

Classification of carbohydrates

Carbohydrates, also called Carbs, are defined as aldehydic or ketonic compounds with a some number of oxydrilic groups (so polyhydroxy aldehydes or ketones as well).

Many of them, but not all, have general formula $(CH_2O)_n$ (only molecules with $n > 4$ are considered carbohydrates); some, in addition to carbon (C), oxygen (O) and hydrogen (H), include nitrogen or sulfur.

On the basis of the number of forming units, three major classes of carbohydrates can be defined: monosaccharides, oligosaccharides and polysaccharides.

- Monosaccharides or simply sugars are formed by only one polyhydroxy aldehydeidic or ketonic unit.

The most abundant monosaccharide is D-glucose, also called dextrose.

- Oligosaccharides are formed by short chains of monosaccharidic units (from 2 to 20) linked one to the next by chemical bounds, called glycosidic bounds.

The most abundant oligosaccharides are disaccharides, formed by two monosaccharides, and especially in the human diet the most important are sucrose (common table sugar), lactose and maltose. Within cells many oligosaccharides formed by three or more units do not find themselves as free molecules but linked to other ones, lipids or proteins, to form glycoconjugates.

- Polysaccharides are polymers consisting of 20 to 10^7 monosaccharidic units; they differ each other for the monosaccharides recurring in the structure, for the length and the degree of branching of chains or for the type of links between units.

Whereas in the plant kingdom several types of polysaccharides are present, in vertebrates there are only a small number.