Summary

Carbohydrates are very important biomolecules occurring in nature as part of plant and animal tissues and also produced by microbes. The carbohydrates were earlier named on the basis of their sources e.g. sucrose from cane sugar, fructose from fruits, maltose from malt etc. Carbohydrates were initially thought to be hydrates of carbon. However, their structure reveals that these are polyhydroxy compounds with an aldehyde or a ketonic group in the chain. The chain may contain three monosaccharide units to hundreds of them.

Food scientists classify carbohydrates into three main categories depending upon the complexity of structure. These categories are simple sugars comprising of mono- and disaccharides, oligosaccharides with 3 to 9 monosaccharide units in them and polysaccharides having more than 9 such units. The polysaccharides are further divided into two types; starch and non-starch polysaccharides. The latter also called dietary fibre includes cellulose and hemicelluloses, pectin and hydrocolloids.

All the carbohydrates depict properties which yield them great utility. They provide sweetness to foods and have good water absorbing ability. They lower the freezing point, increase boiling point and change colour and flavour on heating. The last property is known by the terms caramelization and Maillard reaction. These are known as non-enzymatic browning reactions. The sugars on cooking or heating show non-enzymatic browning while the starches undergo gelatinization and retrogradation. Another characteristic property of carbohydrates is their existence in two forms called α and β forms. It is referred to as mutarotation and depicts a change in optical activity. All types of carbohydrates find applications in food industry. They are used as thickeners, sweeteners, binders, gelatinizers, fat replacers and find use in frozen desserts and ice creams because of their ability to lower the freezing point etc. Besides their application in food preparation and processes, carbohydrates

have a lot of nutritional and clinical importance. The simple sugars are good energy sources while the complex ones, especially the non-starch polysaccharides are good sources of dietary fibers.