

# CARBOHYDRATE METABOLISM

---

**Carbohydrate metabolism** is the whole of the biochemical processes responsible for the metabolic formation, breakdown, and interconversion of carbohydrates in living organisms.

Carbohydrates are central to many essential metabolic pathways.<sup>[1]</sup> Plants synthesize carbohydrates from carbon dioxide and water through photosynthesis, allowing them to store energy absorbed from the sunlight internally.<sup>[2]</sup> When animals and fungi consume plants, they use cellular respiration to break down these stored carbohydrates to make energy available to cells.<sup>[2]</sup> Both animals and plants temporarily store the released energy in the form of high-energy molecules, such as ATP, for use in various cellular processes.<sup>[3]</sup>

Although humans consume a variety of carbohydrates, digestion breaks down complex carbohydrates into a few simple monomers (monosaccharides) for metabolism: glucose, fructose, and galactose.<sup>[4]</sup> Glucose constitutes about 80% of the products and is the primary structure that is distributed to cells in the tissues, where it is broken down or stored as glycogen.<sup>[3][4]</sup> In aerobic respiration, the main form of cellular respiration used by humans, glucose and oxygen are metabolized to release energy, with carbon dioxide and water as byproducts.<sup>[2]</sup> Most of the fructose and galactose travel to the liver, where they can be converted to glucose.<sup>[4]</sup>

Some simple carbohydrates have their own enzymatic oxidation pathways, as do only a few of the more complex carbohydrates. The disaccharide lactose, for instance, requires the enzyme lactase to be broken into its monosaccharide components, glucose and galactose.<sup>[5]</sup>