

## **FOOD CONSTITUENTS**

Water, carbohydrate, lipids and proteins are usually present in large quantities in food, while vitamins and minerals are found in smaller quantity.

### **WATER**

Water is chemically composed of two molecules of hydrogen and one molecule of oxygen. It is present in all foods in large amounts except a few like common salt, sugar and cooking oils. Foods rich in water are fruits, vegetables, milk and beverages such as tea, coffee, carbonated drinks, juices etc. The human body consists of about 60 to 70% water. It is estimated that the normal person should take 2 liters of water every day. But a physical laborer in hot climate should take more water according to his body requirement.

#### **Forms of water in food**

##### **Free water**

Free water is available for chemical and biochemical reactions as well as for use by microorganisms. It can be frozen as well as dried. It can be easily removed or extracted from food by squeezing, cutting or pressing.

For example: Citrus, melon, coconut, pineapple

##### **Physically bound water**

Bonding forces are of physical nature and this water cannot be removed easily.

For example: gel (custard), emulsion.

##### **Chemically bound water**

This type of water involves chemical linkages of water molecules to other food constituents such as carbohydrates and salts. It is difficult to be removed by drying or

freezing. The bonded water provide reduced biochemical reactions as well as microbial activity

### **Emulsion:**

Two immiscible liquids are mixed together with the help of emulsifying agents to form a solution called emulsion.

These emulsifying agents are called emulsifiers that increase the stability of an emulsion.

### **Types:**

- Water in oil emulsion: e.g. Butter and margarine
- Oil in water emulsion: e.g. Milk, cream and mayonnaise

### **Role of water in foods:**

Water provides the medium in which enzymes and other chemical reactions are dispersed. The presence of water in correct form and amount is necessary for the acceptable quality and storage life of food. Fresh fruits and vegetables have high amounts of water and are less stable as compared to grains and dry seeds that contain less water.