



216en02



Notes

## FOOD AND ITS NUTRIENTS

Think about the meals you ate yesterday. Write all the food items you consumed in the table given below. You will realize that you ate different kinds of food item. Why do we need to eat a variety of food? How do these food items help us? In this lesson you will find answers to these questions.

**Table 2.1. Food items consumed by you yesterday:**

<i>Breakfast</i>	<i>Lunch</i>	<i>Snack</i>	<i>Dinner</i>



### OBJECTIVES

After studying this lesson you will be able to :

- define the term 'food' and explain its functions in our body;
- state important functions and sources of each nutrient in our body;
- explain the role of nutrition and nutrients in healthy living;
- describe the term malnutrition and its effects and
- suggest appropriate measures to prevent and cure malnutrition.

### 2.1 FOOD AND ITS IMPORTANCE FOR HEALTHY LIVING

Food satisfies our hunger and provides energy for day to day living. It is also an important part of all our social occasions. When you go to a friend's house, you are generally greeted and offered something to eat and drink. So food serves a social



Notes

function. Similarly when you are away from your home you not only miss your family but also food. Thus, food is important in our life.

Can you elaborate the importance of food in our life? Yes, you are right. We eat to satisfy our hunger, feel happy and even celebrate special occasions. Let us now learn about the various functions of food.

#### 2.1.1. Food gives us energy to work

We need energy to do our work. We need energy for walking, playing, eating, working in the house or outside and for other activities.



Fig. 2.1

#### 2.1.2. Food helps in the growth and repair of tissues

A small child grows into an adult. Do you know the relationship between the growth of our body and the food we eat? The body is made up of thousands of small cells. New cells are added to help the body to grow in size. We need food for the formation of new cells. In addition to growth, new cells are made to replace the dead and damaged cells. Therefore, food helps not only in growth but also in the repair of tissues.

#### 2.1.3. Food gives strength to fight against diseases

We are always surrounded by disease causing organisms. The food we eat helps us in providing protection against them. If we fall ill, food helps us to recover from illness.

#### 2.1.4. Food helps the body to function normally

Do you think we need energy even when we are at rest? Yes you are right, it is because the vital organs inside your body are always working. For example, our heart is pumping blood, stomach is digesting food and lungs are breathing in air. These organs need energy to perform their role which is provided by the food we eat.



#### ACTIVITY 2.1

Anuradha and Shonali were living happily with their parents, younger brother and a dog. Suddenly they lost their parents one after the other and then their dog. The younger brother also left them because of his posting in another town. The sisters went into depression and initially stopped eating regularly and then totally. They became weak



Notes

and stopped communicating with others. Finally they had to be admitted in a hospital in a state of acute depression and nutritional deficiencies. Anuradha died due to severe under nutrition. Shonali survived and had to be treated by doctors, nurses and social workers for a long time for both depression and malnutrition. She had to learn to eat proper meals all over again.

Think about this situation and try to find answers on the basis of the functions performed by food:

Q. What could be the reasons due to which the sisters stopped eating?

Q. Do you stop eating food when you are angry or sad?

You have seen that food performs many functions in our body and all of them are important for not only our existence but also for a healthy life.

### 2.1.5. Food satisfies hunger

We eat food to satisfy our hunger. It also provides mental and psychological satisfaction. Therefore is the prime need to be satisfied in life.

### 2.1.6. Social functions

Food has always been a central part of our social existence. It helps to relax and creates a friendly mood. People take special care in planning and cooking food for social occasions, so food promotes a sense of community.

### 2.1.7. Psychological functions

In addition to social functions food must also satisfy our items emotional needs. These include a sense of security, love and attention. Familiar food items make us feel secure. A baby gets emotional security while being breast feed. Anticipating food needs and fulfilling them are expressions of love, care and attention. Similarly, sharing of food is a token of friendship and acceptance.

## 2.2 NUTRITION AND NUTRIENTS

Have you ever thought what happens to the food we eat? How do we get energy from the food? Now we will discuss about the science behind food and its functions. We can define **nutrition as the science which tells us about what happens to the food when it enters our body and thereafter.** How is food digested and utilized in our body? How does one grow from a little child to a young adult and then an old person?

The food we eat contains many chemical substances. These chemical substances are known as nutrients. We can say that **nutrients are invisible compounds in the food which are necessary for keeping the body healthy.** These nutrients have different names and functions to perform in our body.



Notes

The common nutrients in our food are:

- Carbohydrates
- Proteins
- Fats
- Vitamins
- Minerals
- Fibre
- Water

### 2.3 FUNCTIONS AND SOURCES OF NUTRIENTS

We will now learn about the functions of various nutrients and their sources.

#### 2.3.1 Carbohydrates

Carbohydrates are as important to our body as fuel is to a car. As fuel makes a car run, similarly carbohydrates provide energy to our body, which keeps it going throughout the day. Which food items in our diet contain carbohydrates?

Yes, foods like potatoes, rice and sweets give carbohydrates.


There are two types of carbohydrates in food sugar and starch.

**Sugar:** Sugar is also called simple carbohydrate. Fruits, honey and sugar are some sources of sugar.

**Starch:** starch is called complex sugar. Plants store energy in the form of starch. When we eat plant products containing starch, our digestive system breaks down starch into glucose. This glucose is absorbed in blood and provides energy.


Some foods give carbohydrates to our body in the form of starch. These are cereals, potatoes, sweet potatoes etc. Some other foods give carbohydrates in the form of sugar. For example sugar, honey, jam, jaggery, etc.

**One gram of carbohydrate gives four kcal.** An adult person needs 400-420 gms of carbohydrates everyday.

Functions of Carbohydrates	Sources
<ul style="list-style-type: none"> <li>• Give energy and feeling of fullness.</li> <li>• Increase the bulk of our food.</li> <li>• Spare proteins to perform other functions.</li> <li>• Helps to make the food tasty.</li> </ul>	<p>Starch sources: cereals – like wheat, rice, bajra, maize, potatoes, sweet potatoes, calocasia, etc.</p> 





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	sugar sources: sugar, honey, jaggery, sweets, jam, murabba, etc. 
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### 2.3.2 Proteins

Proteins are needed for muscle building and repairing worn out cells and tissues. Our muscles, organs and even blood are made up of mostly proteins. If we do not eat proteins our body will not be able to repair damaged cells or build new ones. Proteins in our diet come from both animal and plant sources.

The proteins from animal source are known as animal proteins and the proteins from plant sources are known as plant proteins. **One gram of protein gives four kilo calories of energy (kcal).** An adult needs 1gm of protein for every kilogram of body weight per day. For example if Shivali weighs 52 kg then her protein requirement would be approximately 52gms per day.

Functions of proteins	Sources
<ul style="list-style-type: none"> <li>• Needed for making new cells in the body</li> <li>• Helps in repairing old and damaged cells.</li> <li>• Helps in healing wounds.</li> <li>• Needed for making blood, enzymes and hormones</li> </ul>	<p><b>Animal Sources</b> Meat, egg, fish, poultry, milk, curd, cheese, etc.</p>  <p><b>Plant sources</b> All cereals, pulses, peas, soyabean, nuts especially groundnut, etc.</p> 



### ACTIVITY 2.2

Calculate the amount of protein you would require for yourself and for other members of your family. Enter their body weight and protein requirements in the table below:

Member	Body Weight (kg)	Protein requirement (g)/ day
Self		
Father		
Mother		
Brother/Sister		






Notes

### 2.3.3 Fat

**One gram of fat gives you nine kcal.** Fat which we get from animals are called **animal fat**. Fat which we get from plants are called **plant fat**.

Although fat gives more energy than carbohydrates, you eat very little fat and hence fat is not the major source of energy in our body. Food containing large amount of fat can lead to obesity. An adult needs only 30 gms (2 table spoons) of fat everyday. Do you know that chocolate, biscuits, pakoras and patties also contain fat?

Functions of Fat	Sources
<ul style="list-style-type: none"> <li>• Give energy, is the concentrated source of energy.</li> <li>• Helps to keep our body warm.</li> <li>• Help in the utilization of fat soluble vitamins like A, D, E, K.</li> <li>• Provides protection to delicate organs like heart, liver and also provides padding on our skeleton and muscles.</li> <li>• Makes the food tasty.</li> </ul>	<p>butter, ghee, groundnut oil, coconut oil, vanaspati, fried foods, chocolates, etc.</p> 



### ACTIVITY 2.3

Find out the average monthly consumption of oil and/or ghee in your family and calculate your average daily fat consumption. Keeping in view the number of family members, find out if your consumption is adequate or not? Carry out the activity in the space provided below:

Total consumption of oil in the family per month.....kg (or lt)

Total consumption of ghee in the family per month.....kg (or lt)

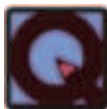
Number of family members.....

Total fat consumption per member/month =.....

Total fat consumption per member/day =.....

*\*Hint – Fat consumption = Total consumption/number of family members*

*\*Hint – 1 lt of oil = 910 gm (approximately)*



## INTEXT QUESTIONS 2.1

1. State four reasons for eating food.

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2. Choose the correct alternative given at the end of each statement given below:

- (i) The main use of proteins in the body is (a) energy for work and play
- (ii) Besides energy fat helps in (b) growth and repair of tissues
- (iii) Carbohydrates are needed to provide (c) making food tasty
- (d) protection to delicate organs in the body

3. Name the main nutrient present in the following:

No.	Food	Nutrient Present	No.	Food	Nutrient Present
(a)	Fish liver oil		(g)	Milk	
(b)	Butter		(h)	Jaggery	
(c)	Vanaspati		(i)	Wheat	
(d)	Cheese		(j)	Egg	
(e)	Dal		(k)	Sweet potato	
(f)	Meat		(l)	Mustard oil	

4. Find out the answers for following questions from the puzzle below. You may look horizontally or vertically. Write your answer in the space provided.

C	E	R	E	A	L	S
A	P	I	S	Z	Q	D
B	R	K	X	F	W	S
D	O	M	W	A	H	A
C	T	G	A	T	R	K
N	E	R	Q	V	Y	K
M	I	F	W	B	I	L
T	N	D	E	M	K	Y
P	O	T	A	T	O	T



Notes

## Notes

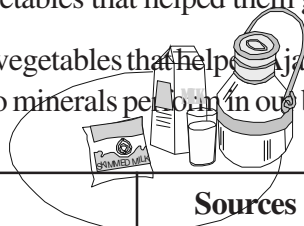
- Which nutrient provides maximum amount of energy \_\_\_\_\_
- Nutrient found in eggs in abundance \_\_\_\_\_
- Major source of energy in our daily diet \_\_\_\_\_
- Good source of carbohydrate \_\_\_\_\_

Minerals are present in all body tissues and fluids. Minerals like **calcium** and **phosphorus** are found in bones and teeth. **Iron** is a mineral which is found in blood as a part of the red pigment haemoglobin. Minerals occur in food as salts.

**Iron and Iodine** are found in the body in smaller quantities, hence are known as **micro minerals**.

Ten year old Ajay and his eight year old sister Priyanka asked their mother why she insists that they should consume more milk and green vegetables. Mother showed them their childhood photographs. The children were surprised to see the photographs. They asked their mother how had they become so tall and big! Their mother explained that it's the milk and green vegetables that helped them grow so well.

What is there in milk and green vegetables that helps Ajay and Priyanka grow? Have you ever wondered what role do minerals perform in our bodies? The main functions of minerals are:



<b>Functions of Minerals</b>	<b>Sources</b>
<ul style="list-style-type: none"> <li>Growth of our body and strength of bones.</li> <li>Maintenance of water balance in the body.</li> <li>Contraction of muscles.</li> <li>Normal functioning of nerves and clotting of blood when needed.</li> </ul>	<p>Milk</p>    <p>Green vegetables</p>

**(a ) CALCIUM**

We all require calcium in our daily diet as it performs the following functions in our body:





Notes

**Functions**

- (i) Helps bones to grow and become strong.
- (ii) Makes teeth healthy and strong.
- (iii) Helps in clotting of blood. You may have noticed that in case of a minor injury blood stops flowing in few seconds and a hard crust is formed on the wound this is known as clotting of blood, for which calcium is needed. Blood clotting can prove to be a life protecting function.
- (iv) It also helps in the movement of muscles.

Calcium is required in large quantity for optimum growth during childhood. A pregnant woman also needs additional calcium to support the growth of foetus. Absorption of calcium is reduced as a person grows old. So, we should be careful regarding the calcium needs of the elderly persons.

**Sources**

- Milk and its products like paneer, cheese, curd, lassi, chhach, butter milk etc. These are the best sources of calcium.
- Green leafy vegetables like spinach, fenugreek, curry leaves and coriander leaves are also good sources of calcium.

**(b) IRON****Functions**

Iron is a very important mineral. It is needed for the formation of a compound called haemoglobin in our blood which helps in carrying oxygen to all parts of the body. Do you know in adolescence (10-19 years) iron requirement of the body increases? The need for iron increases specifically for girls. We must include iron rich foods in our daily diet.



Fig. 2.2

**Sources**

- Green leafy vegetables like spinach, mustard leaves, fenugreek, mint, etc.
- Whole cereals and legumes
- Liver, heart, kidney and egg yolk.
- Gur/jaggery
- Dates and pomegranate.



Notes



#### ACTIVITY: 2.3

Amla is the richest source of iron. It is a very economical source to enhance the iron content in our food and can be eaten on a regular basis. List two food items made of amla.

#### (c) IODINE

Iodine is required for normal functioning of our brain and the growth of our body. **Deficiency of iodine leads to a disease called cretinism.**

##### Functions

Iodine is needed for proper functioning of thyroid gland in our body.

##### Sources

- Sea foods like fish and sea weeds.
- Plants which grow in iodine rich soil.
- Salt fortified with Iodine.

**Cretinism** is a condition of severely stunted physical and mental growth.



Fig.2.3

**Food fortification or enrichment** is the process of adding micronutrients to food. This has been explained later in lesson 4.




#### 2.3.5 VITAMINS

These are the substances which are required in very small amounts in our diet, but are essentials for proper functioning of the body. Vitamins cannot be produced by the body, therefore must be present in our diet. Vitamins are classified into two groups on the basis of their solubility in fats and water.

- **Fat soluble vitamins** are those vitamins which are soluble in fat e.g. Vitamin A, D, E, and K.
- **Water soluble vitamins** are those vitamins which are soluble in water e.g. B-complex vitamins and vitamin C.

You must know the functions and sources of vitamins. Table 2.1 lists vitamins, their functions and sources.

Table 2.2


Vitamins	Functions	Sources	Deficiency Disorders
<b>Fat Soluble Vitamins</b>			
Vitamin A	<ul style="list-style-type: none"> <li>For better vision specially in dim light</li> <li>Makes our skin healthy</li> <li>Necessary for normal growth and development</li> <li>Provides resistance to infection.</li> </ul>	Vegetables, fruits (especially in dim light yellow ones), milk, cheese, eggs yolk, butter, ghee, liver green leafy 	Night Blindness
Vitamin D	Works with minerals - phosphorus and calcium to make teeth and bones strong	Oily fish, milk, cheese, butter, ghee, etc. Our body can make Vitamin D when the skin is exposed to sunlight. 	Rickets in children and Osteomalacia and Osteoporosis in adults
Vitamin E	Prevents tissue breakdown. It is an antioxidant	Whole pulses and cereals 	
Vitamin K	Needed in the process of clotting	Green leafy vegetables	Avitaminosis



Notes



Notes

<b>Water Soluble Vitamins</b>			
B Complex	Helps the body to use energy Keeps the digestive system healthy	Pulses, whole grains cereals, wheat, rice etc. 	
Vitamin C	All the body cells need Vitamin C because it helps to hold cells together. It also keeps our teeth and gums healthy.	Fruits, leafy vegetables, potatoes, sprouted grains, guava. and amla are the richest sources	Scurvy

\*The details of some of these are discussed later in the chapter



### INTEXT QUESTIONS 2.2

Choose the correct option to complete the statements given below.

1. i. Calcium is needed for
  - (i) improving the taste of food.
  - (ii) healthy bones
  - (iii) strong teeth
  - (iv) clotting of blood
- ii. Richest source of iron is
  - (i) iodized salt
  - (ii) milk
  - (iii) leafy vegetables
  - (iv) wheat
- iii. Fortified salt is rich in
  - (i) iron
  - (ii) iodine



Notes

- (iii) calcium
- (iv) all the above
- iv. Person suffering from iodine deficiency must eat/drink
  - (i) sea food
  - (ii) root and tubers
  - (iii) milk products
  - (iv) fibre rich food
- v. Movement of muscles definitely requires presence of
  - (i) iodine
  - (ii) iron
  - (iii) calcium
  - (iv) all the above.
- 2. Tick Mark (✓) the fat soluble vitamins from the choices given:
  - (a) Vitamin A
  - (b) Vitamin B
  - (c) Vitamin C
  - (d) Vitamin D
- 3. Which vitamin will you get from the following food items?
  - (i) amla..... (vii) sprouted pulses.....
  - (ii) carrot..... (viii) sunlight on skin.....
  - (iii) cereals..... (ix) milk.....
  - (iv) eggs..... (x) butter.....
  - (v) fish oil..... (xi) pumpkin.....
  - (vi) green leafy vegetables..... (xii) liver.....
- 4. Fill in the blanks:
  - (i) Vitamin D can be produced by the ..... in the presence of .....
  - (ii) One function of Vitamin A is to keep our..... healthy.
  - (iii) To keep our gums and teeth healthy we must take .....
  - (iv) The vitamin which makes bones and teeth strong is .....



## Notes

**2.4 DIETARY FIBRE**

Shruti's grandmother is an active and cheerful old lady. However, she was uncomfortable as she had not passed stool since last three days. She realized that in the last two-three days she had not been taking enough fresh fruits, vegetables and water. Fresh fruits and vegetables contain fibre that helps in relieving constipation.

Constipation refers to bowel movements that are infrequent and/or hard to pass.

Dietary fibre, also known as roughage, is the indigestible carbohydrate present in food. Fibre is present in foods of plant origin only.

Foods rich in fibre are:

- whole wheat flour, dalia (porridge)
- fruits such as guava, apples, pineapples, banana
- whole pulses like lentil, rajmah, bengal gram
- vegetables such as peas, beans, carrots, cauliflower, green leafy vegetables

When foods are processed there is loss of fibre, vitamins and minerals. For example unpolished rice has higher fibre content than polished rice. Can you think of some other examples? Wheat flour is something many of us consume everyday. Often people sieve the flour and then make chapatis out of it. In the process, wheat bran which is rich in fibre is removed. Thus, reducing the fibre content of the flour. The skin of fruits and vegetables is also rich in fibre.

Fibre performs many essential functions in the body;

- It increases the bulk and softness of stool, thus making it easier to pass;
- Foods which contain fibre require more chewing and thus have a high degree of satiety.

Satiety means being satisfied especially when referring to eating. It prevents over eating.

High fibre diet helps in the prevention of:

- Constipation
- Cancer of the large intestine
- Diabetes
- Obesity

**ACTIVITY 2.4**

Recall what did you eat yesterday and list the fibre rich foods included in your meals.

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**Notes****2.5 WATER**

Mohan's mother was travelling to Jaipur in Rajasthan in the month of May for some work. She packed two bottles of water along with her lunch. Mohan asked his mother about the necessity of carrying the water bottles. Mother explained that during hot weather, our body sweats a lot. This results in depletion of body water. We should drink plenty of water to replenish the loss. Body water need can also be fulfilled by beverages like buttermilk (*lassi*), milk, fruit juices etc. On the other hand, our body's need for water is less during winters.

**Fig.2.4**

Now Mohan understands that water requirement vary with the season. On an average, one should drink about 8-10 glasses of water everyday.

Water is not a nutrient, yet it is very important for our body because;

- It is a constituent of all body fluids.
- It helps to digest food and takes the nutrients from the food to the different cells of your body.
- It helps to keep our body temperature constant. In summer, when we sweat, extra heat is removed from the body.
- It helps to remove the waste products from your body in the form of urine.

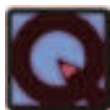
**ACTIVITY 2.5:**

Observe the colour of your urine when you do not drink water for about 6-8 hours and then when you drink water every  $\frac{1}{2}$  hour. Answer the following.

Interval between water intake	Colour
Water after 6-8 hours (when you pass urine for the first time in the morning)	
When you drink water after every $\frac{1}{2}$ hour	



Notes



### INTEXT QUESTIONS 2.3

State whether the following statements are true or false, if true, give the justification:

- (i) True/False     Fiber is not essential in the diet.  
.....
- (ii) True/False     We must remove the outer skin of apples before eating.  
.....
- (iii) True/False     Fiber helps in the prevention of cancer.  
.....
- (iv) True/False     Fiber makes fat.  
.....
- (v) True/False     Fiber is found in tomatoes and grapes.  
.....
- (vi) True/False     Fiber increases bulk of the food.  
.....
- (vii) True/False     You will lose weight if you do not eat fibre.  
.....

### 2.6 DEFICIENCY DISEASES

Geetika wants to lose weight and often skips her meals. Her teacher complained that she is not alert and attentive in the class. One day, she fainted during morning assembly. Her mother was called by the teacher. The mother explained that for the last four months, Geetika was eating very little. She had become very weak. The teacher advised Geetika that by reducing her food intake, she was not getting adequate nutrients essential for her body. This was causing weakness. This would have detrimental effect on her physical, mental and emotional well being.

Geetika became aware of the importance of a nutritious diet for her overall well being. She realized that each nutrient has a specific role in keeping us healthy.

If you do not take these nutrients in the diet, do you know what will happen? Yes, you are right. The body will not be able to function properly and you will fall sick. Interestingly, if you start eating the food with the missing nutrients, the symptoms of the disease start disappearing.



This is the reason why such diseases are called **deficiency diseases**. The deficiency is caused due to shortage or absence of certain nutrients in our daily diet. Deficiency disease is a condition which occurs in the body when a particular nutrient in our daily meals has been missing for a long period. Often the deficiency is reversible if the missing nutrient is detected early and missing nutrient is adequately replaced.

Children and old people are more prone to deficiency diseases. Let us now study some common deficiency diseases.



Notes

### 2.6.1. Protein Energy Malnutrition (PEM)

When there is lack of proteins and energy in the diet for a long time a deficiency disease known as **Protein Energy Malnutrition (PEM)** occurs. This deficiency occurs mainly in children below 5 years of age. In our country PEM is widely prevalent in children belonging to poor and underprivileged communities. When the child is suffering from PEM, often diarrhea and other infections occur due to low body resistance to diseases.

PEM is of two types-

- (1) When the protein intake is deficient but calories or energy from carbohydrates are sufficient, the condition is known as **Kwashiorkor**. The child develops a pot like belly due to this deficiency diseases.



Fig. 2.5 A child suffering from Kwashiorkor

- (2) When protein and energy both are insufficient for a prolonged period then a disease condition known as **Marasmus** occurs. In both these conditions there is growth failure, child does not grow to full potential.



Fig. 2.6 A child suffering from Marasmus



Notes

- (3) A child loses weight and becomes thin when there is deficiency of carbohydrates in the diet. Yet another kind of malnutrition is consumption of excessive calories. If there is excess of carbohydrates in the diet then the person becomes **obese** or fat. This is the condition mostly found in the well-to-do families. This is increasingly becoming a problem in urban areas where more and more people are leading inactive or more sedentary lives.



**Fig. 2.7 A child suffering from Obesity**

### 2.6.2. Vitamin A deficiency

Vitamin A deficiency is also found mainly in children. Pregnant women are also susceptible to this deficiency. Since Vitamin A is required for growth and development of the body. Lack of this vitamin results in stunted growth. Deficiency of Vitamin A also leads to dryness of conjunctiva (the white portion of the eye). At a later stage the conjunctiva may become wrinkled. The cornea (black part of eye) may also become cloudy. At this stage the problem of night blindness sets in, i.e., the child cannot see in dim light. Improvement in the condition can occur if a diet rich in Vitamin A is taken. You would be sad to know that more than 40,000 children in India become blind every year because of vitamin A deficiency. This could be easily prevented.

### 2.6.3. Iron deficiency anaemia

Iron deficiency anaemia is another major nutritional problem in our country. It is found in women and children in all income groups.

Major causes of anemia in our country are:

- inadequate intake of dietary iron or its poor absorption
- hook worm infestation mainly found in young children and adults
- excessive blood loss due to accidental injury, during child birth in women

You have already studied that iron is required for hemoglobin formation. In iron deficiency anemia, there is not enough haemoglobin in blood, therefore, the supply of oxygen to the cells is reduced. When this happens, we feel tired, restless and fatigued all the time. Therefore, we cannot work to our full potential.

### 2.6.4. Vitamin B Complex deficiency

Low intake of Vitamin B rich food in our diet is the main cause of this deficiency. Common symptoms of vitamin B complex deficiency are sore mouth, sore tongue, redness of the tongue and cuts at the angles of mouth.



Notes

Some accompanying symptoms like diarrhea and dysentery may also occur. One does not feel hungry and has difficulty in digesting food. In earlier times a disease known as Beri Beri was quite prevalent in areas where polished rice was the staple food. This deficiency is no longer seen now. Consumption of brown rice instead of white rice prevents the occurrence of this disease.

### 2.6.5. Vitamin C deficiency

In the absence of fresh fruits and vegetables in our diet often deficiency of Vitamin C occurs. It is called **Scurvy**. Our gums, bones and teeth become weak. Gums swell up and start bleeding. Wounds also do not heal quickly. The only solution is to include fresh fruits and vegetables in our diet on regular basis.

### 2.6.6. Iodine Deficiency Disorders (IDD)

Iodine is very essential for the proper functioning of the body. Deficiency of iodine leads to a number of disorders like goitre, cretinism, mental retardation and deaf mutism.

Goitre is generally seen among adolescents, young adults and children. More females than males are affected. A severe deficiency of iodine during prenatal life may lead to Cretinism (severe mental retardation).

In India there are certain regions where goiter is quite prevalent areas. The foothills of Himalayas and the areas where there are frequent floods are the most goiter prone areas. Recent surveys have shown that areas in Andhra Pradesh, Madhya Pradesh, Maharashtra, Bihar, Gujarat and Kerala also have regions where goiter is prevalent.

The only solution to this problem is to eat **iodized salt**. For this reason our Government has banned the used of non-iodized salt.



Fig. 2.8. : A woman suffering from Goitre

**Remember:** Store iodized salt in air tight containers to prevent loss of iodine.

Cover and cook food to which iodized salt has been added.

**Notes****INTEXT QUESTIONS 2.4****I Put a tick mark (✓) against the right answer.**

1. Deficiency diseases are those that occur in your body because of
  - (i) less water
  - (ii) absence of a nutrients
  - (iii) absence of exercise
  - (iv) presence of disease germs
2. Vitamin A is important because it
  - (i) prevents night blindness
  - (ii) keeps the skin healthy
  - (iii) prevents anaemia
  - (iv) prevents constipation
3. Haemoglobin formation is reduced in
  - (i) scurvy
  - (ii) anemia
  - (iii) goiter
  - (iv) night blindness
4. If you take excessive amount of carbohydrates, you will become
  - (i) underweight
  - (ii) anaemic
  - (iii) obese
  - (iv) Marasmic
5. An example of a food which prevents vitamin A deficiency is
  - (i) spinach
  - (ii) lemon
  - (iii) banana
  - (iv) potato

## 2.7 NEED FOR EATING VARIETY OF FOOD

Now you know the different nutrients and also the functions they perform in our body. You also know what happens when these nutrients are missing in our diet.

So what should we do to remain healthy?

We should eat food which provides all the nutrients. As you have seen, there is no single food which gives all the nutrients. You must therefore, eat variety of food items so that our body gets all the nutrients in the required amounts and we do not suffer from deficiency diseases.



### ACTIVITY 2.6:

Examine your diet and check if you are receiving all the nutrients. If yes, mention nutrients you are getting in food items included in each meal in the table provided below. If not, modify your existing diet to include food items that will give you the required nutrients.

<i>Existing diet</i>	<i>Food Intake</i>	<i>Nutrient Intake</i>
Breakfast		
Lunch		
Dinner		

Modify the diet, if needed;

<i>Modified diet</i>	<i>Nutrient Intake</i>	
Breakfast		
Lunch		
Dinner		



Notes



Notes

## 2.8 RELATIONSHIP BETWEEN NUTRITION AND HEALTH

Knowledge of nutrition helps us to know the type and quantities of different foods to be taken in the diet in order to maintain good health. The World Health Organization (WHO) has defined health as “The state of complete physical, mental and social well being and not just the absence of disease”. Hence, to be healthy in the real sense, one must not only eat right but also have a healthy mental and social outlook.



### WHAT YOU HAVE LEARNT

- Carbohydrates, proteins, fat, vitamins and minerals are essential nutrients for our body.
- Water is not a nutrient but is essential in our diet to maintain important body functions.
- Sources of proteins are milk, cheese, egg, meat and pulses.
- Calcium and vitamin D are required to keep the bones and teeth healthy.
- Fresh vegetables and citrus fruits are rich in vitamin C.
- Green leafy vegetables, whole cereals, pulses and dates are good sources of iron.
- Deficiency of iron causes anaemia.
- Good sources of vitamin A are green leafy vegetables, milk and milk products, egg, butter and ghee.
- Deficiency of vitamin A causes night blindness and dry and rough skin.
- Ignorance is the main cause of deficiency diseases.



### TERMINAL EXERCISES

1. List the four important functions of food?
2. Recommend three energy giving foods for an active school going child.
3. Justify the need of extra calcium and iron in diet of adolescents.
4. Write names of any four deficiency diseases and mention one symptom of each.
5. Match the nutrient given in column A with their functions in column B:

Column A	Column B
i Vitamins and minerals	Body building and repair of tissues
ii Proteins	Energy giving
iii Carbohydrates	Protection from the diseases

6. Complete the table given below :

S. No.	Name of nutrient	Main function	Sources		Deficiency Disease
			1	2	
1	Vitamin B				
2	Vitamin C				
3	Vitamin D				
4	Calcium				
5	Iron				
6	Iodine				
7	Water				



Notes



## ANSWERS TO INTEXT QUESTIONS

### 2.1

- Refer to text
- (i) b (ii) c (iii) a
- (a) Fat (b) Fat (c) Fat (d) Protein  
(e) Protein (f) Protein (g) Protein, fat (h) Carbohydrates  
(i) Carbohydrates (j) Protein (k) Carbohydrates (l) Fat
- (a) Fat (b) Protein (c) cereal (d) potato

### 2.2

- i. (iii) ii. (iii) iii. (ii) iv. (i) v. (iii)
- Vitamin A and Vitamin D
- (i) Vit. C (ii) Vit. A (iii) Vit. B (iv) Vit. A, Vit. B  
(v) Vit. A, Vit D (vi) Vit. A, Vit. B (vii) Vit. C (viii) Vit. D  
(ix) Vit. A, (x) Vit. A, Vit. D (xi) Vit. A (xii) Vit. A
- (i) body, sunlight (ii) eyes (iii) Calcium (iv) vitamin B

### 2.3

- (i) F, Makes digestive system healthy (ii) F, apple skin is rich in fibre  
(iii) T (iv) F, makes you fit and healthy (v) T  
(vi) T (vii) F, Fibre gives a feeling of satiety and prevents overeating.

- 2.4 (1) ii (2) i (3) ii (4) iii (5) i