OPEN ACCESS Freely available online

ISSN: 2167-7956
Journal of Biomolecular Research & Therapeutics

Perspective

Role of Carbohydrates in Human Health and Nutrition

Charles Carter*

Department of Biomolecules, The University of Sydney, Sydney, Australia

DESCRIPTION

Carbohydrates, often referred to as saccharides or sugars, are one of the three macronutrients essential for the proper functioning of living organisms. They are a diverse group of organic compounds made up of carbon, hydrogen and oxygen atoms. Carbohydrates serve as a primary source of energy for cells and play vital roles in various biological processes. Carbohydrates, exploring their classification, structure, functions, dietary significance and their role in human health and metabolism.

Types of carbohydrates

Monosaccharides: Monosaccharides are the simplest carbohydrates and cannot be broken down further into smaller sugar units. They consist of a single sugar unit and are often referred to as "single sugars". Common examples include glucose, fructose and galactose. Common disaccharides include sucrose (glucose+fructose), lactose (glucose+galactose) and maltose (glucose+glucose).

Polysaccharides: Polysaccharides are complex carbohydrates composed of many monosaccharide units linked together. They serve as energy storage molecules and structural components in cells. Examples of polysaccharides include starch (found in plants), glycogen (stored in animal tissues) and cellulose (the main component of plant cell walls).

The primary function of carbohydrates is to provide energy to cells. During digestion, complex carbohydrates are broken down into simple sugars like glucose, which is then transported through the bloodstream to cells for energy production through cellular respiration. In plants, carbohydrates are stored as starch, while in animals, glycogen serves as the primary storage form of carbohydrates. When the body requires energy between meals or during periods of physical activity, glycogen is broken down into glucose to meet energy demands. Carbohydrates also play a structural role in living organisms. In plants, cellulose provides rigidity to cell walls, giving strength and support to the plant structure. Chitin a type of polysaccharide is found in the exoskeletons of insects and crustaceans, providing support and protection. Carbohydrates are an essential part of the human diet and serve as a major source of energy. Foods rich in carbohydrates include grains (e.g., rice, wheat), fruits, vegetables, legumes and dairy products. Dietary carbohydrates are classified as simple or complex based on their chemical structure and how quickly they raise blood glucose levels.

Simple carbohydrates: Simple carbohydrates also known as sugars consist of one or two sugar units. They are quickly absorbed by the body and can cause rapid spikes in blood glucose levels. Sources of simple carbohydrates include table sugar, honey and sugary beverages.

Complex carbohydrates: Complex carbohydrates are composed of long chains of sugar units and take longer to be broken down and absorbed. Foods high in complex carbohydrates, such as whole grains, beans, and vegetables, provide a more sustained release of energy and are associated with better blood sugar control.

Carbohydrates play a significant role in human health but the quality and quantity of carbohydrate intake can impact overall well-being. A balanced diet that includes appropriate proportions of complex carbohydrates, fiber and simple sugars is essential for maintaining optimal health. Consuming an excessive amount of refined carbohydrates and added sugars can contribute to weight gain and obesity. On the other hand a diet rich in complex carbohydrates and fiber can promote satiety and aid in weight management. High intake of simple sugars can lead to rapid spikes in blood glucose levels stressing the body's ability to regulate blood sugar. Over time this can increase the risk of developing insulin resistance and type 2 diabetes. Choosing complex carbohydrates and fiber-rich foods can help stabilize blood sugar levels. Dietary fiber, a type of complex carbohydrate, is vital for maintaining a healthy digestive system. Fiber adds bulk to stools, promoting regular bowel movements and reducing the risk of constipation. Excess glucose can be stored as glycogen in the liver and muscles for later use. When the body's glucose needs are met, any surplus glucose is converted into fat and stored in adipose tissue.

Correspondence to: Charles Carter, Department of Biomolecules, The University of Sydney, Sydney, Australia, E-mail: carter@gmail.com

Received: 29-May-2023, Manuscript No. BOM-23-22353; **Editor assigned:** 01-Jun-2023, Pre QC No. BOM-23-22353(PQ); **Reviewed:** 15-Jun-2023, QC No. BOM-23-22353; **Revised:** 22-Jun-2023, Manuscript No. BOM-23-22353(R); **Published:** 30-Jun-2023, DOI: 10.35248/2167-7956.23.12.304

Citation: Carter C (2023) Role of Carbohydrates in Human Health and Nutrition. J Biol Res Ther. 12:304.