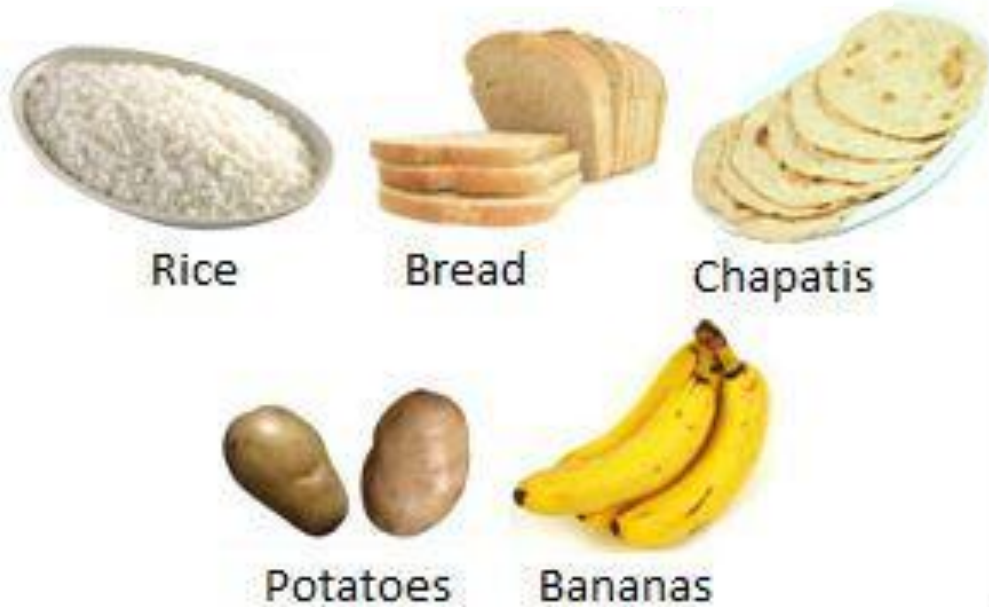


# *Qualitative test of carbohydrates*

**Foods high in carbohydrates:**



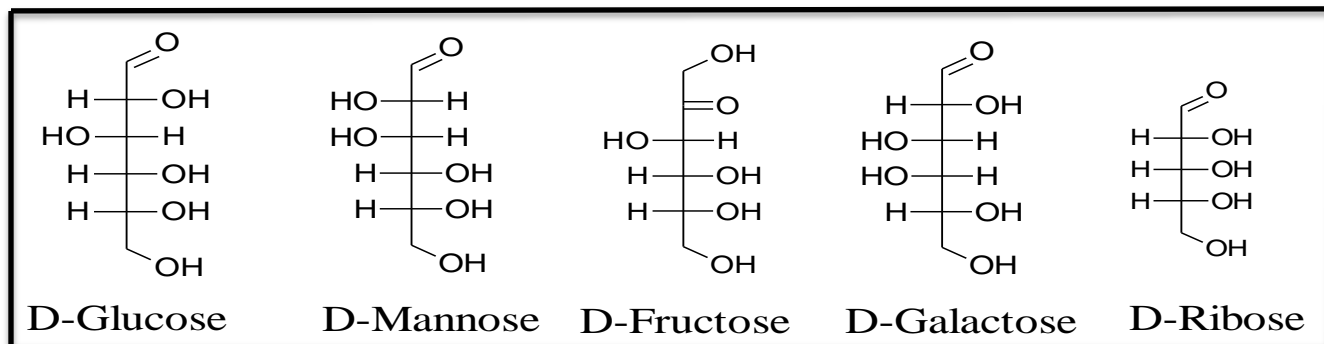
# Carbohydrates

## Carbohydrates:

They are polyhydroxy aldehydes or ketones compounds. The general formula is  $(CH_2O)_n$ , when (n) ranges from three to several thousand. The structure involves only two functional groups ( ketone or aldehyde carbonyls and alcohol hydroxyl groups ). Carbohydrates are classified into;

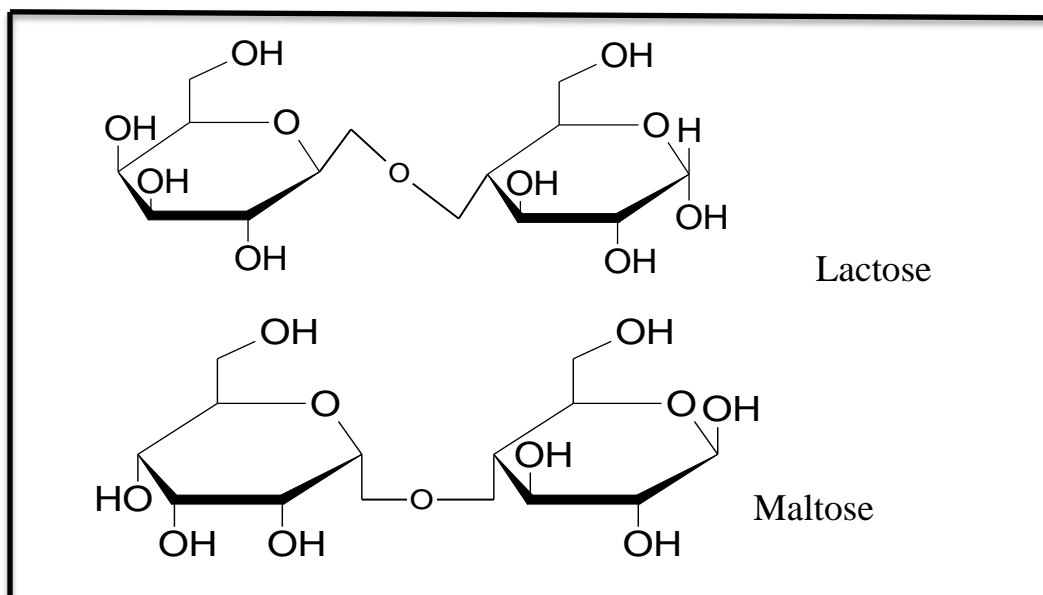
### 1- Monosaccharaides :

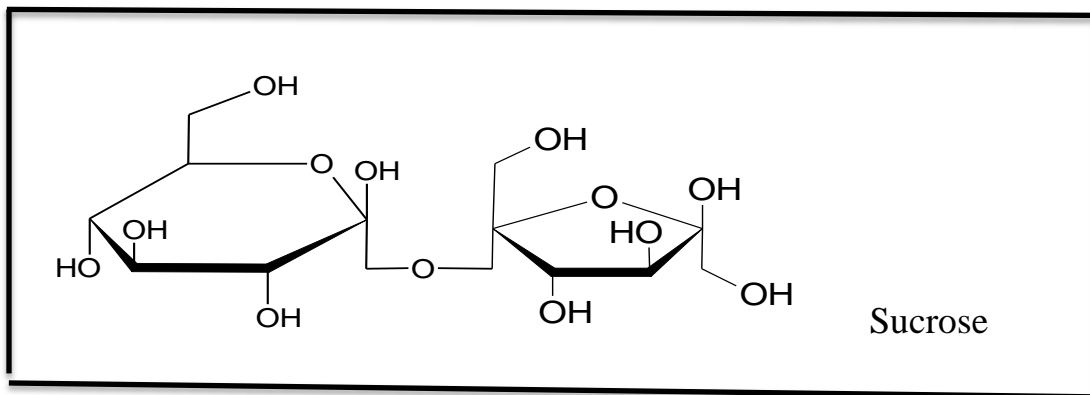
Monosaccharides are the simplest carbohydrates, they cannot be hydrolyzed to simpler chemical compounds. They classified as trioses, tetroses, pentoses, hexoses and heptoses ( depending on the number of carbon atom ) and classified as aldoses or ketoses depending upon whether they have an aldehyde or ketone group. The most important are:



### 2- Disaccharides :

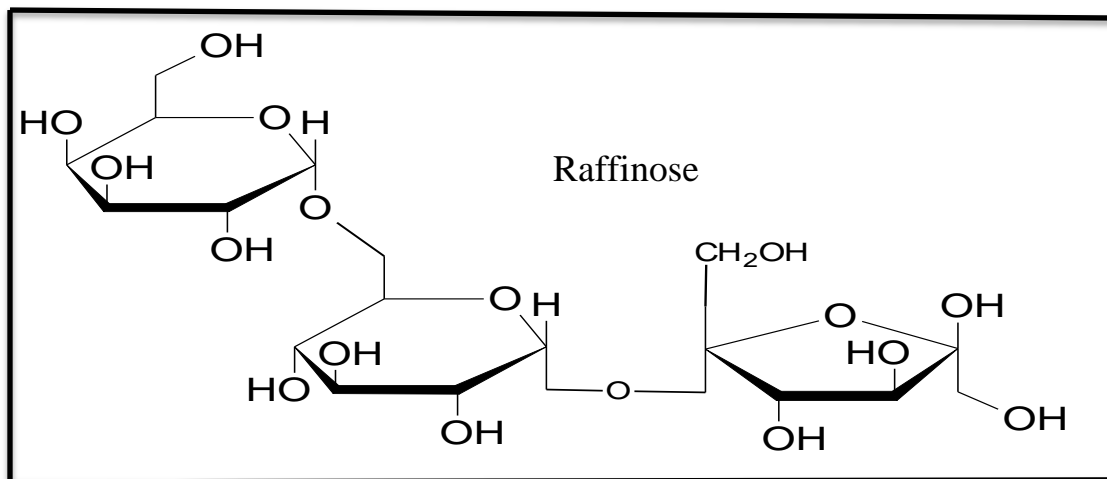
Disaccharides are sugars containing two of monosaccharides joined by glycosidic bond ( C-O-C ) and these are the simplest polysaccharides. Three common examples are:





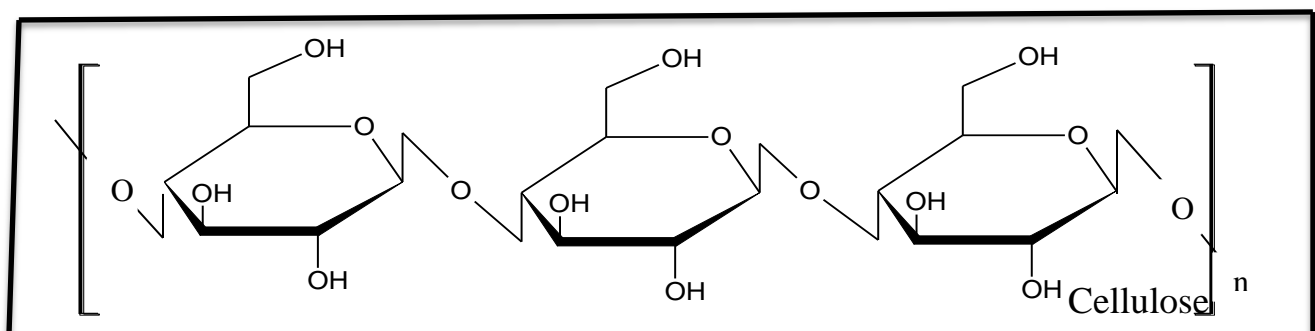
### 3- Oligosaccharides :

They are sugars containing three to ten monosaccharide joined by glycosidic bond.



### 4- Polysaccharides :

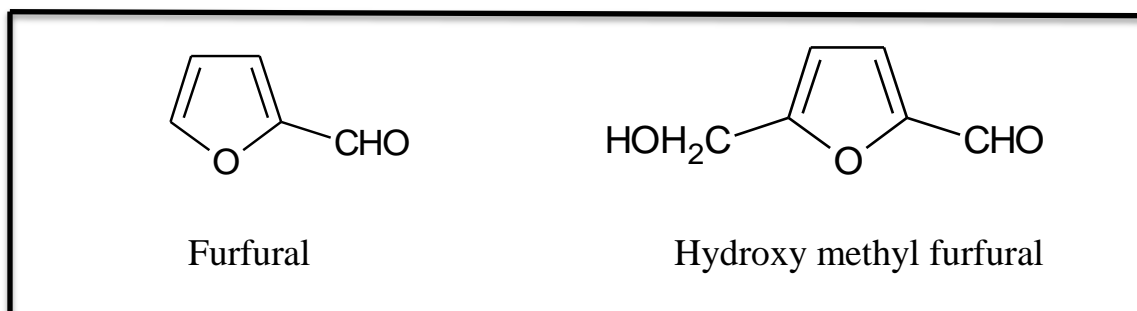
They are sugars of high molecular weight, such as polymers of monosaccharides. Examples include storage polysaccharides such as starch and glycogen, and structural polysaccharides such as cellulose and chitin. All polysaccharides are not reduced because of their large molecular weight, although they contain OH group.



## Qualitative tests of Carbohydrates

### 1- Molisch's test :

It is a general test of carbohydrate based on the dehydration of carbohydrate by using strong acid such as sulfuric acid  $H_2SO_4$ . Pentoses are dehydrated to furfural, while hexoses are dehydrated to hydroxy methyl furfural, then furfural reacts with  $\alpha$ -naphthol to give violet colored product (purple ring).



### Method :

- 1 – In a clean and dry test tube, 2 drops of  $\alpha$ -naphthol are added to 0.5 ml of sugar solution and mixed well.
- 2 – A small amount of concentrated sulfuric acid is slowly added down the sides of the sloping test tube without mixing.
- 3 – The violet colored product (purple ring) will appear between two layers (water and organic layers).

