

## VITAMINS

(Vitamins are a group of nutrients that our body requires in small quantities) They are essential for the proper working of the body. If our diet is lacking in any vitamin, we suffer from certain diseases called **deficiency diseases**. There are about 20 known vitamins. The important vitamins, their sources, importance, and the deficiency diseases caused when we do not get enough, are given in Table 2.1.

*What are minerals*

## MINERALS

(Minerals are nutrients that contain certain elements.) All of them perform particular functions in the body. They are required by our body in small quantities in the diet to maintain good health. Their deficiency in our diet also leads to deficiency diseases. Table 2.2

## IT'S A FACT!

At the time when vitamins were discovered, their chemical compositions were not known. Hence, they were represented by letters of the English alphabet. Scientists now know their chemical composition and have given them chemical names. Vitamins are now manufactured by drug companies and are available at drug stores. They are given to patients suffering from deficiency diseases.

lists some important minerals, their sources, importance and deficiency diseases.

## WATER

Water makes up almost 70 per cent of our body weight. Most of this water is present in the cells of our body. Some water lies in spaces between the cells. Also, (water constitutes the liquid part (called plasma) of the blood. (Life processes cannot occur without water) D3

TABLE 2.1 Some important vitamins

VITAMIN	SOURCES	IMPORTANCE	DEFICIENCY DISEASE
A	milk, butter, eggs, carrots cod-liver oil, tomatoes, green leafy vegetables	for normal growth; keeps the eyes and skin healthy	night blindness, which is the inability to see in dim light; irregular growth of teeth
B-Complex			
B <sub>1</sub>	seafood, milk, meat, peas, cereals, green vegetables	for growth and development	beri-beri, which affects the nervous system
B <sub>2</sub>	yeast, eggs, meat, peas	for healthy skin; for growth	skin disease and retarded growth
B <sub>3</sub> (Niacin)	whole cereals, potatoes, tomatoes, meat, fish	for healthy skin, for proper functioning of digestive and nervous system	pellagra, which affects the skin, digestive system and nervous system
B <sub>12</sub>	liver, eggs, milk, fish	helps in the formation of red blood cells	kind of anaemia in which there is a deficiency of red blood cells
C	Indian gooseberry ( <i>amla</i> ), tomatoes, green leafy vegetables, citrus fruits, water chestnut ( <i>singhara</i> )	for healthy growth and strong blood vessels	scurvy, in which gums swell up and bleed; wounds take longer to heal
D	sunlight (helps our skin prepare vitamin D), milk, butter, green vegetables, cod-liver oil	helps to use calcium for formation of strong bones and teeth	rickets, in which the bones become soft and out of shape, affects children
K	green vegetables like spinach and cabbage, soyabean oil	helps in the clotting of blood	excessive bleeding from wounds

TABLE 2.2 Some important minerals

MINERAL	SOURCES	IMPORTANCE	DEFICIENCY DISEASE
iron	liver, eggs, meat, green vegetables, turnip, germinating wheat grains, yeast	for the formation of the substance that helps red blood cells carry oxygen to body cells	anaemia—the patient becomes weak
calcium	milk and milk products, tapioca, green leafy vegetables, finger millet ( <i>ragi</i> )	for strong bones and teeth	weak bones; tooth decay
phosphorus	meat, fish, eggs, whole grains	for the development of strong bones and teeth; for making energy-rich compounds in the cells of our body	weakness; bad teeth and bones
potassium	green and yellow vegetables	for growth, for keeping cells and blood healthy	muscle weakness
sodium	common salt	for the proper functioning of the nervous system	muscle cramps; tiredness
iodine	iodized salt, seafood	helps in the secretion of thyroid hormone	goitre
fluorine	water in some areas	makes the enamel of the teeth hard and prevents dental caries	dental caries

Water plays a vital role in the body's system.

- ❖ It helps our body absorb nutrients from food.
- ❖ It transports nutrients throughout the body.
- ❖ It collects wastes from different parts of the body, and removes them from the body in the form of urine and sweat. Sweat is mainly water.
- ❖ (The body is cooled by evaporation of sweat from the skin.)

You lose a lot of water every day as you breathe, sweat, cry or get rid of your wastes. About half of this water is replaced by the water in the food you eat. Fruits and vegetables contain large quantities of water. Grapes, for example, contain 80 per cent water. Also, water

is added to many food items while cooking. The other half is replaced when you drink liquids. Most people need 6–8 glasses of water or other liquids every day to stay healthy. Athletes and sportspersons should drink enough water to replace the water they lose through sweating.

Even though it is vital for our body, water does not provide any energy (It only serves as a solvent in which all chemical reactions take place.)

Q. What is Roughage

### ROUGHAGE

Plant foods such as fruits and vegetables contain a carbohydrate that cannot be digested by the body. It is called roughage.) It should form an important part of our diet because of the following reasons:

- ❖ (Roughage adds bulk to our food. Since it is not digested, it passes down the entire digestive tract from the mouth to the anus.) The muscles of the digestive tract need this bulk to push against—like squeezing toothpaste out of a tube.

### IT'S A FACT!

If the body of a person loses too much water, for example, while playing or working in the hot sun, his body may get severely dehydrated. This causes the blood to become thicker and its movement in the body slows down. The consequences are severe pain and cramps in the muscles.

Q. Why water is important for the

**Q1. A child is suffering from a deficiency disease. He shows the following symptoms:**

(i) Swelling of ankle, feet and belly
(ii) Diarrhoea
(iii) Scaly skin
(iv) Mental retardation

Identify the deficiency disease and the deficient nutrient in the child's body.

A)

Deficiency disease	Deficient nutrient
Kwashiorkor	Proteins

B)

Deficiency disease	Deficient nutrient
Goitre	Iodine

C)

Deficiency disease	Deficient nutrient
Anaemia	Iron

D)

Deficiency disease	Deficient nutrient
Rickets	Vitamin D

**Q2: Refer to the given groups (i)-(iii). Each group contains an odd member. Identify the odd ones in each group and select the correct option,**

(i) Calcium	Potassium	Iodine	Sodium
(ii) Vitamin A	Vitamin B	Vitamin D	Vitamin E
(iii) Oil	Cheese	Butter	Ghee

A)

(i)	(ii)	(iii)
Calcium	Vitamin D	Butter

B)

(i)	(ii)	(iii)
Iodine	Vitamin B	Oil

C)

(i)	(ii)	(iii)
Sodium	Vitamin E	Cheese

D)

(i)	(ii)	(iii)
Potassium	Vitamin K	Ghee



**Q3: Aarushi took two food samples X and Y in separate test tubes. She added 2-3 drops of Benedict's solution in food sample X and heated it while she added two drops of copper sulphate solution and few drops of caustic soda solution in food sample Y. She observed that sample X turned brick- red while sample Y turned purple.**

Which of the following is correct regarding X and Y?

- A) X consists of protein while Y consists of starch,
- B) X consists of sugar while Y consists of protein.
- C) X consists of starch while Y consists of protein,
- D) X consists of sugar while Y consists of starch,

**Q4: Study the given table.**

Vitamin	Source	Deficiency
B1	(i)	Beri-Ber
(ii)	Carrot	Night blindness
D	Sunlight	(iii)
C	Orange	(iv)

Select the correct option for (i), (ii), (iii) and (iv).

A)

(i)	(ii)	(iii)	(iv)
Milk	A	Scurvy	Rickets

B)

(i)	(ii)	(iii)	(iv)
Milk	E	Rickets	Scurvy

C)

(i)	(ii)	(iii)	(iv)
Whole grains	A	Rickets	Scurvy

D)

(i)	(ii)	(iii)	(iv)
Whole grains	A	Scurvy	Rickets

**Q5: Which of the following statements is/are incorrect?**

(i) Fats deposited in our body act as shock absorbers and protect us from injury.
(ii) Kwashiorkor is caused by deficiency of protein, carbohydrate and fat.
(iii) Roughage neither releases energy nor helps in tissue or body building.
(iv) Starch containing food item turns bluish black in colour on undergoing iodine test.

- A) (i) and (ii) only
- B) (ii) only
- C) (iii) only
- D) (ii) and (iv) only

**Q6: Given below are the four food components (P-S) and their corresponding sources.**

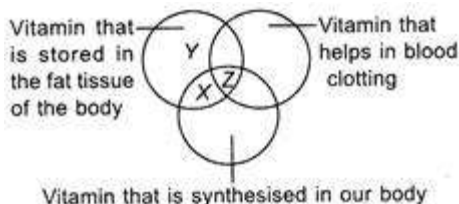
P - Meat, Fish, Egg
Q - Butter, Ghee, Margarine

R - Bread, Biscuit, Potato  
 S - Amla, Tomato, Orange

Select the incorrect statement regarding them.

- A) Deficiency of P causes marasmus in children whereas deficiency of Q causes kwashiorkor in adults.
- B) Among P, Q, R and S, 1 gram of Q produces the maximum energy.
- C) Excess of R gets stored in body cells and is used for production of energy whenever required.
- D) Deficiency of S leads to a disease in which gums swell up and bleed.

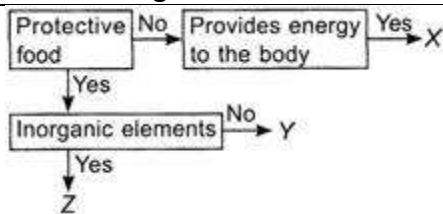
**Q7: Refer to the given Venn diagram and select the correct statement regarding X, Y and Z.**



- A) Deficiency of X and Y causes night blindness and scurvy, respectively.
- B) X helps in the normal growth of bones in children while Y keeps reproductive system healthy.
- C) Deficiency of Z causes pellagra i.e., vitamin complex.
- D) Y is a group of several vitamins.

**Q8:**

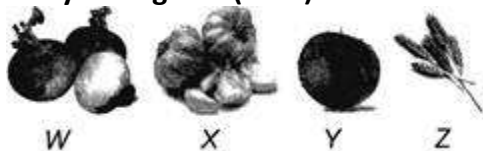
Refer to the given flow chart.



Identify X, Y and Z and select the incorrect option regarding them.

- A) X is formed in leaves of plants during photosynthesis.
- B) Z is essential for the normal functioning of thyroid gland.
- C) Consumption of excess of Y can lead to obesity and heart related problems.
- D) Z helps in formation of haemoglobin in the body.

**Q9: Identify the figures (W- Z) and select the incorrect statement regarding**



these.

- A) W is a modified tap root which serves as a storage organ.
- B) Edible part of X is the same as edible part of onion.
- C) Y is a fruit which is eaten as a vegetable.
- D) Edible part of Z is the same as the edible part of potato.

**Q10: Refer to the given dichotomous key and select the correct option.**

I. (a) It is categorised as energy giving food. - Go to II
(b) It is categorised as protective food. - Go to III
II. (a) It is soluble in water. - [P]
(b) It is insoluble in water. - [Q]
III. (a) It is needed for clotting of blood. - [R]
(b) It helps in formation of haemoglobin. - [S]

- A) Q could be glucose which is instant source of energy.  
 B) Deficiency of S causes anaemia characterised by pale body colour, body fatigue etc.  
 C) R causes osteoporosis in adults while S causes goitre in adults.  
 D) P occurs in the cell wall of plant cells and in fibres.

**Answers:**

1. A
Kwashiorkor is a deficiency disease caused by deficiency of protein in the diet. The child suffering from this disease becomes thin and weak. Skin becomes scaly and develops cracks, there is stunted growth and retarded mental development. Other symptoms of the disease include large pot like belly, swelling of feet and ankle, diarrhoea etc.
2. B
Calcium, potassium and sodium are macrominerals as they are needed by the body in larger amounts whereas iodine is trace mineral as it is needed by the body in very small amount. Vitamin A, D and E are fat-soluble vitamins while vitamin B is water soluble vitamin. Oil is rich in unsaturated fats while cheese, butter and ghee are rich in saturated fats.
3. B
4. C
5. B
Kwashiorkor is caused by deficiency of protein while marasmus is caused by deficiency of protein, carbohydrate and fat.
6. A
P is protein, Q is fat, R is carbohydrate and S is vitamin C. Deficiency of proteins causes kwashiorkor whereas marasmus is caused by deficiency of proteins along with carbohydrate. Marasmus occurs in children usually in infants below the age of 1 year and kwashiorkor occurs in children.
7. B
In the given Venn diagram X, Y and Z represent vitamin D, vitamin E and vitamin K, respectively. Deficiency of vitamin A causes night blindness and deficiency of vitamin C causes scurvy. Pellagra is caused by deficiency of vitamin <b>B3</b> . Vitamin B is a group of several vitamins like <b>B1, B2, B3, B6, B12</b> and folic acid and is known as vitamin ; B complex.
8. C
In the given flow chart, X, Y and Z refer to carbohydrate, vitamin and mineral, respectively.
9. D
'W is the modified fleshy tap root of turnip which stores the reserve food material. 'X' represents garlic i.e. an underground stem modification. In both garlic and onion, fleshy scales are edible. Y is tomato, which is a fruit but is eaten as a vegetable. 'Z' represents wheat grains, which are edible seeds but in potato stem is edible.
10. B
According to the given dichotomous key P, Q, R and S could be glucose, cellulose, calcium and iron respectively. Goitre is caused by deficiency of iodine. Cellulose is complex carbohydrate occurs in the cell wall of plant cells and plant fibres.