

Chapter 1

Components of food

Points to be studied:

- 1.1 Food
- 1.2 Components of food
 - Carbohydrate
 - Protein
 - Fat
 - Vitamin
 - Minerals (Salts)
 - Water
 - Roughage
- 1.3 Balanced diet

1.1 Food :

When we get hungry, we take food items from plants and animals as a food. Our body gets energy from food which increases the working capacity of our body. This food is responsible for growth and development of our body. Which part of plants and animals we eat mainly in the form of food?

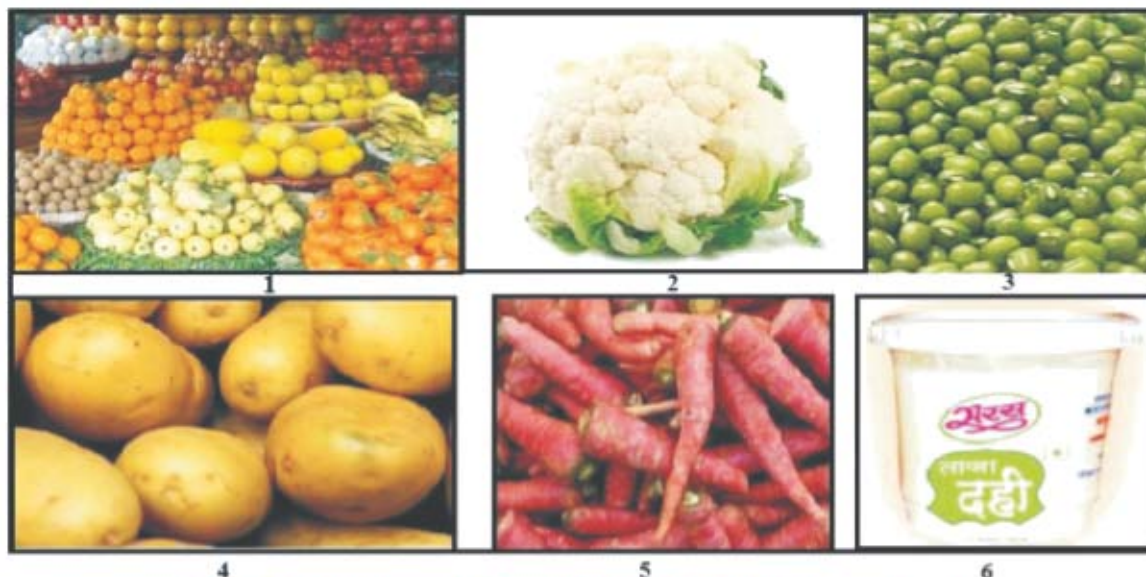


Fig 1.1: Main food material included in our food.



Food is beneficial to us in what ways?

Let us learn -

- Food Provides energy to do work.
- Food helps in growth, development and building of body.
- It also provides protection from diseases
- Nutrition Food develop physical as well as mental development sharp wit along with healthy body.
- Necessary for growth of body .
- Helpful in body building.

1.2 Components of food

The Ingredient of food which is beneficial for our body growth and development called as components of food.

What are those components of the food? Let's find out. The following are the main components of food:

- (I) Carbohydrate (II) Protein (III) Fat (IV) Vitamin
(V) Minerals (Salts) (VI) Water (VII) Roughage

Do all types of food component works alike?

Let's learn.

On the basis of works we can classify components of food as shown in Fig 1.2

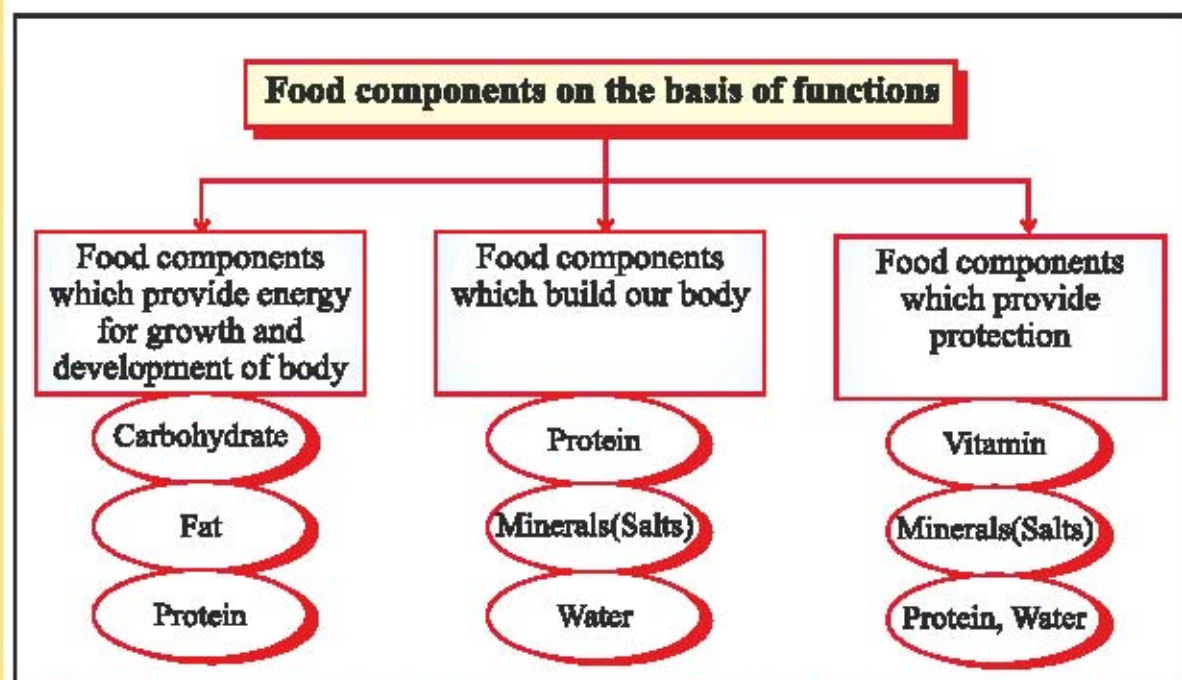


Fig. 1.2 Classification of components of food on the basis of functions

(I) Carbohydrate-

When we play, climb at an altitude, run or work hard, we get tired. Tell me why? Because when we do the hard work our bodies tend to spend the accumulated energy in more quantity. To get this energy instantly, we drink glucose solution. Glucose is a type of carbohydrate by which we get energy instantly.

Carbohydrates are the body's main source of energy and strength. It consists of carbon, hydrogen and oxygen elements. These elements are stored in body in the form of Glycogen. It decomposes by the process of respiration and release energy as needed. Carbohydrates are mainly of two types. Types of Carbohydrates and their sources are depicted in a figure 1.3.

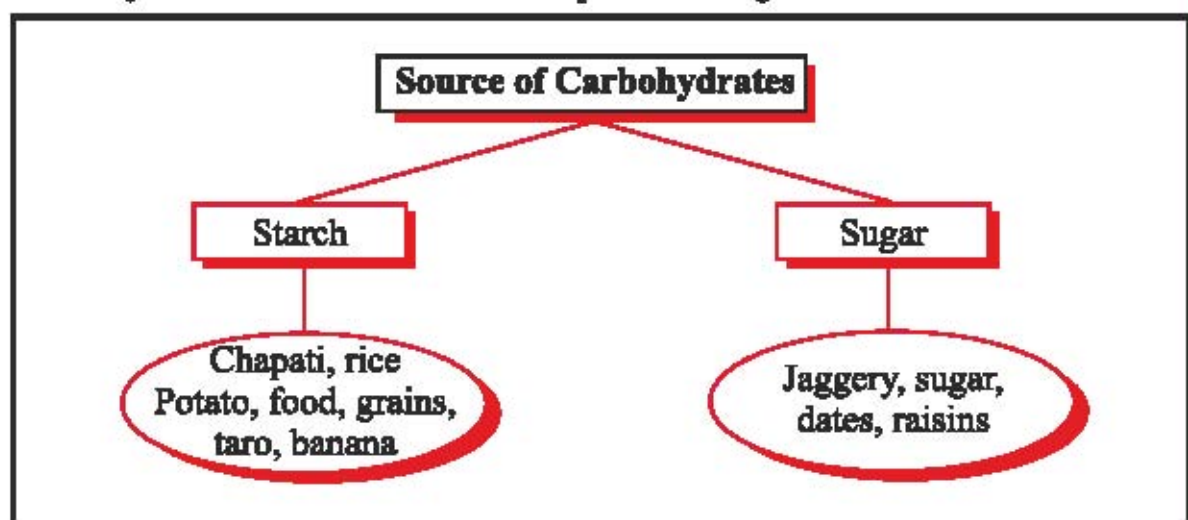


Fig 1.3 : carbohydrate - Type and sources



Fig.1.4 Source of carbohydrate in food

1gm of carbohydrate gives apporximatey 4 calory of energy

How much beneficial these Carbohydrate are for our body? Let's learn -

Functions of Carbohydrate -

- (i) Provide energy to body
- (ii) Control body temperature.
- (iii) Keep cells, Tissues & Body parts active.

Note : If carbohydrate is not included in our food we loose working capacity of our body.

Activity 1

Take two test tubes mark 1 and 2 on it. Take a boiled potato, prepare paste of it and put into a test tube No. 1. Add some water and shake the mixture. In test tube No. 2 add some plain water. Put down two drops of iodine solution in both the test tubes carefully, shake and observe. Tell me what is going to change? Test tube No. 1 potato mixed solution turns blue while test tube no. 2 containing plain water shows no change. Hence on the basis of this test we concluded that starch gives blue color by reacting with iodine solution. This is a starch test method.

(II) Protein-

Protein is necessary for biochemical reactions going on in cells and is essential for cell growth and repair. Body derives nitrogen from protein. They commonly consist of amino acids made by carbon, hydrogen and nitrogen elements. Sources of protein in our diet are as follows:

Source of protein in food -

Pulses, fish, egg, sprouted seeds, soybeans, leguminous vegetables, peas etc are the main sources of protein.

This protein is advantageous in which manner? Let's learn:



Eggs

Milk

Fig. 1.5 : Sources of animal protein



Soyabean

Pulses

Fig. 1.6 : Sources of Plant protein

Functions of protein -

- (i) Build the body.
- (ii) Growth and development of body.
- (iii) Provide mental strength.
- (iv) In construction of enzymes which help in food digestion.
- (v) Provide energy to body in the absence of fat and carbohydrates.
- (vi) They are helpful in cell division and repairing damage.
- (vii) Protein plays an important role as a enzymes in various biochemical reactions.

Special:

- (I) Our food contains ingredient of protein in proper amount than growth and development of body takes place properly.
- (II) Protein intake in childhood adolescence should do more.

Activity 2:

Let's do an experiment for the presence of protein in foods.

Take thick aqueous solution of gram flour in a clean test tube. Add two-three drops Copper Sulphate(CuSO_4) and ten to twelve drops of caustic soda shake well. After some time observe the test tube. What changes are visible on observation? We see that the color of the mixture turned purple.

Protein reacts with CuSO_4 & Caustic Soda than Converts into purple solution.

It proves that the protein component is present in flour.

(III) Fat-

The fats are organic compounds found in cells which are insoluble in water. These are esters of Glycerol. Fat is manufactured by Carbon, Oxygen and hydrogen elements. The energy is stored as fat in our body. Our body gets highest energy from fat. Fat as a solid called as 'Charbi' and as liquid, oily fats. It is smooth and called as body's energy Centers. Where fat comes from? Figure 1.7 helps us to know about the source and the type of fat: -

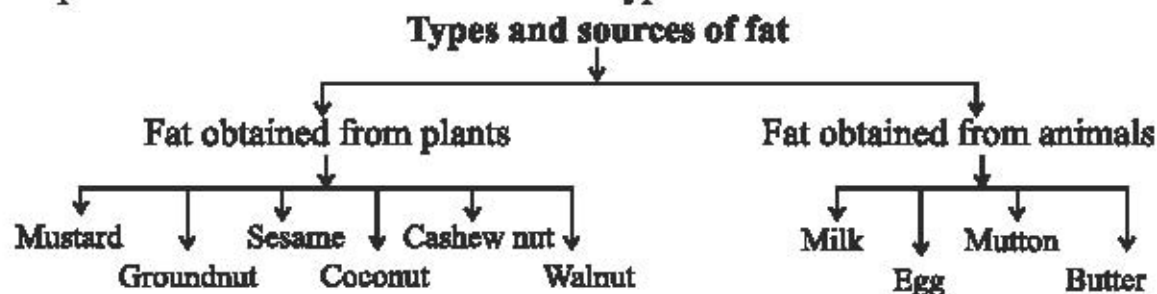


Fig 1.7 Types and sources of fat



So we can see that fats are obtained from both types of food, animals plants. How much beneficial these fats are for our body ? Let's learn -

Function of fat

- (i) Provide more energy to the body.
- (ii) Provide strength to Muscles.
- (iii) It makes a layer Under the skin
toned shape to body. Excess of fat
make the body unshaped
- (iv) Protect internal organs of the body
from external shocks.



Fig. 1.8 Major sources of fat in our food.

Special:-

- (1) Higher amounts of fat is accumulated in camel's hump, due to this the camel can live without food for many days.
- (2) Presently child uses junk food more. It increases obesity because it has high amount of fat.

Activity 3:

Take two white blank papers. Put small amount of butter on first paper and on another paper put 2-3 drops of water. Leave both the papers open for some time. Then observe it. What are visible? On the first paper oil spread more, and the paper has to be sleek as well became translucent when put across the sun. On the second paper water dried up and there are no change. This is a general method of test of fats. We concluded on the basis of that fat is smooth and oily.

(IV) Vitamin -

Such inorganic food material whose small amount is useful for growth and development of our body is called vitamins. It is not synthesized in animal body.

How vitamins are useful to our growth and development? Let's learn:

Function of vitamin:

- | | |
|---------------------------------|---|
| (i) For normal growth of body. | (ii) For normal appetite. |
| (iii) To keep the body healthy. | (iv) For maintaining digestion process. |
| (v) For enhancement of immunity | |

Special: 15 vitamins have been discovered till today in which 6 are major.



Fig 1.9 - Major Vitamins

Let us Come, get information with the help of following table 1.1

Table 1.1- Vitamins and their sources

S. No.	Name of Vitamin	Sources
1	Vitamin-A	Milk, green vegetables, carrot, papaya etc.
2	Vitamin-B	Milk, pulses, egg, soybean, fruits
3	Vitamin-C	Lemon, orange, gooseberry, tomato, guava
4	Vitamin-D	Milk, fish, egg, butter, sun rays
5	Vitamin-E	Milk, green vegetables, butter, Bran
6	Vitamin-K	Green vegetables, Jeera(Cumin), Soybean, Tomato

(V) Minerals

For proper growth, development and building of our body we must take certain amounts of minerals per day in a diet. The number of minerals that are found in our body is nearly 24 but main useful minerals are Calcium, Magnesium, Phosphorus, Iron, Copper, Potassium etc. Where do we get minerals? Let's get information: -

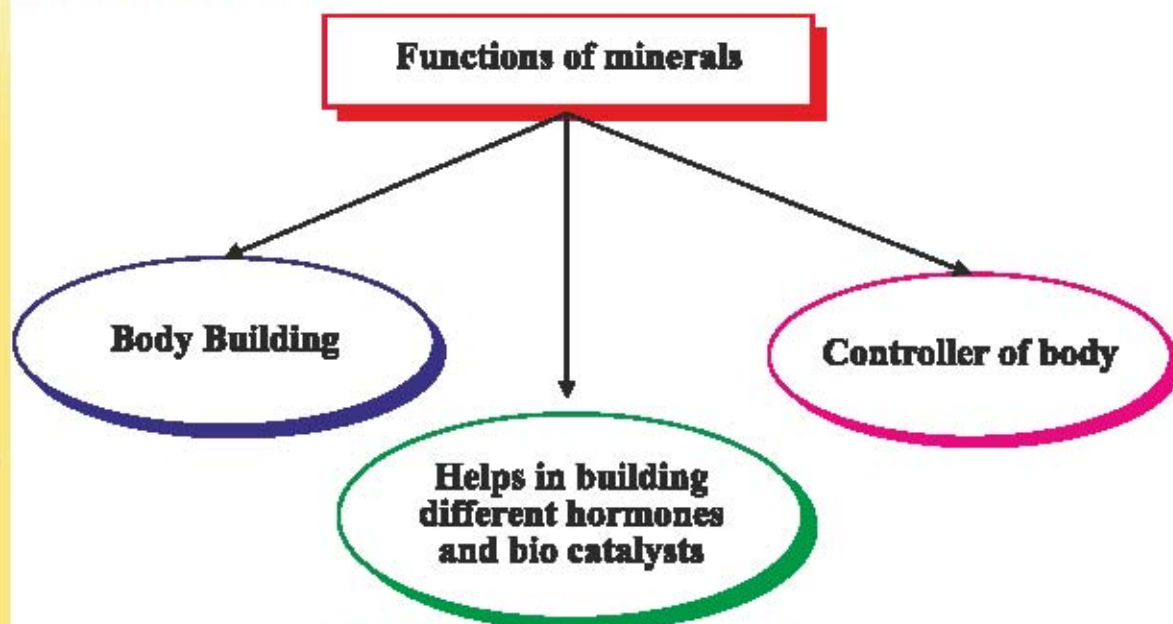
Source of minerals

Mineral salts are mainly received from milk, yogurt, green leafy vegetables, figs, fresh fruit, etc.



Fig 1.10 - Minerals in food



Functions of minerals**Fig 1.11 Functions of minerals****(VI) Water**

Water is very essential ingredient of our body. 70 percent of our body is water. Water acts as a solvent in the body and control the body temperature, may also protect us from many diseases.

Water helps to eliminates harmful substances present in our body. It consists of hydrogen (H_2) and Oxygen (O_2).

Do you know?

- The amount of water in various organs of the body also varies (for example in liver 69 % and in muscles 75%)
- The amount of water in our body is about 70 percent. We required 2-3 liters of water per day.
- In watermelon water is present up to 95%.

(VII) Roughage

A fibrous substance called cellulose is found in shelled corn, fruit, carrot, radish, spinach, okra, beans, cabbage, etc. which we consume in diet. These fibers are called as 'roughage'.

Roughage functions in our body as follows -

Function of Roughage :-

- (i) Roughage helps in the digestion of food.
- (ii) Food is not cling to intestine due to roughage.
- (iii) Roughage absorbs toxic substances and water produced during digestion.
- (iv) Roughage absorbs glucose from the body as a result of which blood sugar remains in controlled and there is a reduced risk of diabetes.

Fiber-rich foods enhance health

1. Fiber rich grains such as corn, beans, pulses etc must include in diet.
2. Eat fruits such as apple, pear and guava with peelings because they contain more fiber.
3. Radishes, cabbage, peas, cucumber, etc. have high amounts of fiber so we must take them.
4. Salads, oatmeal, nuts, peanuts are also good sources of fiber.
5. Please use flour instead of Maida(fine flour).
6. Eat brown rice and oats.

Activity 4 -

We are aware of the different types of food material that we receive as food. Information about the source of food materials and food components present in them is revised by filling Table No. 1.2 -

Table No. 1.2: The source of food materials and food components present in them

S.N.	Food name	Source of food		Component of food present
		Plants	Animal	
1	Rice	√	—	Carbohydrate
2				
3				
4				
5				
6				



This is evident from the table that in every food item, some food ingredient is present.

Disease caused by deficiency of nutritive elements -

Disease due to deficiency of nutritive elements or ingredients of food is called nutrition deficiency disease. Consumption of balanced diet can help in preventing these diseases.

Table 1.3: Various nutritional deficiency diseases and their symptoms

S.N.	Components of food	Deficiency caused disease	Symptoms of disease
1	Carbohydrate	Weakness	Decline in working capacity
2	Protein	Kwashiorkor	stunted growth, anemia, swollen legs
3	Fat	weakness in body	weakness, low energy
4	Vitamin A	Night blindness	poor vision
	Vitamin B	Beriberi	weakness
	Vitamin C	Scurvy	teeth and gum problems
	Vitamin D	rickets	Deformed and soft bones
	Vitamin E	low reproductive capability	low reproductive capability
	Vitamin K	delayed blood clotting	excessive bleeding
5	Minerals (Salts)		
	Calcium, Phosphorus	weakness in teeth and bones	weakness in bones
	Iron	deficiency of hemoglobin in blood	Weakness and feeling tired.
	Iodine	goiter	swelling of thyroid glands

1.3 Balanced diet

Normally food items we receive throughout the day, called as diet (food). For our body's regular growth, development and health, our diet must contain all components in a certain proportion and appropriate amount. This type of diet is called balanced diet.

Needed amounts of ingredients of balanced diet for children of 10-18 years are given in Table 1.4.

Table 1.4: Balanced diet (for age group of 10 to 18 years)

S.N.	Components of food	Quantity
1	Carbohydrate	130 to 150 gram
2	Protein	78 gram
3	Fat	22 gram

4	Vitamin	as per need
5	Minerals(Salts)	660 Mg
6	Water	2 to 3 liter as per need
7	Roughage	as per need

Our body's growth and development and to keep disease free, we should always take clean and balanced food.

What have you learnt:

1. Major components of food are as follows - Carbohydrate, Protein, Fat, Vitamins, Minerals (salts), Water and Roughage.
2. The lack of nutrients in food, our body is likely to be various diseases.
3. For our body's regular growth, development and health, our diet must contain all components in a certain proportion and appropriate amount. This type of diet is called balanced diet.
4. Deficiency of Vitamin A causes night blindness and Vitamin B deficiency causes beriberi disease.
5. For physical development, food nutrients as well as minerals are necessary.

□□□

Exercises

Choose the most appropriate option -

1. Which elements is found in protein -
 (a) Calcium (Ca) (b) Magnesium (Mg)
 (c) Boron (B) (d) Nitrogen (N) ()
2. Which vitamin's deficiency caused a night blindness disease -
 (a) Vitamin B (b) Vitamin C
 (c) Vitamin A (d) Vitamin K ()

Fill in the blanks -

1. Deficiency of vitamin C in diet causes..... disease.
2. Deficiency of causes beriberi disease.



3. Fat isin water.
4. Water acts as a in the body
5. Fibrous substance calledis found in food substances.

Short answer questions -

1. Define balanced diet.
2. Write two functions of protein ?
3. Write two vitamin's name and disease caused by deficiency of them.
4. What is roughage, give two examples?

Large answer questions -

1. Write down names of major sources of energy and describe any two sources.
2. Why is balanced diet necessary for our body?
3. Why are minerals necessary for our diet?
4. Prepare a chart of weekly menu of MDM provided by your school.

Activity:

1. Prepare a chart of food components, sources, impact, diseases caused by deficiency and excess of it and demonstrate in a classroom.
2. Do a role play on a disease caused by deficiency of food components with the help of teacher. "Come, keep the disease away" prepare an article on it and do act.

