

# Balanced and Unbalanced Diets

## **Balanced Diet**



A balanced diet contains the correct proportion of nutrients for all our needs. An unbalanced diet can cause malnutrition, starvation and obesity.

## **The Digestive System**

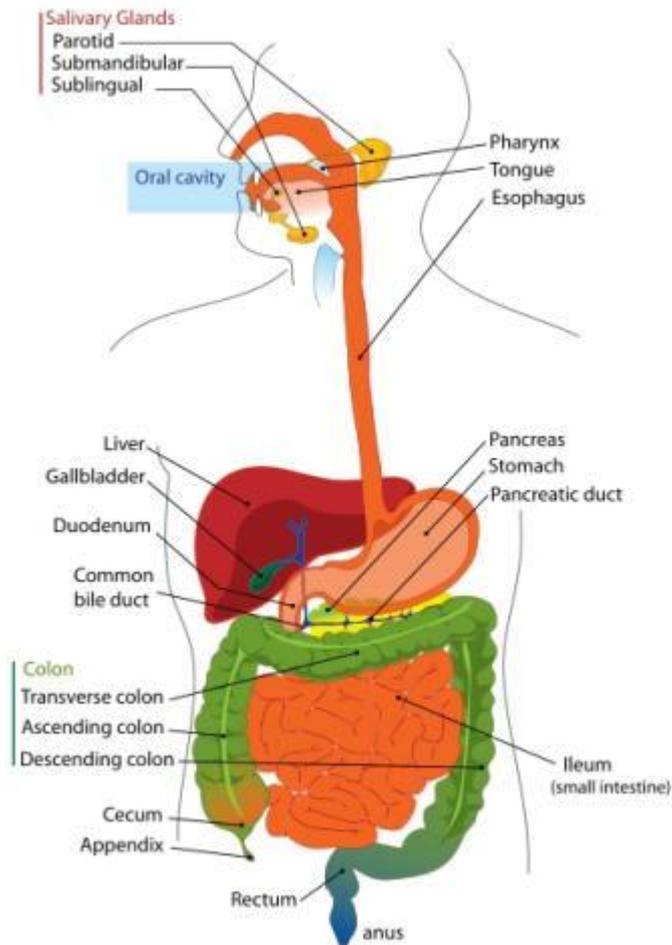
The process by which food is broken down both mechanically and chemically, before absorption is called digestion.

There is a difference between excretion and egestion. Excretion is the removal of metabolic waste while egestion is the removal of undigested waste material.

The digestive system starts from the mouth and ends in the anus. It is made up of:

1. Mouth
2. Oesophagus
3. Stomach
4. Small intestine
5. Large intestine
6. Rectum

## **The Digestive system**



## **Mechanical Digestion**

Mechanical digestion takes place in the mouth, a process of mastication. The chewing of food increases the surface area for better absorption. The teeth cut and grind food. The stomach wall also churns the food. Chemical digestion takes place with enzymes and acids.

Enzymes are biological catalysts that speed up a chemical reaction without them being altered. Enzymes make life possible. Enzymes are mainly protein and that means they can become denatured or inactive. There are many factors that can affect enzymes, these include:

1. Temperature
2. pH
3. Enzyme concentration
4. Substrate concentration

## 5. Enzyme specificity

### **Factors Affecting Enzymes**

All enzymes have their optimum **temperature** around which they work best. They also have a minimum and a maximum temperature. If the temperature is too high the enzyme will be denatured and the protein molecule will unfold from its quaternary structure and hence will not be able to bind to its substrate. If the temperature is too low, the enzyme becomes inactive and slows down remarkably. If however, the temperature is raised the enzyme activity increases. For every 10°C rise in temperature the rate of reaction doubles.

**pH:** this tells the degree of acidity or alkalinity of the substance. Enzymes are highly specific. They either work best in acidic neutral or alkaline conditions but never in all three. The mouth and small intestine are alkaline while the stomach is acidic.

**Lock and key hypothesis:** enzymes are highly specific they all have the substrate on which they act. Each enzyme acts on a specific substrate. The enzyme has an active site on which the substrate binds. It forms an enzyme-substrate complex. The substrate is then converted into products which would no longer fit into the active site and so would dissociate itself from the enzyme.

**Substrate Concentration:** depending on the amount of substrate present the enzyme will work differently. If the substrate concentration is smaller than the enzyme concentration then the reaction will occur at a fast rate. However, if the substrate concentration is far greater than the enzyme concentration then the reaction would proceed at a slower rate.