

Sugar Intake in Infants, Children and Adolescents

This guide has been produced by the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) Committee on Nutrition to provide advice on sugar intake in infants, children and adolescents.

This guide explains what sugar is, current recommendations for sugar intake and outlines the problems of overconsumption that exist. It goes on to explain the taste preference development of children (innate as well as postnatal) and then finally provides recommendations and practical advice on free sugar intake for children as well as the recommended drinks for children of differing ages.

What is Sugar?

Sugar is a very broad term and includes different variations with different meanings. It is important to understand the differences in order to adequately control sugar intake in a child's diet.

Sugar Defined

The term total sugar refers to both naturally occurring sugar and free sugar. Naturally occurring sugar is found in fruits, vegetables, some grains as well as lactose in milk and dairy products.



Free sugar is defined by the WHO as all monosaccharides and disaccharides which have been added to foods and beverages by the manufacturer, cook or consumer, plus sugar naturally present in honey, syrups, fruit juices and fruit juice concentrates.

Importantly, free sugar describes the sugar that may have physiological consequences different from intrinsic sugar which is incorporated within intact plant cell walls as in fruits and vegetables or lactose naturally present in milk and dairy products. There is no dietary requirement for free sugar in infants and children.

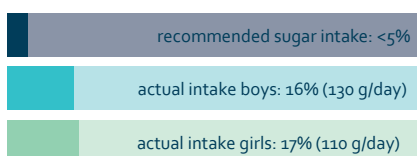


Current Sugar Intake

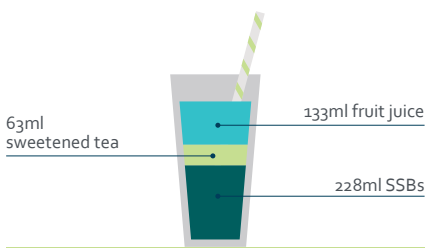
The current food environment is characterised by a cheap and abundant sugar supply and an ongoing increase in consumption.

Consumption of sugar-sweetened beverages (SSBs: beverages that contain added caloric sweeteners, i.e. sucrose, high-fructose corn syrup, fruit-juice concentrates) has increased dramatically in recent decades among children and adults.

Intake of free sugar in Slovenian adolescents (15-16 yrs)



Adolescents (12-17 yrs) from 9 European countries reported consumptions of 424ml of sugar-containing beverages/day



ESPGHAN Recommendation

The ESPGHAN Committee on Nutrition recommends that the WHO definition of free sugar, as defined here, should be used in dietary recommendations, regulations and foods labelling as well as in studies.

Top Tips for parents and guardians

Foods or drinks labelled as no added sugar and/or naturally-occurring sugars may contain free sugar — e.g. when they contain honey, fruit juice or fruit juice concentrate. Under European regulations, there is no mandatory labelling of free sugar, so it may not be apparent from food labels that foods (e.g. processed cereal based foods, baby foods for infants and young children) and beverages (e.g. in fruit juices) contain free sugar.

Fruit juices usually have superior nutritional composition to SSBs, as they contain potassium, vitamins A and C and some are fortified with vitamin D and/or calcium, but they contain similar amounts of free sugar (5-17%) and energy (23-71 kcal/100 ml).

The Impact of the Overconsumption of Sugar on Health

Overconsumption of free sugar, especially in liquid form, is linked to a range of health conditions, both immediately and in later life. Some of the health effects of overconsumption are illustrated in the body graphic below:



Bodyweight and Obesity

Studies have shown that higher than recommended consumption of free sugar, particularly SSBs is associated with a significantly higher risk of becoming overweight or obese.

Cardiovascular Disease and Type 2 Diabetes (T2D)

Data in adolescents reflect interventional studies in adults suggesting that higher fructose consumption (from added sugar) is associated with multiple factors that increase risk for cardiovascular disease and T2D.

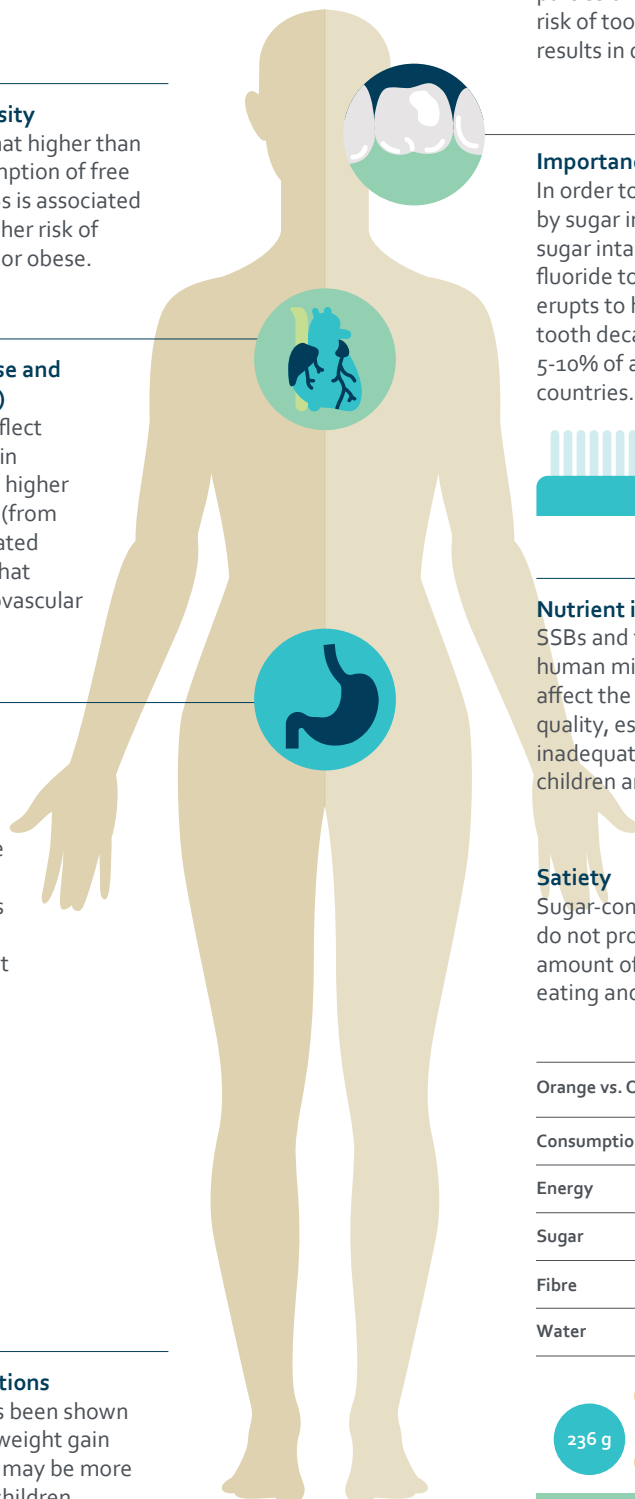
GI complaints

Malabsorption of sugar from fruit juice, especially when consumed in excessive amounts or even in nonexcessive amounts in susceptible infants and children, can result in chronic diarrhoea, flatulence, bloating, abdominal pain and growth faltering.



Behavioural Modifications

SSBs consumption has been shown to be associated with weight gain and the effect of SSBs may be more pronounced in obese children.



Dental caries

Higher than recommended free sugar intake, particularly SSBs, is associated with an increased risk of tooth decay due to free sugar and acidity that results in dental erosion.

Importance of tooth brushing

In order to tackle the impact of tooth decay caused by sugar intake, all children, no matter their level of sugar intake, should regularly brush their teeth with fluoride toothpaste from the time the first tooth erupts to help maintain good dental health. Treating tooth decay and dental diseases account for between 5-10% of all healthcare costs in industrialised countries.

Nutrient intake

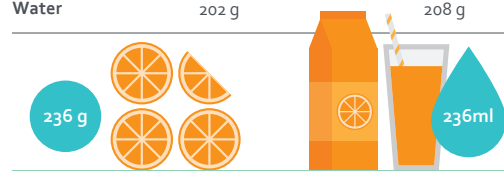
SSBs and fruit juices given to infants may displace human milk or infant formula which may negatively affect the nutrient supply and decrease dietary quality, especially as SSB intake is associated with inadequate calcium, iron and vitamin A intake in children and adolescents.

Satiety

Sugar-containing beverages (SSBs and fruit juices) do not promote satiety compared to the equivalent amount of sugar in solid form, leading to further eating and excessive energy intake.

Orange vs. Orange juice

Consumption time	10 mins	12 seconds
Energy	93 kcal	95 kcal
Sugar	19.5 g (naturally occurring sugar)	20.4 g (free sugar)
Fibre	3.8 g	1.1 g
Water	202 g	208 g



Reference: R. Lustig, *Chicago Tribune*, 2013

Children's Development of Sweet Taste and Preference for Sweet Foods

Innate preferences

Infants have an innate preference for sweet, salty and savoury tastes and newborns prefer sugar solutions to water and sweeter solutions over less sweet solutions. Young children also have a preference for energy-dense foods.

Flavour learning

Food choices and preferences are not only influenced by genetics but also by food availability and by cultural and parental influences.

Acceptance of basic taste in weaning may be different among children who are breast-fed and formula-fed. Formula-fed infants are exposed to a constant flavour, a predominantly sweet taste. Human milk also has a sweet taste, but additionally exposes the infant to varying flavours and aromas, depending on the nutrition of the mother.

Children are also typically phobic to new foods, especially to sour foods, vegetables and protein foods but acceptance of new foods in infants can be enhanced by exposure to a variety of flavours. Children have the ability to learn preferences for foods made available to them, and so the preference for sweet taste can be partly modified by experience with food even in early infancy.

Persistence of learned preferences and intervention successes

Infants routinely fed sugar sweetened water by their parents show a greater preference for sweetened water at least up to 10 years of age, suggesting that SSBs intake during infancy and early childhood may influence sugar sweetened beverage intake in later childhood and into adolescence.

Top tip: Taste development

While preference for sweet taste is innate, it may be changed or reinforced by pre and postnatal exposures. Breastfeeding may be associated with greater acceptability of new foods and flavours.

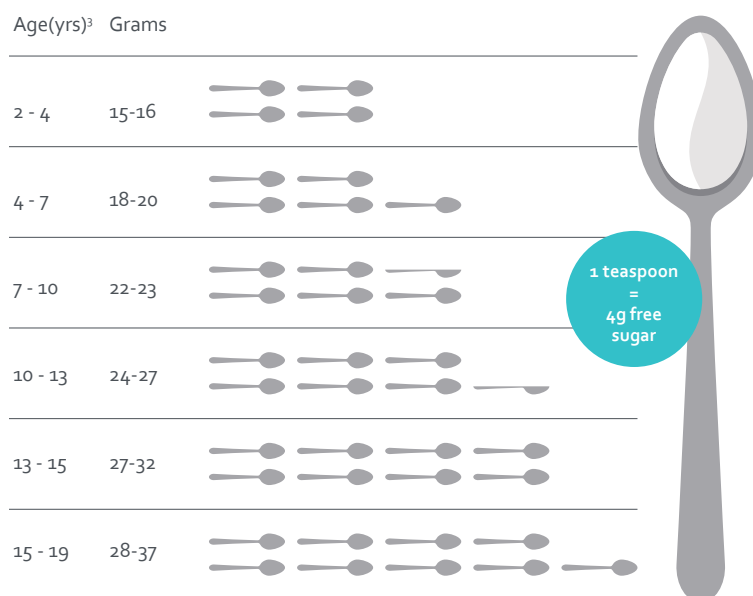
Recommendations: Sugar Intake and Drinks

Existing recommendations for sugar intake focus on free or added sugar rather than on total sugars, as there is consistent evidence that free and added sugars are the major contributor to the weight gain, obesity, dental caries, and other adverse health effects. Therefore, this guide makes recommendations for the maximum daily intake of free sugars.

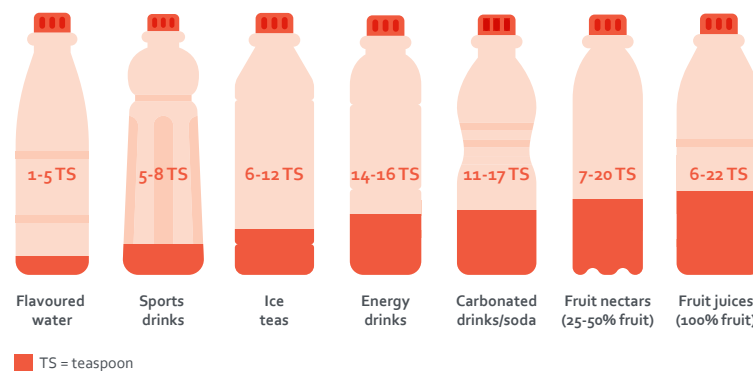
Recommendations on Sugar Intake

The ESPGHAN Committee on Nutrition recommend that intake of free sugar is reduced and minimised to <5% of energy intake for children and adolescents (aged ≥ 2 -18 years). Free sugar intake should be even lower in infants and toddlers below the age of 2 years.

Recommended maximum daily free sugar¹ intake (< 5% of energy intake) by age²



Free sugar content of common sugar sweetened beverages (SSBs) and juices per 500ml⁴



1. Defined by the World Health Organisation, adapted by UK's Scientific Advisory Committee on Nutrition and ESPGHAN's Committee on Nutrition
2. By the UK's Scientific Advisory Committee on Nutrition and ESPGHAN Committee on Nutrition
3. Based on recommended energy intake at medium physical activity level (D-A-CH Reference values for the nutrient intake)
4. Average range

How sugars should be consumed

There is no nutritional requirement for free sugar in infants, children and adolescents. Where possible, sugar should be consumed in a natural form through human milk, milk, unsweetened dairy products (e.g. natural yogurt) and intact fresh fruits, rather than as SSBs, fruit juices, smoothies or sweetened milk drinks and products. Sugar should be consumed as part of a main meal, not as snacks. Infants should not be given sugar containing drinks in bottles or training cups and children should be discouraged from the habit of sleeping with a bottle containing either sugar containing drinks or milk.

Overweight and Obese Children

In overweight and obese children and adolescents, the reduction of free sugar is a vital part of decreasing energy intake which is essential for weight reduction.

Recommended Drinks

The recommended beverage for children is water. Sugar-containing beverages (SSBs and fruit juices), fruit-based smoothies and foods (sweetened milk drinks, sweetened dairy products) should be replaced by water or, in the latter case, with unsweetened milk drinks/products with lactose up to the amount naturally present in milk and unsweetened milk products.

Studies have shown that replacing free sugar with non-nutritive or non-caloric sweeteners (artificial sweeteners, low-calorie sweeteners and non-caloric sweeteners) is associated with reduced weight gain and lower BMI scores in the short-term, but the impact of sweeteners on the long-term metabolic health is currently not well understood, and there is little evidence available in order to make an evidence-based recommendation about their use.

Public Health Policy Recommendations

The ESPGHAN Committee on Nutrition advocate that public health authorities undertake policy interventions aimed at reducing the levels of intake of free sugar in infants, children and adolescents.

Such steps may include:

- Public education campaigns on the impact of high levels of free sugar intake and the health benefits of reducing free sugar intake
- Improved labelling of food and drinks products to alert consumers to free sugar content
- Further restrictions in the marketing and advertising of sugary products
- Standards for limiting free sugar in preschool and school meals
- Fiscal measures, such as taxation on sugary products and incentives for healthy foods

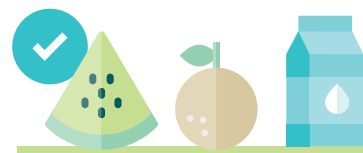
Disclaimer

This advice guide is produced and published by the European Society for Paediatric Gastroenterology, Hepatology and Nutrition and authored by members of the society's Committee on Nutrition.

Full references for the advice within this guide can be found within the following paper, which this guide is based upon: Fidler Mis, N et al. Sugar in Infants, Children and Adolescents: A Position Paper of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition Committee on Nutrition. *J Pediatr Gastroenterol Nutr* 2017; 65(6):681-696.

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Recommended



Limit consumption

