

# UNIT

## 2

# Sports and Nutrition

### INTRODUCTION

All living beings need food for maintaining energy in the body for doing work. The food which we eat is known as 'diet'. The energetic food in our diet consists of various types of essential chemicals for our body termed as 'Nutrients'. An athlete should take balanced diet, which has all the essential nutrients like proteins, minerals, carbohydrates, fats, vitamins etc. We need food not only to get the supply of energy, but also for the growth and compensations of body. The broken cells of the body are repaired by the food which we take. Food is also necessary for the formation of new cells. It also regulates various activities of the body.

### LEARNING OBJECTIVES

- 2.1 Balanced Diet and Nutrition : Macro and Micro Nutrients
- 2.2 Nutritive and Non-Nutritive Components of Diet
- 2.3 Eating for Weight Control – A Healthy weight, The Pitfalls of Dieting, Food intolerance and Food myths

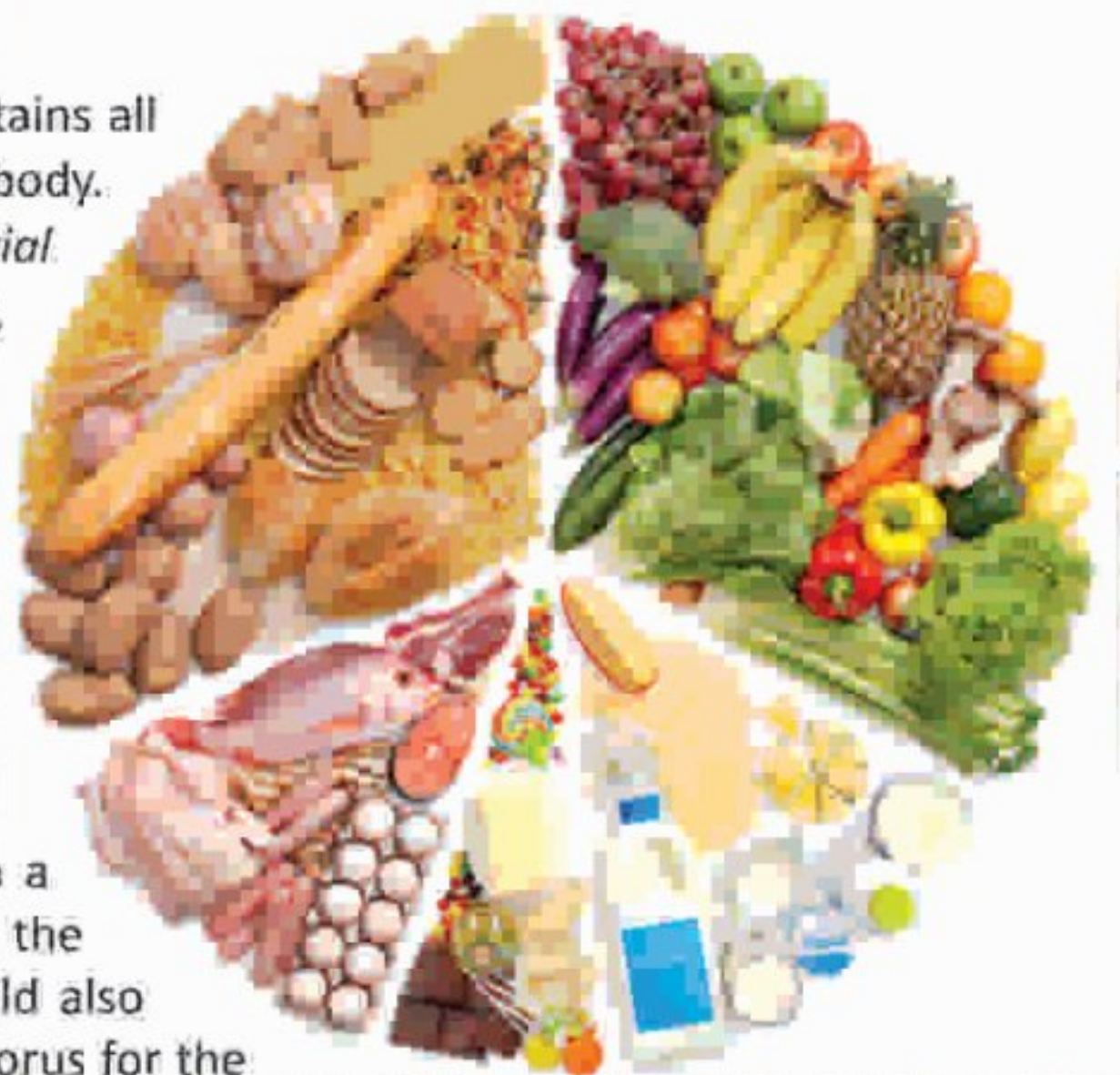
## 2.1 BALANCED DIET AND NUTRITION MACRO AND MICRO NUTRIENTS

### MEANING OF BALANCED DIET

A balanced diet may be defined as that diet which contains all the nutrients in the correct amount as required by the body. In other words, "A diet which consists of all the essential food elements e.g. proteins, carbohydrates, vitamins, fats, minerals and water in correct proportion is called **balanced diet**." The ratio between proteins, fats and carbohydrates should be 1:1:4 respectively. A balanced diet is essential for growth and maintenance of the body. However the diet of every individual is different as it varies according to the needs of their body.

### FACTORS AFFECTING DIET

1. **Age** : A growing child needs more proteins than a grown-up man. The proteins are needed to make the body tissues of the growing child. A growing child also needs more minerals such as calcium and phosphorus for the formation of bones than a young adult.



2. **Occupation** : A person doing hard physical work needs more carbohydrates and fats in his diet than a person doing sedentary work.
3. **State of health** : The persons recovering from illness need more proteins, minerals and vitamins in their diet to repair the damage caused by illness.
4. **Climate** : The diet also depends upon the climate in which we live. If we live in cold climate, we need more quantity of proteins and fats. We should take rich fat diet in cold climates. In hot climate, we should take such a balanced diet, which has less fats.
5. **Gender** : Gender (sex) difference causes variation in diet. Males need more calories as compared to females due to physiological needs of the body.
6. **Body Built or Constitution** : The weight also brings difference of diet. Overweight or obese person should take fibrous food whereas slim or lean (underweight) persons need more proteins and fats.
7. **Pregnant or feeding mother** : A pregnant or feeding mother needs extra diet i.e. more amount of carbohydrates, proteins, fats, vitamins and minerals.

### **FUNCTIONS OF BALANCED DIET / IMPORTANCE OF BALANCED DIET AND NUTRITION FOR BODY**

A balanced diet means eating the right types of food to provide your body with nutrition and energy. Good nutrition is important for healthy growth and development. A balanced diet is important because it enables us to meet our daily nutritional needs and enjoy a higher overall quality of life.

1. **Disease prevention** : Eating a balanced diet is the easiest way to protect yourself from many diseases. Eating in a balanced way boosts our energy level and ensures our body functions normally. Lean protein, whole grains, fruits and vegetables are part of a heart-healthy diet. Low in calories and high in vitamins, minerals and fiber, fruits and vegetables help control weight and blood pressure, which if allowed to rise, are risk factors for heart disease. Fiber-rich whole grain foods help maintain healthy cholesterol levels. A balanced diet also enables us to live longer.
2. **Meeting Nutritional Needs** : Our daily food intake should include grain, fruit, milk (or other dairy products), vegetables, beans, oils and protein. Healthy foods contain vitamins and minerals that boost immunity and serve as natural protection from many common illnesses.
3. **Weight Control** : Eating a balanced diet can be an important first step towards weight control. A balanced diet helps us to maintain healthy weight. If we are underweight, eating a balanced diet can help to gain weight and maintain the weight gain in the long term.
4. **Immune System Health** : Foods rich in vitamins and other nutrients boost **immunity**. Vitamin E contributes to the production of antibodies, making your immune system strong. Eating foods rich in vitamin C, enhances the production of lymphocytes, a type of white blood cell that guards your body against infection. Vitamin D, helps our cells combat germs and eases **inflammation**. Zinc, selenium and iron support a healthy immune system.
5. **Proper sleep** : Eating a balanced diet enables us not only to sleep better without the use of sleeping pills but also feel more rested when we wake up.
6. **Mental Health** : Building diet around whole grains, fish, fruits, vegetables, legumes, beans and seeds helps one stay in good mental health. From a study it has been found that



middle-aged women who ate a healthy diet were about 40 percent more likely to live longer without mental problems than women who adhered to less-healthy diets.

- 7. Quality of life :** Eating a balanced diet is important because it allows us to enjoy life, have more energy, feel less stress and accomplish more in less time. We will have fewer illnesses and medical bills. A balanced diet is the foundation of good health and well-being.

## MEANING OF NUTRITION

Nutrition is the process of consuming food or nourishing liquids, digesting and absorbing them and using them for health and growth. Also, nutrition can be defined as a three-part process *i.e.* consumption, digestion and circulation of the food. The origin of the word 'nutrition' is linked to the Latin words 'nutritionem and nutrire,' meaning "a nourishing" or "to nourish, suckle."

Generally, food and nutrition are considered synonyms to each other which is improper. In fact food is a mixture of various substances which are essential for life whereas nutrition is a **dynamic** process in which body is made healthy by the consumption of food.

**Meaning of Nutrients :** Nutrients are components in food that an organism uses to survive and grow. Organic nutrients consist of carbohydrates, fats, proteins and vitamins. Inorganic chemical compounds such as dietary minerals, water and oxygen may also be considered as nutrients.



## MACRO AND MICRO NUTRIENTS

On the basis of the amount of nutrients required by the human body, they are classified in the following two categories :

### (A) MACRO NUTRIENTS

Those nutrients which are required in large amounts are called as macro-nutrients. These provide energy and are required for growth and maintenance of body to perform activities. These include carbohydrates, fats, proteins and water.

- 1. Carbohydrates :** Carbohydrates are the sugars, starches and fibers found in fruits, grains, vegetables and milk products. They are the most important source of energy. They contain elements of carbon, hydrogen and oxygen. The ratio between hydrogen and oxygen in carbohydrates is 2 : 1 like water. These compounds are important for different digestive functions in our body.

#### Types of Carbohydrates

- (a) Simple Carbohydrates :** Simple carbohydrates or monosaccharaides are those carbohydrates which digest quickly. These are sweet in taste and soluble in water quickly such as glucose.

**(b) Complex Carbohydrates :** Complex carbohydrates or polysaccharides are those carbohydrates, which digest slowly. These are not sweet in taste (like starch in potatoes) and insoluble in water.

**Functions :** Carbohydrates have various functions in the human body as given below :

- (i) They provide energy for working muscles.
- (ii) They provide fuel for the central nervous system.
- (iii) They help enabling fat metabolism.
- (iv) They help preventing protein from being used as energy.



**2. Fats :** Fats contain Carbon, Oxygen and Hydrogen in the percentage of 76, 12 and 12 respectively. Fats are composed of fatty acids. They provide more calories as compared to other constituents of food. They are essential for the absorption of vitamins like A, D, E and K. They are good source of energy. Fats are derived from the following two sources :

**Animal sources :** It consists of meat and dairy products such as milk, butter, cheese and egg yolk.

**Vegetable sources :** It consists of various edible oils of groundnut, mustard, cottonseed, sunflower and coconut.

### Types of Fats

**(a) Saturated Fat :** It is solid at room temperature. It is mostly present in animal foods such as milk, cheese and meat. It is also present in tropical oils such as coconut oil, palm oil etc. Saturated fat can raise your cholesterol level. A healthy diet should have less than 10% calories from saturated fat.

**(b) Trans Fat :** It is a fat that has been changed by a process called **hydrogenation**. It is mostly present in processed foods, snacks, cookies etc. Trans fat can raise your cholesterol level. So, eat as little trans fat as possible to live healthy.



**(c) Unsaturated Fat :** It is liquid at room temperature. It is mostly present in oils from plants. If you eat unsaturated fat instead of saturated fat, it may help to improve your cholesterol level. It is of two types :

**(i) Mono unsaturated Fat :** It is mostly present in vegetable oils such as canola, olive and peanut oils. It helps to lower your 'bad' LDL cholesterol and keeps 'good' HDL cholesterol level high.

**(ii) Poly unsaturated Fat :** It is mostly present in vegetable oils such as sunflower, soyabean, corn oils etc. It also helps to lower your 'bad' LDL cholesterol level.



**Functions :** Fat has various functions in the human body as given below :

- (i) Fats are stored in body and are used as emergency sources of energy.
- (ii) Fats are important sources of energy for long duration activities and important for proper functioning of glands and other internal organs.
- (iii) It helps in transportation of fat soluble vitamins A, D, E, K.
- (iv) It helps in **blood clotting**.
- (v) It helps in maintenance of skin and hair. Our diet should consist of 5 to 10% of fat. Higher intake of fat increases risk of obesity and many heart diseases.
- (vi) Fats maintain body temperature and protect it from the effect of external temperature.
- (vii) They make body soft and oily.

**3. Proteins :** Proteins are the building blocks of body. Proteins contain carbon, hydrogen, oxygen, nitrogen and sometimes sulphur. Proteins are very large molecules, so they cannot get directly into our blood. So they are broken into amino acids by our digestive system. There are 23 amino acids found in proteins and out of these 9 amino acids are essential for us. Proteins help in growth and building new cells and repair the present ones.



Lack of proteins can cause energy **deficiency** in the body, anaemia, low level of immunity, loss of weight, dry skin and irritability etc.

The diseases caused due to deficiency of proteins are Kwashiorkor and Marasmus.

There are two main dietary sources of proteins :

**(a) Animal Sources :** It consists of meat, fish, egg, milk, cheese etc.

**(b) Plant Sources :** It consists of pulses, cereals, nuts, beans, peas etc.

**Functions :** Protein has various functions in the human body as given below :

- (i) **Repair and Maintenance :** Protein is termed the building block of the body and is vital in the maintenance of body tissue, including development and repair.
  - (ii) **Source of Energy :** Protein is a major source of energy.
  - (iii) **Creation of some Hormones :** Protein is involved in the creation of some hormones. These substances help to control body functions that involve the interaction of several organs.
  - (iv) **Transportation and Storage of Molecules :** Protein is a major element in transportation of certain molecules.
  - (v) **Antibodies :** Protein forms antibodies that help preventing infection, illness and disease.
- 4. Water :** Water is very important element of food or diet. Water is made up of hydrogen and oxygen elements in 2:1. Our blood contains 90% of water. Water helps to regulate nutrients of food in the body cells. It is also very useful for **excretion** of waste products from the body. It regulates the body temperature. A normal person requires 4 to 5 litres of water every day.

**Functions :** Water has various functions in the human body as given below :

- (i) It helps to remove poisonous substances and waste products from the body.
- (ii) It helps in food digestion.
- (iii) It helps to form body fluids *i.e.* plasma of the blood, the lymph and digestive juices.
- (iv) It protects the bones to become dry and brittle.
- (v) It helps in blood circulation.
- (vi) It helps to maintain the body temperature.
- (vii) It helps to supply mineral salts to the body.

## **(B) MICRO NUTRIENTS**

Micro nutrients are nutrients required in small quantity. Vitamin and Minerals are commonly referred to as micro nutrients because human body requires small amount for survival and proper growth and development. Various micro nutrients are vitamin A, B, C, D, E and K, minerals such as iron, calcium, magnesium, iodine etc.

1. **Vitamins :** Vitamins are organic chemicals required by the body for its various metabolic processes and for the normal working of the body. Metabolic processes refer to the biological processes that a living organism uses to provide energy for sustaining life and growth. Vitamins are the best sources of energy. They are required in very small amount. They are vital for the body. Lack of vitamins can cause scurvy, beri-beri, rickets, pellagra etc. An individual may need very less amount of vitamins every day and it is in milligrams. Vitamins can be classified as fat soluble and water soluble. These are described as follows :

### **(A) Fat soluble vitamins**

- (i) Vitamin A (ii) Vitamin D
- (iii) Vitamin E (iv) Vitamin K

- (i) **Vitamin A :** Vitamin A is called vitamin of growth. It is very important for children and lack of vitamin A can hinder the growth. It is essential for eye sight. This vitamin keeps the skin in good condition. Lack of this vitamin in children causes prickles on hands and legs. One may catch cold, cough and formation of stones in urinary tract if there is lack of vitamin A. The sources of vitamin A are milk, egg yolk, cod-liver oil, yellow vegetables, mango, papaya etc. The daily requirement is 2 mg approximately.



- (ii) **Vitamin D** : Vitamin D helps to keep the teeth and bones strong, firm and in a right shape. It helps in the utilization and absorption of calcium and phosphoric acid. It also maintains normal functioning of parathormone.

Lack of vitamin D causes rickets in children and bones become weak and flexible. Vitamin D is present in egg specially in yolk, liver of sheep, cod liver oil, shark liver oil, pure milk, etc. Natural source of vitamin D is sun rays specially early in the morning (sun rise time).

- (iii) **Vitamin E** : It is required for **coagulation** of blood. It is used in anti-ageing creams because it keeps the skin healthy. It also maintains normal functioning of reproductive organs. It helps during pregnancy and helps in normal child birth. Lack of this vitamin can cause abortion. Vitamin E is present in wheat and wheat flour, leafy vegetables, carrot, cauliflower, lettuce, cucumber, green pepper, spinach, milk, banana and butter etc.

- (iv) **Vitamin K** : This vitamin is also known as anti bleeding vitamin. Lack of this vitamin causes inability of blood to coagulate. It is present in salad of leaves, cabbage, spinach, cauliflower, tomatoes, peas and carrot etc.

### (B) Water Soluble Vitamins

(i) Vitamin B complex (ii) Vitamin C

- (i) **Vitamin B Complex** : It is a group of 8 water soluble vitamins which are important for cellular metabolism. These are described as follows :

(a) **Vitamin B<sub>1</sub> or Thiamine** : It helps to metabolise carbohydrates and maintains health and efficiency of muscles and nerves. Deficiency of thiamine causes Beri-Beri disease characterised by headache, sleeplessness, muscle weakness, constipation etc.

(b) **Vitamin B<sub>2</sub> or Riboflavin** : It acts as **antioxidant**, maintaining healthy blood cells, protecting skin and eye health. Deficiency causes unhealthy skin, inflammation in eyes and decreased immunity.

(c) **Vitamin B<sub>3</sub> or Pantothenic Acid** : It is helpful in growth of the body. Its deficiency causes greying of hair.

(d) **Vitamin B<sub>5</sub> or Nicotinamide** : It helps in maintaining body weight. Its deficiency causes a disease called Pellagra.

(e) **Vitamin B<sub>6</sub>** : This vitamin helps to keep the skin healthy. It is also essential for formation of haemoglobin.

(f) **Vitamin B<sub>7</sub> or Biotin** : Its deficiency causes muscle strain, impaired growth, depression etc.

(g) **Vitamin B<sub>9</sub> or folic acid** : It helps in blood formation. Deficiency of folic acid can cause loss of leucocytes.

(h) **Vitamin B<sub>12</sub>** : It helps to maintain healthy nerve cells and helps in production of DNA and RNA. Fish, meat, poultry, eggs are rich source of this vitamin. Deficiency causes anemia.

- (ii) **Vitamin C** : It is most important for growth and **regeneration**. It activates enzymes and is useful for tissues. It is also useful for gums, keeps them healthy, heal wounds, maintains red cells in blood and is good for teeth.

Lack of Vitamin C affects the gums, can cause scurvy, swelling in joints and bleeding in skin and mucus membrane etc. It is present in turnip, papaya, leaves, amla, malta, orange, lemon, green chillies, strawberry, musammi, ber, mango and guava etc.

2. **Mineral Salts** : Minerals comprise 4% of our body weight. These are required for various activities such as formation of hormones, maintenance of heartbeat, **transmission** of nerve impulses etc. Mineral salts are called protective elements. These are very important for maintenance of the body. Some minerals are given below :

**Macro Minerals :**

- (i) **Sodium** : It is needed for the proper functioning of nervous system. Its deficiency causes cramps and tiredness. It is present in common salt, vegetables and fruits.
- (ii) **Calcium** : It makes bones and teeth strong. It maintains the blood pressure and helps to make blood clot at the time of bleeding. It helps other molecules to digest food and makes energy for body. It is present in milk, orange, green leafy vegetables, egg etc.
- (iii) **Phosphorus** : It is very important for the formation of tissues and cells in the body. It is very necessary for multiplication of body cells and healthy growth of teeth, bones, nervous system and blood serum. Lack of this can cause **hinderance** in growth, weak bones, etc. It is present in cheese, egg specially in yolk, potatoes, almonds, nuts, wheat, milk and liver etc.
- (iv) **Magnesium** : It helps in proper growth, formation and functions of bones and muscles. It helps to prevent some heart disorders, high blood pressure, improvement of the lung functioning, absorbing calcium and potassium. It prevents depression, helps our brain to function normally and thus it is very important element of our diet. It is present in whole grains, beans, meat etc.
- (v) **Potassium** : It helps to keep nervous system and muscular system fit and active all the time. It also helps in maintaining the amount of water in blood and tissues. It is present in green leafy vegetables, tomato, banana, peanuts, citrus fruits etc.
- (vi) **Sulphur** : It is very important for the formation of brain, nails and hair. It also helps in digestion of food. It is present in cabbage, spinach, pulses, raddish and eggs etc.

**Micro Minerals** : These are required in very less amount i.e 0.01g of each trace elements per day. Some trace elements are :

- (i) **Copper** : It helps in the formation of haemoglobin of blood along with iron. It is present in spinach, dry fruits, meat, egg etc.
- (ii) **Iodine** : This element is required for keeping thyroid gland healthy. This gland uses iodine to make hormones that affect our growth and development. It is present in iodized salt, fish, sea food etc.
- (iii) **Chromium** : It stimulates **insulin** activity. Its deficiency may cause diabetes. It is present in carrot, tomato, soyabean, groundnuts, blackgram etc.
- (iv) **Cobalt** : It helps to protect us from anaemia. It is present in milk, meat, green leafy vegetables etc.
- (v) **Iron** : Iron is the main salt which helps to constitute blood and helps to produce haemoglobin. It acts as oxygen carrier to the lungs. Lack of Iron can cause **anaemia**. It is present in liver, eggs, meat, onions, pulses, dates, figs, dry fruits and lettuce etc.





## 2.2 NUTRITIVE AND NON-NUTRITIVE COMPONENTS OF DIET

Each food that we eat has different nutrient content and therefore it is important that we should know about the effects it can have in meeting nutritional requirements. On the basis of the nutritive value of components of diet, components are divided into two categories.

### NUTRITIVE COMPONENTS OF DIET

- 1. Carbohydrates :** Carbohydrates are one of the important components of diet. Carbohydrates act as fuel in the body and provide energy. People involved in hard work or labour require maximum carbohydrates to produce energy in the body. Excess of carbohydrates intake may change into fats and develop fatty tissues which may lead to obesity. Lack of carbohydrates may cause loss of body weight, wrinkles in the skin appears, individual becomes weak and thin. Carbohydrates can be classified as Simple Carbohydrates (Sugars) and Complex Carbohydrates (Starch and Cellulose). The major difference between simple and complex carbohydrates is time taken for their digestion and their chemical structures. The sources of carbohydrates are described as follows:



**Sugars :** It is obtained from Milk, beet, sugarcane, honey.

**Starch :** It is obtained from wheat, maize, beet, potato, rice etc.

**Cellulose :** It is obtained from cereals, vegetables, fruits etc.

- 2. Fats :** Fats contain carbon, hydrogen and oxygen. Fats are stored in our body as emergency source of energy. They are used after completion of carbohydrates source. Excess fat can get deposited in the body and decreases the efficiency of normal function of organs. However, if there is less intake of fat in diet, carbohydrates change into fat upto some extent. Fats are

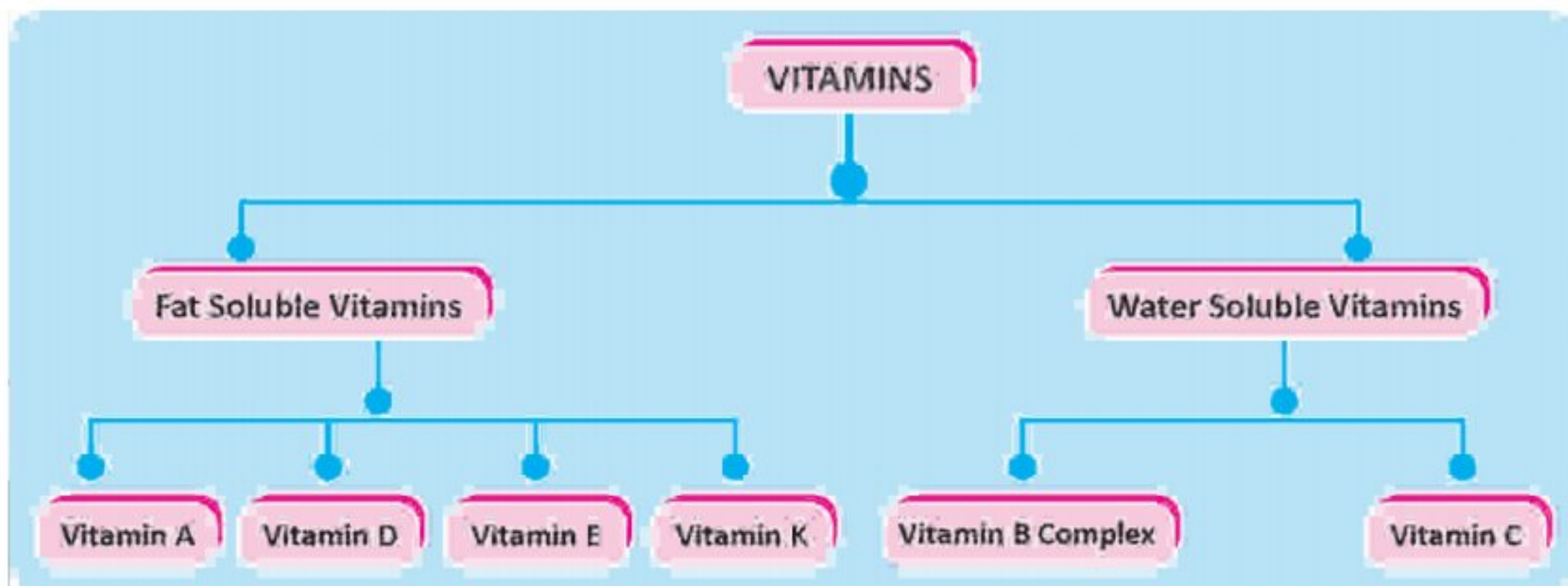


good source of energy. Fats are of two types i.e. vegetable fat and animal fat. Vegetable fat is present in nuts especially groundnuts, mustard seeds, mustard oil, coconut – coconut oil etc. Soya beans also have fats. We get animal fats from milk, meat, butter, ghee and fish etc.

- 3. Proteins :** Proteins contain elements like carbon, hydrogen, oxygen, nitrogen and sulphur. Proteins are large molecules and cannot get directly into our blood. So they are broken down into amino-acids. Proteins are helpful for growth and development of an individual specially children. Moreover these are useful for repairing the wear and tear of tissues. Proteins help in the formation of enzymes, hormones and act as a source of energy. Proteins are very important part of diet. High protein foods include meat, fish, cheese, beans, lentils, yogurt, eggs, nuts and seeds.



- 4. Vitamins :** Vitamins are complex compounds of carbon. These are required by the body in small quantities. Vitamins are not formed in the body but have to be supplemented by diet. These protect us from various diseases and help in development of our body. Vitamins are of two types :



(a) **Fat soluble vitamins** : These vitamins are soluble in fat and stored in liver and fatty tissues. Vitamins increase immunity power in our body against disease and also give their important contribution for general development of body. These vitamins are :

- (i) **Vitamin A** : It is soluble in fat. Lack of vitamin A can cause night blindness and can disturb the growth of individual. It is obtained from milk, cheese, eggs, butter, carrots, raddish, green vegetables, fruits and cod liver oil etc.
- (ii) **Vitamin D** : This vitamin is soluble in fat and present in animal fats specially in fish liver oil. It is present in milk, eggs and groundnuts etc. Natural source of vitamin 'D' is 'Sun'. The deficiency of this vitamin can cause rickets and softening of bones.
- (iii) **Vitamin E** : It is very useful for reproductive process. Green vegetables provide this vitamin to our body. It is soluble in fat. It is required for fast division of cells in the body. The lack of this vitamin can lead to abortion. This vitamin is present in whole wheat grain, leafy vegetables, carrots, cauliflower, lettuce, cucumber, green pepper, spinach, banana, milk and butter etc.
- (iv) **Vitamin K** : It is soluble in fats and necessary for the normal coagulation of blood. Lack of this vitamin can cause extensive bleeding from the wounds. It is present in cabbage, cauliflower, carrot-tops, soyabean oil and sea-weeds. In small amount it can be found in tomatoes, milk, eggs and orange peel etc.

(b) **Water soluble vitamins** : These vitamins are soluble in water. We need these vitamins more frequently because these are not stored in our body. These vitamins are :

- (i) **Vitamin B Complex** : It is a group of 8 water soluble vitamins which are important for cellular metabolism. These are :
  - **Vitamin B<sub>1</sub> or Thiamine** : It helps to metabolise carbohydrates and maintains health and efficiency of muscles and nerves. Deficiency of thiamine causes Beri-Beri disease characterised by headache, sleeplessness, muscle weakness, constipation etc. Wheat, liver, green peas & vegetables, rice, groundnuts are rich sources of thiamine.
  - **Vitamin B<sub>2</sub> or Riboflavin** : It acts as antioxidant, maintaining healthy blood cells, protecting skin and eye health. Deficiency causes unhealthy skin, inflammation in eyes and decreased immunity. Egg Yolk, fish, rice, wheat, green vegetables and pulses are rich sources of riboflavin.



- **Vitamin B<sub>3</sub> or Pantothenic acid** : It is helpful in growth of the body. Its deficiency causes greying of hair. Milk, dry fruits and egg yolk are rich sources of vitamin B<sub>3</sub>.
  - **Vitamin B<sub>5</sub>** : It helps in maintaining body weight. Its deficiency causes a disease called Pellagra. Milk, yeast, polished rice and nuts are rich sources of vitamin B<sub>5</sub>.
  - **Vitamin B<sub>6</sub>** : This vitamin helps to keep the skin healthy. It is also essential for formation of haemoglobin. Meat, rice, wheat, peas, egg yolk are rich sources of vitamin B<sub>6</sub>.
  - **Vitamin B<sub>9</sub>** : It helps in blood formation. Deficiency of folic acid can cause loss of leucocytes. Asparagus, citrus fruits, peas and lentils are rich sources.
  - **Vitamin B<sub>12</sub>** : It helps to maintain healthy nerve cells and helps in production of DNA and RNA. Deficiency causes anemia. Fish, meat, poultry, milk and milk products are rich sources.
  - **Vitamin B<sub>7</sub>** : Its deficiency causes muscle strain, impaired growth, depression etc. Meat, fish, legumes are rich sources.
- (ii) **Vitamin C** : It is present in citrus fruits like orange, lemon etc. Lack of vitamin C can cause hindrance in growth, gum pain and continued vitamin deficiency can cause a disease called scurvy.
- 5. Minerals** : Minerals are very important components of diet. Minerals are necessary for the growth and development of an individual. They also help in the functioning of muscles and formation of teeth. There are various types of minerals i.e.

#### Macro Minerals

- (a) **Calcium and phosphorus** : Calcium and phosphorus are very important constituents of bones as well as other tissues of the body. The skeletal system is the main calcium deposit.
- (i) **Calcium** : Calcium is required for formation of bones and teeth. It also helps to maintain the acid base balance. It strengthens the neuro-muscular system. It plays an important role in blood clotting.
- To prevent the deficiency of calcium one should take diet which is rich in calcium such as milk and dairy products, orange juice, green leafy vegetables, cereals, fruits, tomatoes etc.
- (ii) **Phosphorus** : It is very important for the formation of tissues and cells in the body. It is very necessary for multiplication of body cells and healthy growth of teeth, bones, nervous system and blood serum. Lack of this can cause hinderance in growth, weak bones, etc.
- To prevent the deficiency of phosphorus one should take diet which is rich in phosphorus such as cheese, egg specially yolk, potatoes, almonds, nuts, wheat, milk and liver etc.
- (b) **Magnesium** : It provides flexibility to the bones and elasticity to the muscles. It is called body refresher. It makes the teeth strong. It is present in coconut, almond, french beans, cabbage etc.
- (c) **Potassium** : It is required to activate **enzymatic system**. It is also important for blood plasma. It also helps in healing wounds. Potassium helps to grow the brain tissues and

acts as a tonic for brain. It is present in carrot, lettuce, onion, cucumber, tomato, mango, banana, orange, apple and coconut etc.

- (d) **Sulphur** : It is necessary for the purification of blood and for keeping the skin in good condition. It strengthens the brain and nervous system.

The sources of sulphur are mustard, cucumber, carrot, peas, spinach, tomato, raddish, pineapple, apple, coconut etc.

- (e) **Sodium** : It maintains balance of water in the body. It also maintains acid base balance in the body. Sodium is present in common salt, eggs, meat, milk & milk products etc.

### Micro Minerals

- (a) **Copper** : It helps in the formation of haemoglobin of blood along with iron. It is present in spinach, dry fruits, meat, egg etc.

- (b) **Iodine** : It is required for the proper functioning of the body. It helps the thyroid gland to secrete thyroxine and regulates the body temperature.

It helps to develop brain and useful for hair. Lack of iodine causes hindrance in growth. The sources of iodine are common salt (iodized), sea foods, French beans, lettuce, sea greens etc.

- (c) **Chromium** : It stimulates insulin activity. Its deficiency may cause diabetes. It is present in carrot, tomato, soyabean, groundnuts, blackgram etc.

- (d) **Cobalt** : It helps to protect us from anaemia. It is present in milk, meat, green leafy vegetables etc.

- (e) **Iron** : Iron is found in the body in the form of organic and inorganic compounds which includes haemoglobin, myoglobin etc. It is very important for blood, due to which blood is red in colour and helps to carry oxygen to the various parts of the body. Lack of iron causes anaemia.

To prevent deficiency of iron one should eat green leafy vegetables, water melon, cabbage, lettuce, cucumber, spinach, pista, almond, apple, wheat grains. etc.

## NON-NUTRITIVE COMPONENTS OF DIET

Non-nutritive components of diet are compounds absorbed from the food but they do not provide energy in the form of calories. They can either help us or harm us. Given below is the explanation of some of the non nutritive components:

- |                  |                      |                          |
|------------------|----------------------|--------------------------|
| 1. Water         | 2. Roughage or fibre | 3. Artificial Sweeteners |
| 4. Preservatives | 5. Food Additives    | 6. Plant Compounds       |

1. **Water** : Water is very important element of food or diet although it does not provide any nutritional value to our body. Our blood contains 90% of water. Water helps to transport nutrients of food in the body cells. It is also very useful for excretion of waste products from the body. It controls the body temperature. A normal person requires 4 to 5 litres of water every day. It has various functions in the human body like removal of poisonous substances and waste products from the body, helps to digest food, forms body fluids, protects the bones, maintains the tissues in a soft and flexible condition, helps in blood circulation, maintains the



body temperature and helps to supply mineral salts to the body. Water is excreted from body in form of sweat, urine and faeces. 80% of our intake is by drinking water and rest comes from food.

**2. Roughage or Fibre :** Roughage or Fibre has no nutrient value. Dietary fibre, or roughage is the indigestible portion of food that cannot be digested by human intestinal tract. Its main function is to add bulk to the diet, which in turn helps in the digestion process and healthy function of the **bowel system**. Roughage comes in two different types, usually referred to as soluble and insoluble fibre.

**(a) Soluble fibre :** It dissolves in water. It reduces blood sugar fluctuation and helps to lower cholesterol.

**(b) Insoluble fibre :** It does not dissolve in water. It is a good stool softener.

**Some of the Sources of roughage or fibre are :** Peas, soybeans, oats, rye, chia, and barley, some fruits (including prunes, plums, avocados, berries, ripe bananas, and the skin of apples, and pears), certain vegetables such as broccoli, carrots, root vegetables such as sweet potatoes and onions (skins of these are sources of insoluble fibre also), flax seeds, nuts etc.

**3. Artificial Sweeteners :** Artificial sweeteners are **synthetic** sugar substitutes that may be derived from naturally occurring substances, including herbs or sugar itself. Artificial sweeteners are attractive alternatives to sugar because they add no calories to our diet. In addition, we need only a fraction compared with the amount of sugar we would normally use for sweetness.

Artificial sweeteners are widely used in processed foods, including baked goods, soft drinks, powdered drink mixes, candy, puddings, canned foods, jams, jellies and dairy products etc.

**4. Preservatives :** A preservative is a naturally occurring or synthetically produced substance that is added to foods, to prevent any undesirable chemical changes and increase their shelf life. Preservatives can be divided into two types, depending on their origin :

**(a) Natural food preservation :** Naturally occurring substances such as rosemary extract, hops, salt, sugar, vinegar, alcohol and castor oil are also used as traditional preservatives. Certain processes such as freezing, pickling, smoking and salting can also be used to preserve food.

**(b) Artificial food preservation :** Man-made chemicals that are added to foods to stop them from spoiling. Preservatives that are commonly used in foods in small amounts include **sorbets**, which can be identified by the additive numbers (200-203), benzoates (210-218), sulphites (220-228) and propionates (280-283). Some nitrites (249-250) are also classified as preservatives.

**5. Food Additives :** Food additives may be regarded as substances, either synthetic or natural, which are normally not consumed as food itself, but is deliberately added, usually in small amounts. These may include colour compounds or flavour compounds.

**(a) Colour compounds:** Colour compounds are added by food producers to colour food or to adjust the colour to desired level are among the commonly used food additives. They are used to enhance the appearance and quality. Colour compounds are usually added to processed food such as candies, snacks, margarine, cheese, soft drinks, jam/jelly, gelatin,

pudding and pastry fillings. Colour compounds are divided into two groups based on their sources as natural and synthetic. Natural colour compounds are produced from sources such as beetroot, grape, cabbage and paprika. They are less stable to heat, light or pH, and their production is inadequate to meet industrial demand. Synthetic colour compounds are substances which are not found in nature due to chemical structures and obtained are by chemical synthesis.

- (b) **Flavour compounds:** Flavour compounds increase taste and consumer acceptability of the food item. A flavour compound is defined as a substance that gives another substance flavour, altering the characteristics of the solute, causing it to become sweet, sour, tangy, etc.

**6. Plant compounds :** Plant compounds are non nutritive components of diet. These substances when ingested may have beneficial or harmful effects on the body. If taken in excess there are many plant compounds which can harm our body. For example, caffeine when taken in excess quantity may lead to increase heart rate, **secretion** of stomach acid and excessive urination.

2.3

## EATING FOR WEIGHT CONTROL A HEALTHY WEIGHT, THE PITFALLS OF DIETING, FOOD INTOLERANCE AND FOOD MYTHS

Eating For Weight Control includes the energy balance which is important for maintaining a healthy weight. The amount of energy or calories you get from food and drinks (*i.e.* energy IN) is supposed to be balanced with the energy your body uses for things like breathing, digesting, and being physically active (*i.e.* energy OUT).

The same amount of energy IN and energy OUT over a period of time = weight stays the same (energy balance)

More energy IN than OUT over a period of time = weight gain

More energy OUT than IN over a period of time = weight loss

To maintain a healthy weight, your energy IN and OUT don't have to balance exactly every day. It's the balance over time that helps you maintain a healthy weight.

You can reach and maintain a healthy weight if you follow a healthy diet, and if you are overweight or obese, reduce your daily intake for weight loss.

### A HEALTHY WEIGHT

A healthy weight is one that is right for your body type and height. It is based on your body mass index (BMI) and the size of your waist (waist circumference).

$$\text{BMI} = \frac{(\text{Weight in kgs})}{(\text{Height in m})^2}$$

National Institute of Health defines healthy weight as the one that is between 19 and 25 (BMI).



If BMI is less than 18.5, the person is in the underweight category.

If BMI is between 18.5 and 24.9, the person is in the recommended weight category.

If BMI is 25 to 29.9, the person is in the overweight category.

If BMI is 30 or higher, the person is in the obese category. He may need to lose weight and change his eating and activity habits to get healthy and stay healthy.

Classification	BMI
Underweight	< 18.5
Normal Weight	18.5 - 24.9
Over Weight	25.0 - 29.9
Class I Obesity	30.0 - 34.9
Class II Obesity	35.0 - 39.9
Class III Obesity	40.0

It's important to remember that BMI is only one measure of health. A person who is not at a "normal" weight according to BMI charts may be healthy if he or she has healthy eating habits and exercises regularly. People who are thin but don't exercise or eat nutritious foods aren't necessarily healthy just because they are thin.

**Chart of Height and Weight**

MALE				FEMALE			
HEIGHT IN CM	LOW WEIGHT (KG)	MEDIUM WEIGHT (KG)	MAXIMUM WEIGHT (KG)	HEIGHT IN CM	LOW WEIGHT (KG)	MEDIUM WEIGHT (KG)	MAXIMUM WEIGHT (KG)
157.5	50.7-54.4	53.7-57.1	57.1-63.9	147.5	41.7-44.4	43.5-48.5	47.1-53.9
160	52.1-55.8	54.8-60.3	58.5-65.3	150	42.6-45.8	44.4-49.9	48.0-55.3
162.5	53.5-57.1	56.2-61.6	59.8-67.1	152.5	43.5-47.1	45.8-51.2	49.4-56.7
165	54.8-58.5	57.8-63.0	61.2-68.9	155	44.9-48.5	47.1-52.6	50.8-58.0
167.5	56.2-60.3	59.0-64.8	62.6-70.0	157.5	46.2-49.9	48.5-53.9	52.1-59.4
170	58.0-62.1	60.7-66.6	64.4-73.0	160	47.6-51.2	49.9-55.3	53.5-60.7
172.5	59.8-63.9	62.6-68.9	66.6-75.2	162.5	49.0-52.6	51.2-57.1	54.9-62.6
175	61.6-63.7	64.4-70.7	68.4-77.1	165	50.3-53.9	52.6-58.9	56.7-64.4
178	63.4-68.0	66.6-72.5	70.3-78.9	167.5	51.6-55.8	54.4-61.2	58.5-66.2
180	65.3-69.8	68.0-74.8	72.1-81.1	170	53.5-57.6	56.2-63.0	60.3-68.0
183	67.1-71.6	69.8-77.1	75.3-83.4	172.5	54.8-59.4	58.0-64.8	62.1-69.8
185.5	68.9-73.4	71.6-79.3	76.1-85.7	175	57.1-61.2	59.8-66.6	63.9-71.6
188	70.7-75.7	73.4-81.6	78.4-87.9	178	58.9-63.5	61.6-68.4	65.7-73.9
190.5	72.5-77.5	75.7-83.9	80.7-90.2	180	60.7-65.3	63.5-70.3	67.5-76.2
193	74.3-79.3	78.0-86.1	82.5-92.5	183	62.6-67.1	65.3-72.1	69.4-78.4

### WAIST SIZE

Measuring waist can help one find out how much fat one has stored around the belly. People who are "apple-shaped" and store fat around their belly are more likely to develop weight-related

diseases than people who are "pear-shaped" and store most of their fat around their hips. Diseases that are related to weight include type 2 diabetes, heart disease and high blood pressure.

For most people, the goal for a healthy waist is:

Less than 40 in. (102 cm) for men.

Less than 35 in. (88 cm) for women.

Steps to achieve Healthy Weight are given below:

- 1. Set an appropriate goal :** Setting realistic goals for achieving or maintaining a healthy weight is an important first step. It helps you focus and start planning for change. Having a clear goal in mind helps you to stay motivated. So, start by defining your goals. Choose goals that you can fit into your life and budget.
- 2. Avoid strange diets :** Establishing healthy eating habits is the key to a healthy weight. Any strange, extreme diet should be avoided. One should choose healthy foods and eat smaller portions, slowly. Achieving and maintaining a healthy weight is, after all, a long-term process. It's about changing what you eat and drink, and how active you are for the rest of your life.
- 3. Limit intake of sugars :** Avoid sugar-sweetened drinks such as soft drinks, sports drinks, energy drinks, fruit drinks, vitamin waters etc. Such products increase the risk of weight gain. Also avoid adding sugar to tea or coffee and limit confectionery as well as cakes, biscuits and desserts. Drinking sugared soda, fruit drinks, or juice can give you several hundred calories a day without realizing it. Switching from these to water or unsweetened drinks can reduce weight.
- 4. Eat Balanced diet and healthy diet :** To maintain a healthy weight, one should take a balanced diet. One should think before eating. Unnecessary munching of food will lead to weight gain. Eat a healthy diet consisting of plenty of vegetables, fruit, **legumes** and whole grains. Also include low-fat milk and dairy products, as well as some lean meat, poultry, fish, eggs or plant-based choices such as legumes, nuts and seeds.
- 5. Limiting the quantity of food:** When we talk about our diets, we usually talk about what we eat, but we don't often talk about how much we eat. To achieve and maintain a healthy weight, it is just as important to eat the right amount of food as the right type of food. The amount of food we should eat varies depending on our age, gender, height, body size and physical activity level.
- 6. Balance calorie Intake and Expenditure :** The secret to maintaining a healthy weight is to balance calorie intake and calorie expenditure. Calorie intake means the calories you get from the food and beverages you consume. Calorie expenditure means the calories you burn for basic body functions and during physical activity. It is important to maintain the balance between the calorie intake and expenditure for having a healthy weight. When your calorie intake is more than the expenditure you end up gaining weight. When your calorie expenditure is more than your calorie intake, weight loss occurs. When both the calorie expenditure and intake are same, your weight also remains same.
- 7. Do not skip meals :** To maintain a healthy weight, it is also important to not skip any meals. Eat breakfast every day. People who don't eat breakfast tend to eat bigger meals later in the day, are likely to have more snacks and have dietary patterns that are higher in **kilojoules**. When we skip meals, in the next meal we tend to overeat which leads to obesity.





8. **Avoid Junk foods :** Most of the junk foods are high in kilojoules, saturated fat and salt, and high in sugar. They also tend to be low in dietary fibre and other nutrients. Junk foods such as pizza, cookies, burger, cold drinks, chocolates are rich in calories and can lead to overweight. So these should be avoided.
9. **Active Lifestyle and Regular Exercise :** To maintain and achieve a healthy weight, exercise is as important as the healthy diet. It is important to move more, sit less, every day. Regular exercise helps to keep the body fit and active and also helps in weight loss. Exercise can increase your metabolism and improve your outlook. Go for a walk, a bike ride, a swim, do a fitness class or play a game of sport. One should have an active life style to maintain a healthy weight. For example, taking stairs instead of elevators, playing outdoor games instead of video games etc.

### THE PITFALLS OF DIETING

Dieting means restricting to small amount of food intake or having special kind of food in order to lose or maintain weight.

As many people set goals of losing weight, there are many **pitfalls** that set them up for failure when it comes to eating right. If the dieting process is not implemented correctly ; it has various possible dangers referred to as the pitfalls of dieting. These are described as follows :

1. **Eating very less Calories :** Usually during dieting, calorie intake reduces extremely. Our body needs specific amount of calories for proper functioning. When we under eat, our body goes into 'starvation mode', causing our metabolism to drop. Cutting down on calories may result in loss of weight but it can be dangerous for our body in the long run.
2. **Skipping Meals :** People often skip meals to reduce weight. Skipping meals can actually work against weight loss plans. Also, studies have shown that we often consume more calories at the meal after skipping than we would get out of having the two separate meals. Skipping a meal can slow down the metabolism, which will hurt you later on in the day as your body won't be able to burn off the rest of your food as efficiently.
3. **Limiting intake of some nutrients:** Many diets severely limit intake of a major nutrient. Some diets cut out the carbohydrates, another limit protein, and others push for fat-free diet. But our body needs all forms of nutrients. Our body is made to consume all the nutrients found in the major food sources on Earth. If we restrict taking these nutrients it can lead to impaired functioning.
4. **Low Energy Diet :** The person take diet without fats and less carbohydrates by which health is affected due to impaired functioning of the body. Poor nutrition can contribute to stress, tiredness and our capacity to work, and over time, it can contribute to the risk of developing some illnesses and other health problems.
5. **Intake of calories through beverages/underestimate calories through beverages:** When we try to lose weight, we often focus on what we eat and not what we drink. Beverages can play a huge role depending on what we drink. For example: If we consume sodas, iced tea, juices, smoothies and flavoured ice drinks, they can really contribute to weight gain.



6. **Not Performing Physical Activity** : People often consider that dieting is good for controlling weight and they neglect physical activity which is equally important for healthy lifestyle. If you don't live an active lifestyle, losing weight will be an uphill battle. Exercise has a huge impact on body metabolism and also helps to burn some extra calories off. Simple exercises like walking, biking, etc can help in weight loss.
7. **Heart Problems** : Dieting, particularly when done in an extreme fashion, can put extra strain on the heart. **Crash dieting** repeatedly can increase the risk of heart attack. During diets, the heart does not get enough potassium and other minerals that it needs to function properly. For optimal cardiac health one should not reduce the amount of nutrients one ingests.
8. **Side Effects** : When dieters cut out a large portion of the calories they normally consume, this can very easily lead to caloric and nutritional deficiencies, which can cause a host of side effects. Some of the more common ones can include headaches, muscle cramps, constipation, trouble sleeping and loss of bone density. Dieting can also greatly reduce the body's normal metabolic rate, which can result in tiredness and fatigue.
9. **Emotional Dangers** : Excessive dieters are likely to become depressed and suffer from mood swings. Weakness and lack of energy causes loss of interest in many activities. One may lose confidence and self esteem, become tense, irritable or angry, and suffer from high levels of stress.
10. **Mental Dangers** : Obsessive dieting can cause the inability to be mentally alert. Slower reaction time makes the person more likely to cause or be involved in accidents. When a person does dieting in excess his memory suffers, he can't concentrate, and he is easily confused. One may have a hard time accomplishing normal activities such as reading, studying, working, driving and following a conversation.

From above we can conclude that it is important to lose weight but it should be done safely, which usually means slowly. The best way to do so is to exercise regularly and stick to a diet that limits saturated fat and sugars and gives adequate nutrients to the body. The key to losing weight is a combination of diet and exercise.

## FOOD INTOLERANCE

**Food intolerance** means that individual elements of certain foods cannot be properly processed and absorbed by our digestive system. Food intolerance or food sensitivity occurs when a person has difficulty digesting a particular food. Some individuals can tolerate a small amount of the food but if taken too often or in large quantities, symptoms of food intolerance occur. Food intolerances involve the digestive system. Many food intolerances are caused by deficiencies or reactions in the digestive tract. Lactose intolerance (caused by an enzyme deficiency) and celiac disease (an autoimmune disorder characterized by the inability to digest wheat, rye, and barley) are among the most common food intolerances.



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**Signs and symptoms** : Symptoms of food intolerance vary greatly.

Food intolerance symptoms usually begin about half an hour after eating or drinking the food in question, but sometimes symptoms may be delayed up to 48 h. Symptoms of food intolerance can include :



Nervousness, **tremor**, sweating, **palpitations**, rapid breathing, headache, **migraine**, Diarrhea, burning sensations on the skin, tightness across the face and chest, breathing problems - asthma-like symptoms, allergy-like reactions.

**Causes :**

1. **Absence of an enzyme.** Enzymes are needed to digest foods fully. If some of these enzymes are missing, or insufficient, proper digestion may not take place.
2. **Chemicals.** Certain chemicals in foods and drinks can cause intolerance. Some people are more at risk to these chemicals than others.
3. **Food poisoning toxins.** Some foods have naturally-occurring chemicals that can have a toxic effect on humans, causing nausea and vomiting.

**Management :** Individuals can try minor changes of diet to exclude foods causing the reactions. Persons with food intolerance problem should seek expert medical and dietician help.

Over a period of time it is possible for individuals avoiding food chemicals to build up a level of resistance by regular exposure to small amounts in a controlled way, but care must be taken, the aim being to build up a varied diet with adequate composition.

**FOOD MYTHS**

There are many food myths. Many people just believe everything they hear or read, but one should ask questions and research the topic if one really wants to get to the truth. India is a country rich in flavours, spices and foods. Each part of the country has a rich food heritage that spans the ingredients used, the cooking techniques and the combination of flavours. But with the large number of food cultures and sub-cultures, come the myths. What to eat, when to eat and how often to eat are such questions which usually confuse. Here's the scientific explanation for most widely believed food myths in India.

**Myth 1. Potatoes make you fat :**

**Fact :** Carbohydrates are the body's preferred energy source. Eating a potato, or any type of carbohydrate rich food, won't automatically make you fatter. So, there is no problem in eating potatoes in moderate quantities.

**Myth 2. Drinking water in between your meals will mess up your digestion :**

**Fact :** The theory behind this **misconception** is that digestive juices and enzymes will be **diluted** by the fluid, and this will slow down the digestion and lead to excess body fat. There is no scientific evidence to back this up. In fact, evidence suggests that drinking water with your meal improves digestion.

**Myth 3. Eating eggs increase cholesterol :**

**Fact :** Eggs are low in saturated fat. Moderate egg consumption - up to one a day - does not increase cholesterol risk in healthy individuals and can be part of a healthy diet. Eggs are a nutritious whole food which are an inexpensive source of protein and contain other nutrients.

**Myth 4. The peel of fruits and vegetables contain no nutrients :**

**Fact :** Peels are packed with beneficial nutrients. The amounts of nutrients they contain vary based on the type of fruit or vegetable. However, generally speaking, non-peeled produce contains higher amounts of vitamins, minerals and other beneficial plant compounds, compared to its peeled counterparts.



**Myth 5. Eating after 7 pm will make you fat :**

**Fact :** Experts say that its not when you eat that can make you fat. What you eat and the amount of calories you consume makes you fat. The only thing late night eating does is promote unhealthy snacking and hamper with your sleeping pattern.

**Myth 6. Having milk immediately after eating fish :**

**Fact :** Some believe that the combination of milk and fish makes you sick while some believe it makes spots appear on your skin. But there is no scientific reason why you cannot have milk and fish together. In fact, there are many wonderful and healthy recipes around which combine the goodness of fish and milk.

**Myth 7. Drinking lots of milk :**

**Fact :** Milk is a wonderful source of calcium, protein and also important minerals like phosphorus and magnesium. But filling up with too much milk also means that one won't have enough appetite left to eat the remainder of a balanced diet. So drink milk in moderation.

**Myth 8. Eating ghee after pregnancy :**

**Fact :** Sometimes new mothers are fed ghee-laden laddoos, post delivery, to help their bodies heal. While 1-2 tbsp of ghee is good for the new mother, more than that is just excess calories, which are better expended on other calcium and protein-rich foods.

**Myth 9. Fat free products will help you in losing weight :**

**Fact :** In cases of fat free products or low fat products, the fat is replaced by sodium, sugar, or carbohydrates. In order for the fat-free food to maintain its taste, the fat has to be replaced with something else that will give it a similar flavour and texture. So it is a misconception that fat free products help in losing weight.

**Myth 10. Starving oneself to lose weight/ Crash Dieting or Fasting to lose weight :**

**Fact :** It may be true in short term but ultimately it hinders weight loss. Weight loss requires you to reduce your total calorie intake to below what you burn. However, quick weight loss is simply not this easy. Starving yourself may result in some immediate weight loss, but most of it will return once you begin eating regular food again.

**Myth 11. Vegetarians cannot build muscles :**

**Fact :** Vegetarians can build muscles as meat eaters by getting their proteins from foods such as cheese, nuts, pulses etc.

**Myth 12. Healthy food is expensive :**

**Fact :** Tinned, stored, packed food is expensive. Whereas local and seasonal food is inexpensive.

**Myth 13. Exercise makes you eat more :**

**Fact :** Exercise burns calories and depletes your body of energy, and our bodies need food to **replenish** our energy. But researches show that increased physical activity or exercise does not affect our food intake.

There are many other myths other than those given above. But one must remember that everything should be eaten in moderation. One must eat a healthy and balanced diet along with proper exercising.





**MIND MAPPING**

**Diet : The food which we eat is known as 'diet'.**

**1. BALANCED DIET**

A balanced diet may be defined as that diet which contains all the nutrients in the correct amount as required by the body.

**3. FUNCTIONS/IMPORTANCE OF BALANCED DIET AND NUTRITION FOR BODY**

- 1. Disease prevention
- 2. Meeting Nutritional Needs
- 3. Weight Control
- 4. Immune System Health
- 5. Proper sleep
- 6. Mental Health
- 7. Quality of life

**5. MACRO NUTRIENTS**

Those nutrients which are required in large amounts are called as macro-nutrients. 1. Carbohydrates 2. Fats 3. Proteins 4. Water

**1. Carbohydrates** are the sugars, starches and fibers found in fruits, grains, vegetables and milk products. **Sources-** fresh fruits, vegetables, milk, grains, etc. **Types-** (a) Simple Carbohydrates digest quickly. (b) Complex Carbohydrates digest slowly.

**2. Fats** contain Carbon, Oxygen and Hydrogen in the ratio 76:12:12 respectively and provide more calories as compared to other constituents of food.

**Sources-** (a) Animal sources : Meat and dairy products such as milk, butter, cheese and egg yolk. (b) Vegetable sources : Edible oils of groundnut, mustard, cottonseed, sunflower and coconut.

**Types of Fats-** (a) Saturated Fat (b) Trans Fat (c) Unsaturated Fat

**3. Proteins** : Proteins are the building blocks of body. Proteins contain carbon, hydrogen, oxygen, nitrogen and sometimes sulphur.

**Sources** : (a) Animal Sources : It consists of meat, fish, egg, milk, cheese etc. (b) Plant Sources : It consists of pulses, cereals, nuts, beans, peas etc.

**4. Water** : Water is made up of hydrogen and oxygen elements in 2:1. Our blood contains 90% of water.

**2. FACTORS AFFECTING DIET**

- 1. Age
- 2. Occupation
- 3. State of health
- 4. Climate
- 5. Gender
- 6. Body Built or Constitution
- 7. Pregnant or feeding mother

**4. NUTRITION**

Nutrition is the process of consuming food or nourishing liquids, digesting and absorbing them and using them for health and growth.

Nutrients : Nutrients are components in food that an organism uses to survive and grow.

**6. MICRO NUTRIENTS**

Micro nutrients are nutrients required in small quantity.

1. Vitamins 2. Mineral Salts

**1. Vitamins** are organic chemicals required by the body for its various metabolic processes and for the normal working of the body.

**Types :**

(A) **Fat soluble vitamins** (i) Vitamin A (ii) Vitamin D (iii) Vitamin E (iv) Vitamin K

(B) **Water Soluble Vitamins** (i) Vitamin B complex (ii) Vitamin C

**2. Mineral Salts** : Minerals are required for formation of hormones, maintenance of heartbeat, transmission of nerve impulses etc.

**Types :**

**Macro Minerals** : (i) Sodium (ii) Calcium (iii) Phosphorus (iv) Magnesium (v) Potassium (vi) Sulphur

**Micro Minerals** : (i) Copper (ii) Iodine (iii) Chromium (iv) Cobalt (v) Iron



## 7. NUTRITIVE COMPONENTS OF DIET

### NUTRITIVE COMPONENTS OF DIET

- Carbohydrates** : Carbohydrates act as fuel in the body and provide energy.
- Fats** : Fats contain carbon, hydrogen and oxygen.
- Proteins** : Proteins contain elements like carbon, hydrogen, oxygen, nitrogen and Sulphur. Proteins are helpful for growth and development of an individual specially children.
- Vitamins** : Vitamins are complex compounds of carbon. These are required by the body in small quantities. Vitamins are of two types :
  - Fat soluble vitamins** : These vitamins are soluble in fat and stored in liver and fatty tissues. Types : (i) Vitamin A (ii) Vitamin D (iii) Vitamin E (iv) Vitamin K
  - Water soluble vitamins** : These vitamins are soluble in water. Types : (i) Vitamin B Complex (ii) Vitamin C
- Minerals** : Minerals are necessary for the growth and development of an individual. They also help in the functioning of muscles and formation of teeth. Types : **Macro Minerals**:(a)Calcium (b) Phosphorus (c) Magnesium (d)Potassium (e)Sulphur (f)Sodium  
**Micro Minerals** : (a) Copper (b) Iodine (c) Chromium (d) Cobalt (e) Iron

## 10. THE PITFALLS OF DIETING

**Dieting** : Dieting means restricting to small amount of food intake or having special kind of food in order to lose/gain or maintain weight. Various possible dangers referred to as the pitfalls of dieting are :

- Eating very less Calories
- Skipping Meals
- Limiting intake of some nutrients
- Low Energy Diet
- Intake of calories through beverages
- Not Performing Physical Activity
- Heart Problems
- Side Effects
- Emotional Dangers
- Mental Dangers

There are many food myths. Many people just believe everything they hear or read, but one should ask questions and research the topic if one really wants to get to the truth.

## 12. FOOD MYTHS

## 8. NON-NUTRITIVE COMPONENTS OF DIET

Non-nutritive components of diet are compounds absorbed from the food but they do not provide energy in the form of calories.

- Water
- Roughage or fibre
- Artificial Sweeteners
- Preservatives
- Food Additives
- Plant Compounds

## 9. A HEALTHY WEIGHT

A healthy weight is based on your body mass index (BMI) and the size of your waist (waist circumference).  $BMI = (\text{Weight in kgs}) / (\text{Height in m})^2$

Steps to achieve Healthy Weight are given below:

- Set an appropriate goal
- Avoid strange diets
- Limit intake of sugars
- Eat Balanced diet and healthy diet
- Limiting the quantity of food
- Balance calorie Intake and Expenditure
- Do not skip meals
- Avoid Junk foods
- Active Lifestyle and Regular Exercise

## 11. FOOD INTOLERANCE

Food intolerance refers to individual elements of certain foods that cannot be properly processed and absorbed by our digestive system.

**SIGNS AND SYMPTOMS** : Symptoms of food intolerance can include : Nervousness, tremor, sweating, palpitations, rapid breathing, headache, migraine, Diarrhea, burning sensations on the skin, tightness across the face and chest, breathing problems - asthma-like symptoms, allergy-like reactions.

**Causes** : 1. Absence of an enzyme, 2. Chemicals, 3. Food poisoning toxins  
**Management** : Individuals can try minor changes of diet to exclude foods causing the reactions. Persons with food intolerance problem should seek expert medical and dietician help.