2 Sports and Nutrition

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

No doubt that everyone wants to remain fit and healthy. Food and nutrition play a very vital role in our growth and development. These are helpful for maintaining good health. The requirement of nutrition is essential for every individual but it is indispensable for the individuals who actively participate in games and sports. With the help of appropriate nutrition, sportspersons can enhance their performance. Even some supplements are also essential to provide proper nutrition to sportspersons.

2.1 BALANCED DIET AND NUTRITION: MACRO AND MICRO NUTRIENTS

Meaning of a Balanced Diet

A balanced diet refers to the intake of edibles which can provide all the essential food constituents necessary for growth and maintenance of the body, in definite amount in which they are required by the body. A balanced diet means eating the right amount of foods from all food groups.

"A diet which consists of all the essential food constituents, viz., proteins, carbohydrates, fats, vitamins, minerals and water in correct proportion is called a balanced diet."

A balanced diet

In other words, *"Balanced diet is that diet which consists of various constituents of food in accurate and appropriate quantity and quality according to the requirement of an individual."*

In fact, every individual does not require same type of diet. The diet differs from individual to individual. The following points sum up a balanced diet.

1. A balanced diet must contain all the essential constituents in adequate amount.
2. There must be definite proportion between the different constituents of food.
3. The food should be easily digestible.
4. Cooking of food is necessary because it sterilizes foodstuff and makes it palatable and easily digestible.

Meaning of Nutrition

Every individual in this world wants to lead a healthy life. Food is the main basis for maintaining health. So, the knowledge of 'food and nutrition' is essential for every individual. Generally, food and nutrition are considered synonymous with one another, when actually it is not so. In fact, food comprises all those substances that human beings consume for their survival. Food is a mixture of various substances which are essential for life; whereas nutrition is a dynamic process which comprises consumption of food to remain healthy. In fact, nutrition is essentially the process of nourishing or being nourished. The process by which a living organism assimilates food and uses it for growth and replacement of tissues is called nutrition.

'Nutrition' is defined as the science of food and its relationship with health. In other words, it can be said that nutrition is the science of foods which comprises the dynamic process in which the consumed food is digested, nutrients are absorbed and distributed to the tissues for utilisation and wastes are disposed of the body.

Macro Nutrients

Macro nutrients constitute the majority of individuals' diet. Hence, it can be said that they are taken in large amounts. They supply energy and are needed for growth and maintenance of the body. They include carbohydrates, proteins, fats and water. The explanation of these macro nutrients is given below.

1. **Carbohydrates:** Carbohydrates are the most important source of energy. They contain the elements of carbon, hydrogen and oxygen. The very first part of the name 'carbo' means that they contain carbon.

   The second part of the name 'hydr' means that they contain hydrogen. The third part of the name 'ate' means that they contain oxygen. In all carbohydrates, except rhamnose ($C_6H_{12}O_5$), the ratio of hydrogen atoms to oxygen atoms is 2:1 just like water, i.e., H_2O. Carbohydrates are actually the organic compounds that are important for different digestive operations in our body. There arelots of

Macro nutrients

differences between carbohydrates and the other elements important for nutrition such as proteins and fats. Generally, it is seen that a diet rich in carbohydrates needs less amount of water in comparison to diet rich in proteins and fats.

There are two main types of carbohydrates, i.e., simple carbohydrates and complex carbohydrates. Glucose, Fructose, Galactose, Sucrose, Maltose and Lactose are called simple carbohydrates. These carbohydrates are soluble in water. These are crystalline. These are sweet in taste and are called sugar. Starch, dextrin, glycogen and cellulose are called complex carbohydrates or polysaccharides. These are not sweet in taste. They are insoluble in water. They are not crystalline. The main difference between the types of carbohydrates is actually the difference between their chemical compositions. Simple carbohydrates have smaller chain of chemical compositions in comparison to the complex ones.

2. **Proteins:** Proteins contain—carbon, hydrogen, oxygen, nitrogen and sometimes sulphur. Proteins are very large molecules, so they cannot be directly absorbed into our blood. So they are turned into amino acids by our digestive system. There are 23 amino acids. Out of these, 9 amino acids must be available in the diet. These amino acids are used by the body to create blood, muscles, nails, skin, hair and tissues in internal organs. Proteins form new tissues, repair the broken tissues, regulate balance of water and acids, transport oxygen and nutrients and make antibodies. Excessive use of proteins in diet, especially animal proteins can result in heart diseases, osteoporosis, stroke and kidney stones. Body requires only 0.36 grams of protein per pound of the ideal body weight. If proteins are not taken in appropriate amount in diet, then we may suffer from deficiency diseases. Marasmus and kwashiorkor are protein deficiency diseases in children.
3. **Fats:** Fats contain carbon, oxygen and hydrogen in the percentage of 76, 12 and 12, respectively. Fats are necessary for many body functions. Fats keep us warm and protect our organs. Fats also help in the production of hormones. Fats can be classified according to their structures. Different types of fats have different characteristics and they react in different ways inside the body. There are three different groups of fats in diet, that is, saturated fats, polyunsaturated fats and mono-unsaturated fats. The intake of saturated fats increases the chances of heart diseases, due to the increase of cholesterol in the blood. Such fats are found in fast foods, pastries and biscuits. The polyunsaturated fats and mono-unsaturated fats help in lowering the blood cholesterol. The polyunsaturated fats are slightly better than mono-unsaturated fats. Fats are essential in diet but the quantity of intake should be limited.
4. **Water:** Water is a compound which is made up of hydrogen and oxygen elements in the ratio 2 : 1. Our blood also contains 90% of water. Water helps in the transportation of nutrients to the cells of the body. It is also important for the excretion of waste products. It also regulates the body temperature. It is vital for various chemical reactions taking place in our body. It is essential for the body's metabolism. UNICEF says that water is not included in macro nutrients but USDA, that is, United States Dietary Association, includes it as a part of macro nutrients. As a matter of fact, macro nutrients are consumed in large amount. Water must be taken in large quantity, therefore, it can be considered a part of macro nutrients.

Micro Nutrients

Minerals and vitamins are included in micro nutrients. Micro nutrients are required in very small amounts. These nutrients are extremely significant for normal functioning of the body. The main function of these nutrients is to enable various good chemical reactions to occur in the body. Minerals are further divided into two categories, namely, macro minerals and micro minerals or trace minerals. The explanation of micro nutrients is given below.

Micro nutrients

1. **Minerals:** Minerals are essential in our diet. About 4 per cent of our body weight is made up of minerals. Minerals are required for healthy teeth, bones and muscles. Minerals are also used by body for various activities such as transmission of nerve impulses, formation of hormones, maintenance of heartbeat, etc. Minerals can be classified into macro, i.e., major minerals and micro-elements or trace minerals. Our body requires more amount of macro minerals than trace minerals. Macro minerals or macro-elements such as calcium, phosphorus, sodium, chlorine, magnesium, potassium and sulphur are required by our body in more amounts, i.e., 0.1 gram of each of these minerals per day. On the other hand, trace elements or micro minerals such as copper, iron, iodine, fluoride, cobalt, chromium, selenium and zinc are required in less amounts, i.e., 0.01 gram of each trace element per day.

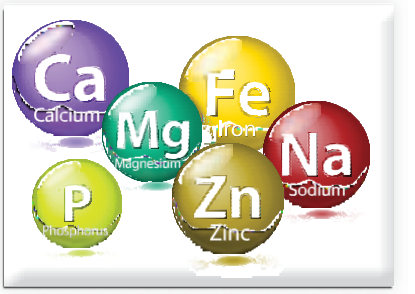
   (a) Macro minerals: Some macro minerals are described below.

   - **Calcium.** Calcium is among the top macro-minerals in terms of growth and development of our bones and teeth. It makes the teeth and bones strong and healthy. It helps in blood clotting. Its deficiency may cause rickets. It is found in various products such as cheese, milk, orange juice, eggs, yogurt, green leafy vegetables and cereals.
   - **Potassium:** Potassium is one of the most important minerals in diet. It is helpful in keeping the nervous system and muscular system fit and active all the time. It helps in maintaining the amount of water in blood and tissues. Its main sources are banana, tomatoes, green leafy vegetables, peanuts, citrus fruits, beans, etc.
   - **Sodium:** It helps in muscular activities. It also helps in the transmission of nerve impulses. Its main sources are table salt, pickles, butter, etc.
   - **Magnesium:** It repairs and maintains body cells. It is found in meat, brown rice, beans, whole grains, etc.
   - **Phosphorus:** Phosphorus helps in the formation of bones and teeth. It keeps the muscles and nerve activities normal. It is found in rich quantity in egg, fish, cod liver, milk, unpolished rice, etc.

   (b) Micro minerals. Some micro minerals are described below.

   - **Iodine:** It helps in the production of hormones in the thyroid gland. It is also significant for proper growth and development of the body. Lack of iodine can cause goitre (swollen thyroid gland) and mental retardation. It is found in iodised salt, fish and sea food.

- **Iron:** It is essential in the production of haemoglobin. Its deficiency causes anaemia. It is found in liver, meat, egg, dry fruits, spinach, banana, and green leafy vegetables.
- **Chromium:** It stimulates insulin activity. Its deficiency may cause diabetes. It is found in soyabean, blackgram, carrot, tomato, groundnuts, bajra and barley.
- **Copper:** It helps iron in the formation of haemoglobin. It is found in eggs, pulses and green leafy vegetables.



Minerals

- **Cobalt:** It protects us from anaemia and is found in green leafy vegetables, milk and meat.

2. **Vitamins:** Vitamins are chemicals, which are required in very small amount to keep our body healthy. If a particular vitamin is not present in our diet, it may cause a deficiency disease. For example, if vitamin C is not included in diet, it will cause scurvy. In fact, all the vitamins are organic chemicals. There are two groups of vitamins which are mentioned below.

(a) Fat Soluble Vitamins: Fat soluble vitamins are those vitamins which are soluble in fat. These vitamins are composed of the elements of carbon, hydrogen and oxygen. These vitamins are vitamin A, vitamin D, vitamin E and vitamin K. The brief description of these vitamins is given below.

- **Vitamin A:** It was the first vitamin that was discovered in 1913 by **Elmer McCollum**. This vitamin is found in various forms such as retinol, retinal and retinoic acid. This vitamin is formed by the elements of hydrogen, carbon and oxygen. It is helpful in the formation of bones and teeth. It also promotes normal vision. It also provides resistance to infections. Its deficiency leads to night blindness, keratomalacia and xerophthalmia. Its sources are cod liver oil, animal liver, egg yolk, milk, milk products, mango, papaya and yellow vegetables. Its daily requirement is approximately 2 mg.
- **Vitamin D:** It is formed by the elements of carbon, hydrogen and oxygen. It is a white crystalline substance. It helps in the absorption of calcium and phosphorus. It maintains the normal functioning of parathormone, the hormone secreted by parathyroid glands. It also maintains the level of calcium and phosphorus. Its deficiency may cause rickets, osteomalacia, tetany, dental cavities and osteoporosis. Sunrays, milk, butter and fish liver oils are the main sources of this vitamin.
- **Vitamin E:** Vitamin 'E' is an important vitamin required for the growth of many organs in our body. Generally, the deficiency of vitamin E is rare but it can occur in people with certain genetic disorders and in very low-weight, premature infants. Its deficiency may cause anemia, or low red blood count, which may affect our body's ability to produce sex hormones that promote the function of reproductive system. It is also an anti-oxidant. This means it helps to slow down the process that damage cells. Its deficiency may cause nerve and muscle damage that results in loss of feeling in arms and legs, loss of body movement control, muscle weakness and vision problems. Green vegetables, kidney, liver, heart, cotton seed, sprouts, coconut oil, yolk, dry and fresh fruits, milk, meat, butter and maize are rich sources of Vitamin 'E'.

- **Vitamin K:** The main function of this vitamin is to clot the blood. It also helps in the prevention of haemorrhage and excessive bleeding in wounds. Its deficiency may cause anaemia. Its main sources are tomato, potato, spinach, cabbage, soyabean, fish, cauliflower, wheat, egg and meat.

(b) Water Soluble Vitamins: These vitamins are soluble in water. These vitamins contain the elements of nitrogen and even sulphur. These vitamins are vitamin B and vitamin C. Earlier, the chemical names of all the vitamins (fat soluble and water soluble vitamins) were not known but now their chemical names are available. Their temporary names are used even today for the ease of understanding. The description of these vitamins is given below.

- **Vitamin B Complex:** Vitamin B consists of eight soluble vitamins that play important roles in cell metabolism. Earlier, they were thought to be a single vitamin but later, research showed that they were chemically distinct vitamins. Now, they are referred to as vitamin 'B' complex. A brief description of these vitamins is given below.

(i) Vitamin B_1 or Thiamin: This vitamin is also called thiamin. This is a colourless vitamin. Its taste is salty. Its smell is just like yeast. It helps in metabolising carbohydrates. It maintains the health of liver, kidneys, intestines, stomach, brain, etc. It also maintains the health and efficiency of nerves and muscles. It helps in the assimilation of vitamin A in our body. Deficiency of vitamin B_1 causes numerous ailments such as skin diseases, headache, lack of concentration, sleeplessness, loss of appetite, indigestion, lower heartbeat and also retardation of muscular efficiency. Due to the acute shortage of vitamin B_1, an individual may fall prey to 'beri-beri' disease. Its deficiency may cause constipation, irritation and anger. Development of the body stops, if there is any shortage of vitamin B_1.

(ii) Vitamin B_2 or Riboflavin: This vitamin is yellow in colour. It is usually destroyed in sunlight and also if the food is cooked for a longer time. It helps in preserving and maintaining the characteristics of youth, tightness and smoothness of skin, activity, health of body tissues, etc. It is essential to keep the eyes, nose, mouth, lips and tongue in healthy state. The deficiency of this vitamin causes stunted growth, unhealthy skin and inflammation in eyes. Its deficiency also decreases immunity power of white blood corpuscles.

(iii) Vitamin B_3 or Niacin: Vitamin B_3 or Niacin is water soluble, so our body does not store it. This means that our body can excrete excess amount of the vitamin if it is not needed. Its deficiency may cause pellagra. Symptoms of its deficiency include indigestion, fatigue, vomiting and depression.

(iv) Vitamin B_5 or Pantothenic Vitamin B_5 is also called pantothenic acid. It is necessary for making blood cells. It plays a vital role in the breakdown of fats and carbohydrates for energy. The deficiency of this vitamin may include the symptoms such as fatigue, insomnia, depression, irritability, vomiting, stomach pain and burning feet.

(v) **Vitamin B_6:** This vitamin is vital for the formation of haemoglobin. It also keeps the skin healthy.

(vi) **Vitamin B_{12}:** Its colour is red. This vitamin is usually destroyed if food is cooked for a longer time. Its deficiency may cause anaemia.

(vii) **Vitamin B_9 or Folic Acid:** It is tasteless, odourless and yellow in colour. Simple cooking can destroy this vitamin. It is very essential for reproduction, growth and development of body. This vitamin is helpful in blood formation. The deficiency of folic acid may cause loss of leucocytes.

(viii) **Vitamin B_7:** Its chemical name is biotin. Its deficiency may lead to impaired growth, depression, muscle strain, etc.

Vitamin C: This vitamin is also known as ascorbic acid. It is a water soluble vitamin. It is a white crystalline substance. Vitamin C helps in healing the wounds. It increases metabolic rate and is helpful in absorbing calcium. It is also a highly effective antioxidant. It is also essential for the formation, growth and repair of bones, skin and connective tissues. It also maintains healthy teeth and gums. The deficiency of vitamin C causes scurvy. Adults may feel tired, weak and irritable due to the deficiency of vitamin C. This vitamin is usually found in lemons, pineapples, guava, amla, ber, oranges, tomato, green chillies and apples.

2.2 NUTRITIVE AND NON-NUTRITIVE COMPONENTS OF DIET

Nutritive Components of Diet

Nutritive components of diet are those components which provide energy or calories. There are various nutritive components of diet which are described below.

1. **Proteins:** The word 'Protein' is derived from the Greek word '*Protias*'. Its meaning is 'the best substance from foodstuffs'. Protoplasm is formed by protein, which is the base of living cells. The maximum amount of protein is found in the tissues of our body. Besides this, protein is also found in blood, secretion of endocrine glands, bones, teeth and in delicate tissues. If water is extracted from our body, the maximum percentage of protein will be left behind in our body. Protein is a compound, which is formed by the combination of oxygen, carbon, hydrogen and nitrogen. Among energy producing food substances, protein is the only constituent in which chemical elements of nitrogen, phosphorus and sulphur are found. That is why protein is also called nitrogenous food. Our physical growth and development will be retarded, if we take less amount of protein in our food. Proteins promote cell growth and repair. Apart from this, protein also plays an important role in the mental development of an individual. Proteins are known as the building blocks of life.

Sources of Protein: From the point of view of sources, protein can be divided into two categories.

(a) Animal Protein (*b*) Vegetable Protein

(a) Animal Protein: Protein, which we get from animal products, is called animal protein. This protein is found in eggs, milk, milk products, meat and fish. Egg is the best example of rich protein because sufficient amounts of amino acids are found in eggs.

(b) Vegetable Protein: Protein, which we get from vegetables, is called vegetable protein. Vegetable protein is usually found in various types of pulses and beans, soyabean, mustard, green peas, nuts, groundnuts, dry fruits and food grains.

2. **Carbohydrates:** Carbohydrate is also an essential nutritive component of food. Carbohydrate is also a compound which is formed by the chemical composition of carbon, hydrogen and oxygen. Carbohydrate acts like a fuel in our body. Carbohydrate provides energy. We also need carbohydrate for the formation of fats. People who indulge in hard work, need maximum amount of carbohydrate. However, if excess amount of carbohydrate is taken in food by an individual, it always changes into fats and after that it is accumulated in fatty tissues. Lack of carbohydrate in the body reduces the weight of an individual. The skin becomes loose and wrinkles start appearing on the face. A person becomes lean and thin. On the other hand, if an individual takes the right amount of carbohydrate in his food, his body weight starts increasing. He experiences high body temperature. In such a condition an individual becomes lethargic.

   Sources of Carbohydrates: Generally, carbohydrate is found in rice, maize, jowar, bajra, pulses, gram, dry pea, dates, grapes, potato, banana, gur, sugar, etc.

3. **Fats:** Fat is an essential nutritive component of food. Fat is also a compound. It is made up of carbon, hydrogen and oxygen. Fat provides heat and energy to the body. It also helps in the regulation of body temperature. It is helpful in making the body soft and smooth and protects the body from the extreme effects of hot and cold climates. For the purpose of energy, fat is considered better than carbohydrate. If fat is used with carbohydrates in food, fat can be digested easily as well as rapidly. If excess fat is not used by the body, it is accumulated in the body due to which various organs of the body do not work efficiently. If fat is available in less quantity in the food, carbohydrates to some extent, change into fat.

   Sources of Fat: Following are the sources of fat.

   (a) Animal Sources: Animals are good source of fats. We get various products from animals such as ghee, butter, cheese, curd, fish oil, milk, meat and eggs.

   (b) Vegetable Sources: We also get fats from various vegetables such as unprocessed starchy vegetables such as sweet potato, whole corn, dry fruits, coconut, soyabean, foodgrains, mustard oil, cotton seed, etc.

4. **Vitamins:** Vitamins are important nutritive component of food just like protein, carbohydrate and fat. Vitamins are vital for healthy life. Vitamins protect us from various types of diseases. In fact, vitamins increase immunity in our body against diseases. They also contribute in the general development of body. If our diet lacks in various vitamins, we may suffer from different deficiency diseases. Although, we need these vitamins in less quantity, they are essential for leading a healthy life.

   Types of Vitamins: Vitamins can be divided into two categories.

   (a) Fat Soluble Vitamins: These vitamins are easily dissolved in fat. These vitamins are stated below.

   - Vitamin A
   - Vitamin D
   - Vitamin E
   - Vitamin K

   (b) Water Soluble Vitamins: These vitamins are soluble in water. The following vitamins fall in this category.

   - Vitamin B complex
   - Vitamin C

(a) Fat Soluble Vitamins: The detail of these vitamins is given below.

- **Vitamin A: Dr McCollum** discovered vitamin A. This vitamin is yellow in colour. Usually, this vitamin is not destroyed at normal temperature but it can be destroyed by oxidation process. The ultraviolet rays of the sun can also destroy this vitamin. It may be destroyed at normal temperature in the presence of oxygen. Due to the deficiency of vitamin A numerous diseases can attack a person. Night blindness and xerophthalmia are main diseases that are caused by the deficiency of vitamin A. Vitamin A is essential for the normal growth of an individual. Due to the deficiency of vitamin A, skin may become dry. There may be wrinkles on the skin. Teeth lose their brightness and usually become yellow. This vitamin also has a negative effect on kidneys, nervous system and digestive system. Sometimes, there can be kidney stones. Due to the deficiency of vitamin A, poisonous substances develop in spinal cord. This vitamin also protects the body from communicable diseases.

  ***Sources*:** Vitamin A, is mainly found in ghee, milk, curd, egg yolk, fish, tomato, papaya, green vegetables, orange, spinach, carrot, pumpkin, etc.

- **Vitamin D:** This vitamin is white and odourless. Vitamin D is helpful for the formation and maintenance of good teeth and healthy bones. It enables the body to accumulate calcium and phosphorus, which help in the formation of the bones and teeth. Deficiency of this vitamin causes rickets, ill-shaped teeth, and softness of bones. The intake of this vitamin should be increased in order to cure bones and teeth diseases.

  ***Sources*:** Vitamin D is mainly supplied by egg yolk, fish, sunlight, vegetables, cod liver oil, milk, cream, butter, tomato, carrot, etc.

- **Vitamin E:** Vitamin 'E' is an important vitamin required for the growth of many organs in our body. Generally, the deficiency of vitamin E is rare but it can occur in people with certain genetic disorders and in very low-weight, premature infants. Its deficiency may cause anemia, or low red blood count, which may affect our body's ability to produce sex hormones that promote the function of reproductive system. It is also an anti-oxidant. This means it helps to slow down the process that damage cells. Its deficiency may cause nerve and muscle damage that results in loss of feeling in arms and legs, loss of body movement control, muscle weakness and vision problems.

  ***Sources*:** Green vegetables, kidney, liver, heart, cotton seed, sprouts, coconut oil, yolk, dry and fresh fruits, milk, meat, butter and maize are rich sources of Vitamin 'E'.

- **Vitamin K:** Vitamin K is derived from the word 'coagulation', which means clotting of blood. This vitamin is helpful in the clotting of blood. Due to the deficiency of this vitamin, blood does not clot easily and generally blood continues to flow for longer time in the event of an injury. The requirement of this vitamin is more for pregnant ladies. Its deficiency also causes anaemia.

  ***Sources*:** This vitamin is mainly available in cauliflower, spinach, cabbage, tomato, potato, green vegetables, wheat, egg, meat, etc.

(b) Water Soluble Vitamins

- **Vitamin B Complex:** There are 8 vitamins under vitamin B complex. Important forms of vitamin B are stated below.

(i) **Vitamin B_1 or Thiamin:** This vitamin is also called thiamin. This is a colourless vitamin. Its taste is salty. Its smell is just like yeast. It helps in metabolising carbohydrates. It maintains the health of liver, kidneys, intestines, stomach and brain, etc. It also maintains the health and efficiency of nerves, muscles. It helps in the assimilation of vitamin A in our body. Deficiency of vitamin B_1 causes numerous ailments such as skin diseases, headache, lack of concentration, sleeplessness, loss of appetite, indigestion, lower heartbeat and retardation in the muscular efficiency. Due to the acute shortage of vitamin B_1, an individual may fall prey to 'beri-beri' disease. Its deficiency may cause constipation, irritation and anger. Development of the body stops, if there is any shortage of vitamin B_1.

***Sources*:** Wheat, groundnuts, green peas, orange, pig meat, liver, eggs, green vegetables, rice and sprouts seeds are rich sources of vitamin B_1.

(ii) **Vitamin B_2 or Riboflavin:** This vitamin is yellow in colour. It is usually destroyed in sunlight and in cooking the food for a longer time. It helps in preserving and maintaining the characteristics of youth, tightness and smoothness of skin, activity and body tissues, etc. It is essential to keep the eyes, nose, mouth, lips and tongue in healthy state. The deficiency of this vitamin causes stunted growth, unhealthy skin and inflamed eyes. Its deficiency also decreases immunity power of white blood corpuscles. ***Sources*:** This vitamin is richly found in egg yolk, fish, pulses, peas, rice, yeast, wheat and in green vegetables.

(iii) **Vitamin B_3** or **Niacin:** Vitamin B_3 or Niacin is water soluble, so our body does not store it. This means that our body can excrete excess amount of the vitamin if it is not needed. Its deficiency may cause pellagra. Symptoms of its deficiency include indigestion, fatigue, vomiting and depression.

***Sources*:** Food sources of vitamin B_3 include yeast, meat, fish, milk, eggs, nuts, green vegetables, beans and cereals.

(iv) **Vitamin B_5** or **Pantothenic Acid:** Vitamin B_5 is also called pantothenic acid. It is necessary for making blood cells. It plays a vital role in the breakdown of fats and carbohydrates for energy. The deficiency of this vitamin may include the symptoms such as fatigue, insomnia, depression, irritability, vomiting, stomach pain and burning feet.

***Sources*:** The main sources of this vitamin include meat, fish, whole grains, egg, yolk, milk products and soyabeans.

(v) **Vitamin B_6:** This vitamin is vital for the formation of haemoglobin. This vitamin also keeps the skin healthy.

***Sources*:** This vitamin is richly found in meat, fish, egg yolk, yeast, rice, wheat and peas, etc.

(vi) **Vitamin B_7** or **Biotin:** Biotin helps release energy from carbohydrates and aids in the metabolism of fats, proteins and carbohydrates from food.

***Sources*:** Egg yolk, milk, fresh vegetables, yeast breads, cereals, etc.

(vii) **Vitamin B_{12}:** Its colour is red. This vitamin is usually destroyed in cooking for a longer time. Its deficiency may cause anaemia.

(viii) **Folic Acid:** Folic acid is tasteless, odourless and yellow in colour. Simple cooking can destroy this vitamin. It is very essential for reproduction,

and growth and development of body. This vitamin is helpful in blood formation. The deficiency of folic acid may cause loss of leucocytes.

***Sources*:** Folic acid is found in yeast, spinach and liver.

- **Vitamin C:** Vitamin C is also called ascorbic acid. It is odourless and white in colour. Due to the presence of Vitamin C, wounds are healed rapidly. It is significant in increasing the metabolic rate. It is helpful in absorbing iron and calcium. The deficiency of this vitamin causes 'scurvy'. The individuals, who do not take fresh fruits and vegetables, often suffer from this disease. Vitamin C is also helpful in maintaining the health of the connecting tissues, and in the formation of bones and red blood corpuscles. Generally, blood oozes from the gums due to the deficiency of vitamin C in the body. During illness and growth period of children this vitamin is very helpful.

  ***Sources*:** Lemons, pineapples, grapes, apples, oranges, green vegetables, turnip, cabbage, spinach and sprouty pulses are rich in vitamin C. This vitamin is found in high quantity in amla, green chillies and tomatoes.

5. **Minerals:** Minerals are very important nutritive components of food. As mentioned earlier, they are helpful for health and general development of the body, proper functioning of the muscles, formation of teeth, clotting of blood and in maintaining the balance of acid and base in the body. Let us read about benefits of some minerals.

   (a) Calcium: Calcium is helpful in the formation of teeth and bones. It helps in clotting of blood. It also maintains the balance between acid and base. Its deficiency causes numerous diseases such as asthma, rickets and skin diseases like scabies, eczema, chilblains, etc. Milk, cheese, yolk, orange and green vegetables have rich amount of calcium.

   (b) Phosphorus: Phosphorus is helpful in the formation of teeth and bones. It is found in egg, fish, meat, milk, liver and in unpolished rice.

   (c) Iron: Iron has an important role to play in the human body. It plays an important function in the formation of haemoglobin. It is also helpful in metabolising fats, carbohydrates and proteins. Its absence in the body may cause anaemia. The main source of iron is liver. Besides this, it is found in enough quantity in meat, egg, dry fruits and green vegetables.

   (d) Iodine: For the formation and normal functioning of thyroid gland, iodine is essential. The deficiency of iodine may cause goitre. Its deficiency may hinder the general growth and development. A child may remain a dwarf. The skin becomes rough and fatty. Its deficiency may stop the growth of hair. Generally, iodine is not taken in sufficient quantity by those people who live too far from the sea. It is found in rich quantity in sea fish. Iodized salt is the main source of iodine for vegetarians and those who don't eat sea food regularly.

   (e) Sodium: Sodium maintains the balance of acid and base. It also maintains the balance of water in the body. It also helps in the contraction of muscles. Sodium is available in enough quantity in common salt. Besides this, it is found in milk and milk products, meat, eggs, etc.

   (f) Potassium: Deficiency of potassium weakens the muscles of the body and the individual becomes lethargic and may contract Addison's disease. It is mostly found in carrot, beetroot, onion, tomato, orange, mango, banana, apple, etc.

   (g) Sulphur: It is helpful for the formation and functioning of cells of body. It is also helpful in the formation of hair and nails. It is found in egg, radish, pulses, carrot, peas, spinach, tomato, cabbage and cereals.

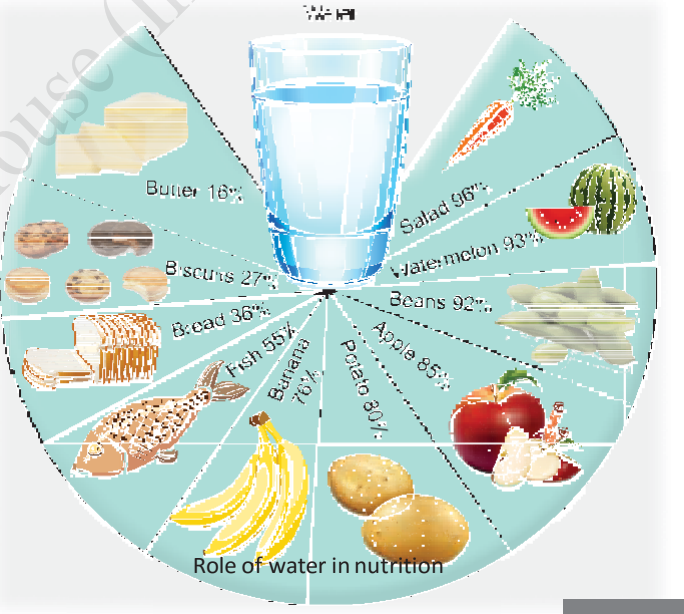
Non-Nutritive Components of Diet

Non-nutritive components of diet are those components that do not provide energy or calories. Roughage or fibre, water, colours, flavours, pesticide residues, etc., are among tens of thousands of non-nutritive components of diet or food. As a matter of fact, there are a lot of non-nutritive components of diet that can be identified easily. However, there are also many non-nutritive components of diet that have been discovered recently. There may be thousands of phyto-chemicals which can both help us or harm us. Some of them are considered to check the cancer initiators or promoters in the body. The explanation of non-nutritive components of diet is given below.

1. **Fibre or Roughage:** Fibre or roughage has no nutrient value. Hence, it is included in the non-nutritive components of diet. It is the undigested part of the food or it can be said that it cannot be digested by the human intestinal tract. It consists of water and improves intestinal function by adding bulk to food. It satisfies the appetite. It helps to correct the disorders of large intestine. It prevents constipation. Roughage or fibre can be divided into two categories, i.e., soluble and insoluble fibres. Soluble fibres can dissolve in water, whereas, insoluble fibre can't. The soluble fibre reduces blood sugar fluctuation and lowers cholesterol. Insoluble fibre is a good stool softener. Usually 30 grams of fibre is recommended for an adult per day. Both types of roughage or fibre are equally significant for human beings. Fibre is helpful in decreasing the risk of heart disease and in preventing certain types of cancer.

   Sources. Whole wheat, fresh fruits, root, vegetables, oats, connective tissues of meat and fish are very good sources of roughage.

2. **Water:** Water is also an essential component of diet. Even blood comprises 90% of water. Water in the blood helps in the transportation of the nutrients to various cells of the body. Water is also significant in the excretion of waste products. It also regulates the body temperature. Our body loses approximately 2% of our body weight as water per day. We recover this loss of water by drinking water and by intake of food substances. Water also functions as a lubricant, keeps the skin moist and protects the body from shock. Generally, about 20% of water intake comes from food and remaining



intake comes from drinking water. It is excreted from the body in various forms such as urine, faeces, sweat and water vapour in the exhaled breath.

3. **Colour Compounds:** Food or diet is made more appetizing and attractive by the wide reflection of colours made possible through pigments. Natural pigments are found in fruits and vegetables. The colours derived from animal products and grains are less bright. There are various colours derived from fruits and vegetables such as red, orange, yellow, green, blue and cream.
4. **Flavour Compounds:** Flavours are derived from both nutritive and non-nutritive components of food. Sometimes it becomes very difficult to know the source of a specific flavour. An acidic food provides sour taste while an alkaline one provides a bitter taste.
5. **Plant Compounds:** In addition to colour compounds and flavour compounds, there are some plants which contain other non-nutritive substances. When these substances are ingested they may have beneficial or harmful effects. There are many compounds that inhibit cancer. There are also a number of harmful substances in plants which have harmful effects if ingested in excess. Caffeine is one such example. If it is taken in excess quantity then it may increase heart rate, secretion of stomach acid, lead to excessive urination.

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

Meaning of Healthy Weight

Usually an individual who has healthy weight leads a healthy life with a reduced risk of diseases. It means that if an individual has a healthy weight, he can lead a healthy life. On the other hand, if an individual has an unhealthy weight be it underweight or overweight, he/she is not able to lead a healthy life.

According to **National Institute of Health**, "*A healthy weight is considered to be the one that is between 19 and 25 (BMI). If the BMI is between 25 and 29 an adult is considered overweight. If the BMI is 30 or greater, the person is considered to be obese*."

In simple words, it can also be said that a healthy weight is that weight which lowers an individual's risk for various health problems such as heart diseases, stroke, high blood pressure, diabetes, etc.

Measurement of height

Measurement of weight

There are usually two popular methods to find out or calculate the healthy weight, i.e., height and weight chart and body mass index chart (BMI chart). Height and weight chart tells us about healthy body weight, whereas another method is based on BMI using which one can come to know whether one has healthy body weight or not.

1. **Method to know healthy weight through height and weight chart**

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	67.5–6.2
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

2. **Method to Calculate BMI.** If you want to know your body mass index, then divide your body weight in kg by your height in metre square, viz.,

$$\text{Body Mass Index} = \frac{\text{Weight in kg}}{\text{Height in m}^2}$$

$$\text{or} = \frac{\text{Weight}}{\text{Height} \times \text{Height}}$$

Healthy BMI for both women and men

The WHO criteria for underweight, healthy or normal weight, overweight and obesity by BMI are as follows:

Category	BMI
Underweight	< 18.5
Normal weight	18.5 – 24.9
Overweight	25 – 29.9
Obesity Class I	30 – 34.9
Obesity Class II	35 – 39.9
Obesity Class III	> 40

So, you can understand your weight category by having a glance at these criteria.

Methods to Control Healthy Body Weight

Stress should be laid on the following points for proper methods to control healthy body weight.

1. **Set an Appropriate Goal:** For losing body weight, you should set an appropriate goal, i.e., how much weight you want to shed or lose. While setting the goal, you should know about your capacities and limitations. Your goal should be achievable. You may set your goal for one month. Take a pledge that you will lose 1 kg per month depending on how much excess weight you have. After that you can further set your goal for weight control.

2. **Lay Stress on Health Not on Weight:** It is a well-known fact that losing weight for health rather than appearance can make it easier to set reasonable goals. From the point of view of health, you should make efforts to achieve or maintain a body mass index between the range of 18.5 and 24.9. If your BMI or waist measures beyond these limits you may be at a risk of contracting various diseases. So, from the point of view of health try to maintain these limits.
3. **Cut Your Calories:** Keep a plan ready to get back on the track if your body weight begins to exceed the required level. It is a simple plan to follow. Just cut or subtract only 100 calories a day. In this way, you can return to your set goal.
4. **Active Lifestyle:** An active dynamic lifestyle plays a pertinent role in controlling weight. School children should prefer to walk to school instead of going by car or motorbike. Instead of elevators, they should take stairs. If they want to switch off the TV, they should not use a remote control but should do this physically. They should not watch TV for more hours. Instead of watching TV for more hours they should play outdoor games. In this way, they can lead an active lifestyle, which will be beneficial in their weight control.
5. **Bring Out Support:** No doubt, you can lose or maintain your weight without anybody's support, but if you get support from other people it makes the process of losing weight easier and more pleasant. Tell people who are close to you about your intention that you are serious and committed to losing weight. Tell them that you would appreciate their support. In fact, having a support of a partner really works wonders for many persons. Promising to meet a partner for the regularly scheduled gym time is a great way to stick to a workout routine. Such type of support can be sought for lifetime. It will help you in maintaining your weight.
6. **Yogic Exercises:** Yogic exercises can help in controlling as well as maintaining proper weight. For example, pranayama and yogic asanas, are helpful in controlling weight. As a matter of fact, research studies have proved that stress and tension tend to increase weight. Meditative asanas are beneficial in relieving stress and tension. Therefore, yogic exercises can also be used for keeping a good control on weight.
7. **Avoid Fatty Foods:** If you want to lose or maintain weight, you should avoid fatty foods in your diet. Fats are known to have maximum number of calories. These extra calories will be accumulated in your body. So avoid fatty foods, if you want to remain healthy.
8. **Avoid Junk and Fast Foods:** Try to avoid junk and fast foods such as pizza, burger, chips, cookies, pastry, chocolate, cold drinks, etc., if you want to lose weight. These foodstuffs are also rich in empty calories. Intake of such foodstuffs leads to the condition of overweight.
9. **Avoid Overeating:** To control or maintain weight, you should not overeat. It means that you should eat food as per the requirement of your body. Suppose, you require 2,000 calories per day, then you should take the food that consists of only 2,000 calories. If you take 2,100 calories per day, the 100 calories will be accumulated daily as fat in your body. So, you should avoid overeating.

10. **Don't Eat Smaller Meals Frequently:** You should not form a habit of eating smaller meals frequently. So, avoid eating smaller meals frequently to avoid adding excess fat to the body.
11. **Avoid Rich Carbohydrate Food:** To lose weight, avoid rich carbohydrate foods. But it does not mean that you should not take carbohydrates at all. Carbohydrate is necessary to increase the level of energy. So, you should just reduce the amount of carbohydrate in your diet. For this purpose try to avoid sugar, rice, potatoes, toffees, chocolates and other sweets.
12. **Don't Skip Meals:** Don't skip your meals, such as breakfast, lunch and dinner. If you skip your meal, the next time you will definitely indulge in overeating which may lead to obesity. In fact, skipping meals increases hunger and it results in greater food consumption in the next meal that you take.
13. **Regular Exercise or Physical Activity:** Exercise helps to control your weight by using up excess calories. On the other hand, if you do not exercise, the excess calories will be stored as fat. In fact, your body weight is regulated by the number of calories you take in and use each day. In reality, whatever you eat, contains calories and whatever you do, uses calories. Even calories are used while breathing, sleeping and digesting food. Regular exercise or physical activity is a vital part of weight loss or weight control programme for lifetime. Research studies consistently indicate that regular physical activity/exercise such as aerobic exercise and strengthening exercise for at least 30 minutes, combined with healthy eating habits, is the healthiest way to control weight for a lifetime. Whether you are making endeavours to lose weight or maintain it, you should never forget the significant role of exercise/ physical activity.
14. **Balancing the Intake of Calories and Expenditure of Calories:** For maintaining a healthy weight, you should always try to strike a balance between your intake of calories and expenditure of calories. For implementing this, try not to eat more calories than your body burns each day. Always stick to your eating plan even on a holiday or a function. If your intake of calories is more than what you need, the excess calories are stored as fat. Too much stored fat raises your BMI and makes it hard to return to your aimed weight. Lay stress on the following points for balancing the intake and burning of calories.
    (a) When you take more calories than you require to do your day's activities, your body stores the extra calories and as a result of this you gain weight.
    (b) When you take less number of calories than your expenditure of calories, you lose weight.
    (c) When your intake and expenditure of calories remain same, your body weight also remains the same.

By laying stress on the above-mentioned points, a healthy body weight can be achieved. It is usually said that you may lose your body weight for short period but it is difficult to maintain it for a lifetime. Indeed, it requires a strong willpower, dedication, firm

determination, persistent endeavours and motivation to control weight and maintain a healthy weight.

The Pitfalls of Dieting

Nowadays everybody wants to remain slim and trim. People who are overweight use various methods to lose weight. Most of them adhere to dieting. In the beginning, dieting produces good results or success. But after initial success it adds more weight later on. Even research studies indicate that 90% of the dieters gain all of their weight back and sometime more than that. In fact, we are all aware that shedding or losing weight is not as simple as it sounds. Eat less and exercise more to burn calories. We know this scientific fact but it is difficult to implement. In fact, there are some pitfalls/dangers of dieting that keep us away from losing or reducing weight. The major pitfalls of dieting are stated below.

1. **Extreme Reduction of Calories:** For dieting, intake of calories is reduced extremely. Research studies indicate that 1800 calories a day cannot meet all the nutritional requirements of an individual. If you reduce intake of calories it will result in a huge loss of weight. It can be dangerous for you. It will definitely lower your metabolism and as a result of this your body weight will not be reduced in a healthy manner.
2. **Restriction on Some Nutrients:** Generally some nutrients like carbohydrates and fats are restricted in dieting. In reality, your body needs all types of nutrients. If you don't take all the nutrients in required amounts, the proper functioning of the body will be impaired.
3. **Skipping Meals:** It is a fact that if you have good metabolic rate, you can maintain or lose weight. If your metabolic rate is slow you gain weight very easily. So, if you skip meals, it will lower your metabolism to conserve energy. So, skipping meals works against your weight-loss plans. Research studies also show if you skip one meal, you take more calories during the next meal.
4. **Intake of Calories through Beverages:** If you want to lose your weight, most probably, you lay stress on not to eat more and not on what you drink. In fact, beverages, coffee with cream and sugar, sweetened juices and sodas really contribute to weight gain.
5. **Underestimating the Calories:** It is a fact that most of the persons who go on dieting usually underestimate the number of calories they consume. So, it is essential to be more aware of the amount of calories you take in your diet.
6. **Intake of Labelled Foods:** Most of the persons who go on dieting usually go for such food products that carry the label 'lean', 'sugar free', 'low calories' or 'no fat or fat-free'. Such type of food is not always the best for losing weight. In addition, it does not meet all the nutrient requirements of your body. As a matter of fact, three chocolate biscuits contain 140 calories whereas three non-fat cookies contain 120 calories. This difference is insignificant. Apart from this, when you eat such products you think that these products have very few calories and so you tend to eat more, as a result of which, you end up consuming more calories.

7. **Not Exercising:** If you go on dieting and do not exercise, it will work against the weight-loss programme. Instead of losing weight you are likely to gain weight. As a matter of fact, exercise has a positive effect on metabolism and also helps to burn some extra calories. Exercise increases metabolic rate which ultimately reduces body weight. So, dieting is beneficial only if you exercise alongside.

Food Intolerance

Food intolerance is more common than food allergy. Food intolerance is a term used widely for varied physiological responses associated with a particular food. In simple words, food intolerance means the individual elements of certain foods that cannot be properly processed and absorbed by our digestive system. Some persons can tolerate a reasonable amount of the food but if they eat too much or too often they get symptoms of food intolerance because their body cannot tolerate unlimited amounts. Food intolerance comes on gradually not frequently. It is not life threatening.

Causes of Food Intolerance

Food intolerance is caused by part or complete absence of activity of the enzymes responsible for breaking down or absorbing the food elements. These deficiencies are usually innate. Sometimes food intolerance can be diet-related or can be due to illness.

Symptoms

Food intolerance can cause nausea, stomach pain, diarrhoea, vomiting, flatulence, gas, cramps, heartburn, headaches, irritability, nervousness, etc.

Management of Food Intolerance

Individuals can try minor changes of diet to exclude food causing adverse reactions. Sometimes it can be managed adequately in such a way without the need for professional assistance. If you are unable to know the food which causes problem you should seek expert medical help. Guidance can also be provided by your general practitioner to assist in diagnosis and management. For managing food intolerance, fructose intolerance therapy, lactose intolerance therapy and histamine intolerance therapy can be applied.

Food Myths

There are various food myths which are prevailing not only in India but all over the world. What to eat, when to eat and how often to eat are such questions which usually confuse most of the individuals. We believe in such myths because they sound like they could be true. Nowadays, we have scientific knowledge and on the basis of that knowledge we should not believe in food myths. The most common food myths which are still prevalent in our contemporary society are stated subsequently.

1. **Potatoes Make You Fat:** Earlier, people used to think that carbohydrate-rich foods such as rice, potato, etc., increase body weight. So, for losing or reducing weight they used to eliminate carbohydrate-rich foods from the diet. Now, we know that carbohydrates are the body's preferred energy source. Potatoes do not automatically make you fat. So, there is no problem in taking potatoes in moderate quantity.
2. **Fat-free Products Will Help You in Losing Weight:** Fat-free labelled products can lead to weight gain, In fact, these foods have more calories. Approximately, these products have the same number of calories (may be slightly less) in comparison to other regular food. In addition, most of the persons eat more quantity of labelled food under the misconception that it comprises less calories. However, they ultimately consume more calories which can cause weight gain.
3. **Eggs Increase Cholesterol Levels So Avoid Them:** Eggs are, undoubtedly good source of health. An egg provides you various nutrients such as protein, vitamins A, B, D, zinc, iron, calcium, phosphorus, etc. It also fulfils the daily requirement of cholesterol by our body. So, taking one egg daily causes no problem in the level of cholesterol.
4. **Drinking While Eating Makes You Fat:** The actual fact behind this misconception is that enzymes and their digestive juices will be diluted by drinking water while eating. It will slow down your digestion which may lead to excess body fat. In contrary, there is a scientific fact that drinking water while eating improves digestion.
5. **Don't Take Milk Immediately After Eating Fish:** Many people believe that you should not take milk immediately after eating fish. They think that it will make you sick. Some people even think that spots can appear on your skin if you consume milk after eating fish. As a matter of fact, there is no scientific reason in taking milk immediately after eating fish. Indeed, these products may be taken together.
6. **Starve Yourself If You Want to Lose Weight:** Eating a good diet is more important than not to eat when you are on a weight-loss programme. Include such food items in your diet which suppress appetite and increase metabolism so that you don't eat too much. So, there is no need to starve yourself if you want to lose weight.
7. **Exercise Makes You Eat More:** Exercise burns calories which may increase your hunger. Research studies conducted in this area have not shown that the individuals who do exercise, consume more calories than those who don't exercise. So, there is no truth in this statement.

Exercises

Objective Type/Multiple Choice Questions (Carrying 1 Mark)

Give one word answers.

1. Which diet can provide all the essential food constituents necessary for growth and maintenance of the body?

2. Who discovered vitamin 'A'?

3. Which mineral helps iron in the formation of haemoglobin?
4. Which vitamin was discovered by Elmer McCollum?
5. What is the name of that carbohydrate in which the ratio of hydrogen atoms to oxygen atoms is not 2: 1?
6. What is the other name of vitamin B_2?
7. Which vitamin helps in maintaining the level of calcium and phosphorus in our body?

Fill in the blanks.

1. Our blood contains ..... percent of water.
2. Minerals and .....are included in micronutrients.
3. The deficiency of..... may cause goitre.
4. About..... percent of our body weight is made up of minerals.
5. Vitamin 'C' is also known as ..... .

State True or False.

1. A balanced diet must contain all the essential food constituents in adequate amount. (True/False)
2. Carbohydrates contain the elements of carbon, hydrogen and oxygen. (True/False)
3. Glucose, fructose, sucrose and maltose are called complex carbohydrates. (True/False)
4. Fats contain carbon, oxygen and hydrogen in the percentage of 76, 12 and 12 respectively. (True/False)

Choose the correct answer.

1. In most of the carbohydrates, the ratio of hydrogen atoms to oxygen atoms is:
   (a) 2 : 1 (b) 1 : 2 (c) 1 : 3 (d) None ofthese
2. Trypsin helps in the digestion of:
   (a) Vitamins (b) Fats (c) Protein (d) Carbohydrates
3. Which group of fats usually increases the chances of heart diseases?
   (a) Saturated fats (b) Poly unsaturated fats
   (c) Mono-unsaturated fats (d) None of the above
4. Which one of the following is not the example of macrominerals?
   (a) Sodium (b) Potassium (c) Iron (d) Calcium
5. Which one of the following is an example of water soluble vitamins?
   (a) Vitamin 'D' (b) Vitamin 'C' (c) Vitamin 'A' (d) Vitamin 'E'
6. Which disease is caused by the deficiency of vitamin B_5?
   (a) Beri-beri (b) Pellagra (c) Rickets (d) Nightblindness
7. Which one of the given minerals plays an important role in the formation of haemoglobin?
   (a) Iron (b) Sulphur (c) Phosphorus (d) Sodium
8. Which one of the following is not the non-nutritive component of diet?
   (a) Roughage (b) Colour compounds (c) Protein (d) Flavourcompounds
9. What is the other name of Vitamin B_3?
   (a) Riboflavin (b) Biotin (c) Niacin (d) Thiamin

10. Which Vitamin is derived from the word "Coagulation"?

(a) Vitamin E (b) Vitamin K (c) Vitamin A (d) Vitamin C

11. Which one of the following vitamins is helpful in the clotting of blood?

(a) Vitamin K (b) Vitamin C (c) Vitamin A (d) Vitamin E

Short Answer Questions-I (Carrying 3 Marks)

1. Clarify the meaning of balanced diet in brief.

2. What do you mean by macro and micro nutrients?

3. What do you mean by nutritive and non-nutritive components of diet?

4. Briefly explain about vitamins.

5. Enlist the forms of vitamin B and explain any one of them in brief.

6. What is roughage? Explain in brief.

7. Explain in brief, the importance of water.

8. What do you mean by colour compounds?

9. Briefly explain any two food myths.

10. What do you mean by macro nutrients? Explain about any two macro nutrients.

11. What do you mean by micro nutrients? Discuss about macro and micro minerals.

12. What do you mean by vitamin? Explain about fat soluble and water soluble vitamins.

13. Discuss protein as the nutritive component of diet.

14. What do you mean by water soluble vitamins? Explain about them in brief.

15. Discuss about mineral as nutritive component of diet.

16. Discuss water and roughage as a non-nutritive components of diet.

17. Enlist the non-nutritive components of diet. Explain about any two components of diet.

18. Discuss any four pitfalls of dieting.

19. Discuss the causes and management of food intolerance.

20. What do you mean by food myths? Briefly explain about four myths.

21. In sports such as Boxing and Wrestling, do players tend to lose weight sharply? Explain the pitfalls of dieting. *[CBSE Sample Paper 2015]*

22. Briefly explain the functions and resources of three fat soluble vitamins.

23. Write briefly about protein as an essential component of diet. *[AI 2016]*

24. Discuss any four pitfalls of dieting. *[CBSE Sample Paper 2016]*

25. Mention the difference between macro and micro nutrients.

26. What do you understand by food myths?

Or

Discuss briefly about various food myths. *[Delhi 2016]*

27. Explain various pitfalls of dieting. *[CBSE Compt. 2018]*

Short Answer Questions-II (Carrying 5 Marks)

1. What do you mean by macro nutrients? Explain about any four macro nutrients.

2. What do you mean by micro nutrients? Explain in brief about minerals as micro nutrients in detail.

3. What do you mean by nutritive components of diet? Explain about any three of them in brief.
4. What do you mean by non-nutritive components of diet? Explain any four non-nutritive components in brief.
5. What do you mean by healthy weight? Discuss about the methods to control healthy body weight for lifetime.
6. Elucidate about the various pitfalls of dieting in detail.
7. What do you mean by food intolerance? Explain the causes, symptoms and management of food intolerance in detail.
8. What do you mean by food myths? Explain any six food myths prevailing in contemporary society.
9. "Vitamins are essential for our metabolic process". What happens if we devoid our diet of vitamins? *[Delhi 2012]*
10. Vitamins are very essential for the normal working of the body and are divided into two groups. Explain about them. *[AI 2015]*
11. What is balanced diet? Explain the components of diet. *[AI 2014]*
12. What are the nutritive and non-nutritive components of diet? Explain. *[AI 2017]*
13. What do you mean by 'Healthy weight'? Explain the methods to control healthy body weight to lead healthy-living. *[Delhi 2017]*
14. What do you mean by vitamins? Discuss the fat soluble and water soluble vitamins in detail.
15. Explain macro-nutrients and their role in our diet. *[CBSE 2019]*

Answers

Objective Type/Multiple Choice Questions

Give one word answers.

1. Balanced Diet
2. Elmer McCollum
3. Copper
4. Vitamin 'A'
5. Rhamnose ($C_6H_{12}O_5$)
6. Riboflavin
7. Vitamin 'D'

Fill in the blanks.

1. 90
2. Vitamins
3. Iodine
4. 4
5. ascorbic acid

State True or False.

1. True **2.** True **3.** False **4.** True

Choose the correct answer.

1. (a) 2:1 **2.** (c) Protein **3.** (a) Saturated fats **4.** (c) Iron

5. (b) Vitamin 'C' **6.** (b) Pellagra **7.** (a) Iron **8.** (c) Protein

9. (c) Niacin **10.** (b) Vitamin K **11.** (a) Vitamin K

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