

## 4.1: Sugar Chemistry (ADD US)

Chemically, sugar consists of carbon (C), oxygen (O), and hydrogen (H) atoms, and is classified as a **carbohydrate**. There are three main groups of sugars, classified according to the way the atoms are arranged together in the molecular structure. These groups are the following:

- **Monosaccharides** or simple sugars. **Dextrose (glucose)** is the major monosaccharide. Others are **levulose** or **fructose** (found in honey and many fruits), and galactose, which is a milk sugar. Such sugars do not readily crystallize. (Mono means one, indicating that the sugar consists of only one molecule.)
- **Disaccharides** or complex sugars. Sucrose (common sugar) is the primary example of a disaccharide. Maltose, found in cereals, and **lactose**, found in milk, are others.
- **Polysaccharides**. Examples are starches, dextrans, and cellulose.

Bakers are not concerned with polysaccharides but rather with the monosaccharides and disaccharides. The latter two both sweeten, but they cannot be used interchangeably because they have different effects on the end product. These differences are touched on later in the book.

### Sugar Names

It is helpful to understand some of the conventions of the names of different sugars. Note that sugar names often end in “ose”: sucrose, dextrose, maltose, lactose, etc. **Sucrose** is the chemical name for sugar that comes from the cane and beet sugar plants.

Note that glucose is the chemical name for a particular type of sugar. What is sometimes confusing is that glucose occurs naturally, as a sugar molecule in substances such as honey, but it is also produced industrially from the maize plant (corn).

The Canadian Food and Drug Regulations (FDR) govern the following definitions:

- **Sugars:** All monosaccharides and disaccharides. Used for nutrition labelling purposes.
- **Sweetening agent:** Any food for which a standard is provided in Division 18 of the Food and Drug Regulation, or any combination of these. Includes sugar (sucrose), sugar syrups, and molasses derived from sugar cane or sugar beet, dextrose, glucose and syrups, honey and lactose. Excludes sweeteners considered to be food additives.
- **Sweetening ingredient:** Any sugar, invert sugar, honey, dextrose, glucose, or glucose solids, or any combination of these in dry or liquid form. Designed for sweetening fruits, vegetables, and their products and substitutes.
- **Maple syrup:** The syrup obtained by the concentration of maple sap or by the dilution or solution of a maple product, other than maple sap, in potable water.
- **Sweetener:** Any food additive listed as a sweetener. Includes both sugar alcohols and high intensity- sweeteners such as acesulfame-potassium, aspartame, and sucralose.
- **Sugar alcohols:** Food additives that may be used as sweeteners. Includes isomalt, lactitol, maltitol, maltitol syrup, mannitol, sorbitol, sorbitol syrup, xylitol, and erythritol.

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