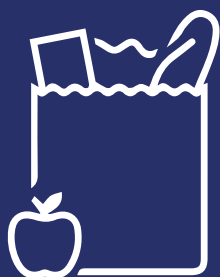




**World Sugar Research
Organisation**

Dietary Sugars & Diabetes



**Did
You
Know?**



Carbohydrates in the diet are broken down by the body into simple sugars like glucose, fructose and galactose. Glucose is the main sugar found in the bloodstream and is the primary source of energy for the body. Our bodies need to maintain a balanced and constant supply of glucose in the bloodstream because many organs (such as the brain) depend on glucose to work properly.

Diabetes

Diabetes is a leading cause of death worldwide, with currently 1 in 9 adults living with diabetes globally¹. There are two main forms of diabetes, Type 1 and Type 2. Type 1 diabetes mellitus (T1DM) is an auto-immune disease. Dietary factors are not associated with development of T1DM². Type 2 diabetes mellitus (T2DM) is the most common form, accounting for around 90% of diabetes cases worldwide³.

In the early stages of T2DM, the body's cells become less sensitive to insulin's signal for glucose to move from the blood into the body's cells to be used as energy. This is called insulin resistance. Blood glucose levels therefore remain high after eating carbohydrates. As a result, the pancreas produces more insulin to help lower blood glucose. Over time this increased demand for insulin can damage the insulin-producing β -cells in the pancreas. The pancreas is unable to maintain enough insulin production. Consequently, blood glucose levels are not correctly controlled and become too high⁴. Untreated diabetes can affect many major organs, including the heart, blood vessels, nerves, eyes and kidneys.

There are various risk factors for the development of T2DM, these include: excess body fat and obesity, smoking, family history, genetics, ethnicity (especially being from a South Asian (Indian, Pakistani or Bangladeshi), Black African, or African Caribbean background), high blood pressure, increased age. Research suggests that the biggest risk factor for T2DM is obesity^{5,6}.



**1 in 9 adults
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Dietary Sugars and T2DM

Individuals living with obesity are up to 80 times more likely to develop T2DM, compared to individuals who have a healthy body weight⁶. Excess calorie intake, which can occur by overconsumption of any type of calorie-containing nutrient, increases body weight. It is the excess calories over time which may increase the risk of T2DM. High intakes of total sugars, sucrose or fructose have not been directly linked to an increased risk of developing T2DM⁷⁻¹⁰.

There is observational evidence to suggest that drinking lots of sugars-sweetened beverages (SSBs) is

associated with increased risk of T2DM. However, it is still not clear whether links between drinking SSBs and health outcomes are due to the sugars component of SSBs, or other lifestyle factors common in individuals who drink a lot of SSBs, such as low physical activity levels and smoking¹¹⁻¹³. In randomised controlled trials, SSBs have not been found to have a harmful effect on blood glucose control when calorie intake is kept the same across diets. SSBs appear to only have an adverse effect on blood glucose control when adding excess energy to the diet⁹.

Key Findings from Public Health Agency Reports

European Food Safety Authority Opinion (2022) - No consistent evidence of a relationship between total sugars and risk of T2DM. Evidence does not suggest a relationship between intake of added or free sugars in isocaloric exchange with other macronutrients (i.e., keeping the calorie content the same but substituting sugars with other macronutrients) and risk of T2DM. However, there was evidence to suggest a relationship between the intake of SSBs and risk of T2DM¹⁴.

Scientific Advisory Committee on Nutrition (2015) - No consistent evidence of an association between different intakes of sugars and development of T2DM. Based on limited evidence, there is no effect of sugars consumption on blood glucose and insulin levels. The same findings were reported for individual sugars (sucrose and fructose)⁷.

US Dietary Guidelines Advisory Committee (2015) - Strong evidence that higher consumption of added sugars, especially SSBs, increases the risk of T2DM and this relationship is not fully explained by bodyweight¹⁵.

T2DM Prevention and Management

The World Health Organization recommend that "A healthy diet, regular physical activity and maintaining a normal body weight are ways to prevent or delay the onset of type 2 diabetes"¹⁶.

Typical diets recommended for people living with T2DM worldwide follow the basic principles of healthy eating, including ensuring that calories are not consumed in excess of requirements. For most T2DM cases, weight loss is an important tool for managing and even putting diabetes into remission during the early stages¹⁷.

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