

## CHAPTER

# 05

# *Sports and Nutrition*

Every individual require food to fulfill energy needs and for the development of the body. The food consumed by an individual is known as diet. The food contains a various types of essential chemicals known as nutrients.

## **Balanced Diet**

A balanced diet is the diet which contains all the nutrients in adequate amount necessary for growth and maintenance of the body. A balanced diet consists of protein, carbohydrates, fats, vitamins and minerals in correct proportion.

In other words, a balanced diet means eating the right amount of food from all food group. Balanced diet varies from individual to individual.

For instance, person A lacks iron and person B lacks protein respectively. Hence, their balance diet will be different, as per their body requirement. The essentials for balanced diet are

- Inclusion of all essential nutrients in the food in adequate amount.
- There must be a definite ratio between fats, proteins and carbohydrates.
- The food should be easily digestible.
- The food should be properly cooked because it sterilises food stuffs.

## CHAPTER CHECKLIST

- Balance Diet
  - Nutrition
  - Nutritive and Non-nutritive Components of Diet
-

## Nutrition

It is a process by which a living organism assimilates (intake) food and uses it for the growth of the body. It is a dynamic process in which the essential elements present in the food are absorbed by the body. The absorbed elements are used by tissues and organs to perform various functions.

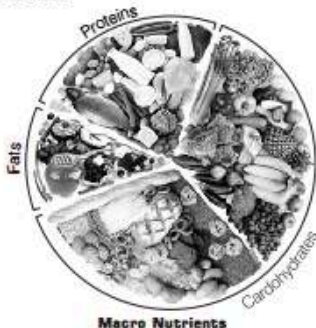
It encompasses different processes right from digestion to absorption to extraction of waste.

Sports nutrition is a science which clarifies the interaction of nutrients and other substances in food essential for health, growth and physical performance.

There are number of nutrients required in balanced diet. These can be categorised into two parts, *i.e.* macro nutrients and micro nutrients.

## Macro Nutrients

Macro nutrients are those nutrients which are required by our body in large amount or quantity. They supply energy and play prominent role in growth and maintenance of our body. They include carbohydrates, proteins and fats.



Each of them are discussed below

## Carbohydrates

These are the main source of energy in all activities performed by an organism. The elements of carbohydrates are carbon, hydrogen and oxygen.

In all carbohydrates, the ratio of hydrogen atoms to oxygen atoms is 2 : 1. Carbohydrates are organic

Their primary function is to provide energy to the body, especially to the brain and nervous system.

There are two main types of carbohydrates *i.e.* simple carbohydrates and complex carbohydrates.

### Simple Carbohydrates

Glucose, fructose, galactose, sucrose, maltose and lactose are called simple carbohydrates. They are soluble in water and are crystalline. They are sweet in taste and are called as sugar.

**Sources** It's main sources includes fruits, low fat milk, table sugar, refined honey, jam, vegetables (potato, carrot), candy etc.

### Complex Carbohydrates

Starch, dextrans, glycogen and cellulose are called complex carbohydrates or polysaccharides. They are not sweet in taste and are insoluble in water. They are not crystalline.

**Sources** It's main sources includes bread, cereals (wheat, rice, maize, bajra), vegetable, whole pulses etc.

The main difference between the two types of carbohydrates is the difference in their chemical compositions. Simple carbohydrates have smaller chain of chemical compositions in comparison to the complex ones.

## Proteins

It is a compound that is formed by the combination of oxygen, carbon, hydrogen, nitrogen and sometimes sulphur. Proteins are the basic constituents of our cells.

They are large molecules, so they cannot get directly into our blood. Thus, they are turned into amino acids by our digestive system. There are 23 amino acids and out of these, atleast 9 should be available in diet.

They help in formation of new tissues, repair the broken tissues, regulate balance of water and acids, transport oxygen and nutrients, and make antibodies.

Body requires only 0.36 gram of protein per pound of the ideal body weight. If protein is not taken in appropriate amount in diet, then the deficiency diseases like marasmus and kwashiorkor are caused in children etc.

Proteins are of two types *viz.* essential and non-essential proteins. Former are taken from food and they are not

**Sources** There are two important sources of vitamin, *i.e.* animal protein and vegetable protein. Food which are rich in animal protein are eggs, meat, fish and dairy products, while food which are rich in vegetable protein are pulses, nuts, cereals, etc.

Excessive use of animal protein in diet can result in heart diseases, osteoporosis, stroke and kidney stones.

## Fats

It contain carbon, hydrogen and oxygen in the percentage of 76, 12 and 12 respectively. These are the most concentrated source of energy in food. Fats give twice as much energy as carbohydrates.

The body uses fat as a fuel source. It helps in transportation of a fat soluble vitamins like Vitamin A, D, E and K.

Different types of fats have different characteristics and these react in different ways inside the body.

Many fats are unhealthy such as trans fats found in deep fried foods. Some fats are good for us, such as omega-3 fatty acids in salt water fish. Fats can be classified according to their structures.

There are three different groups of fats in the diet which are saturated, polyunsaturated and monounsaturated fats.

The intake of saturated fats increases the chances of heart diseases, due to the increase of cholesterol in blood. Such types of fats are found in fast foods, pastries and biscuits.

The polyunsaturated and monounsaturated fats help in lowering the blood cholesterol. The polyunsaturated fats are slightly better than monosaturated fats.

**Sources** There are two important sources of fat, *i.e.* animal sources and vegetable sources. Products like ghee, cheese, milk, eggs, etc. are good examples of animal sources, while vegetables like sweet potato, coconut, soybean, food grains, etc. are examples of vegetable sources.

## Micro Nutrients

Micro nutrients control growth and development, cell formation, disease resistance and repair processes of our body. They are required in very small amount.

They do not supply us with energy, but are vital and we

## Vitamins

Vitamins are compounds of carbon which are essential for the normal growth and working of the body. They are required in very small quantities.

Many of them can be stored in the body for months or even years but others need to be freshly absorbed every day.

There are two groups of vitamins *i.e.* fat soluble and water soluble vitamins.

### Fat Soluble Vitamins

These vitamins are composed of carbon, hydrogen and oxygen and they are soluble in fats, such as vitamin A, vitamin D, vitamin E and vitamin K. These are stored in liver and fatty tissues.

The fat soluble vitamins are explained below

#### 1. Vitamin A

This vitamin was discovered by Elmer McCollum in 1913. It is formed by the elements of hydrogen, carbon and oxygen. It is also known as retinol.

**Sources** Its sources are milk, curd, ghee, egg yolk, fish, tomato, papaya, green vegetables, orange, spinach, carrot and pumpkin.

**Function** This is essential for normal growth of the body and development of eyes and skin. It is also helpful in formation of bones and teeth.

**Deficiency** Deficiency of Vitamin A leads to night blindness and also affects the kidneys, nervous system and digestive system.

#### 2. Vitamin D

This vitamin is white crystalline substance and is formed by the elements of carbon, hydrogen and oxygen. This is essential for the formation of healthy teeth and bones.

**Sources** Its sources are egg yolk, fish, sunlight, vegetables, cod liver oil, milk, cream and butter.

**Function** It maintains the normal functioning of parathormone, (the hormone secreted by parathyroid glands.) The presence of this vitamin in the body enables it to absorb calcium and phosphorus.

**Deficiency** Its deficiency causes rickets, softness of bones and teeth diseases.

#### 3. Vitamin E

**Function** This vitamin is needed in strengthening cell membrane. This is essential in increasing the fertility among men and women as well as proper functioning of adrenal and sex glands.

**Deficiency** Its deficiency causes weakness in muscles and heart, slow growth and even paralysis.

#### 4. Vitamin K

**Sources** It's sources are cauliflower, spinach, cabbage, tomato, potato, wheat, soyabean, egg and meat.

**Function** This is helpful in the clotting of blood, prevention of haemorrhage and excessive bleeding in wounds.

**Deficiency** Its deficiency may cause anaemia and blood do not clot easily.

### Water Soluble Vitamins

These vitamins are composed of nitrogen, sulphur and soluble in water, such as vitamin B complex, vitamin C. Being water soluble, they are not stored in body and thus their need arises frequently.

The water soluble vitamins are explained below

#### 1. Vitamin B Complex

There are 8 vitamins in this group. It includes B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>5</sub>, B<sub>6</sub>, B<sub>7</sub>, B<sub>9</sub> and B<sub>12</sub>. They are necessary for growth, proper functioning of heart, liver, kidney and maintains smooth skin. These are as follows

• **Vitamin B<sub>1</sub> (Thiamin)** This vitamin is also called thiamin and it is colourless in nature.

**Sources** It's sources are egg yolk, wheat, groundnut, peas, orange and sprouts.

**Function** It helps in growth and development of body. It also play significant role in the assimilation of vitamin A and synthesis of carbohydrate in our body. Its taste is salty and smell like yeast.

**Deficiency** It's deficiency causes Beri-Beri. Its deficiency may also cause constipation, irritation and anger.

• **Vitamin B<sub>2</sub> (Riboflavin)** This vitamin is known as riboflavin and it is yellow in colour.

**Sources** It's sources are fish, pulses, rice, wheat and green vegetables.

**Function** It is essential to keep the eyes, nose, mouth, lips and tongue in healthy state. It is essential in preserving and maintaining smoothness of skin, health of body tissues, etc.

• **Vitamin B<sub>3</sub> (Niacin)** This vitamin works with other b-complex vitamins to metabolise food and provide energy for the body.

**Sources** It's sources are milk and dry fruits.

**Function** Vitamin B<sub>3</sub> is involved in energy production, normal enzyme function, digestion, promote normal appetite, healthy skin and nerves.

**Deficiency** It's deficiency includes fatigue, indigestion, depression, etc.

• **Vitamin B<sub>5</sub> (Pantothenic acid)** This vitamin is also called pantothenic acid.

**Sources** It's sources are corn, broccoli, tomatoes, egg yolks, chicken, milk, peanuts, etc.

**Function** It helps in the breakdown of fats and carbohydrates to release energy. It's inclusion in diet is necessary for making blood cells.

**Deficiency** Fatigue, insomnia, depression are some of symptoms of its deficiency.

• **Vitamin B<sub>6</sub> (Pyridoxine)** This vitamin is also called pyridoxine.

**Sources** It's sources are meat, fish, egg yolk, yeast, rice, wheat and peas.

**Function** This vitamin plays a key role in protein and glucose metabolism as well as in the formation of haemoglobin. Vitamin B<sub>6</sub> is also involved in keeping the lymph nodes and thymus healthy.

**Deficiency** It's deficiency causes anaemia, depression, confusion, etc.

• **Vitamin B<sub>7</sub> (Biotin)** This vitamin is known as biotin.

**Sources** It's sources are corn, egg yolk, milk, legumes and mushrooms.

**Deficiency** It's deficiency may lead to muscle strain, depression and impaired growth.

• **Vitamin B<sub>9</sub> (Folic acid)** This vitamin is yellow in colour.

**Sources** It's sources are chickpeas, lentils, beat, spinach.

**Function** It is essential for normal growth and development of reproductive system.

**Deficiency** It's deficiency may cause loss of leucocytes.

• **Vitamin B<sub>12</sub> (Cobalamin)** This vitamin is also known as Cobalamin.

**Function** It helps in the building of genetic material, production of normal red blood cells, and maintenance of the nervous system.

**Deficiency** It's deficiency cause anaemia.

## 2. Vitamin C

It is also called ascorbic acid, which is a water-soluble vitamin and cannot be stored in the body. Most plants and animals can produce their own vitamin C but humans cannot.

**Sources** It's sources are lemons, pineapple, oranges, tomatoes, green vegetables, cabbage etc.

**Function** Vitamin C is needed for proper growth, development, and to heal wounds. It is used to make the collagen tissue for healthy teeth, gums, blood vessels and bones.

**Deficiency** Deficiency of vitamin C causes scurvy.

## Minerals

Minerals are micro-nutrients that are essential for the normal functioning of the body. They consist of 4% of our body weight.

Minerals are essential for various activities such as maintaining healthy teeth and bones, blood composition, nerve impulses, maintenance of heartbeat, formation of hormones and overall normal functioning of the body.

Minerals are inorganic elements that, depending on their concentration in the body, are divided into macro and micro elements. The former include calcium, phosphorus, potassium, magnesium or sodium, while later includes iron, iodine, cobalt, chromium, zinc or fluorine.

The requirement of macro and micro mineral in our body is 0.1 and 0.01 gram of each of these mineral per day respectively. A shortage of minerals can have severe effects on health.

For example, a long-term shortage of foods containing iodine in people lead to thyroid gland diseases.

## Macro Minerals

Some of the macro minerals are described below

### 1. Calcium (Ca)

**Sources** It's sources are milk, egg yolk, cheese, green vegetables, cereals and orange.

**Function** It is needed for the formation of strong bones, teeth and also helps in clotting of blood and

### 2. Potassium (K)

**Sources** It's main sources are banana, carrot, beetroot, onion, tomato, green leafy vegetables, peanuts, citrus fruit, orange and mango.

**Function** It is one of the most required minerals in diet. It play key role in keeping the nervous system and muscular system fit and active all the time. It also helps in hydro (water) balance of the body.

**Deficiency** It's deficiency weakens the muscles of the body.

### 3. Sodium (Na)

**Sources** It's sources are table salts, butter, milk and milk products, meat and eggs.

**Function** It is needed for the proper functioning of the nervous system.

**Deficiency** It's deficiency causes hyponatremia. It may lead to coma and can be fatal.

### 4. Magnesium (Mg)

**Sources** It's sources are meat, brown rice, beans, whole grains etc.

**Function** It repairs and maintains body cells.

**Deficiency** It's deficiency causes loss of appetite, nausea, vomiting, fatigue and weakness. Severe magnesium deficiency result in low hypocalcemia (low calcium).

### 5. Phosphorus (P)

**Sources** It's sources are egg, fish, meat, cod liver oil, milk and unpolished rice.

**Function** It is required for development of strong bones and teeth and keeps muscles and nerve activities normal.

**Deficiency** It's deficiency causes bone diseases such as rickets in children and osteomalacia (weakening of bones) in adults.

## Micro Minerals

Some of the micro minerals are described below

### 1. Iodine (I)

**Sources** It's main sources are seafood, fish and iodised salt.

**Function** It is essential for proper thyroid function.

**Deficiency** It's deficiency causes goitre (swollen thyroid gland) and mental retardation.

### 2. Iron (Fe)

**Sources** It's main sources are meat, eggs, dry

### 3. Chromium (Cr)

**Sources** It is found in soybean, carrot, tomato, blackgram, groundnuts, bajra and barley.

**Function** It stimulates insulin activity.

**Deficiency** It's deficiency may cause diabetes.

### 4. Copper (Cu)

**Sources** Its main sources are almond, pulses, sunflower seeds and apricot.

**Function** It is helpful in the formation of red blood cells, connective tissue and nerve fibre formation and functioning.

**Deficiency** It's deficiency causes heart and kidney failure, liver damage, brain disorder, etc.

### 5. Cobalt (Co)

**Sources** It is found in green leafy vegetables, milk and meat.

**Function** Cobalt is needed for making red blood cells.

**Deficiency** It's deficiency causes anaemia.

### 6. Zinc (Zn)

**Sources** Its main sources are pumpkin seeds, sesame seeds, chick peas.

**Function** It is required for insulin production and also for functioning of male prostate, digestion and metabolism.

**Deficiency** It's deficiency causes impaired growth and development, skin rashes, chronic diarrhea, etc.

### 7. Fluorine (F)

**Sources** Its main sources are seafood and water.

**Function** It is important to make the enamel (polish) of the teeth hard and prevents dental diseases.

**Deficiency** It's deficiency causes dental problem (such as tooth decay) and osteoporosis (porous bone).

## Nutritive and Non-nutritive Components of Diet

Food components are categorised into 2 types *viz.* *nutritive* (providing calories) or *non-nutritive* (not providing calories). They are added to a multitude of foods and beverages.

They not only provide a sweet flavour to foods, but are also used to preserve foods (in jams or jellies), provide shape and texture (in ice cream and baked goods).

## Nutritive Components of Diet

Nutritive components of diet are those components which contribute or provide energy or calories. The nutritive components of diet are proteins, carbohydrates, fats, vitamins and minerals.

These nutritive components of diet are described earlier in this chapter.

## Non-nutritive Components of Diet

Non-nutritive components of diet do not provide energy or calories. Their main purpose is to make the food smell and taste better, last longer, or look better etc.

Some of these components are essential for body while other harms the body. Few of them are helpful to check the initiators of cancer in the body.

Some of the important non-nutritive food components are discussed below

### 1. Roughage or Fibre

Roughage does not have any nutritional value but it is very essential for body. It cannot be digested by the human intestinal tract. It satisfies the appetite.

It's main function is to correct the disorder of large intestine and it helps in preventing constipation.

It is of two types *i.e.* soluble and insoluble. Soluble fibre dissolves in water, reduces cholesterol and manages blood sugar level. Insoluble fibre clears the digestive tract.

30 grams of fibre is required for adult per day. Root vegetables, oats, fruits, meat and wheat provide roughage.

### 2. Water

It is non-nutritive but essential component of diet. It is the main component of blood that carries nutrients to various cells in the body, regulates the body temperature and is significant in the excretion of waste products. It also helps in keeping the skin moist and protect the body from shock.

The body loses water in the form of urine, faeces, sweating and water vapours exhaled through breathing. Water intake comes from food and from drinking water.

Around 2% of body weight is lost as water per day

### 3. Plant Compounds

These are derived from plants and mainly used in small amounts. Their excess use may turn them into non-nutritive, like caffeine, tea leaves.

If caffeine is taken in excess, then it may increase heart rate, secretion of stomach acid and frequent urination.

### 4. Colour Compounds

Colours are added to the food to make it look attractive and colourful. These are non-nutritive components of diet and excess consumption can be harmful.

However, some fruits and vegetables have natural colour pigments like beet root and saffron that adds colour to the food preparation.

### 5. Flavour Compounds

These are flavouring agents that add flavour to the food. These compounds are derived from both nutritive and non-nutritive components of food.

Sour taste in the food is generally provided by acidic food, while alkaline provides bitter taste. Artificial sweeteners like saccharin, sucralose are added to sweeten the foods.

### 6. Food Additives

Certain chemicals like benzoic acid, sodium benzoate and other chemicals are used as food preservatives to increase the shelf life of the food. They are non-nutritive.

Their excess consumption causes skin infections, digestive problems, asthmatic reactions etc.

# CHAPTER PRACTICE

## OBJECTIVE TYPE QUESTIONS

### Multiple Choice Questions (MCQs)

- 1 Balance diet consists high sources of  
(a) Proteins (b) Fruits  
(c) Fats  
(d) All the components in balanced form

**Ans** (d) All the components in balanced form

- 2 The following are macro nutrients, except  
CBSE 2021 Term I  
(a) Carbohydrates (b) Fat  
(c) Vitamins (d) Proteins

**Ans** (c) Vitamins

- 3 The main sources of protein are CBSE 2020  
(a) Fish, meat and eggs (b) Green vegetables  
(c) Wheat and rice (d) Sunlight and water

**Ans** (a) Fish, meat and eggs

- 4 Deficiency of which vitamin causes night blindness?  
(a) Vitamin A (b) Vitamin B  
(c) Vitamin C (d) Vitamin D

**Ans** (a) Vitamin A

- 5 Scientific name of Vitamin 'C' is  
CBSE 2021 Term I  
(a) Ascorbic acid (b) Calcium  
(c) Retinol (d) Thiamine

**Ans** (a) Ascorbic acid

- 6 Which one of the following is not example of macro mineral?  
(a) Copper (b) Calcium  
(c) Iodine (d) Cobalt

**Ans** (b) Calcium

- 7 Which macro mineral helps in hydro balance in body?  
(a) Potassium (b) Calcium  
(c) Sodium (d) Phosphorus

**Ans** (a) Potassium

- 8 What is main function of fluorine?

- 9 Which of the following do not have nutritive properties?  
(a) Carbohydrate (b) Fat  
(c) Protein (d) Water

**Ans** (d) Water

- 10 Assertion (A) Risk of cancer can be reduced by eating more colourful vegetables, fruits and other plant foods that have certain phytochemicals in them. CBSE 2021 Term I

Reason (R) Non-nutritive components of diet is a part of balanced diet.

In the context of above two statements, which one of the following is correct

#### Codes

- (a) Both A and R are true and R is the correct explanation of A  
(b) Both A and R are true, but R is not the correct explanation of A  
(c) A is true, but R is false  
(d) A is false, but R is true

**Ans.** (c) A is true, but R is false

#### Fill in the Blanks

- 11 Mineral consist of \_\_\_\_\_ percentage of our body.

**Ans** 4

- 12 Deficiency of \_\_\_\_\_ may cause goitre.

**Ans** Iodine

- 13 Water is \_\_\_\_\_ but essential component of diet

**Ans** Non-nutritive

- 14 Deficiency of Vitamin C causes \_\_\_\_\_ .

**Ans** Scurvy

#### State True or False

- 15 Nutrition is a dynamic process.

**Ans** True

- 16 The macro nutrients include carbohydrates, proteins and vitamins.

**Ans** False. Macro nutrients include carbohydrates, proteins and fats.



- 18** The deficiency of iron causes or lead to anaemia.

**Ans** True

Match the Following

19	List I (Macro nutrient)	List II (Feature)
	A. Carbohydrates	(i) Made up of Amino acid
	B. Proteins	(ii) Transportation of vitamin
	C. Fats	(iii) Main source of energy

**Codes**

- |     |       |      |       |
|-----|-------|------|-------|
|     | A     | B    | C     |
| (a) | (iii) | (i)  | (ii)  |
| (b) | (ii)  | (i)  | (iii) |
| (c) | (i)   | (ii) | (iii) |
| (d) | (iii) | (ii) | (i)   |

**Ans** (a) (iii) (i) (ii)

- 20** Match the following CBSE SQP 2021 Term II

List I (Vitamin B)	List II (Scientific Name)
A. Vitamin B12	(i) Thiamin
B. Vitamin B3	(ii) Biotin
C. Vitamin B7	(iii) Cobalamin
D. Vitamin B1	(iv) Niacin

**Codes**

- |     |       |       |       |      |
|-----|-------|-------|-------|------|
|     | A     | B     | C     | D    |
| (a) | (iv)  | (iii) | (i)   | (ii) |
| (b) | (ii)  | (iii) | (iv)  | (i)  |
| (c) | (i)   | (ii)  | (iii) | (iv) |
| (d) | (iii) | (iv)  | (ii)  | (i)  |

**Ans** (d) (iii) (iv) (ii) (i)

- 21** Match List I with List II CBSE 2020

List I	List II
A. Energy yielding	(i) Carbohydrate
B. Body-building	(ii) Vitamin
C. Protective	(iii) Cellulose
D. Fiber	(iv) Protein

**Codes**

- |     |      |      |      |       |
|-----|------|------|------|-------|
|     | A    | B    | C    | D     |
| (a) | (i)  | (iv) | (ii) | (iii) |
| (b) | (iv) | (i)  | (ii) | (iii) |

## C VERY SHORT ANSWER TYPE QUESTIONS

- 22** What is balanced diet? Delhi 2014

*Or* What do you mean by balanced diet?

**Ans** A balanced diet is the diet which contains the proper amount of each nutrient required by our body e.g. proteins, fats, carbohydrates, minerals, salts, vitamins and water.

- 23** What do you mean by food and nutrition?

**Ans** Food is a mixture of various substances that supplies energy for every action our body does, whereas nutrition is a dynamic process in which the body absorbs the essential element present in food.

- 24** What are carbohydrates?

**Ans** Carbohydrates are compounds of carbon, hydrogen and oxygen. The main function of carbohydrates is to provide energy for the body, brain and nervous system.

- 25** Why does the weightlifter's diet include lots of protein?

**Ans** The diet of weightlifter's include lot of protein because protein contains amino acids. This is used in building muscles and increasing strength, which are necessary for weightlifting.

- 26** What are fats? Delhi 2013

**Ans** Fats are the energy boosters which provide us with twice as much energy as carbohydrates. We can store extra fat in our body that can be used later.

- 27** Write briefly about micro nutrients.

**Ans** Micro nutrients are nutrients which are required in less amount by the body. They control growth and development, cell formation, disease resistance and repair processes of our body vitamins and minerals.

- 28** What are vitamins? All India 2014, 2010

**Ans** Vitamins are compounds of carbon which are essential for the normal growth and working of the body. They are required in very small quantities. The important vitamins are A, B-complex, C, D, E and K.

- 29** Enlist two sources of calcium and iron

**30** Enlist two non-nutritive components of diet. All India 2015

**Ans** Non-nutritive components of diet are

- (i) Colour compounds
- (ii) Flavour compounds

**31** What are trace elements?

**Ans** Trace elements are the minerals required by our body in very little amount like iron, iodine, cobalt, chromium, zinc etc.

**32** Name the types and sources of roughage. All India 2010

**Ans** Roughage is of two types viz. soluble roughage and insoluble roughage. Its sources are root vegetables, oats, fruits, meat, wheat etc.

### SHORT ANSWER TYPE QUESTIONS

**33** What is the difference between macro and micro nutrients? All India 2011

**Ans**

Basis	Macro Nutrients	Micro Nutrients
Requirement	They are needed in large amount.	They are needed in less amount.
Function	They cover energy requirements of the body.	They control growth development.
Example	Carbohydrates, proteins and fats are major macro nutrients.	Vitamins and minerals are major micro nutrients.

**34** What are nutritive and non-nutritive components of diet? Explain. Delhi 2017

**Ans** Nutritive components of diet are those components which contribute or provide energy to the body. The nutritive components of diet are proteins, carbohydrates, fats, vitamins and minerals.

Non-nutritive components of diet are those components that do not contribute to provide energy or nutrition to the body. Some non-nutritive components like roughage, water, plant compounds are essential for healthy living.

**35** What are fats? Write a detailed note on its types. Also mention its importance in the proper functioning of the body.

Sources of fats are animal products like meat, poultry and dairy products like milk, cream, cheese, butter and ice-cream, peanuts, olive oil etc.

Fats can be classified according to their structures. Different types of fats have different characteristics and these react in different ways inside the body.

There are three different groups of fats in the diet which are saturated, polyunsaturated and monounsaturated fats. The intake of saturated fats increases the chances of heart diseases due to the increase of cholesterol in the blood.

**36** Discuss the functions and sources of fats.

**Ans** Fats are an essential ingredient of food. Fat is also a compound of carbon, hydrogen and oxygen.

Functions of fats are

- They provide heat and energy to the body.
- They also help in regulation of body temperature.
- They help the body to absorb nutrient, mineral and vitamins.
- Fat play important role in protecting from diseases and illness.

Sources of fats are

- (i) **Animal Sources** We get various products from animals such as ghee, butter, curd, fish oil, milk, meat and eggs.
- (ii) **Vegetable Sources** We also get fats from various vegetables such as dry fruits, coconut, soyabean, foodgrains, mustard oil and cotton seeds.

**37** What are the uses of any three minerals in our diet?

- Ans**
- (i) **Iodine** It is essential for proper thyroid function. Its deficiency causes goitre and sources are seafood and salt.
  - (ii) **Calcium** It is helpful in the formation of teeth and bones. It helps in clotting of blood. Its deficiency causes rickets and asthma. Milk, cheese, oranges and green vegetables have a rich amount of calcium.
  - (iii) **Phosphorus** It is required for the development of strong bones and teeth and also help in synthesising energy from food.

**38** Write briefly about protein as an essential component of diet. All India; Delhi 2016

**Or** What are proteins? Discuss.

There are two types of proteins

(i) Vegetable proteins (ii) Animal proteins

**Sources** All meat and other animal products are sources of proteins. The best sources are eggs, milk, meat, poultry, milk products, beans etc.

- 39** List down the nutritive component of diet and explain anyone. **CBSE 2020**

**Ans** The nutritive components of diet are proteins, carbohydrates, fats, vitamins and minerals. Carbohydrates are the main source of energy in all activities that we do. The elements of carbohydrates are carbon, hydrogen and oxygen. Carbohydrates are organic compounds which are important for our digestive process. They require less water in the diet for being digested.

Their primary function is to provide energy to the body, especially to the brain and nervous system. There are two main types of carbohydrates i.e. simple carbohydrates and complex carbohydrates.

- 40** What do you understand by non-nutritive component? Elucidate any four non-nutritive component of diet. **CBSE 2020**

**Ans** Non-nutritive component of diet do not provide energy or calories. Their main purpose is to make the food smell better, taste better, last longer, and look better.

Some of these component are essential for body while other harms the body. Four non-nutritive components of diet are as follows

- (i) **Food Addictives** Certain chemical like benzoic acid, sodium benzoate and other chemicals are used as food preservatives to increase the shelf life of the food.
- (ii) **Colour Compounds** Colours are added to the food to make it look attractive and colourful. These are non-nutritive components of diet and excess consumption can be harmful.
- (iii) **Plant Compounds** These are derived from plants and mainly used in small amounts. Their excess use may be harmful for body, like caffeine, tea leaves.
- (iv) **Water** It is non-nutritive but essential component of diet. It is the main component of blood that carries nutrients

- 41** 10 year old Swati eats lot of candies and dislikes eating vegetables. Based on this, answer the following.

(i) Swati is likely to suffer from ..... deficiency diseases.

- (a) vitamin (b) protein  
(c) carbohydrate (d) fats

(ii) Swati should not eat lots of sugar as they are converted into ..... in the body.

- (a) proteins (b) minerals  
(c) glucose (d) carbohydrates

(iii) Deficiency of which mineral may cause goitre?

- (a) Iron (b) Iodine  
(c) Zinc (d) Calcium

- Ans.** (i) (a) Vitamin  
(ii) (c) Glucose  
(iii) (b) Iodine

- 42** A balanced diet refers to the intake of food constituting all the necessary nutrients. Ram shares his knowledge of 'food and nutrition' with neighbours while visiting his grandparents in a village. Ram notices that few people living in that village are suffering with goiter and severe anemia.



(i) Minerals are placed under ..... nutrient category on basis of required quantity.

- (a) micro  
(b) macro  
(c) roughage  
(d) non-nutritive

(ii) Goiter is caused due to deficiency of.....

- (a) calcium (b) iodine  
(c) selenium (d) iron

(iii) Low levels of this mineral will lead to Anaemia.

- (a) Copper (b) Sodium  
(c) Iron (d) Calcium

- 43** Food is the basic requirement of every individual to fulfill the energy needs and to meet the development of the body. The nutritious diet directly affects the health of an individual. It contains various types of nutrients in it.



- (i) The bottom most part of the food pyramid is occupied by \_\_\_\_\_, indicating large quantities of intake.  
 (a) carbohydrates (b) vitamins  
 (c) minerals (d) fats
- (ii) Major portion of individuals diet constitute \_\_\_\_\_ nutrients  
 (a) macro (b) micro  
 (c) water (d) roughage
- (iii) Fat soluble vitamins are \_\_\_\_\_  
 (a) Vit A & D (b) Vit A & K  
 (c) Vit E & D (d) Vit A, D, E & K

**Ans.** (i) (a) carbohydrates (ii) (a) macro  
 (iii) (d) Vit A, D, E & K

- 44** Vikas a state level wrestler has been advised by his coach to take adequate amounts of simple carbohydrates, vitamins, minerals and proteins in his diet along with the training schedule. He has also been advised to follow the diet plan and be aware of the drawbacks of unsupervised dieting.

- (i) Glucose, Fructose, Lactose are \_\_\_\_\_  
 (a) simple carbohydrate  
 (b) complex carbohydrate  
 (c) minerals (d) fats
- (ii) Which amongst these is a pitfall of dieting?  
 (a) Skipping meal  
 (b) Reducing energy food  
 (c) Drinking lot of water  
 (d) Taking food supplements
- (iii) Amino acids and protein are the \_\_\_\_\_ of life.  
 (a) building block (b) training blocks

- 45** Below given is the details of different types of vitamins required for our body.



- (i) The vitamins, minerals, and water collectively called as \_\_\_\_\_ food.  
 (a) body building (b) defensive  
 (c) energy yielding (d) facilitating
- (ii) Vitamin E contributes to the production of \_\_\_\_\_, making our \_\_\_\_\_ system strong.  
 (a) strength, digestive  
 (b) antibodies, immunity  
 (c) Both (a) and (b)  
 (d) hormones, muscular
- (iii) \_\_\_\_\_ vitamin is a group of 8 water soluble vitamin which are important for cellular metabolism.  
 (a) E (b) B Complex  
 (c) C (d) D

**Ans.** (i) (b) defensive  
 (ii) (b) antibodies, immunity  
 (iii) (b) B Complex

- 46** The Ganga school teams have started the practice for Basketball Cluster Tournament. One day the school secretary visited the playground and watched the practice session. He felt that the players were weak. After discussion with the coach, he arranged a dietician to rectify the players' requirements.

- (i) Which types of the nutrients are advisable for the player?  
 (a) Proteins (b) Minerals  
 (c) Vitamins (d) Carbohydrates
- (ii) It is recommended to drink \_\_\_\_\_ of water daily.  
 (a) 1-2 litres (b) 2-3 litres  
 (c) 1-1.5 litres (d) 2-4 litres
- (iii) Vitamins are called  
 (a) Protective food (b) Body Building food

**47** Rahul, a student of class XII, has recently joined a gym near his house to get a toned and muscular body. He consults his gym trainer regarding his diet and is advised to increase the intake of protein in his diet.

- (i) Proteins are also known as.....  
 (a) nitrogenous food (b) body building food  
 (c) fatty food (d) Both (a) and (b)
- (ii) Deficiency of protein can cause .....  
 (a) rickets (b) kwashiorkor  
 (c) scurvy (d) night blindness
- (iii) Protein helps in .....  
 (a) increasing bone density  
 (b) protoplasm formation  
 (c) antibodies formation  
 (d) Both (b) and (c)

**Ans.** (i) (d) Both (a) and (b) (ii) (b) kwashiorkor  
 (iii) (d) Both (b) and (c)

**48** On his scheduled health check-up Deepak a student of class VI was diagnosed with Beri-beri disease. His parents are very concerned about his health and asked the doctor more about this disease.

- (i) According to the doctor this disease is caused due to deficiency of .....  
 (a) Vitamin B5 (b) Vitamin B1  
 (c) Vitamin B3 (d) Vitamin B7
- (ii) Symptoms of Beri-beri are .....  
 (a) loss of appetite (b) shortness of breath  
 (c) swollen feet (d) All of these
- (iii) Other diseases which might occur due to this vitamins deficiency are .....  
 (a) constipation (b) irritation  
 (c) Both (a) and (b) (d) high blood pressure

**Ans.** (i) (b) Vitamin B1 (ii) (d) All of these  
 (iii) (c) Both (a) and (b)

**49** During a survey done in class VIII on the topic favourite fruit of children following data was collected. On the basis of given data answer the following questions.



(i) Which fruit is liked most by the children?

- (a) Banana (b) Apple  
 (c) Oranges (d) Peach

(ii) Which acid is present in oranges?

- (a) Ascorbic (b) Citric  
 (c) Pantothenic (d) All of these

(iii) Which fruit is a good source of potassium?

- (a) Oranges (b) Peach  
 (c) Kiwi (d) Banana

**Ans.** (i) (a) Banana (ii) (b) Citric  
 (iii) (d) Banana

## C LONG ANSWER TYPE QUESTIONS

**50** What do you mean by balanced diet and nutrition? Explain. Delhi 2012

**Ans** **Balance Diet** A balanced diet is that which contains the proper amount of each nutrient. A balanced diet consists of all essential food constituents i.e. protein, carbohydrates, fats, vitamins and minerals in correct proportion. Salient features of balanced diet are as follows

- A balance diet must contain all the essential constituents in adequate amount.
- There must be definite proportion between the different constituents of food.
- The food should be easily digestible.

**Nutrition** It is a dynamic process in which the body is made healthy by the consumption of food. It is the essential substances or the chemical compositions present in the food that are essential for the growth and replacement of tissues. If a person takes proper nutrition, he/she will be physically fit and healthy.

**51** Explain any five essential elements of diet. Delhi 2014

**Ans** There are many nutrients in the food. These are known as elements. Essential elements of our diet are

(i) **Carbohydrates** These are the compounds of carbon, hydrogen and oxygen.

**Sources** Fruits, milk, vegetables, pulses,

- (ii) **Proteins** Proteins are a chain of amino acids that contain carbon, oxygen, hydrogen and nitrogen.

**Sources** Eggs, milk, meat, beans and animal products.

**Function** Proteins are the main components of muscles, organs and glands. The cells of muscles and ligaments are maintained with protein and proteins are used for the growth and development of children.

- (iii) **Fats** Fats contain carbon, hydrogen and oxygen.

**Sources** Animal products, milk, cream, cheese, butter, olive oil etc.

**Function** Fats are a source of energy. They are important for the proper functioning of the body. Fatty acids provide the raw materials which help in control of blood pressure.

- (iv) **Vitamins** Vitamins are compounds of carbon. The important vitamins are A, B-complex, C, D E and K.

**Sources** Milk, butter, eggs, green vegetables, exposure to sunlight, oil, nuts, seeds, fish, amla etc.

**Function** Vitamins play an important role in many chemical processes in the body. Vitamins are essential for metabolism of fat and carbohydrate and are needed for healthy skin. They are helpful in RBC production.

- (v) **Minerals** Minerals are iron, calcium, phosphorus, sodium, iodine, copper, chloride etc.

**Sources** Eggs, milk, meat, green vegetables, pulses, fish, salts, tea and coffee etc.

**Function** Minerals are essential for proper growth of the body. Calcium is needed for strong teeth and bones. It is also essential for proper thyroid functioning.

**52** 'Vitamins are essential for our metabolic process'. What happens if we deviate our diet of vitamins? All India 2012

**Ans** Vitamins are required by the body for the proper growth and development. The following may happen if we will avoid vitamins in our diet

- Deficiency of Vitamin B causes Beri-Beri disease.
- Deficiency of Vitamin C causes Scurvy.
- Deficiency of Vitamin E causes weakness in heart and muscles.
- Deficiency of Vitamin K causes Anaemia.
- In addition, deficiency of vitamins in the body affects the working of the organs, nervous system and digestive system is adversely affected.
- Their presence is necessary for maintaining healthy teeth and bones.

**53** Vitamins are very essential for working of the body and are divided into two groups. Explain about them. All India 2015

**Ans** There are two groups of vitamins

- (i) **Fat Soluble Vitamins** The fat soluble vitamins are those vitamins which are soluble in fat. These include Vitamins A, D, E and K stored in the liver and in body fat.
- **Vitamin A** It is also known as retinol. This is essential for normal growth of the body and development of eyes and skin. Deficiency of Vitamin A leads to night blindness and also affects the kidneys, nervous system and digestive system.
  - **Vitamin D** This is essential for the formation of healthy teeth and bones. The presence of this vitamin in the body enables it to absorb calcium and phosphorus. It maintains the normal functioning of parathormone, the hormone secreted by parathyroid gland. Its deficiency causes rickets, softness of bones and teeth diseases.
  - **Vitamin E** This is essential in increasing the fertility among men and women as well as proper functioning of adrenal and sex glands. Its deficiency causes weakness in muscles and heart.
  - **Vitamin K** This is helpful in the clotting of blood. Its deficiency may cause anaemia and blood do not clot easily.

(ii) **Water Soluble Vitamins** The vitamins that are composed of nitrogen, sulphur and are soluble in water, such as Vitamin B-complex, Vitamin C.

- **Vitamin B Complex** There are 8 vitamins in this group. It includes B<sub>1</sub>, B<sub>2</sub>, B<sub>3</sub>, B<sub>5</sub>, B<sub>6</sub>, B<sub>7</sub>, B<sub>9</sub> and B<sub>12</sub>. They are necessary for growth, proper functioning of

- **Vitamin B<sub>1</sub> (Thiamin)** This vitamin is also called thiamin and it is colourless in nature. It helps in growth and development of body. It also play significant role in the assimilation of Vitamin A and synthesis of carbohydrate in our body. It's deficiency causes Beri-Beri.
- **Vitamin B<sub>2</sub> (Riboflavin)** It is also referred as riboflavin. It is essential to keep the eyes, nose, mouth, lips and tongue in healthy states. It's deficiency causes Pellagra.
- **Vitamin B<sub>3</sub> (Niacin)** Vitamin B<sub>3</sub> or niacin works with other b-complex vitamins to metabolise food and provide energy for the body. It is involved in energy production, normal enzyme functioning, digestion, promoting normal appetite and healthy skin.
- **Vitamin B<sub>5</sub> (Pantothenic acid)** It is also called pantothenic acid. It helps in breakdown of fats and carbohydrates to release energy.
- **Vitamin B<sub>6</sub> (Pyridoxine)** Vitamin B<sub>6</sub> is a key factor in protein and glucose metabolism as well as in the formation of haemoglobin. Haemoglobin is a component of red blood cells-it carries oxygen.
- **Vitamin B<sub>7</sub> (Biotin)** It is also known as biotin. Its deficiency may lead to impaired growth, depression, muscle strain, etc.
- **Vitamin B<sub>9</sub> (Folic acid)** It's chemical name is folic acid. It is yellow in colour and is essential for the normal growth and development of the reproductive system.
- **Vitamin B<sub>12</sub> (Cobalamin)** Vitamin B<sub>12</sub> is also known as cobalamin, aids in the building of genetic material, production of normal red blood cells, and maintenance of the nervous system.
- **Vitamin C** It is also called ascorbic acid. It is needed for proper growth, development, and to heal wounds. It is used to make the collagen tissue for healthy teeth, gums, blood vessels and bones.

**54** Explain macro nutrients and role in our diet.

CBSE 2019

**Ans** Macro nutrients are those nutrients which are required by our body in large amount. They supply energy and play important role in

The amount of different macro nutrients a person needs as well as their ratio of nutrients to each other varies by age and lifestyle.

Role of macro nutrients in our body is as follows

#### Carbohydrates

- Carbohydrates provide energy to body and regulate blood glucose level.
- It helps in break down of fatty acids and also prevent body from kelosis.
- It participate as reaction intermediates in some vital reactions.
- It aids in bowel movement.
- It is also stored as the reserve food in the body.

#### Proteins

- Protein is the building block which is responsible for the growth and maintenance of eyes, skin, hair, nails and muscle tissues.
- It aids the thousands of bio-chemical reactions that take place in our body.
- Some proteins act as a hormone in body.
- Some proteins are fibrous and provide cells and tissues with stiffness and rigidity.
- It also transport other important nutrients in body.

#### Fats

- Fats keep us warm and give protection to organs.
- It also help in production of hormones.
- It helps in maintaining healthy skin and hair.
- It helps in transportation of fat soluble vitamins.
- It also boost body's immunity system.

**55** Monika is a dietician. She has to plan a balanced diet for the women's cricket team. What is a balanced diet? Explain its components.

**Ans.** A balanced diet is the diet which contains all the nutrients in adequate amount necessary for growth and maintenance of the body. A balanced diet consists of carbohydrates, protein, fats, vitamins and minerals in correct proportion. These components are discussed below

(i) **Carbohydrates** These are the main source of energy in all activities performed by an organism. The elements of carbohydrates are carbon, hydrogen and oxygen. Their primary function is to provide energy to

- (ii) **Proteins** It is a compound that is formed by the combination of oxygen, carbon, hydrogen, nitrogen and sometimes sulphur. Proteins are the basic constituents of our cells. They help in formation of new tissues, repair the broken tissues, regulate balance of water and acids, transport oxygen and nutrients, and make antibodies.
- (iii) **Fats** It contain carbon, hydrogen and oxygen in the percentage of 76, 12 and 12 respectively. These are the most concentrated source of energy in food. The body uses fat as a fuel source. It helps in transportation of a fat soluble vitamins like Vitamin A, D, E and K.

- (iv) **Vitamins** Vitamins are compounds of carbon which are essential for the normal growth and working of the body. They are required in very small quantities. Many of them can be stored in the body for months or even years but others need to be freshly absorbed every day.
- (v) **Minerals** Minerals are micro-nutrients that are essential for the normal functioning of the body. They consist of 4% of our body weight. Minerals are essential for various activities such as maintaining healthy teeth and bones, blood composition, nerve impulses, maintenance of heartbeat, formation of hormones and overall normal functioning of the body.



# SELF ASSESSMENT

## OBJECTIVE ANSWER TYPE QUESTIONS

- Amino acids are basic component of which of the following nutrient?  
(a) Carbohydrate      (b) Fat      (c) Vitamin      (d) Protein
- Fat give \_\_\_\_\_ as much energy as carbohydrate.  
(a) Twice      (b) Thrice      (c) Four time      (d) Five time
- There are \_\_\_\_\_ vitamin in B-complex.  
(a) 4      (b) 8      (c) 10      (d) 12
- What is the other name of Vitamin B<sub>3</sub>?  
(a) Riboflavin      (c) Biotin      (c) Niacin      (d) Thiamin
- Iodine is essential for \_\_\_\_\_ functions.
- Vitamin 'C' is also known as \_\_\_\_\_ .
- Protein plays an important role in the formation of haemoglobin. State true or false.
- Roughage do not have any nutritious value. State true or false.

## VERY SHORT ANSWER TYPE QUESTIONS

- Enlist two macro nutrients.
- Name two fat soluble vitamins.
- Why phosphorus is needed in the body?
- Which is the most concentrated form of energy among all the elements of a balanced diet?

## SHORT ANSWER TYPE QUESTIONS

- Describe the role of water in performing various body's functions.
- Explain the various components of our diet.

## LONG ANSWER TYPE QUESTIONS

- What do you mean by micro nutrients? Explain about any four macro nutrients.
- "Vitamins and minerals are required in very small quantities, however a person may suffer if the diet is devoid of them". Justify the statement.