



321en04

4

FOOD, NUTRITION AND HEALTH

The term 'food' brings to our mind countless images. We think of items not only that we eat and drink but also how we eat them and the places and people with whom we eat and drink. Food plays an important role in our lives and is closely associated with our existence. It is probably one of the most important needs of our lives.

The food that we eat is composed of small units that provide nourishment to the body. These are required in varying amounts in different parts of the body for performing specific functions. This means that good nutrition is essential for good health. However, if our diet provides the important units in incorrect amounts, either very less or in excess of what is required, it results in an imbalance of nutrients in your body. The condition is responsible for various deficiency diseases and slow or no growth of the body.

In this lesson you will learn about why **food** is essential, its functions and components. You will also be introduced to the terms like '**nutrition**' and '**nutrients**'. After learning the meaning of these terms, you will then learn the sources and functions of the nutrients and the amounts required by different individuals.



OBJECTIVES

After reading this lesson, you will be able to:

- explain the functions of food;
- enumerate the sources and functions of the nutrients;
- relate the nutritional requirements in terms of Recommended Dietary Allowances (RDAs) to nutrition and health.



Notes

4.1 WHAT IS FOOD?

The term 'food' refers to anything that we eat and which nourishes the body. It includes solids, semi-solids and liquids. Thus, two important features for any item to be called food are:

- (i) It should be worth eating, that is, it should be 'edible'.
- (ii) It must nourish the body.

Have you ever wondered why food is considered a basic necessity?

Food is anything that we eat and which nourishes our body. It is essential because it contains substances which perform important functions in our body.

4.2 FUNCTIONS OF FOOD

There are basically **three** important functions of food:

1. Social Function

Food and eating have significant social meaning. Sharing food with any other person implies social acceptance. Food is also an integral part of festivity every where in the world. Have you noticed that certain occasions such as birth of a child or a marriage or birthdays, are celebrated by having feasts and serving delicacies? Food also has a specific significance and meaning in the religious context.

2. Psychological Function

We all have emotional needs, such as need for security, love and affection. Food is one way through which these needs are satisfied. For example, how do you feel when your mother prepares your favourite food or dish? You feel that she loves you and cares for you. Food is often served as a reward also. Do you recall giving a chocolate because some one had been good to you? Similarly, certain foods become associated with sickness, such as khichri and bland foods. Sickness is an unpleasant experience, hence, even the food items served during this state may be associated with unpleasant feelings.

3. Physiological Function

There are three physiological functions performed by food. These are



energy giving, body building, regulating body processes and providing protection against diseases. Let us see them in detail.

(i) Food provides energy

Everybody needs energy to do work. Energy is required for walking, studying, eating, working in the house or outside. You get this energy from the food that you eat. You need energy even when you are resting. Can you tell why? Different organs inside your body are always working, for example, heart is pumping blood, stomach is digesting food, lungs are breathing in air, etc. All these organs need energy for their respective functions and food provides that energy.

(ii) Food helps in body building

Have you ever wondered how a small child grows into an adult? Our body is already made up of thousands of small cells. New cells are added to these to help the body to grow. Food is needed for the formation of new cells. Cells also die or are damaged due to injury. New cells need to be formed and this repair work is done with the help of food.

(iii) Food regulates body processes and provides protection against diseases

Regulatory functions refer to the role of food in controlling body processes, for example, our body temperature is maintained at 98.6°F or 37°C. Similarly, the heart beats are also maintained at 72 beats/minute. Excretion of waste products from the body is also regular. If not, the body suffers from a disease called constipation which can lead to further complications. All these processes are regulated by the food that you eat.

The food that we eat gives us strength to fight against disease germs.

Look at the illustration 4.1 to learn about the functions of food.



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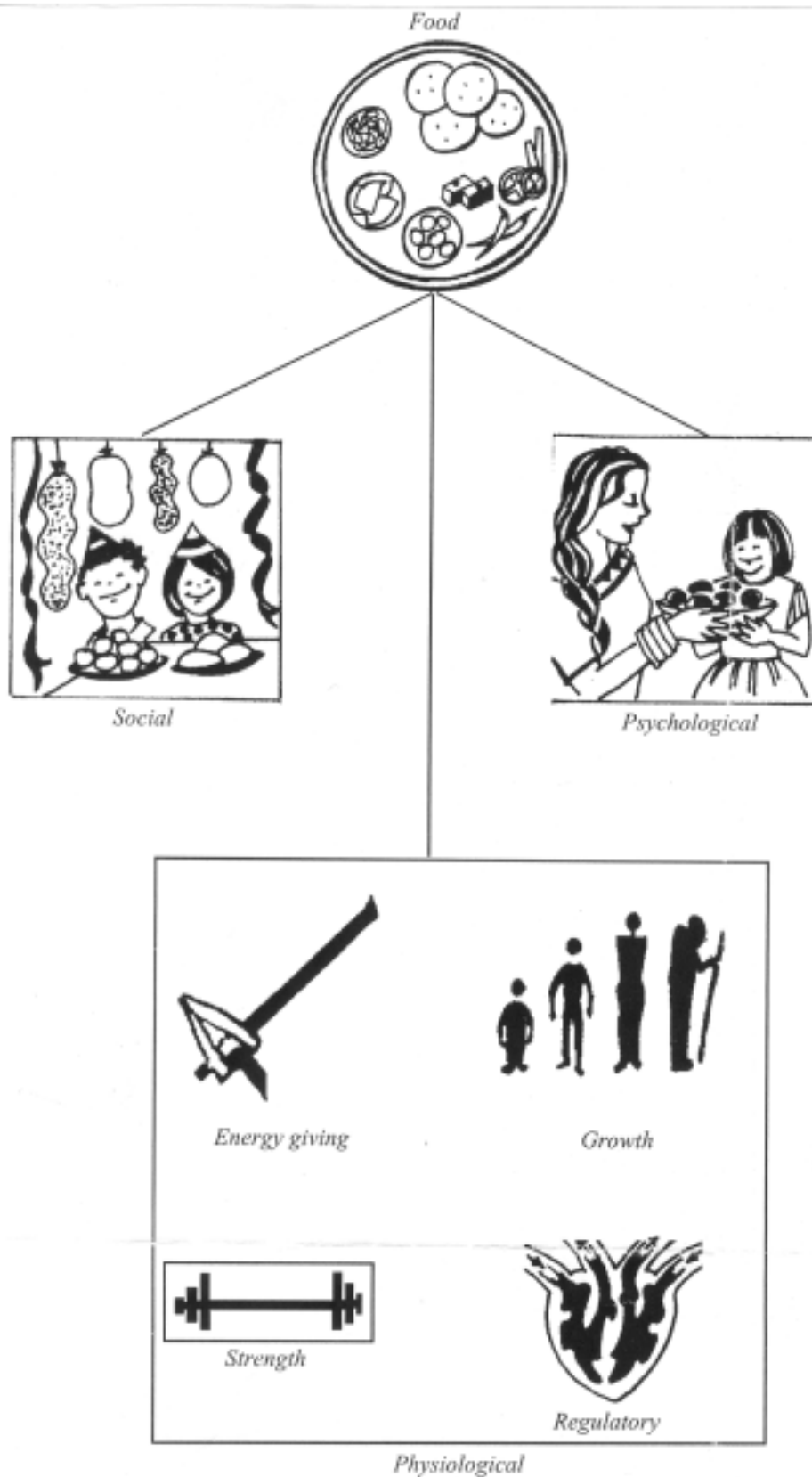


Fig. 4.1 : Functions of food



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INTEXT QUESTIONS 4.1

1. Define food.
.....
2. List the three functions of food.
.....
.....
.....
3. Give one example (other than those given in text) of each function of food.
.....
.....
.....

4.3 NUTRITION AND NUTRIENTS

Let us now read about the meaning of nutrition. All of us eat food. Food provides nourishment to the body and enables it to stay fit and healthy. The food that we eat undergoes many processes, like, first the food is digested, then it is absorbed into blood and transported to various parts of the body where it is utilized. The waste products and undigested food are excreted from the body.

NUTRITION is the process by which food is taken in and utilized by the body.

NUTRITION = Eating → Digestion → Absorption → Transportation → Utilization

Nutrients and their Functions

We all know that food helps in the nourishment and health of our body. The nourishment is brought about by small units called nutrients present in food. Now what are these nutrients?

Nutrients are the chemical substances present in food and are responsible for nourishing the body.

Nutrients are of two types:

1. **Macronutrients**
2. **Micronutrients**

Both macronutrients and the micronutrients are equally essential for good health. Each nutrient plays a significant role in the body.



Notes

1. Macronutrients

These are present in large quantities in foods and are also required in large amounts by the body.

Carbohydrates, proteins, fats and oils are macronutrients.

A. Carbohydrates

(i) Available carbohydrates

Carbohydrates are present in a large quantity as *starch* in cereals, legumes, pulses and potatoes. They are present as *simple* carbohydrates in sugar, jaggery, fruits, honey and milk.

Starch and sugars are easily digested and provide energy to the body.

(ii) Unavailable carbohydrates or dietary fibre

They are present in the form of cellulose and hemicellulose which are not digested in our body. They add bulk to the stool and help in easy defecation process.

Energy can be derived from carbohydrates, fats and proteins and it is measured in kilo calories. However, carbohydrates are cheapest sources of energy. If there is a short supply of carbohydrates and fats in our body, proteins are utilized for energy production. Function of proteins is to provide for body building. Therefore, carbohydrates have to be consumed in proper amounts to spare proteins for body building purpose.

Functions of carbohydrates are summarized here:-

- Carbohydrates provide *energy*
- Carbohydrates are the *main source* of energy
- Carbohydrates *spare proteins* for body building function
- Dietary fibre increases the bulk in stool and *helps in defecation*

1 gm of carbohydrate gives 4kcal of energy. Kilocalorie is the measure of energy in food.

Food sources of carbohydrates are:

- Cereals - wheat, rice, bajra, maize, etc.
- Pulses - Rajma, channa, all dals
- Roots and tubers - potatoes, sweet potatoes, beetroot and tapioca
- Sugar, jaggery

B. Proteins

Protein are needed in the body for body building.

1 gm of protein gives 4kcal of energy

Proteins are made up of smaller units known as amino acids. There are all together 22 amino acids, out of which there are 8 amino acids which our



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body cannot manufacture. Rest of the amino acids can be manufactured by the body.

Essential amino acids are those which our body cannot manufacture and hence have to be supplied through the diet.

Non essential amino acids are those amino acids which our body can manufacture.

Functions and sources of proteins

Functions

- (i) Needed for growth, maintenance and repair of tissues.
- (ii) Necessary for production of enzymes, hormones, antibodies, haemoglobin, etc.
- (iii) Help in the clotting of blood
- (iv) Provide energy, if necessary

Sources

- Meat, poultry, fish, eggs
- Milk, cheese, paneer, curd
- soybeans, peas, pulses,
- cereals, nuts and oilseeds like til, groundnuts, etc.

Special features

- (i) Animal proteins, i.e., proteins from meat, eggs, milk, etc., are better than vegetable proteins, i.e., proteins, from pulses, cereals, etc. This is because proteins from vegetable sources do not contain all essential amino acids.
- (ii) Including two or more sources of vegetable proteins in each meal helps to improve the quality of proteins and their utilization.

Note: When the body does not get enough carbohydrates or fats to meet its energy needs, proteins are broken down to supply these calories. When proteins are used for energy they are not available for other vital functions.



Activity 4.1: List five dishes that you can prepare at home by mixing proteins from two different sources. Example - Khichri

S.No.	Name of dish	Protein sources
1.		
2.		
3.		
4.		
5.		



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C. Fats and Oils

Fats and oils are the concentrated source of energy in our diet. **1 gm of fat gives 9 kcal of energy.** Fats are made up of small units called fatty acids. The nature of fats is dependent on the type of fatty acids present. Fatty acids may be saturated or unsaturated. Saturated fatty acids are found in solid fats whereas oils contain more of unsaturated fatty acids. Vegetable oils are rich in unsaturated fatty acids. Do you know there is a difference between fats and oils?

If a substance is liquid at room temperature it is called **oil** and if it is solid at the room temperature, it is known as **fat**.



Activity 4.2: List down five fats and oils that are used in your home.

1.
2.
3.
4.
5.

Functions and sources of fats and oils

Functions

- (i) Provide concentrated source of energy
- (ii) Reduce the use of proteins for energy
- (iii) Carry fat soluble vitamins (A, D, E, K) into the body and help in the absorption of these vitamins
- (iv) Help to maintain body temperature. The layer of fat under the skin helps to conserve body heat
- (v) Act as a cushion to certain vital organs
- (vi) Help in growth of tissues

Sources

- Cooking oils, ghee, butter
- Oilseeds, nuts
- Meat, poultry, fish, eggs
- Whole milk, cheese

Special features

- (i) Fats improve the texture as well as absorb and retain flavours making meals more appetizing.
- (ii) Fats have properties that help them to remain in the stomach longer and prolong the feeling of fullness.



Notes



INTEXT QUESTIONS 4.2

1. Answer the following questions

(a) What is nutrition?

.....

(b) List the main functions of nutrients.

.....

(c) Give at least 2 examples of the following foods-

(i) Food rich in proteins.....

(ii) Food rich in carbohydrate.....

2. Indicate whether true or false. Give reasons for your answer.

(a) The energy giving function is the major function of protein.

.....

(b) Dietary fibre is the unavailable carbohydrate.

.....

(c) Combination of cereals and pulses in a meal improves the quality of protein.

.....

(d) Fats are liquid at room temperature.

.....

2. Micronutrients

Other important nutrients which are present in small quantities in foods but are essential for our body are called micronutrients. These are **minerals** and **vitamins** and are required in very small quantities. If these micronutrients are not eaten in required amounts, it results in deficiency diseases.

Minerals and vitamins are called micronutrients

Let us study some of the important micronutrients.



Notes

1. Vitamins

Our body contains very little quantity of vitamins, however, you will be surprised to know that they are responsible for all the major functions of the body. These vitamins are of two types:

- (i) Fat soluble: A, D, E and K
- (ii) Water soluble: B and C

Now, let us study the functions, food sources and deficiency diseases of these vitamins as given in table 4.1 and 4.2.

Table 4.1
Fat Soluble Vitamins: Functions and Sources

Nutrients	Functions	Sources
Vitamin A	<ul style="list-style-type: none"> (i) Essential for proper functioning of eyes, that is, vision in dim light (ii) Necessary for healthy skin and linings of nose, mouth, throat, eyes, ears, lungs and other organs 	<ul style="list-style-type: none"> - Liver, eggs, fish liver oils. - Milk and its products - Green leafy vegetables, i.e., bathua, etc. - Yellow or orange fruits and vegetables such as pumpkin, carrot, papaya, mango, etc.
Vitamin D	<ul style="list-style-type: none"> (i) Necessary for formation and maintenance of strong, healthy teeth and bones (ii) Helps in the proper absorption and utilization of calcium and phosphorus in the body 	<ul style="list-style-type: none"> - Exposure of skin to sunlight (When the body is exposed to the sun rays, a substance in the skin is converted into vitamin D and transferred to the blood stream) - Eggs, liver, fish liver oils - Milk, butter - Refined oils and ghee fortified with vitamin D
Vitamin E	<ul style="list-style-type: none"> (i) Prevents destruction of certain substance in presence of oxygen 	<ul style="list-style-type: none"> - All cereals, pulses, vegetables oils
Vitamin K	<ul style="list-style-type: none"> (i) Necessary for clotting of blood 	<ul style="list-style-type: none"> - Formed in the intestines by bacteria normally present there - Green leafy vegetables - Egg, liver



Notes

Table 4.2
Water Soluble Vitamins: Functions and Sources

Nutrients	Functions	Sources
Vitamin B complex There are eight B vitamins. Together they are called vitamin B-complex. These are: thiamine B ₁ , Riboflavin B ₂ , niacin etc.	(i) Necessary for utilization of carbohydrates in the body (ii) Necessary for normal functioning of nervous system (iii) Essential for proper growth (iv) Helps body organs to function normally (v) Needed for formation of red blood cells (vi) Helps in digestion and improves appetite.	– Liver, poultry, meat, fish, eggs; – Whole grain cereals and pulses – Green leafy vegetables and milk
Vitamin C	(i) Necessary for the formation of the substance that holds cells together (ii) Needed for strong teeth and bones (iii) Helps in the production of haemoglobin (iv) Helps in the utilization of other nutrients in the body (v) Helps in fighting the germs causing diseases	Citrus fruits like amla, orange, lemon, guava, etc; Green leafy vegetables, e.g. spinach, cabbage; Sprouted pulses such as grams



INTEXT QUESTIONS 4.3

- Classify the vitamins A,B,C,D,E and K as:
 Water soluble vitamins.....
 Fat soluble vitamins.....
- State whether the following statements are 'True' or 'False', correcting the statement where ever necessary.
 - Vitamin C is produced when the body is exposed to sunlight.

 - Vitamin A helps to keep our eyes healthy.

 - Vitamin K plays a role in our feeling hungry.



Notes

- (iv) Vitamin E is necessary for clotting of blood.

.....

- (v) Vitamin A and B are necessary for strong and healthy teeth and bones.

.....

2. Minerals

Minerals constitute a very small amount of the total body tissues. However, these are essential for many vital processes and also for the maintenance of the body. In total, there are about 19 minerals required by the body in various amounts.

Let us now study some of the important minerals.

Calcium: Calcium and phosphorus are available in sufficient quantities in milk, curd, green leafy vegetables, ragi and oil seeds. Other foods also provide fair quantity of calcium.

The major function of calcium is the formation and development of bones and teeth. Calcium is also required in blood clotting and muscular contraction.

Calcium is necessary for bone formation, blood clotting and muscular contraction

Deficiency of calcium in the body results in poor bone development, particularly in children, women and elderly. The deficiency disease is known as **osteoporosis**. In this, the bones become brittle and people become prone to frequent fractures.

Iron: Iron is required in very small quantity by the body. It is an important material present in haemoglobin which is a part of red blood cells and is responsible for the red colour of blood. Whole grain cereals and pulses are the major sources of iron in our diet. Other sources of iron are green leafy vegetables, egg yolk, liver and meat. In our country, majority of the population, especially women and children, suffer from iron deficiency disease called **anaemia**.

Young girls (12-18 yrs.) need more iron rich foods in their diets because of loss of iron during the menstrual cycle. Extra iron is also needed during pregnancy for healthy development and growth of the foetus. (Refer to Table 4.3)

This is not because people do not consume food which are rich in iron but because the absorption and utilization of iron is poor. This is due to the presence of certain naturally occurring constituents in food called oxalates and phytates. These oxalates and phytates are called *inhibitors* of iron. Vitamin C and proteins help in better absorption of iron and are known as *enhancers of iron*.



Notes

Iron is essential for haemoglobin formation.

Iodine: Iodine is an important substance present in thyroxine hormone produced from thyroid gland. Thyroxine regulates various functions of the body. We get iodine from water and food. The foods which grow in iodine rich soil provide iodine for us. Sea foods are also rich in iodine. Iodine deficiency disorder is known as *goitre* or enlargement of the neck region. Deficiency of iodine causes mental retardation in children. Recent studies have shown a direct link between iodine deficiency and academic performance of children. Iodine deficiency disorders have been identified in many parts of India.

Iodine is necessary for growth and development.

To avoid goitre we must have iodine rich food sources in our daily meals. Iodized salt is a good source of iodine and we must consume it instead of the non-iodized salt.

Make iodized salt a part of your daily diet.

Certain foodstuff like cabbage, cauliflower, radish, ladies finger, oilseeds etc., contain substances known as *goitrogens* which interfere with the body's ability to produce and use thyroxine. These goitrogens are destroyed on cooking. Therefore, these foodstuffs should be cooked before eating.



INTEXT QUESTIONS 4.4

Answer the following questions–

1. What is the difference between iodized salt and normal salt?
.....
.....
2. What is the importance of calcium?
.....
.....
3. Name the two factors that enhance and that interfere with the absorption of iron in the body.
.....
.....
4. Which mineral is important for haemoglobin formation?
.....
.....



Notes

5. Bones in our body are made up of which mineral?

.....

.....

6. The lack of which mineral causes mental retardation in children?

.....

.....



Activity : From the last meal you ate, do the following:

- List all the dishes you ate
- Identify the food items (ingredients) used in each dish
- From the above items, identify the macro and micro nutrients present in them.

S.No.	Dishes eaten	Ingredient	Nutrient	
			Macro	Micro

3. WATER

Water is the major constituent of our body. It forms about two-thirds of the body weight. We can do without food more readily than water. It is present in all the cells, being a vital part of all living tissues. It surrounds tissues and organs, and gives protection from shock.

Water helps in digestion, absorption and transportation of nutrients in the body. It helps to excrete unwanted materials in the form of urine and maintains body temperature through perspiration.

Normally, we need to drink 6-8 glasses of water everyday. Other forms in which we can receive water are milk, juice, kanji, etc.

Water is vital for survival

4.4 NUTRIENT REQUIREMENTS

Now we know that all the nutrients are required for good health. But how much should we eat so that our nutritional requirements are met? There are various factors which influence the nutritional requirements of an individual. Let us learn about them.



Notes

Table 4.3
Recommended Dietary Allowances for Indians (Recommended by ICMR)

Group	Particulars	Body wt kg.	Net energy Kcal/d	Protein g/d	Fat g/d	Cal- cium mg/d	Iron mg/d	Vit.A. Reti- nol µg/d	β- caro- tene µg/d	Thia- min mg/d	Ribo- flavin mg/d	Nico- tinic acid mg/d	Pyri- doxin mg/d	Ascor- bic acid mg/d	Folic acid µg/d	Vit. B ₁₂ µg/d
Man	Sedentary work		2425							1.2	1.4	16				
	Moderate work	60	2875	60	20	400	28	600	2400	1.4	1.6	18	2.0	40	100	1
	Heavy work		3800							1.6	1.9	21				
Woman	Sedentary work		1875							0.9	1.1	12				
	Moderate work	50	2225	50	20	400	30	600	2400	1.1	1.3	14	2.0	40	100	1
	Heavy work		2925							1.2	1.5	16				
	Pregnant woman	50	+300	+50	30	1000	38	600	2400	+0.2	+0.2	+2	2.5	40	400	1
	Lactation															
Infants	0-6 months		+550	+25	45	1000	30	950	3800	+0.3	+0.3	+4	2.5	80	150	1.5
	6-12 months	50	+400	+18						+0.2	+0.2	+3				
	0-6 months	5.4	108/kg	2.05/kg		500				55µg/kg	65µg/kg	710µg/kg	0.1	25	25	0.2
Children	6-12 months	8.6	98/kg	1.65/kg				350	1200	50µg/kg	60µg/kg	650µg/kg	0.4			
	1-3 years	12.2	1240	22			12	400		0.6	0.7	8			30	
	4-6 years	19.0	1690	30	25	400	18	400	1600	0.9	1.0	11	0.9	40	40	0.2-1.0
	7-9 years	26.9	1950	41			26	600	2400	1.0	1.2	13	1.6	60	60	
Boys	10-12 years	35.4	2190	54	22	600	34	600	2400	1.1	1.3	15	1.6	40	70	0.2-1.0
	10-12 years	31.5	1970	57			19			1.0	1.2	13				
Boys	13-15 years	47.8	2450	70	22	600	41	600	2400	1.2	1.5	16				
	13-15 years	46.7	2060	65			28			1.0	1.2	14	2.0	40	100	0.2-1.0
Boys	16-18 years	57.1	2640	78	22	500	50	600	2400	1.3	1.6	17				
	16-18 years	49.9	2060	63			30			1.0	1.2	14	2.0	40	100	0.2-1.0



Notes

Nutritional requirements are influenced by:

- age
- height/weight
- sex
- climatic condition
- health
- occupation
- physiological condition

Indian Council of Medical Research (ICMR) after conducting a lot of research has recommended nutritional intakes for various age groups. You will find recommended dietary allowances (RDAs) given by ICMR for various physiological age groups in Table 4.3.

Have you noticed that a sedentary worker needs lesser calories than a person performing heavy work? There is a difference in energy requirements of males and females as well as physically fit or sick persons. Notice the difference in nutritional requirements of a woman during pregnancy and lactation and between boys and girls, men and women.

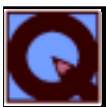
If you take a closer look at the above table, you will find the recommendations for infants, preschool and school children, adults and adolescents. Variations in energy needs according to activity are indicated in adult stage. Special requirements of pregnancy and lactation are also covered in the recommendation. A liberal margin of safety is provided in the recommended allowances to cover individual differences for need of the nutrients.



Activity : Let us see what you have learnt from table 4.3

Can you find out-

- How much extra protein pregnant lady needs?
- How much calcium does a lactating mother need?
- What is the requirement of iron for adolescent girls and boys (13-15 years) respectively?



INTEXT QUESTIONS 4.5

Tick mark (✓) the most appropriate answer:-

1. Nutrition is the process by which the food is taken in and
(a) digested in the body



Notes

- (b) absorbed in the body
 - (c) utilized in the body
 - (d) all the above
2. The macro nutrients are carbohydrates, fats and
 - (a) proteins
 - (b) vitamins
 - (c) minerals
 - (d) all the above
3. Micro nutrients are
 - (a) vitamins, water
 - (b) vitamins, minerals
 - (c) sugars and minerals
 - (d) all the above
4. The amounts of nutrients required by different people are
 - (a) the same
 - (b) generally the same but occasionally different
 - (c) at times the same and at times different
 - (d) different

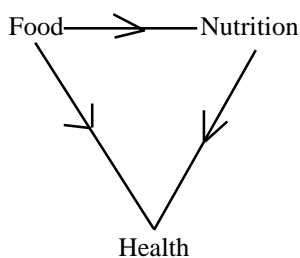
4.5 INTER-RELATIONSHIP OF FOOD, NUTRITION AND HEALTH

Earlier in this lesson you have learnt about the meaning and functions of food. You have also read the definition of health in previous unit. Let us now learn about nutrition in detail and understand how food and nutrition are related to health.

Nutrition is a scientific discipline in which food is a major focus of interest. The simplest definition of nutrition is *the study of what happens to food once it enters the mouth and thereafter*. A more formal definition of nutrition is *study of processes by which the living organism receives and utilizes the materials necessary for growth, renewal and maintenance of body components*. All foods contain some essential substances which perform important functions in our body. These essential substances contributed by our food are called **nutrients**.

These nutrients help us to maintain our body functions, that is, to grow and to protect our organs from diseases and infections.

The health of a person depends on the type and quantity of food stuff consumed. Good nutrition is essential for a person to grow and develop normally and to remain healthy throughout life. When a person does not eat proper food, there are chances of the body not developing normally. There are chances that some organs of the body may start malfunctioning or there may be some disease. Poor nutrition may also influence the mental and social well being adversely.



Good nutrition is a prerequisite for good health



INTEXT QUESTIONS 4.6

Test your word power -

Hope you have enjoyed learning about the Functions of food. While studying this lesson you must have come across some new words. Let us see how well you have understood their meaning. Given below are the words and their possible meanings. Choose the option closest to the real meaning of the word.

- (1) Nutrient : (a) tasty food (b) balanced diet (c) essential substance for life and growth (d) waste product
.....
- (2) Edible : (a) poisonous (b) fit to be eaten (c) spiritual (d) part of building
.....
- (3) Digestion : (a) process of converting food into substance used by body (b) growth (c) cooking food (d) chemical reaction
.....
- (4) Macronutrient : (a) large quantity (b) visible to the naked eyed (c) fixed amount (d) substance required in large amounts
.....
- (5) Legume : (a) cereal (b) dal (c) evergreen plant (d) cactus
* Rate yourself by giving 1 point for every correct answer.
Vocabulary Ratings: 4-5 : Excellent, 2-3: Good, 0-1: You need to read the lesson again.
.....

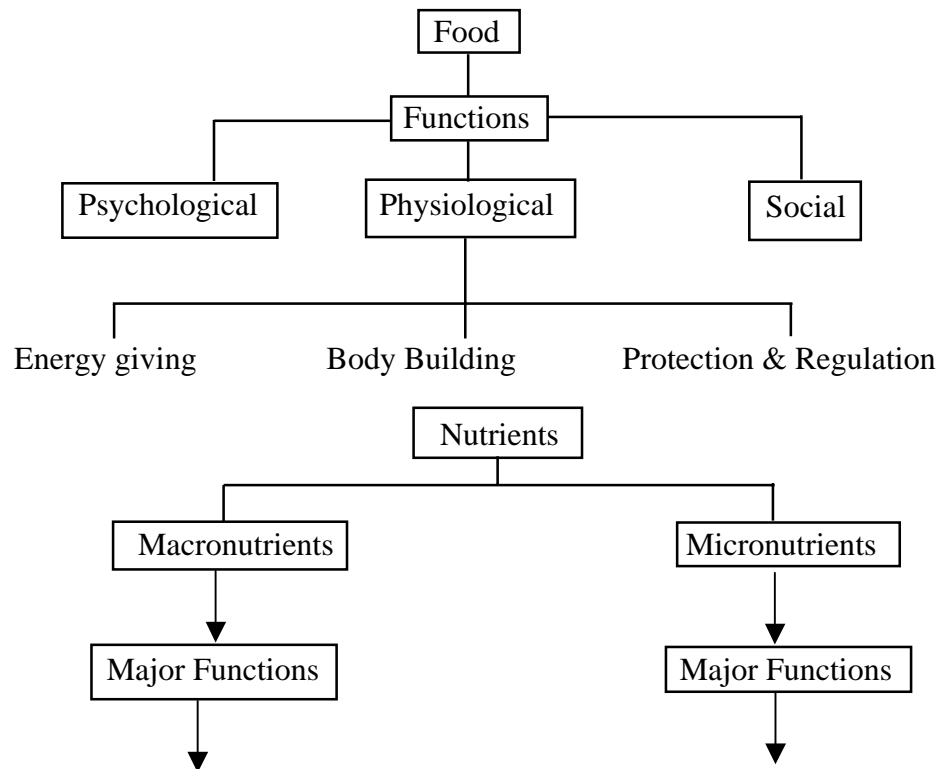




Notes



WHAT HAVE YOU LEARNT



- Carbohydrates: Energy
- Fats: Energy
- Protein: Body building
- Water: regulatory and excretory function

- Minerals: Calcium, iron, iodine: Body building and regulation
- Vitamins: Vitamin A: healthy vision
- Vitamin D: development of bones and teeth
- Vitamin E: Reproduction
- Vitamin K: Blood coagulation
- B complex: Normal growth and development
- Vitamin C: Normal teeth & bones

NUTRITION → Eat → Digestion → Absorption → Transportation → Utilization
Food → Nutrients → Nutrition → Health

**TERMINAL EXERCISE**

1. List the food items you had for dinner and identify the energy giving and body building foods.
2. Define macronutrients and micronutrients.
3. List the functions of carbohydrates and proteins.
4. Are the nutritional requirements of your family members the same or different? Give reasons.

**ANSWERS TO INTEXT QUESTIONS**

- 4.1**
1. Item which is edible and nourishes the body
 2. Social, psychological and physiological function.
 3.
 1. Energy giving
 2. Body building
 3. Regulatory function and protection from disease
- 4.2**
1. (a) Refer to text
 2. (a) False (b) True (c) True (d) False (Refer to text for reasons)
- 4.3**
1. Water soluble - Vitamin B & C
Fat soluble - Vitamin A,D,E,K
 2. (i) false, D (ii) true (iii) false, vit K is necessary for clotting the blood. Vit B complex helps in digestion and make us feel hungry. (iv) false, K (v) false
- 4.4**
1. Iodine is obtained from iodized salt.
 2. Bone development, blood clotting and muscular coordination
 3. Vitamin C and protein facilitate absorption and oxylates and phytates interfere with the absorption.
 4. Iron 5. Calcium 6. Iodine
- 4.5**
1. (d) 2. (a) 3. (b) 4. (d)
- 4.6**
- 1) Nutrient : (c) This is a substance that provides nourishment essential for the maintenance of life and growth

**Notes**

**Notes**

- 2) Edible : (b) fit to be eaten
- 3) Digestion : a) The process of breaking down the food in the stomach and using it for growth and development in the body.
- 4) Macronutrient : d) A substance required in relatively large amount by living beings.
- 5) Legume: b) Edible part of a leguminous plant used as food known in India as dal

- 4.7** (1) Energy giving foods - rice/wheat and potatoes
Body building food - milk, dals
- (2) **Macronutrients** - Carbohydrates, proteins, fat
Required in large amounts
Micronutrients Vitamins and Minerals
Required in small quantities.
- (3) Ref 4.6
- (4) Ref 4.5

AUDIO - Quiz on Nutrients

VIDEO - Bhojan aur uske Poshak Tatva

*For more information log on to
<http://www.Nutrients.com>*