

The role of sucrose in human nutrition and health.

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Introduction

Sugar, in various forms, has been a part of the human diet for centuries. Among these sugars, sucrose holds a prominent place as a natural sweetener found in a wide range of foods and beverages. However, the consumption of sucrose has become a topic of concern in recent years due to its potential health impacts, particularly in excess. Understanding sucrose- Sucrose, commonly known as table sugar or simply "sugar," is a disaccharide composed of two simple sugars: glucose and fructose. It is naturally present in various plants, with sugar cane and sugar beet being the primary commercial sources of sucrose production. When sucrose is consumed, it is broken down in the digestive system into its constituent sugars, glucose, and fructose, before being absorbed into the bloodstream. Sources of sucrose in the diet- Sucrose is ubiquitous in the modern diet, present in a wide range of foods and beverages, both naturally occurring and added during food processing [1].

Some common sources of dietary sucrose include: Table sugar: sucrose is commonly used as a sweetener in homes and foodservice establishments. It is often added to coffee, tea, and a variety of baked goods. Fruits: many fruits, such as apples, bananas, and oranges, contain naturally occurring sucrose, along with other sugars like fructose and glucose. Vegetables: some vegetables, like carrots and sweet potatoes, also contain small amounts of sucrose. Processed foods: sucrose is frequently added to processed foods, including soft drinks, candies, desserts, and canned fruits. Condiments and sauces: many condiments and sauces, like ketchup and barbecue sauce, contain added sucrose for flavor enhancement. Metabolism of sucrose in the body- The metabolism of sucrose is a complex process that involves the breakdown of the disaccharide into its constituent monosaccharides, glucose, and fructose [2].

This process primarily occurs in the digestive system and involves the following steps: Digestion: enzymes in the digestive tract, such as sucrase, break down sucrose into glucose and fructose. Absorption: glucose and fructose are then absorbed into the bloodstream through the intestinal lining. Transport: once absorbed, glucose is transported to cells throughout the body, where it can be used for energy or stored as glycogen. Fructose is primarily metabolized in the liver. Metabolic fate: in the liver, fructose is converted into glucose, used for energy, or converted into fat and stored for later use. Hormone regulation: the hormone insulin plays a critical role

in regulating the utilization of glucose in the body. It helps facilitate the uptake of glucose by cells, regulating blood sugar levels. The impact of sucrose on health- The consumption of sucrose has been a topic of debate and research regarding its impact on human health [3].

Here, we'll explore some of the key considerations: Caloric content: sucrose, like all sugars, is a source of calories. Excessive calorie intake, including those from sucrose, can contribute to weight gain and obesity when not balanced with physical activity. Dental health: sucrose is a fermentable carbohydrate, and when consumed in excess, it can lead to dental cavities and tooth decay. Bacteria in the mouth metabolize sucrose, producing acids that erode tooth enamel. Blood sugar control: the consumption of large amounts of sucrose can lead to rapid spikes in blood sugar levels, potentially contributing to insulin resistance over time. Individuals with diabetes need to monitor their sucrose intake to manage blood sugar levels effectively. Cardiovascular health: some studies have suggested a link between high sucrose consumption and an increased risk of cardiovascular disease. Excess sugar intake can contribute to elevated triglyceride levels and unhealthy blood lipid profiles. Liver health: the metabolism of fructose, a component of sucrose, primarily occurs in the liver. Excessive fructose consumption has been associated with non-alcoholic fatty liver disease (NAFLD). Obesity: high sucrose intake has been linked to an increased risk of obesity, as excessive calorie consumption from sugary foods and beverages can contribute to weight gain. Behavior and addiction: some research suggests that sucrose may have addictive properties, leading individuals to consume it excessively, which can contribute to health problems associated with sugar consumption. Balancing sucrose intake- While there are concerns associated with excessive sucrose consumption, it's essential to recognize that sugar, including sucrose, can be part of a balanced diet when consumed in moderation [4,5].

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Received: 23-Aug-2023, Manuscript No. AAFTP-23-112966; Editor assigned: 25-Aug-2023, PreQC No. AAFTP-23-112966 (PQ); Reviewed: 01-Sep-2023, QC No. AAFTP-23-112966;

Revised: 13-Sep-2023, Manuscript No. AAFTP-23-112966 (R); Published: 18-Sep-2023, DOI:10.35841/2591-796X-7.5.193

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Citation: Tian Y. *The role of sucrose in human nutrition and health. J Food Technol Pres.* 2023;7(5):193