

Importance of Carbohydrates:

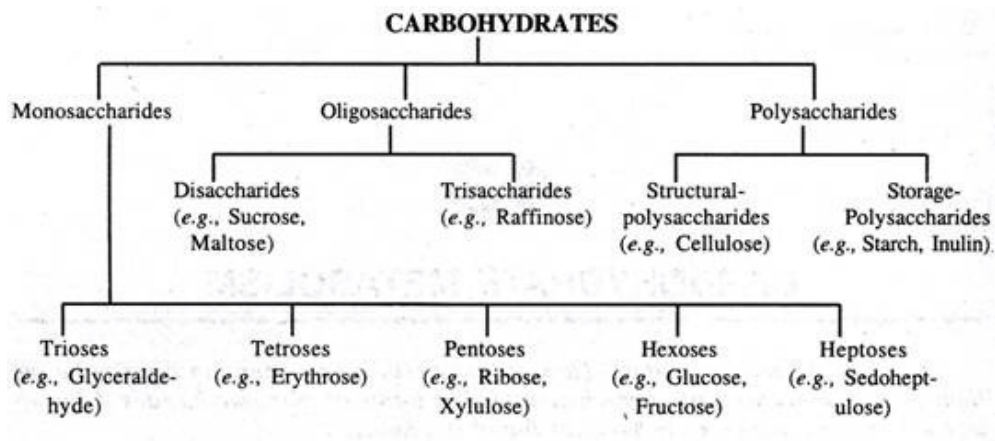
Carbohydrates are one of three macronutrients, along with proteins and fats that our body requires daily.

Carbohydrates are the sugars, starches and fibres present in the products of fruits, grains, vegetables and milk. They are the primary source of energy for the body. They contain carbon, hydrogen, and oxygen at the chemical level.

Carbohydrates are our body's main source of energy. They help fuel your brain kidneys heart muscles and central nervous system. Fibre is a carbohydrate that aids in digestion helps you feel full and keeps blood cholesterol levels in check. Our body can store extra carbohydrates in your muscles and liver for use when you're not getting enough carbohydrates in your diet. A carbohydrate-deficient diet may cause headaches fatigue weakness difficulty concentrating nausea constipation bad breath and vitamin and mineral deficiencies.

Carbohydrates can be classified on the basis of their behaviour on hydrolysis. They are mainly classified into three groups:

1. Monosaccharides
2. Disaccharides
3. Polysaccharides



1. Monosaccharides

Monosaccharide carbohydrates are those carbohydrates that cannot be hydrolyzed further to give simpler units of polyhydroxy aldehyde or ketone. If a monosaccharide contains an aldehyde group then it is called aldose and on the other hand, if it contains a keto group then it is called a ketose.

2. Disaccharides

On hydrolysis, disaccharides yield two molecules of either the same or different monosaccharides. The two monosaccharide units are joined by oxide linkage which is formed

by the loss of water molecule and this linkage is called glycosidic linkage. Sucrose is one of the most common disaccharides which on hydrolysis give glucose and fructose. Maltose and Lactose (also known as milk sugar) are the other two important disaccharides. In maltose, there are two α -D-glucose and in lactose, there are two β -D-glucose which are connected by oxide bond.

3. Polysaccharides

Polysaccharides contain long monosaccharide units joined together by glycosidic linkage. Most of them act as food storage for e.g. Starch. Starch is the main storage polysaccharide for plants. It is a polymer of α glucose and consists of two components- Amylose and Amylopectin. Cellulose is also one of the polysaccharides that are mostly found in plants. It is composed of β -D- glucose units joined by a glycosidic linkage between C1 of one glucose unit and C4 of the next glucose unit.

Importance of Carbohydrates:

1. Carbohydrates provide energy and regulation of blood glucose.
2. It will prevent the degradation of skeletal muscle and other tissues such as the heart, liver, and kidneys.
3. It prevents the breakdown of proteins for energy.
4. Carbohydrates also help with fat metabolism. If the body has enough energy for its immediate needs, it stores extra energy as fat.
5. Carbohydrates are an important component of many industries like textile, paper, lacquers and breweries.
6. Detoxification of physiological importance is carried out to some extent with carbohydrate derivatives.
7. Agar is polysaccharide used in culture media, laxative and food.
8. Carbohydrates form a part of genetic material like DNA and RNA in the form of deoxyribose and ribose sugars.
9. Hyaluronic acid found in between joints acts as synovial fluid and provides frictionless movement.
10. They help make up the body mass by being included in all the parts of the cell and tissues.
11. Adequate storage of hepatic glycogen helps in detoxifying a normal liver.
12. They form components of bio-molecules which have a key role in blood clotting, immunity, fertilization etc.
13. Carbohydrate, basically the main fibre of the diet that provides the bulk fibre for better digestion.
14. Carbohydrates help clear gut and prevent constipation.
15. Starch is the form the food is stored in plants.
16. It provides sweetness to foods.
17. Pectine and Hemicellulose are the structural carbohydrate in plant cell walls.
18. It plays important roles in cellular recognition processes.
19. cell walls of plants are made of cellulose and Chitin forms the cell wall of fungi and the outer exoskeleton of insects.
20. Bacterial cell walls are made of peptidoglycan (also called murein), which is made from polysaccharide.