World Sugar Research Organisation

# Sugars-sweetened beverages & health

## Sugars-sweetened beverages (SSBs)

SSBs are commonly defined as drinks which are sweetened with added sugars, such as carbonated and non-carbonated regular soft drinks, juice drinks, iced-teas, sports drinks, energy drinks, and concentrated forms of soft/ juice drinks which require dilution with water prior to consumption. Definitions sometimes include sugars-sweetened tea/coffee, sugars-sweetened dairy drinks, and/or 100% fruit juice.

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## Obesity

There is evidence to suggest high intakes of SSBs are linked to increased risk of obesity[1,2]. SSBs, like any food or drink that provides energy (calories), can lead to weight gain if consumed excessively. Obesity is a multi-factorial disease and research has shown that people who drink lots of SSBs are more likely to have an "unhealthy diet" and exercise less, which can also contribute to obesity[3-5].

High intakes of SSBs have been linked to increased risk of a number of other health problems[2], including;

- Type 2 diabetes mellitus
- Heart disease
- Non-alcoholic fatty liver disease.

Weight gain and living with obesity can increase the risk of type 2 diabetes mellitus, heart disease and non-alcoholic fatty liver disease. It's not clear whether links between drinking SSBs and these health conditions are due to overall excess energy intake, other 'less healthy' diet and lifestyle factors that are common in individuals who drink high amounts of SSBs, and/or due to the sugars component of SSBs[3-6]. Most of the evidence comes from observational studies in which it is difficult to control for the role of excess calories intake and the effect of other lifestyle factors. Also, these studies often categorise SSBs differently, are based on very high intakes of SSBs, use inaccurate methods to measure SSB intakes and do not have enough information to determine the sugar content of the SSBs. This makes it difficult to draw conclusion across the evidence base[2].

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# Sugars, SSBs & Health

SSBs are frequently researched for their possible effects on health and much of the evidence on sugars & health is based on studies using SSBs. This research often looks at high intakes of SSBs, in many cases above usual intakes.

## Feelings of fullness

It has been suggested that the form in which sugars are consumed (e.g., foods vs. beverages) may be important when looking at the risk of obesity and other health outcomes. Indeed, sugars in beverages may have a greater effect on body weight compared to sugars in foods, when calories from sugar are consumed in excess[7]. It is thought this may be because the energy (calories) in the form of sugars in beverages are consumed at a faster rate and produce a lower sensation of fullness, compared to food[8]. This may lead to a faster recurring feeling of hunger, resulting in an increased energy (calorie) intake at subsequent meals, compared to when energy (calorie) matched foods are consumed. Reviews of short-term intervention studies generally provide support for this hypothesis and have shown that sugars consumed within foods are more satiating (filling) than those consumed within beverages[9–11]. However, slightly longer duration intervention studies do not show clear differences on body weight between sugars in beverages vs. foods[12,13]. More research is needed before a consensus can be reached.

## Cancer

Associations between SSB intake and risk of cancer have been found. However, leading cancer organisations, such as the World Cancer Research Fund (WCRF) and American Institute of Cancer Research (AICR), agree that SSB intake is not directly linked with cancer risk[14]. Instead, it is likely that the indirect link between SSB intake and risk of some cancers, is mainly related to increased risk of obesity [15]. Obesity is a major risk factor for many different cancer types. WCRF recommend limiting SSBs as "there is convincing evidence that the consumption of SSBs is a cause of weight gain, overweight and obesity", which is linked to increased risk of obesity-related cancers[16].

## Dental Caries

There is limited observational evidence that shows higher frequency of SSBs (number of times consumed per day) is linked to an increased risk of dental caries[17]. Very limited evidence suggests that the amount of SSB intake may also be linked with an increased risk of dental caries[2]. Oral hygiene, use of fluoride and other preventative measures can greatly reduce the incidence of dental caries and are likely to lessen any impact of consuming SSBs[18].

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# Fructose

In a few countries, high fructose corn syrup (HFCS, also known as glucose-fructose syrup and isoglucose) is used as the sweetening agent in some SSBs. HFCS is derived from corn starch and contains both glucose and fructose. Unlike sucrose (table sugar), the glucose and fructose in HFCS are not bound together but they are still processed in the same way by the body. There have been media reports that HFCS, and fructose in particular, increases the risk of obesity, non-alcoholic fatty liver disease, and diabetes. However, these reports are mainly based on animal studies and some overfeeding trials in humans, where the levels of fructose given are much greater than usual population intakes. Higher quality evidence at typical intakes in the diet does not support these concerns. Research suggests it's the excess energy (calories) in the diet which may increase the risk of weight gain and other associated health problems, rather than sugars or the type of sugar per se[7,19,20].

# Guidelines and Policies on SSBs

Most public health agencies suggest people should limit or minimise intake of SSBs to reduce risk of obesity and associated chronic health outcomes[21–24].

As such, many countries have introduced taxes on SSBs. However, there is currently no substantial evidence to suggest that taxes on SSBs have a direct effect on diet-related conditions, such as obesity. It is difficult to collect evidence on the effectivness of these policies. Assessing any health impact from public health policies is problematic due to time lags, multiple policies running in parallel (e.g., physical activity initiatives, smoking cessation programmes, and food labelling measures), and determining which products, if any, are bought as a substitution to SSBs.

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