



Diabetes and dietary sugars

Key Messages:

- **Type 2 diabetes is driven by multiple risk factors**, including excess body weight, genetics, age, ethnicity, smoking, and physical inactivity. No single food or ingredient causes the condition.
- **Excess body weight is the biggest modifiable risk factor for Type 2 diabetes**, with people living with obesity at significantly greater risk of developing the disease.
- **Dietary sugars have not been shown to directly cause Type 2 diabetes**, according to reviews by leading scientific and public health organisations.
- **Excess calories, regardless of their source, can contribute to weight gain**, and it is this weight gain over time that is associated with an increased risk of Type 2 diabetes.

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Diabetes facts and figures

Diabetes is a leading cause of death worldwide, with currently 1 in 11 adults living with diabetes globally (1). There are two main forms of diabetes, Type 1 and Type 2. Type 1 diabetes mellitus (T1DM) is an autoimmune disease resulting in a lack of the hormone insulin. Diet, individual foods, or ingredients are not associated with the development of T1DM (2). Type 2 diabetes mellitus (T2DM) is the most common form, accounting for around 90% of diabetes cases worldwide (3).

Prediabetes

In the early stages before T2DM develops and can be diagnosed, known as prediabetes, 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 (higher than the normal range). As a result, the pancreas produces more insulin to help lower blood glucose. If steps are taken to manage blood glucose in prediabetes, including following a healthy diet and lifestyle, T2DM can be delayed or prevented (4). For individuals with prediabetes, losing a small amount of body weight (5-7%) if overweight, and getting regular physical activity, can lower an individual's risk for developing T2DM (5).



Diabetes

If steps are not taken to prevent progression of prediabetes to T2DM, then, 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 high (6). Untreated or inadequately managed T2DM 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 [research suggests this is the biggest risk factor (7,8)]
- smoking
- family history
- genetics
- ethnicity
- high blood pressure
- increased age

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) normally depend on glucose to work properly. Although blood glucose is sometimes known as blood sugar, it does not equal the sugar you eat. In healthy individuals, blood glucose is tightly regulated (9).

SSBs and risk of developing T2DM

There is a considerable amount of observational evidence to suggest that drinking a high amount of sugars-sweetened beverages (SSBs) is associated with increased risk of T2DM (10). 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 smoking (8,11-14). A review of randomised controlled trial evidence was conducted by scientists from the University of Toronto. Trials included people with and without diabetes, those of normal body weight or those living with overweight or obesity. The review found SSBs did not have a harmful effect on blood glucose control when calorie intake was kept the same across the different study diets (15). As such, the authors concluded that SSBs appear to only have an adverse effect on blood glucose control when adding excess energy to the diet (15).



Dietary sugars and risk of developing T2DM

According to Diabetes UK, individuals living with obesity are up to 80 times more likely to develop T2DM, compared to individuals who have a healthy body weight (8). Excess calorie intake, which can occur by overconsumption of any type of calorie-containing nutrient (including fat, starchy carbohydrates, sugars and alcohol), increases body weight. Therefore, it is the excess calories over time which may increase the risk of T2DM (9). Upon review of the evidence, several scientific groups, including the UK Scientific Advisory Committee on Nutrition (16), have concluded that high intakes of total sugars, sucrose or fructose are not directly linked to an increased risk of developing T2DM (10,12,15,16).

Prevention and management of T2DM

The World Health Organization states that a healthy diet, regular physical activity, and maintaining a normal body weight are ways to help prevent or delay the onset of T2DM (4). Typical diets recommended for people living with T2DM follow the basic principles of healthy eating. This includes eating plenty of fruits and vegetables and fibre-rich foods, and ensuring that calories, including those from refined carbohydrates including sugars, are not consumed in excess of requirements (17,18).

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