- ❖ It is a highly coiled structure which is about 7.5 m long. The secretions from the small intestine, liver and pancreas further digest the food.
- ❖ The liver secretes bile juice that is stored in a sac called the gall bladder which plays an important role in the digestion of fats.
- ❖ The pancreas also secretes pancreatic juices that help in the digestion of carbohydrates and proteins.
- ❖ The partly digested food now reaches the lower part of the small intestine where the intestinal juice completes the digestion of all components of the food.

Absorption in the small intestine

- ❖ Now the **absorption** of the digested food takes place as the food passes through the blood vessels in the wall of the small intestine.
- ❖ The small intestine has many small finger like projections called villi which increase the surface area for the absorption of the digested food.
- ❖ Each villus has a network of thin and small blood vessels close to its surface.
- ❖ This food is then transported to each and every tissue of the body where is utilized for synthesizing proteins. This process is called **assimilation**.

Large intestine

- ❖ The undigested food is then transported to the large intestine which absorbs water and some salts from the undigested food material.
- ❖ The rest of the waste passes into the rectum and remains there as semi-solid faeces.
- ❖ The faecal matter is removed through the anus from time-to-time. This is called **egestion**.