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INTRODUCTION TO CARBOHYDRATES

What are Carbohydrates?

Carbohydrates are **organic compounds** made up of **Carbon (C)**, **Hydrogen (H)**, and **Oxygen (O)**

General formula: **(CH₂O)**

They are the **primary source of energy** for living organisms

Functions of Carbohydrates:

Provide energy (Glucose)

Store energy (Starch, Glycogen)

Structural role (Cellulose)

Examples:

Sugar, rice, wheat, fruits

MONOSACCHARIDES

Definition:

Simplest form of carbohydrates cannot be hydrolyzed into smaller sugars

Examples:

Glucose

Fructose

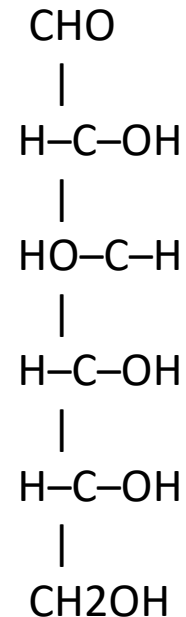
Galactose

Based on number of carbon atoms:

Trioses – 3 carbons

Pentoses – 5 carbons (Ribose)

Hexoses – 6 carbons (Glucose)



Glucose

Oligosaccharides

Contain **2–10 monosaccharide units**

Mostly **disaccharides**

Examples:

Sucrose = Glucose + Fructose

Lactose = Glucose + Galactose

Maltose = Glucose + Glucose

Polysaccharides

Contain **more than 10 monosaccharide units**

Generally insoluble and non-sweet

Examples:

Starch – Storage carbohydrate in plants

Glycogen – Storage carbohydrate in animals

Cellulose – Structural component of plant cell wall

Derived Carbohydrates

Formed by modification of monosaccharides

Examples:

Amino sugars – Glucosamine

Sugar alcohols – Sorbitol

Sugar acids – Gluconic acid