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Components of Food

Introduction

- Nutrients
- Testing for some nutrients
- Roughage and water
- Balanced diet
- Proper cooking of food
- Deficiency diseases
- How to prevent deficiency diseases

We have seen that we eat various kinds of food almost everyday. We normally eat a cereal in every meal, along it we eat a dal or meat and some vegetable. We may also eat curd, salad, pickle with it. There may be times when there is not this much variety in our food. We eat whatever is available.

We know that food has various components that are needed by our body. These components are called **nutrients**. There are five types of nutrients. They are carbohydrates, proteins, fats, vitamins and minerals. In addition to these five nutrients our body also needs water and dietary fibre.



Facts to know

Calorie is a unit of energy. The number of calories a person needs in a day depends on his or her age, height, weight, gender and physical activity level.

CARBOHYDRATES

Sugar and starch are the two main types of carbohydrates found in our food. They are the main source of energy. Carbohydrates are of two types—simple and complex carbohydrates. Simple carbohydrates are known as **sugar**. Complex carbohydrate are known as **starch**. They need to be broken down into simple sugar.



Sources of carbohydrates



Activity - 1

Testing the presence of starch.

Take a small quantity of food or raw material which is to be tested.

Add 2–3 drops of dilute iodine solution. Do you observe any change in colour?

If the colour changes to blue black it indicates starch.



Testing for starch

PROTEINS

They are known as body-building substances. Our body needs proteins to make new cells, to replace worn out and damaged cells. This is why growing children and sick people need more proteins.



Sources of proteins



Facts to know

A person needs approx. 1g of protein/kg of body weight.



Activity - 2

Test for proteins

Take a small quantity of a food item to be tested in a test tube. In case the food is solid, powder it or make a paste of it. Then add 10 drops of water and shake the test tube.

Add two drops of copper sulphate and 10 drops of caustic soda solution using a dropper to the test tube. Shake well. Allow the test tube to stand for a few minutes. A violet colour indicates presence of proteins in the food item.



Fat

Fats are the best energy-giving foods. The amount of energy released by 1 gram of fat is more than twice the energy released by the same quantity of carbohydrates or proteins. Our body uses the fat stored under the skin and other parts. When we are short of energy. Fats are the store house of energy. Fats also provide warmth to our body.



Sources of fat



Activity - 3

Test for the presence of fat

Take a small quantity of the food to be tested. Wrap it in a piece of paper and crush it, taking care not to tear the paper. Open the paper and observe it by holding it against a source of light for a translucent spot. An oily patch shows the presence of fat.



They are required in very small quantities. They are needed to protect us from disease and to keep us healthy. Vitamins are of two types — fat soluble and water soluble vitamins. Each are of several kinds.



Facts to know

Fat Soluble : Our body prepares vitamin D in the presence of sunlight.
Vitamin A, D, E and K

Water Soluble : Vitamin B and C

Vitamin A keeps our eyes and skin healthy. Vitamin C helps our body to fight against diseases. Vitamin D helps our body to use calcium for bones and teeth.

MINERALS



Foods rich in Vitamin D



Vitamin C



Vitamin B



Vitamin A

Minerals are also required by our body in very small amounts. They are required for proper growth of the body and for good health.

- ♦ Calcium and phosphorous are required for healthy teeth and bones.
- ♦ Iron is necessary for the formation of haemoglobin.
- ♦ Iodine helps in the secretion of thyroid hormone.



Sources of iodine



Sources of iron



Sources of phosphorous



Sources of calcium

Roughage:

Dietary fibre is known as roughage. Roughage has no nutritive value. It adds bulk to the food. This helps our body to get rid of undigested food. Whole grains, pulses, vegetables like fresh fruits, potato, cucumber, spinach and cabbage are the main sources of roughage.

Water:

Water helps our body to absorb nutrients from food. It eliminates waste from the body in the form of urine and sweat. Fruits and vegetables contain a large amount of water. About half the water lost is replaced from the food we eat. We also add water to food while cooking. We must drink at least 6—8 glasses of water or liquid daily.



Activity - 5

To see whether vegetables contain water

Take 100 g of potato, onion, spinach, tomato, cucumber

Spread all the items separately in the sun to dry them completely. It will take a couple of days. After they have dried, weigh them. The difference in weight is the water content of that vegetable.

Weight after drying.

Tomato

vegetable which has lost the most.

Cucumber

weight has the highest.

Potato

amount of water.

Onion

can you think of any fruit or vegetable?

Spinach

which has no water?



Facts to know

The government of India has started many programmes to combat malnutrition among children, pregnant women and nursing mothers. One such programme is the mid-day meal programme for school children.

BALANCED DIET

Different food items contain different nutrients. To remain healthy and for proper growth and maintenance, our diet should contain all the nutrients our body needs in the right amounts. No single item contains all the nutrients.

A diet which contains all the important nutrients in the right amounts is called a complete or a **balanced diet**.

The balanced diet is not the same for everyone. It depends on various factors like age, sex, physical activity of a person.

If you consume an improper diet, i.e. a person takes in more calories than are used by him he will gain weight and become **obese**. This condition is called **obesity**. Hence, we should not eat too much of fat rich foods.



Obese child cartoon



Facts to know

Obesity occurs due to improper food habits and lack of physical activity.

COOKING OF FOOD

The food we eat must be cooked properly, to avoid loss of nutrients :

- Vitamin C is destroyed by heat during cooking. Hence we should eat raw fruits and vegetables to get vitamin C.
- Do not wash fruits and vegetables after peeling or cutting them. This results in the loss of vitamins and minerals. The skin of many fruits and vegetables are rich in vitamins and minerals. Repeated washing of rice and pulses also results in the loss of these nutrients.
- Cook food in just enough water. Don't throw away the excess water used in cooking as it results in loss of many useful vitamins and minerals.

DEFICIENCY DISEASES

Deficiency diseases are caused by a lack of essential nutrients such as proteins, vitamins and

minerals that the body cannot make from other foods. The steady absence of one vitamin in an otherwise complete diet causes a deficiency disease. Deficiency of nutrients can lead to diseases or disorders in our body. The diseases that occur in our body due to lack of essential nutrients over a long period of time are called **deficiency diseases**.

- **Deficiency of Proteins**

Deficiency of proteins causes stunted growth, swelling of face, discolouration of face, skin diseases and diarrhoea.

- **Deficiency of Carbohydrates**

Causes the person to become thin and weak.

If the diet is deficient in both proteins and carbohydrates for a long time, growth may stop completely.

Diseases caused due to deficiency of Vitamins and Minerals

Vitamin/Mineral	Deficiency Disease	Symptoms
Vitamin A	Night Blindness	Loss of vision in darkness.
Vitamin B	Beriberi	Malfunctioning of the nervous system, muscle weakness.
Vitamin C	Scurvy	Swelling of the gums, bleeding gums, wounds take long time to heal.
Vitamin D	Rickets	Bones become soft and deformed.
Calcium	Rickets	Weak bones, tooth decay.
Iodine	Goitre	Swelling of the thyroid gland. mental disability in children.
Iron	Anaemia	General weakness

We can prevent deficiency diseases by taking a balanced diet. We can have a balanced diet even by eating simple inexpensive foods like pulses, soyabean, groundnuts, sprouted pulses, fermented food (Idli, Dosa, Dhokla), using a combination of flours (missiroti) bananas, spinach, khichri (combination of rice and pulses) etc. It is not necessary to eat only expensive fruits and vegetables. Besides eating the right type of food, we must also cook the food properly as explained earlier.



Glossary

nutrients	: building blocks of food are called nutrients
roughage	: indigestible cellulose that improves intestinal functions by adding bulk to food
enzymes	: certain protein that regulate chemical reactions in your body
balanced diet	: a diet which contains all nutrients in the right proportions
deficiency	: a disease caused by lack of nutrients in the diet



Summary

- ◆ A diet which contains all the nutrients in the right amount is called a balanced diet. It must contain adequate amount of water and roughage.
- ◆ A balanced diet is necessary for good health.
- ◆ Deficiency of one or more essential nutrients in our food over a long period of time can cause deficiency diseases.
- ◆ We must cook food properly to avoid loss of nutrients.
- ◆ Food is made up of several components needed by our body called nutrients.
- ◆ The main nutrients of food are carbohydrates, proteins, fats, vitamins and minerals. Food also contains water and dietary fibres.
- ◆ Carbohydrates and fats provide us with energy. Sugar and starch are the two types of carbohydrates.
- ◆ Proteins are body building foods. They replace worn out or damaged cells and build new cells. They are thus needed for growth.
- ◆ Vitamins and minerals are protective foods. They help us in protecting against disease.



Exercise

A. Multiple Choice Questions (MCQs)

Tick (✓) the right option.

- Iodine solution is used to test the presence of
(a) starch ☐ (b) fats ☐ (c) proteins ☐ (d) vitamins ☐
- This is the quickest source of energy
(a) fats ☐ (b) sugar ☐ (c) proteins ☐ (d) starch ☐
- This is a body building food
(a) rice ☐ (b) pulses ☐ (c) apples ☐ (d) spinach ☐
- This is a water soluble vitamin
(a) vitamin A ☐ (b) vitamin B ☐ (c) vitamin D ☐ (d) vitamin K ☐

5. This is required for healthy teeth

(a) calcium ☐ (b) iron ☐ (c) iodine ☐ (d) vitamin C ☐

B. Write 'T' for true and 'F' for false statements.

1. Rice is rich in proteins. ☐
2. Fats are the store house of energy. ☐
3. We must throw away the water in which pulses are soaked. ☐
4. Most fruits and vegetables contain water. ☐
5. Chapatis alone provide our nutritional requirement. ☐

C. Fill in the blanks with the correct words.

Fats Iron balanced starch warmth

1. Sugar and _____ are the two main types of carbohydrates found in our food.
2. _____ are the best energy-giving foods.
3. Fats also provide _____ to our body.
4. _____ is necessary for the formation of hemoglobin.
5. A _____ diet is necessary for good health.

D. Give one word for each one of the following.

1. This gives more energy than carbohydrate _____
2. A vitamin required to fight against diseases _____
3. Diseases caused due to lack of nutrients _____
4. Deficiency of this mineral causes goitre _____
5. This vitamin is formed by our body in sunlight _____

E. Answer the following questions in short.

1. Name the five nutrients in food.
2. Why are proteins called body-building foods?
3. Name the two kinds of carbohydrates.
4. Why must we not wash fruits and vegetables after peeling?
5. What are the symptoms of scurvy?

F. Answer the following questions.

1. How will you test presence of starch in food items?
2. Why do children need more proteins than adults?
3. What is a balanced diet? Is it same for all? Explain.
4. What is a deficiency disease? What happens if the diet is deficient in proteins and carbohydrates over a period of time?
5. Is it necessary to eat expensive foods to have a balanced diet? Explain.



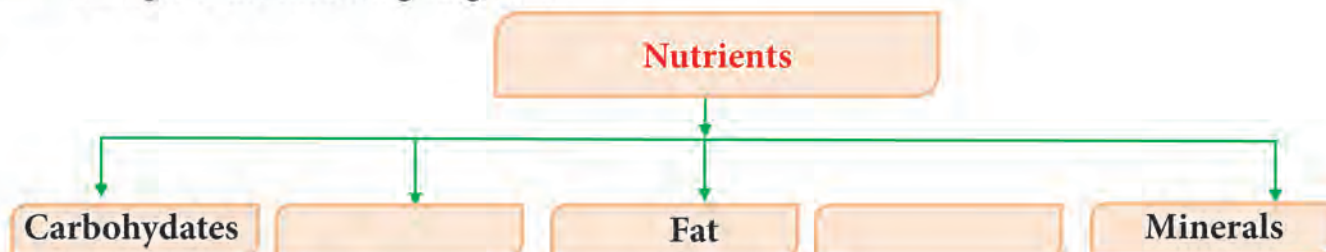
HOTS (Think and Answer)

1. Why do you think a child who eats fried foods is fatter than a child who eats roasted snacks?
2. Why do you think we must include salad in our diet?



Let's Recall

Complete the following diagram.



Group Discussion

Make a group of 5–6 students. Discuss the following points

- (i) nutrients (ii) balanced diet (iii) deficiency diseases



Activity to do

Find the nutrients in the food you eat in a day.

Meal	List of food eaten	Carbohydrate	Fat	Protein	Vitamin
Breakfast	1. 2. 3.				
Mid-morning snacks	1. 2. 3.				
Lunch	1. 2. 3.				
Evening Snack	1. 2. 3.				
Dinner	1. 2. 3.				



Creative Task

Create a recipe for a snack that you would give someone who is overweight and watching their calorie intake.



WORKSHEET-1

Find words related to food and nutrition that you have learnt in the lesson in the grid given below. Circle them.

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