BMJ 2018;363:k4943 doi: 10.1136/bmj.k4943 (Published 22 November 2018)

NEWS

Type 2 diabetes: sweetened drinks pose greater risk than other sugary foods

Zosia Kmietowicz

The BMJ

Sweetened drinks pose a greater risk of type 2 diabetes than most other foods containing fructose because of their effect on blood glucose levels, an evidence review in *The BMJ* has found.[1] Fruit and other foods containing fructose seemed to have no harmful effects.

"These findings might help guide recommendations on important food sources of fructose in the prevention and management of diabetes," said John Sievenpiper, the study's lead author and a researcher at the Clinical Nutrition and Risk Factor Modification Centre of St Michael's Hospital in Toronto, Canada. "But the level of evidence is low, and more high quality studies are needed."

The role of sugars in the development of diabetes and heart disease attracts widespread debate, and increasing evidence shows that fructose may be particularly harmful to health. Fructose occurs naturally in a range of foods, including whole fruits and vegetables, natural fruit juices, and honey. But it is also added to foods such as soft drinks, breakfast cereals, baked goods, sweets, and desserts as "'free sugars."

Current dietary guidelines recommend reducing free sugars, especially fructose in sweetened beverages, but it is not clear whether this holds for all food sources of these sugars.

So, researchers based at St Michael's and the University of Toronto analysed the results of 155 studies assessing the effect of different food sources of fructose sugars on blood glucose levels in people with and without diabetes, who were monitored for a maximum of 12 weeks.

Results were based on four study designs: substitution (comparing sugars with other carbohydrates), addition (energy from sugars added to diet), subtraction (energy from sugars removed from diet), or ad libitum (energy from sugars freely replaced).

Outcomes were glycated haemoglobin (HbA_{1c}: the amount of glucose attached to red blood cells), fasting glucose, and fasting insulin (blood glucose and insulin levels after a period of fasting). An assessment detected no serious risk of bias, but the certainty of the evidence was low.

The results showed that most foods containing fructose sugars did not have a harmful effect on blood glucose levels when these foods did not provide excess calories. However, some studies found a harmful effect on fasting insulin.

Analysis of specific foods found that fruit and fruit juice—when these foods did not provide excess calories—may have had beneficial effects on blood glucose and insulin control, especially in people with diabetes, whereas several foods that added excess "nutrient poor" energy to the diet, especially sweetened drinks and fruit juice, seemed to have harmful effects.

The low glycaemic index of fructose compared with other carbohydrates, and the higher fibre content of fruit, may help explain the improvements in blood glucose levels by slowing down the release of sugars, the researchers said.

They noted some limitations, such as small sample sizes, short follow-up periods, and a limited variety of foods in some studies. However, strengths included an in-depth process of search and selection and a thorough assessment of evidence quality.

They concluded, "Until more information is available, public health professionals should be aware that harmful effects of fructose sugars on blood glucose seem to be mediated by energy and food source."

1 Choo VL, Viguiliouk E, Blanco Mejia S, etal . Food sources of fructose-containing sugars and glycaemic control: systematic review and meta-analysis of controlled intervention studies. *BMJ* 2018;363:k4644. 10.1136/bmj.k4644.