Scientific Advisory Committee on Nutrition

Free sugars in processed fruit and vegetables: SACN statement

Published 10 November 2026

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1. Introduction

Background

1.1 Higher consumption of sugars and foods and drinks containing sugars is associated with a greater risk of dental caries (tooth decay) and increased or excess energy intake (and therefore greater risk of obesity) (Scientific Advisory Committee on Nutrition (SACN), 2015).

1.2 SACN noted that the term ‘sugars’ conventionally describes monosaccharides and disaccharides, with the principal sugars being glucose, fructose and galactose. SACN (2015) described these as follows:

> “Glucose is widely distributed in small amounts in fruits, plant juices and honey. Fructose is found in the free state alongside glucose in ripening fruits and honey. Sucrose is the predominant disaccharide occurring in the free form and is composed of the monosaccharides glucose and fructose. Galactose occurs in milk, in chemical combination with glucose as lactose.”

1.3 It is important to distinguish between sugars naturally present in foods and drinks and sugars that have been added. There is no evidence that sugars naturally present in foods and drinks and incorporated in the cellular structure of foods or lactose in milk or milk products (milk sugars) have adverse effects on health (Department of Health, 1991; SACN, 2015).

1.4 Sugars not incorporated into the cellular structure of foods and drinks - either naturally or released as a result of processing - are commonly referred to as ‘free sugars’. Free sugars include all added sugars, plus sugars naturally present in honey, syrups, and processed fruit and vegetables such as juices and purées (Swan and others, 2018).

1.5 The UK government has adopted SACN’s recommendation that for those aged one year and over, free sugars should provide a population average of no more than 5% of energy (SACN, 2015).

1.6 Mean daily intakes of free sugars in children and adults are currently around double the UK recommendation (Office for Health Improvement and Disparities (OHID), 2025). As a result, the UK government has a range of policies in place or in development aimed at reducing intakes of foods high in free sugars (as well as saturated fat and salt).

1.7 The UK nutrient profiling model (NPM) underpins a range of policies aimed at improving population dietary intakes. It is a technical tool used to identify food and drinks that are classified as ‘less healthy’ for government policies, such as:

- restricting advertising of less healthy food or drink on TV and online
- restricting promotions of products high in saturated fat, sugar or salt by location and by volume price

The NPM score is based on a calculation of beneficial and less beneficial nutrients. SACN has previously noted that the NPM broadly aligns with SACN's dietary recommendations (see minutes of SACN November 2025 meeting available from the SACN webpage). The Nutrient profiling model 2018 uses the definition of free sugars as set out by Swan and others (2018). Consultation on applying the NPM 2018 to advertising and promotions restrictions highlighted a number of stakeholder concerns in applying the definition to products containing fruit and vegetables. Concerns include:

- how terms such as 'stewed' and 'mashed' differ from purées and pastes
- what degree of processing makes sugars count as free sugars

1.8 In June 2026, the Department of Health and Social Care (DHSC) asked SACN to provide advice on how the UK definition of free sugars applies to processed fruit and vegetables. This was in light of deliberations on applying the definition to a range of policies.

Terms of reference

1.9 The terms of reference for this statement were to consider:

- the UK definition of free sugars against the most recent definitions used by non-UK expert bodies or countries, with specific consideration given to whether stewed, or other processed fruit and vegetables, should be considered wholly or partly the same as puréed fruit and vegetables
- UK intakes of free sugars in the National Diet and Nutrition Survey (NDNS), with specific consideration given to puréed, stewed and other processed fruit or vegetables
- implications of any proposed changes to the UK definition of free sugars and make recommendations

1.10 Processed fruit and vegetables include stewed, canned, puréed and extruded products. Cooking or processing terms used in this position statement are defined in the glossary (see chapter 12).

1.11 SACN only considered issues relating to sugars naturally contained in, or released from, processed fruit and vegetables. They did not consider issues relating to other sugars, such as added sugars.

1.12 This statement does not consider or change SACN's existing recommendations for population intakes of free sugars, as set out in SACN's Carbohydrates and Health report (2015).

1.13 SACN reviewed specific questions relating to the definition of free sugars. It did not consider wider policy questions or implications for consumer advice. This is in line with SACN's remit, as stated in the SACN code of practice:

> "The function of SACN is to gather and assess scientific information (risk assessment) to assist policy making or analysis (risk management). The task of policy making is the responsibility of government, which will consider practical options for responses to the problem on which scientific advice has been sought, assessing those options and making decisions on them. Where required, SACN may advise on possible practical solutions, but does not develop policy on behalf of government."

1.14 Throughout this statement, dietary intakes and recommendations on sugars are expressed as a percentage of energy excluding ethanol (alcohol) (hereafter shortened to 'percentage (%) of energy') (SACN, 2025).

Intrinsic and extrinsic sugars

1.15 In 1989, SACN's predecessor, the Committee on Medical Aspects of Food and Nutrition Policy (COMA), published its report on 'Dietary Sugars and Human Disease', available on COMA reports. The report introduced new terminology on sugars.

1.16 COMA used the following definitions:

- 'intrinsic' sugars were, "sugars forming an integral part of certain unprocessed foodstuffs, that is, enclosed in the cell, the most important being whole fruits and vegetables (containing mainly fructose, glucose and sucrose)"

- 'extrinsic' sugars were "sugars not located within the cellular structure of a food"

1.17 COMA stated that the “sugars occurring naturally in milk and milk products (almost entirely lactose) are extrinsic sugars but … considered them a special case so that they form a separate sub-group”. The extrinsic sugars in milk and milk products (that is, lactose), were therefore exempt from the definition.

1.18 In 1991, COMA set dietary reference values for non-milk extrinsic sugars (NMES) in its report 'Dietary Reference Values for Food Energy and Nutrients for the United Kingdom'. NMES were further defined by Buss and others (1994) to include:

- sugars added to foods, such as sucrose, glucose and fructose, and sugars naturally present in fruit juices and honey
- sugars from canned, stewed, dried and preserved fruit were assumed to be half extrinsic and half intrinsic

Free sugars definitions

WHO and EFSA

1.19 In 2002, the Food and Agriculture Organization (FAO) and World Health Organization (WHO) expert consultation defined the term 'free sugars' (WHO, 2003). This included:

- all monosaccharides and disaccharides added to foods by the manufacturer, cook or consumer
- sugars naturally present in honey, syrups and fruit juices

1.20 The term was used to update the WHO population nutrient intake goals, which were originally established by the WHO Study Group in 1989.

1.21 The WHO Nutrition Guidance Expert Advisory Group Subgroup on Diet and Health subsequently considered the definition and in 2015, the WHO definition was amended to “free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates” (WHO, 2015a). WHO notes that:

> “Free sugars are different from intrinsic sugars found in whole fresh fruits and vegetables. As no reported evidence links the consumption of intrinsic sugars to adverse health effects, recommendations [on free sugars] do not apply to the consumption of intrinsic sugars present in whole fresh fruits and vegetables” (WHO, 2015b).

1.22 A number of non-UK expert bodies and countries have now adopted the WHO 2015 definition of free sugars, including the European Food Safety Authority (EFSA).

1.23 In 2022, EFSA considered a tolerable upper intake level for dietary sugars (addressing total, added and free sugars) (EFSA, 2022a). They used a definition for free sugars consistent with the WHO 2015 definition, with slightly simplified phrasing. EFSA provides a helpful visual representation of the definition, see figure 2 in EFSA's report on tolerable upper intake level for dietary sugars (EFSA, 2022a). EFSA's glossary definition of free sugars notes that "they do not include the sugars naturally found inside whole fruits, vegetables, or milk".

1.24 Neither EFSA nor WHO explicitly state how processed fruit and vegetables (other than juiced) should be treated for free sugars purposes. However, EFSA note that a 10-step process, as set out by Wanselius and others (2019), was "systematically used as the basis for the estimation of added and free sugars" (EFSA, 2022a). Steps in this process include consideration of whether there is data on individual intrinsic sugars (lactose or fructose), whether free sugars can be subjectively estimated and if none of the steps can be met then to assign 50% of total sugars as free or added.

SACN

1.26 In 2015, as part of its report on Carbohydrates and Health, SACN recommended that the concept of 'free sugars' be adopted in the UK.

1.27 SACN noted that the WHO free sugars definition does not include any sugar (naturally present) in stewed, dried or canned fruit (or vegetables) (SACN, 2015).

1.28 SACN considered the definition of NMES by Buss and others (1994) in its deliberations on the proposed definition of free sugars. The definition said that 50% of the sugar in processed fruit would constitute NMES. In its 2015 report on Carbohydrates and Health, SACN noted that:

> "The only difference between non-milk extrinsic sugars and free sugars is that non-milk extrinsic sugars includes 50% of the fruit sugars from stewed, dried or canned fruit … but free sugars includes none."
>
> "The 50% figure is arbitrary and is used to account for the partial breakdown of the cellular structure during processing (Buss et al., 1994) but proves problematic when trying to estimate the sugars composition of certain foods."

> “The definition of 'free sugars', as used by the World Health Organization, captures all sugars added to foods and those present in fruit juice and honey but does not apply the figure of 50% of sugars in dried and cooked fruit. Therefore, the definition of free sugars is similar to non-milk extrinsic sugars but overcomes the problem of trying to account for the additional sugars from processed fruit.”

1.29 At its meeting in June 2016, SACN discussed the definition of free sugars in more detail to support development of the detailed definition to enable estimation of intakes in the NDNS. Papers and minutes from the meeting are available from the SACN webpage.

1.30 However, in SACN’s subsequent deliberations on the definition in June 2016, it noted that the approach for NMES would have been a compromise to recognise the extent to which sugars are released when fruit is processed. SACN therefore did not opt for this approach in its more detailed definition of free sugars. SACN advised the following:

- “sugars in dried, canned and stewed fruit should be outside the definition of free sugars”
- sugars from purées and smoothies “should now be included in the definition of free sugars”
- “foods subject to blending, pulping or macerating which breaks down the cellular structure should also be considered as containing free sugars”
- “vegetable purées should be treated in the same way as fruit purées as there was no scientific basis for treating processed fruit and vegetables differently”

1.31 SACN's advice was reflected in an expanded UK definition of free sugars for the UK, for the purpose of estimating intakes in dietary surveys (Swan and others, 2018) (see chapter 3).

1.32 At the November 2025 SACN meeting, SACN discussed the topic of free sugars in relation to hydrolysed lactose and published a post meeting paper available on the SACN webpage. SACN agreed that the following should be classified as free sugars:

- lactose and galactose added as ingredients
- lactose in whey powder

- all sugars in lactose-free dairy products where the lactose has been broken down to glucose and galactose through the addition of lactase

Free sugars and health outcomes

SACN

1.33 In its report on Carbohydrates and Health (2015), SACN reviewed prospective cohort studies and randomised controlled trials (RCTs) investigating the relationship between sugars, individual sugars, sugars-sweetened foods and drinks and cardio-metabolic, colorectal and oral health outcomes.

1.34 SACN concluded that if people ate less free sugars, they would both lower their risk of tooth decay and of eating excess calories, and therefore the risk of obesity. SACN recommended that:

- "the average population intake of free sugars should not exceed 5% of total dietary energy for age groups from 2 years upwards"

- "the consumption of sugars-sweetened beverages should be minimised in children and adults" due to evidence in children and adolescents that consumption may be linked to weight gain and evidence in adults that it is associated with an increased risk of type 2 diabetes mellitus (T2DM)

1.35 SACN stated that:

> "This advice, that people's intake of 'free sugars' should be lower than that currently recommended for non-milk extrinsic sugars, is based on SACN's assessment of evidence on the effect of free sugars on the risk of dental caries and on total energy intake. A higher sugars intake increases the risk of higher energy intakes - the higher the consumption of sugars, the more likely people are to exceed their estimated average requirement (EAR) for energy. Therefore, if intakes of free sugars are lowered, the more likely it is that the EAR for energy will not be exceeded, and this could go some way to addressing the significant public health problem of obesity."

1.36 SACN also stated that:

> "Since the dietary reference values were last considered, the level of evidence indicating that a high intake of free sugars is detrimental to several health outcomes has strengthened. Higher consumption of sugars, and sugar-containing foods and beverages, is associated with

greater risk of dental caries. RCTs conducted in adults indicate that increasing or decreasing the percentage of total dietary energy as sugars when consuming an ad libitum diet, either through the substitution of other macronutrient components or by replacing sugars with non-caloric sweeteners, leads to a corresponding increase or decrease in energy intake.

"Consumption of sugars-sweetened beverages is associated with a greater risk of type 2 diabetes mellitus. RCTs conducted in children and adolescents indicate that consumption of sugars-sweetened beverages, as compared with non-calorically sweetened beverages, results in greater weight gain and increases in body mass index; this finding suggests that there is inadequate energy compensation (degree of voluntary reduction in intake of other foods or drinks), for energy delivered as sugar."

1.37 SACN highlighted that: "Overall, there were very few studies on individual sugars, such as glucose, fructose or sucrose, which met the inclusion criteria for this report". The majority of the evidence on sugars, sugars-sweetened foods and drinks was derived from cohort studies. SACN did not identify evidence comparing free sugars versus added sugars.

WHO

1.38 In 2015, WHO reviewed evidence on the effects of increasing or decreasing intake of free sugars on excess weight gain and dental caries. This was part of its guideline on sugars intake for adults and children (WHO, 2015a). WHO deemed these 2 health outcomes as critical in relation to free sugars intake.

1.39 WHO set the following recommendations for free sugars intake in adults and children, using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) classification framework. These recommendations are "based on the totality of evidence reviewed regarding the relationship between free sugars intake and body weight (low [to] moderate quality evidence) and dental caries (very low [to] moderate quality evidence)". WHO described its recommendations as follows:

"WHO recommends a reduced intake of free sugars throughout the life course (strong recommendation (note 1)).

"In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake (strong recommendation (note 1)).

> "WHO suggests a further reduction of the intake of free sugars to below 5% of total energy intake (conditional recommendation (note 2))."

Note 1: strong recommendations indicate that "the desirable effects of adherence to the recommendation outweigh the undesirable consequences". This means that "the recommendation can be adopted as policy in most situations".

Note 2: conditional recommendations are made when there is less certainty "about the balance between the benefits and harms or disadvantages of implementing a recommendation". This means that "policy-making will require substantial debate and involvement of various stakeholders" for translating them into action.

1.40 WHO made further remarks in relation to the evidence behind their free sugars recommendations:

> "Increasing or decreasing free sugars is associated with parallel changes in body weight, and the relationship is present regardless of the level of intake of free sugars. The excess body weight associated with free sugars intake results from excess energy intake.
>
> "The recommendation to limit free sugars intake to less than 10% of total energy intake is based on moderate quality evidence from observational studies of dental caries.
>
> "The recommendation to further limit free sugars intake to less than 5% of total energy intake is based on very low-quality evidence from ecological studies in which a positive dose-response relationship between free sugars intake and dental caries was observed at free sugars intake of less than 5% of total energy intake.
>
> "The recommendation to further limit free sugars intake to less than 5% of total energy intake, which is also supported by other recent analyses … is based on the recognition that the negative health effects of dental caries are cumulative, tracking from childhood to adulthood … Because dental caries is the result of lifelong exposure to a dietary risk factor (i.e. free sugars), even a small reduction in the risk of dental caries in childhood is of significance in later life; therefore, to minimize lifelong risk of dental caries, the free sugars intake should be as low as possible.
>
> "No evidence for harm associated with reducing the intake of free sugars to less than 5% of total energy intake was identified."

EFSA

1.41 The 2022 EFSA opinion (EFSA, 2022a) aimed to "provide scientific advice on a tolerable upper intake level (UL) or a safe level of intake for dietary (total/added/free) sugars". This was based on systematic reviews of RCTs and prospective cohort studies examining the relationship between free sugars and outcomes such as obesity, T2DM, dyslipidaemia, non-alcoholic fatty liver disease (NAFLD) and dental caries.

1.42 EFSA was unable to compare the health effects of added sugars and free sugars separately "owing to the low number of studies available per each exposure and endpoint and the fact that intakes of added and free sugars widely overlap". Therefore, evidence was combined and conclusions were drawn jointly for added sugars and free sugars.

1.43 EFSA identified a "positive and causal relationship between the intake of added or free sugars and risk of some chronic metabolic diseases: The level of certainty is moderate for obesity and dyslipidaemia ([greater than] > 50–75% probability), low for NAFLD and T2DM (> 15–50% probability) and very low for hypertension (0–15% probability)". EFSA also noted that "the intake of dietary sugars is a well-established hazard in relation to dental caries in humans".

1.44 As no intake level could be identified below which the risk of chronic metabolic disease or dental caries was not increased, EFSA was unable to establish a UL or safe intake level and concluded that "the intake of added and free sugars should be as low as possible in the context of a nutritionally adequate diet".

1.45 Some researchers hypothesised that sugars in whole foods might pose less risk of T2DM than free sugars in drinks (due to the role of the food matrix on sugar digestion, absorption and satiety) (Louie and Tan, 2026). However, a secondary analysis of the 30 RCTs on free and added sugars included in EFSA found no statistical interaction between source (drinks, foods or mixed) and the intake of free sugars and their effect on health (EFSA, 2022a; Peregoy and others, 2026). The authors of the analysis noted such effects could have been masked by confounding and highlighted the need for further research in the area.

Challenges with an operational definition for free sugars

1.46 While it has been recognised for many years that processing releases 'intrinsic sugars' from fruit and vegetables, there is a lack of evidence on the extent to which different processing methods affect the cellular structure of different fruit and vegetables. There is also a lack of evidence on the percentage of sugars released.

1.47 As set out by Mela and Woolner (2018), the definition and chemical analysis of total sugars are straightforward and unambiguous. For added and free sugars, measurement is more challenging. This is because, as they note:

> "Sugar molecules are, of course, chemically and biologically indistinguishable by source, and therefore any physiologic differentiation between these classes must arise mainly from effects of the matrix in which the sugars are found."

1.48 For free sugars, Mela and Woolner (2018) summarise the challenges in developing "a completely consistent and scientifically justified definition … issues arise with processed forms of fruit and vegetables … after processes such as chopping, cooking, sieving, etc., these sugars will be present within a heterogeneous mix of liquids and particles, and thus along a continuum between clearly intact and clearly free sugars sources, with variable amounts of other plant components [later this is referred to as a 'continuum of effect']. Within this, it is uncertain where or how the boundary between "intact" and free should be set".

Mela (2020) proposed development of a simple sieving-based method, using particle size thresholds derived from mastication research, to estimate the proportion of sugars that are free versus retained within an intact plant matrix. As far as SACN is aware, no such method has been developed to date.

1.49 There is limited additional evidence on how processing fruit and vegetables affects their free sugars content. Some relevant publications were identified, but rather than looking at free sugars content, they focused on how processing affects:

- food structure (Alongi and others, 2023)
- fibre characteristics (Colin-Henrion and others, 2009)
- glycaemic response (Crummett and Gross, 2022; Górecka and others, 2020; Wei and others, 2025)
- satiety (Flood-Obbagy and Rolls, 2009; Krishnasamy and others, 2020)
- polyphenol content (Arfaoui, 2021; Kosewski and others, 2023)

1.50 Most product labelling does not include information on the free sugars content. Instead, they typically include information on total or added sugars. This can make implementing policies that focus on free sugars challenging. Calculating the amount of free sugars in a product requires an understanding of the ingredients, how they have been processed and whether any sugar has been added. Products that

include fruit and vegetables that are not either entirely whole or entirely juiced or purée, present a particular dilemma.

2. Methods

Approach and scope of statement

2.1 SACN established a small working group in June 2026 to work on this topic quickly.

2.2 SACN agreed the approach and scope of this statement in July 2026. SACN agreed to:

- conduct a scoping review of the most recent definitions of free sugars used by non-UK expert bodies or countries, including:
    - identifying definitions for detailed assessment
    - comparing the identified definitions (with specific consideration of puréed, stewed and other methods of processing fruit or vegetables)
    - considering the evidence supporting the identified definitions
- assess UK dietary intakes of free sugars (using the current definition) in the National Diet and Nutrition Survey (NDNS), including specific consideration of the contribution of:
    - sugars from fruit and vegetable juice and purée to free sugars intakes
    - sugars from fruit and vegetable juice, purée, stewed fruit and dried fruit to total sugars intakes
    - relevant fruit and vegetable food groups identifiable in the NDNS data set to free sugars and total sugar intakes
    - the above by age and index of multiple deprivation (IMD)
- consider implications of any proposed changes to the UK definition of free sugars on UK fruit and vegetable intakes
- draw conclusions and make recommendations

2.3 The sugars referred to in this document relate to processed fruit and vegetables that exclude any added sugars (that is, any added sugar within canned or dried fruit and vegetables).

2.4 This was a rapid piece of work and a formal systematic approach was not used. A pragmatic approach has been taken to providing background and supporting evidence. It is possible, therefore, that some potentially relevant sources of information may not have been included.

2.5 This position statement was conducted in line with the SACN 'Framework for the evaluation of evidence', available on the SACN webpage. The work on free sugars is also captured in the minutes of the SACN meeting in June and matters arising in November 2026, available on the SACN webpage.

Identifying free sugars definitions

2.6 A comprehensive scoping search was carried out for free sugars definitions used by countries and non-UK expert bodies globally. A formal systematic approach was not used because it was recognised that relevant information would largely be found in 'grey literature', rather than identified through systematic searches of online databases. It is accepted that this approach may mean some sources of information have not been identified.

2.7 A series of scoping searches was conducted in June and July 2026 to identify and review definitions of free sugars used by non-UK expert bodies or countries. PubMed (an online database) was searched for any evidence that provided information on the free sugars definitions used by non-UK expert bodies or countries, using the search term ‘free sugars definitions’. A scoping search for grey literature was also undertaken to find additional information on free sugars definitions used globally.

2.8 Information on free sugars definitions was extracted for the UK and for non-UK expert bodies or countries, and compared the non-UK definitions with the UK's definition. Particular consideration was given to the extent of fruit and vegetable processing. WHO, EFSA and the Pan American Health Organization (PAHO) reviewed the content from their own publications.

2.9 The approach to these comparisons is consistent with that previously adopted by SACN, including as part of horizon scanning in 2026 (available in the SACN horizon scan meeting papers folder for 18 June 2026).

National Diet and Nutrition Survey

2.10 Data on free and total sugars intakes was extracted from the UK NDNS 2019 to 2023 data set (OHID, 2025).

2.11 The NDNS is a continuous cross-sectional survey of food consumption, nutrient intakes and nutritional status in adults and children living in private households in the UK. It is designed to be representative of the UK population and has been running since 2008. The NDNS is jointly funded by DHSC and the UK Food Standards Agency (FSA). Until 2023, the survey had an annual sample size of approximately 500 adults and 500 children from 18 months upwards per year. Pregnant and breastfeeding women were excluded.

2.12 The NDNS analysis here is based on data collected from 2019 to 2023 with a sample size of 2,296 adults and 2,074 children.

2.13 Dietary assessment in the 2019 to 2023 data set was carried out using an automated online tool, Intake24. This method replaced the paper diary in 2019. Details of the rationale, design and methods of the survey have been described elsewhere (Venables and others, 2022).

2.14 The NDNS reports free sugars intakes based on Swan and others (2018). Free sugars values were originally calculated for composite foods in the nutrient databank, using a recipe approach whereby each food code was broken down into ingredients and proportions. For each ingredient, it was decided if the sugar content met the definition of free sugars. If so, the sugar content was assigned to the relevant free sugars component: table sugar, syrups and other sugar-based sweeteners, honey, fruit juice, fruit purée, vegetable purée and juice.

2.15 NDNS 2019 to 2023 data was analysed for the contribution of these component categories to total sugars and free sugars intakes.

2.16 The data was also analysed for the contribution of food groups to total sugars and free sugars intakes, using the most detailed level of breakdown available for fruit and vegetables.

2.17 In line with SACN's position statement on expressing energy, fat and carbohydrate intakes and recommendations (SACN, 2025), intakes from sugars are expressed as a percentage of energy excluding ethanol (alcohol) (hereafter shortened to 'percentage (%) of energy') for comparison with the dietary reference values.

3. Comparing free sugars definitions

UK and international definitions

3.1 The free sugars definitions currently used by the UK, WHO and European Food Safety Authority (EFSA) are set out below, highlighting the main differences between the WHO and EFSA definitions compared with the UK definition.

3.2 In summary, all definitions of free sugars considered in this statement are derived from WHO's 2015 definition (WHO, 2015a). In particular, the:

- UK definition (Swan and others, 2018) develops the WHO definition further and includes a broader range of foods, including smoothies and purées, which contain free sugars from fruit and vegetables due to processing methods

- EFSA definition (EFSA, 2022a) has simplified the language used by WHO - in place of "monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer" the EFSA definition simply uses the term "added sugars"

The UK's free sugars definition

What the existing UK definition includes

3.3 The UK defines free sugars as the following (Swan and others, 2018):

> "All added sugar in whatever form, including honey, syrups and nectars whether added to products during manufacture or by the consumer during cooking or at the table. This includes ingredients such as malt extract and glucose syrup.
>
> "All the sugars naturally present in fruit and vegetable juices, concentrates, smoothies, purées, pastes, powders and extruded fruit and vegetable products.
>
> "All sugars in drinks except for [naturally occurring] sugars in milk and other dairy-based drinks. Including:

- all sugars in unsweetened fruit and vegetable juices

- fruit and vegetable juice concentrates and smoothies

- all sugars in alcoholic drinks

- all sugars naturally present in dairy-alternative drinks such as soya, rice, oat and nut-based drinks"

3.4 The SACN definition of free sugars also includes (SACN post meeting paper November 2025, available from the SACN webpage):

- "lactose and galactose added as an ingredient to foods or drinks"
- "lactose in whey powder added as an ingredient"
- "all sugars in lactose free dairy products where the lactose has been broken down to glucose and galactose through the addition of lactase"

Further information supporting the UK free sugars definition

3.4 The current UK definition is based on the WHO definition and incorporates SACN's advice (Swan and others, 2018).

3.5 SACN (2015) recommended that the definition of 'free sugars' be adopted in the UK. The SACN 2015 report notes:

> "The only difference between non-milk extrinsic sugars and free sugars is that non-milk extrinsic sugars includes 50% of the fruit sugars from stewed, dried or canned fruit, but free sugars includes none". "The 50% figure is arbitrary and is used to account for the partial breakdown of the cellular structure during processing (Buss et al., 1994) but proves problematic when trying to estimate the sugars composition of certain foods."

3.6 SACN subsequently discussed the definition of free sugars in more detail at its meeting in June 2016. This was to enable estimation of intakes in the NDNS (see minutes of SACN June 2016 meeting, available from the SACN webpage). The definition was updated by Swan and others (2018).

3.7 SACN discussed the topic of free sugars in relation to hydrolysed lactose at its meeting in November 2025 (see minutes of SACN November 2025 meeting, available from the SACN webpage).

WHO's definition of free sugars compared with the UK definition

3.8 WHO defines free sugars as (WHO, 2015):

> "Free sugars include monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates."

Main differences to the UK definition

3.9 WHO's definition does not mention the following terms that are included in the UK definition:

- nectars, malt extract, vegetable juices, smoothies, purées, pastes, powders and extruded fruit and vegetable products
- alcoholic drinks
- dairy-alternative drinks
- lactose and galactose added as ingredients
- all added sugars in whatever form

3.10 Where WHO's definition mentions monosaccharides and disaccharides more generally, the UK's definition specifically mentions glucose, lactose and galactose.

Further information supporting the WHO free sugars definition

3.11 WHO uses the term 'intrinsic sugars', which are sugars incorporated within the structure of intact fruit and vegetables, and sugars from milk (lactose and galactose).

EFSA's definition of free sugars compared with the UK definition

3.12 EFSA defines free sugars as (EFSA, 2022a):

> "… added sugars plus sugars naturally present in honey, syrups, fruit (and vegetables (note 3)) juices and fruit (and vegetables (note 3)) juice concentrates."

Note 3: clarification provided from personal communication with EFSA August 2026.

Main differences to the UK definition

3.13 EFSA's definition does not mention the following terms that are included in the UK's definition:

- malt extract, smoothies, purées, pastes, powders and extruded fruit and vegetable products
- alcoholic drinks
- dairy-alternative drinks

Further information supporting the EFSA free sugars definition

3.14 EFSA's definition largely adopts WHO's definition, but the language is simplified. EFSA also has a definition for added sugars:

> "… mono- and disaccharides added to foods as ingredients during processing or preparation at home, and sugars eaten separately or added to foods at the table."

3.15 EFSA's glossary definition of free sugars notes that "they do not include the sugars naturally found inside whole fruits, vegetables, or milk".

Summary of free sugars definitions currently used by UK, WHO and EFSA

3.16 Table 1 summarises the free sugars definitions currently used by UK, WHO, and EFSA according to the level of fruit and vegetable processing. This comparison exercise found that:

- sugars naturally present in juice and juice concentrates are included in all 3 of the free sugars definitions
- sugars naturally present in smoothies, purées, pastes, powders and extruded products (see glossary), are included in the UK definition but not mentioned in the WHO or EFSA definitions
- sugars naturally present in stewed, canned, frozen and dried fruit and vegetables are explicitly excluded from the UK definition but not mentioned in the WHO or EFSA definitions

Table 1: comparison of free sugars definitions by UK, WHO and EFSA by levels of fruit and vegetables processing

Sugars naturally present in:	UK free sugars definition	WHO free sugars definition	EFSA free sugars definition
Juice	Included	Included	Included
Juice concentrates	Included	Included	Included
Smoothies	Included	Not mentioned	Not mentioned
Purées	Included	Not mentioned	Not mentioned
Pastes	Included	Not mentioned	Not mentioned
Powders	Included	Not mentioned	Not mentioned
Extruded products	Included	Not mentioned	Not mentioned
Blended or pulped	Included	Not mentioned	Not mentioned
Sieved	Not mentioned	Not mentioned	Not mentioned
Mashed or crushed	Not mentioned	Not mentioned	Not mentioned
Pressed	Excluded	Not mentioned	Not mentioned
Stewed	Excluded	Not mentioned	Not mentioned
Canned	Excluded	Not mentioned	Not mentioned
Frozen	Excluded	Not mentioned	Not mentioned
Dried	Excluded	Not mentioned	Not mentioned
Chopped	Not mentioned	Not mentioned	Not mentioned
Sliced	Not mentioned	Not mentioned	Not mentioned

Sugars naturally present in:	UK free sugars definition	WHO free sugars definition	EFSA free sugars definition
Diced	Not mentioned	Not mentioned	Not mentioned
Grated	Not mentioned	Not mentioned	Not mentioned

Overview of countries that have free sugars definitions

3.18 Annex 1 provides an overview of the countries that have, to date, either adopted free sugars definitions in national dietary guidelines or collected information on free sugars intake in their national dietary surveys.

3.19 Information on the use of free sugars definitions in dietary guidelines was identified for 9 other non-UK expert bodies or countries. In addition, a further 3 countries were identified that refer to free sugars in their national dietary surveys. One additional country was identified following personal communication with the Pan American Health Organization (PAHO) in 2026 that used a definition of free sugars in their nutrition legislation.

3.20 National documentation indicates that currently:

- New Zealand, Austria, Canada, Germany, PAHO, Netherlands and Slovenia use WHO's phrasing for the definition for free sugars in their national dietary guidelines or recommendations

- for Ireland, dietary guidelines for older adults and children aged 1 to 5 years include free sugars recommendations based on the WHO definition (dietary guidelines for the general population do not include a definition for free sugars) and both the WHO and EFSA definitions were used for intake monitoring purposes

- the Nordic and Baltic countries have adopted EFSA's wording around free sugars in their dietary guidelines

- Australia and Portugal refer to the WHO definition in their dietary surveys

- Switzerland does not refer to free sugars in its national dietary guidelines, but its 'added sugar' definition is broadly consistent with the WHO definition for free sugars - it refers to SACN's definition for free sugars in its national dietary survey

- Spain does not refer to free sugars in its consumer facing guidelines but uses EFSA's phrasing around free sugars in their technical documentation behind the guidelines

- Mexico incorporates WHO's phrasing for free sugars in its own definition, which is used in national legislation - this legislation requires the application of warning labels and other regulatory policies for products excessive in sugars, including sugars from vegetable juice concentrates (personal communication with PAHO, 2026)

3.21 Many countries only use the phrase 'added sugars' in their dietary guidelines, including the USA's Dietary Guidelines for Americans (PDF, 3.3MB). Data on these countries has not been extracted.

Application of definitions in policy

UK nutrient profiling model

3.9 The new UK nutrient profiling model (NPM) (2018) uses free sugars instead of total sugars. The UK nutrient profiling model technical guidance (DHSC, 2026) notes that the definition of free sugars is based on Swan and others (2018) plus additional guidance from SACN in a post-meeting letter on hydrolysed lactose (available in the SACN meeting papers folder for 13 November 2025). As such, free sugars are stated as including:

- all added sugars in any form
- sugars in honey, syrups and nectars
- all sugars naturally present in fruit and vegetable juices, purées, powders and pastes, extruded fruit and vegetable products, and similar products in which the structure has been broken down
- all sugars in drinks (except for unsweetened dairy-based drinks)
- lactose and galactose added as ingredients (this also includes hydrolysed lactose and the sugars (lactose) in whey powder)
- all sugars in drinks, except for lactose naturally present in cows' milk and other dairy products, this includes the sugars naturally present in fruit and vegetable juices, concentrates, smoothies and dairy-alternatives
- all sugars in lactose-free dairy products where the lactose has been partially removed through filtration and the remainder broken down to glucose and galactose using lactase

They exclude:

- sugars (lactose and galactose) naturally present in cows' milk and other dairy products including dried milk powder
- all sugars naturally present in fresh, frozen, dried, stewed and canned fruit and vegetables (other than purées, powders, pastes, juices, smoothies and extruded products)

- all sugars naturally present in puréed and powdered starchy carbohydrates, including tubers (such as potatoes, sweet potatoes, yams, cassava and plantain)

- all sugars naturally present in cereal grains including rice, pasta and flour and all sugars naturally present in nuts and seeds (other than cereal-based or nut-based drinks)

- maltodextrins, oligofructose and sugar substitutes such as polyols (for example, sorbitol)

3.10 Infant formula and other foods intended for infants and young children are outside the scope of the NPM. The model was not developed or validated for children aged 4 years and under, and products for this age group are subject to separate regulatory requirements.

Other nutrient profiling models

3.11 Most non-UK nutrient profiling models do not currently use free sugars. Instead, they score total sugars that are routinely available from nutrition labels.

3.12 These non-UK nutrient profiling models include:

- Nutri-Score in France

- Health Star Rating System in Australia and New Zealand

- WHO Europe Nutrient Profile Model

- Canada's front-of-package nutrition symbol

- Chile's food warning labels

3.13 In 2022, EFSA provided the European Commission with scientific advice on nutrient profiling. This covered the development of harmonised mandatory front of pack nutrition labelling and the setting of nutrient profiles for restricting nutrition and health claims of foods. EFSA concluded that “As excess intakes of … added/free sugars … are associated with adverse health effects, they could be included in nutrient profiling models” (EFSA, 2022b).

3.14 The only non-UK NPM identified that currently uses free sugars is the PAHO nutrient profiling model (PAHO, 2016). This model has adopted WHO's free sugars definition but estimates free sugars from total sugars when added sugars or free sugars are not declared. It calculates free sugars by excluding naturally occurring sugars in fruit and milk. If a product declares total sugars, PAHO estimates free sugars as follows:

- “… is part of a group of foods with no or a minimal amount of naturally occurring sugars … the estimated free sugars equal … declared total sugars”

- “…is a processed fruit item with sugars in the list of ingredients … the estimated free sugars equal ... 50% of declared total sugars (for example, fruit in syrup)"

- “… is yogurt or milk, with sugars in the list of ingredients … the estimated free sugars equal … 50% of declared total sugars (for example, flavoured milk or yoghurt)"

- “… the product has milk or fruit in the list of ingredients … the estimated free sugars equal … 75% of declared total sugars (for example, a cereal bar with fruit)"

Advice on fruit and vegetable intake

UK

3.15 The UK government advises consuming at least 5 portions of a variety of fruit and vegetables every day. Current advice on the NHS website (NHS, 2022) states that one portion includes:

- 80 grams (g) of fresh, canned or frozen fruit and vegetables (but not potatoes and some other starchy foods) - the advice states that:

    - “for tinned or canned fruit and vegetables, choose those in natural juice or water, with no added sugar or salt”

    - '5 A Day' includes the fruit and vegetables cooked in dishes such as soups, stews or pasta or included in ready-made foods that contain fruits and vegetables, such as ready meals and shop-bought pasta sauces, soups and puddings

- 30g of dried fruit (this is equivalent to around 80g of fresh fruit) - the advice states that “dried fruit should be eaten at mealtimes, not as a between-meal snack, to reduce the risk of tooth decay”

- 150 millilitres (ml) of fruit juice, vegetable juice or smoothie - the advice states “limit the amount you drink to a combined total of 150ml a day. Crushing fruit and vegetables into juice and smoothies releases the sugars they contain, which can damage teeth. Juices and smoothies should be consumed at mealtimes, not as a between-meal snack, to reduce the risk of tooth decay”

WHO

3.16 WHO advises that “everyone older than 10 years of age should aim for at least 400 grams of fruits and vegetables per day” (WHO, 2023). Of potential relevance to free sugars, these recommendations note:

> “Evidence from the systematic reviews suggests health benefits from a wide range of fruit and vegetables, including those that are fresh, cooked, frozen or canned.”
>
> “Specific evidence for dried fruits and fruit juices in the systematic reviews is very limited, and results are inconsistent; however, both can be significant sources of sugars, as can fruit concentrates and fruit sugars (i.e. sugars and syrups obtained from whole fruits). All should therefore be consumed in accordance with WHO recommendations on free sugars intake.”
>
> “The method of preparation and the level of processing should be considered when consuming whole grains, vegetables, fruits and pulses, and should be compatible with other WHO macronutrient recommendations. For example, frying and addition of sauces or condiments can significantly increase the amount of fat, sugars or salt. Therefore, fresh foods, or foods that are minimally processed or modified beyond the treatment necessary to ensure edibility, without added fat, sugars or salt, are preferred.”

EFSA and other countries

3.17 EFSA does not make policy recommendations or set public health guidelines and therefore does not provide a fruit and vegetable recommendation.

3.18 Annex 2 provides the fruit and vegetable recommendations of the other countries that have adopted the free sugars definition. Across the recommendations, there is strong consistency that fruit and vegetables should be eaten regularly, most commonly framed as at least 5 portions or servings per day. Several countries specify a split of around 3 portions of vegetables and 2 portions of fruit, while others use gram-based targets. Overall, most countries recommend consuming fruit and vegetables as whole foods, while limiting sugar-containing or lower fibre alternatives, such as juice.

4. Free sugars intakes

National Diet and Nutrition Survey (NDNS) data

4.1 This chapter and accompanying data tables (available on the Free sugars in processed fruit and vegetables: SACN statement page) present information on intakes of

free sugars and total sugars based on the latest NDNS data (2019 to 2023) food groups (OHID, 2025).

Intakes by age and index of multiple deprivation (IMD)

4.2 Table 4.1 (see data tables) shows that mean (and also median) free sugars intakes in all age groups in 2019 to 2023 exceeded the recommendation that no more than 5% of energy should come from free sugars. For adults aged 19 to 64 years and children from 4 years, mean intakes were around double the recommendation.

4.3 Table 4.2 (see data tables) presents free sugars intakes by index of multiple deprivation (IMD) for children and adults. Mean (and also median) free sugars intakes exceeded the recommendation of no more than 5% of energy across all IMD quintiles in all age groups. Mean intake of free sugars as a percentage of energy was highest in the most deprived IMD quintile in all age groups, although no clear pattern was observed across IMD quintiles.

Contributors to total sugars intakes

4.4 Table 4.3 (see data tables) shows the contribution of sources of sugar to total sugars intake. Free sugars were the main source of total sugars for children aged 4 years and older and for adults aged 19 to 64 years, providing over half of total sugars intake. In children aged 1.5 to 3 years, over a third of total sugars intake came from free sugars. Stewed fruit and the fruit component of canned fruit provided less than 1% of total sugar intakes across age groups.

4.5 Table 4.4 (see data tables) shows the contribution of food groups to total sugars intake. Fruit provided 11% to 20% of total sugars intake for adults and children from 4 years, and 31% in younger children. Almost all of this was from “fresh and frozen fruits” which have not been cooked or otherwise processed.

Contributors to free sugars intakes

4.6 Table 4.5 (see data tables) shows the contribution of sources of sugar to free sugars intake. Added sugar provided the majority of free sugars in all age groups - around three-quarters in children aged 10 years and under, and around 80% for older children and adults. In older children and adults, fruit purées provided around 2% of free sugars intake, and vegetable purées and vegetable juices provided 3% to 5%. In the youngest age group (1.5 to 3 years), the contributions were higher: 5% from fruit purée and 7% from vegetable purées and vegetable juices.

4.7 Table 4.6 (see data tables) shows the percentage contribution of food groups to free sugars intake. The main sources of free sugars in the diet were:

- cereal products (in particular, biscuits, buns, cakes and pastries and breakfast cereals)
- table sugar
- preserves and confectionery
- drinks (in particular, fruit juice and soft drinks)

Fruit provided less than 3% of free sugars intake in children aged 1.5 to 3 years and 1% or less in other age groups, almost all of which was from processed fruit.

4.8 Table 4.7 (see data tables) presents the contribution of sources of sugar to total sugars intake by IMD quintile (England only). For all age groups, the contribution of free sugars to total sugars intake was higher in the most deprived than in the least deprived IMD quintile, although no clear pattern was observed across quintiles. The difference between quintiles was largely due to added sugars. Where there were small differences in the contribution of processed fruit categories, these were in the direction of lower contributions in the most deprived quintile.

4.9 Analysis by ethnicity is not possible for this data set due to small numbers.

Other relevant data

4.10 We are not aware of relevant data from other dietary surveys in the UK.

4.11 There is limited additional information on total and free sugars in the Office for Health Improvement and Disparities report Changes in food purchasing behaviour and the impact on diet and nutrition: 2021 to 2023. Analysis of household food purchasing data by broad food groups shows that discretionary foods are the main contributor to total sugar purchased, followed by fruit and vegetables and dairy and alternatives. For free sugars, discretionary foods are the main contributor, followed by drinks and bread, rice, pasta and other starchy carbohydrates.

4.12 The latest NDNS data (2019 to 2023) shows that adults aged 19 to 64 years consumed on average 3.3 portions of fruit and vegetables per day, which is lower than the recommendation to eat at least 5 portions. Older adults consumed 3.6 to 3.7 portions per day. Overall, 17% of adults met the NHS 5 A Day recommendation. Children aged 11 to 18 years consumed 2.8 portions per day on average, and 9% met the 5 A Day recommendation.

Summary

4.13 In summary, NDNS data indicates that:

- mean free sugars intakes in all age groups and IMD quintiles exceed the recommendation that no more than 5% of energy should come from free sugars
- mean intake of free sugars as a percentage of energy was highest in the most deprived IMD quintile in all age groups, although no clear trends were observed across quintiles
- added sugars are the main source of free sugars intakes in the UK diet
- over half of total sugars intake comes from free sugars in children from 4 years and adults 19 to 64 years, the majority of which is added sugars
- purées and stewed fruit contribute small amounts to total sugar intakes - in older children and adults, fruit purées provide around 2% of free sugars intake and “vegetable purée and juice” provide 3% to 5% with higher contributions observed in the youngest age group (5% from fruit purée and 7% from “vegetable purée and juice”)

5. Discussion

Information considered

5.1 For this position statement, SACN considered clarifications to the UK definition of free sugars. SACN took account of:

- previous SACN deliberations on the definition of free sugars (see chapter 1)
- comparison of the UK approach to defining free sugars with that of non-UK expert bodies or countries (see chapter 3)
- data on UK dietary intakes, from the National Diet and Nutrition Survey (NDNS) (see chapter 4)
- information on policy implementation issues provided to the committee (see chapter 1)

5.2 SACN noted that in the definition of free sugars set out by Swan and others (2018), the following terms were:

- explicitly excluded - 'stewed' and 'pressed'
- not mentioned - 'sieved', 'mashed' and 'crushed'
- not explicitly excluded - 'chopped', 'sliced', 'grated' and 'diced'

5.3 SACN reflected that NDNS data indicates that intakes of free sugars are high, and intakes of fruit and vegetables are low across all UK population groups. Improving both would have wide ranging population health benefits. Because of this, SACN considered the definition of free sugars alongside existing dietary recommendations, which state that:

- free sugars should provide a population average of no more than 5% of energy (SACN, 2015)
- everyone should consume at least 5 portions of a variety of fruit and vegetables each day

5.4 While processed fruit and vegetables are currently a minor source of free sugars in UK diets, it is important to provide consistency and clarity in the definition of free sugars.

5.5 SACN has previously noted that the UK nutrient profiling model (NPM) broadly aligns with SACN's previous dietary recommendations (see minutes from SACN meeting November 2025, available from the SACN webpage). SACN noted that while free sugars within fruit and vegetables were a focus of their deliberations for this statement, the NPM also reflects SACN's recommendations on saturated fat, salt, protein and fibre.

5.6 SACN only considered issues relating to sugars naturally contained within or released from fruit and vegetables. SACN did not consider issues relating to other sugars, such as added sugars.

Conclusions on the definition

5.7 Members supported SACN's previous conclusions on how free sugars should be defined (SACN meeting June 2016, minutes, available on the SACN webpage; SACN, 2015; Swan and others, 2018). These were:

- fruits and vegetables subject to processes that break down the cellular structure should be considered as containing free sugars
- the definition should apply equally to all scenarios, for example home cooking and manufactured products, though recognising that intensive, industrial processes may be more likely to produce free sugars than less intensive, home cooking
- the definition should apply to both fruit and vegetables (while noting that vegetables naturally contain lower levels of sugar)
- considering a percentage of the total sugars in some or all processed fruit or vegetables as free sugars would be arbitrary

5.8 There is consistency in the overarching definitions of free sugars used by the UK, non-UK expert bodies and countries. While the deliberations and recommendations by non-UK expert bodies or countries provided limited additional evidence or information, it was of note that:

- the EFSA glossary states that the definition of free sugars does not include the sugars naturally found inside whole fruits and vegetables - most non-UK expert bodies promote consumption of ‘whole’ fruit and vegetables

- WHO (2015a) highlights that ‘intrinsic sugars’ are those incorporated within the structure of intact fruit and vegetables

- WHO (2019) notes that commercial purées are likely to be higher in free sugars and have a sweeter taste than home-prepared versions of smooth and mashed fruit and vegetables

5.9 SACN took a pragmatic approach, given the lack of evidence on the extent to which different processing methods affect the cellular structure of different fruit and vegetables and the resulting percentage of free sugars released. SACN noted that it was helpful to consider the final state of a product and whether any of the original fruits or vegetables were likely to have remained intact.

5.10 The various processes outlined in chapter 3 (particularly table 1) were considered in relation to their likely effect on the cellular structure of fruit and vegetables. SACN noted that most of the processes resulting in free sugars were due to mechanical disruption or heating for an extended period of time. SACN noted that the processes considered often increased the concentration of free sugars.

5.11 Pragmatic decisions were taken about whether processes were likely to result in a fruit or vegetable remaining largely intact. Where fruit and vegetables are no longer intact, free sugars are likely to be released. Considering whether fruit and vegetables remain intact or whole is consistent with the overarching definitions of free sugars used by the UK and non-UK expert bodies or countries.

Clarification of UK definition

Groupings

5.12 Processes can be split into the following 2 groups.

Group 1 - processes that are considered to produce free sugars. All the naturally occurring sugars in products that have undergone these processes should be considered free sugars.

Group 2 - processes that are considered to produce no or minimal free sugars. None of the naturally occurring sugars in products that have undergone these processes should be considered free sugars.

5.13 Group 1 processes resulting in free sugars include:

- liquidising, blending, pulping, sieving (to create, for example, juices, smoothies, pastes and purées) and instances of stewing where the fruit or vegetable is no longer intact (such as apples and tomatoes)

- processes that produce concentrates, extruded products, powders, freeze dried and fully dehydrated products

- other processes that result in the cellular structure no longer being intact, releasing free sugars - this includes mashing, pressing and crushing

5.14 Group 2 processes resulting in no or minimal free sugars include:

- 'simple' processes where the cellular structure remains largely intact such as chopping, slicing, dicing and grating

- drying when the cellular structure remains largely intact (for example, dried apricots or raisins)

5.15 The processes listed in groups 1 and 2 are not intended to be exhaustive.

Points of note

5.16 These groupings mean that processes which were already included in the UK free sugars definition remain as they are (Swan and others, 2018). The groupings proposed by SACN are therefore a clarification of the existing definition rather than a substantive change.

5.17 SACN recognised that the effect of processing may not be uniform due to differences in intensity or across different types of fruit and vegetable. While there may be a continuum of effect (see paragraph 1.48), SACN considered that where the cellular structure is likely to be damaged and the fruit or vegetable is no longer intact, it should be assumed that all the sugars within a fruit or vegetable are free sugars. Any resulting overestimation in UK population intakes of free sugars is likely to be minimal.

5.18 SACN noted the following points.

Simple cutting processes such as chopping, slicing, dicing and grating of fruit and vegetables result in minimal disruption to the cellular structure. Where this is the case, the

sugars in fruit and vegetables should not be considered free sugars. Very fine chopping may result in them becoming a purée or paste texture. Where this is the case, all of the sugars in the fruit or vegetable would be considered free sugars.

Stewing is a process that can result in a range of effects. The type of fruit or vegetable, and the extent of cooking and any other processes used, will affect whether the cellular structure remains intact. As such:

- stewed fruit or vegetables that remain intact are considered as containing no or minimal free sugars (that is, group 2) - this also means that intact chopped, sliced or diced vegetables within a casserole or stew would not be considered as containing free sugars

- stewed fruit or vegetables that break down, and where the fruit or vegetable is no longer intact, are considered as containing free sugars (that is, group 1)

- for canning, freezing and specific cooking methods (such as making a soup), the type of processing and the state of the final product should be considered - the free sugars content of canned or frozen fruit will be determined by whether the fruit within the can or frozen product is chopped or puréed

- the intensity or extent of cooking processes will affect the extent of disruption of the cellular structure of fruit and vegetables - home cooking may be less likely to result in the release of free sugars than intensive, industrial processing, however SACN has assumed that the definitions continue to apply to all settings

- powders, freeze dried and fully dehydrated products are considered as containing free sugars as the cellular structure is unlikely to have remained intact

Summary

5.19 SACN has clarified the existing definition of processes resulting in free sugars to the following groups.

Group 1 processes - all the naturally occurring sugars in fruit and vegetables that have undergone these processes should be considered free sugars. This is because the cellular structure will no longer be intact.

Group 2 processes - none of the naturally occurring sugars in fruit and vegetables that have undergone these processes should be considered free sugars. This is because there will be no or minimal effect on the cellular structure.

5.20 For specific processes, this means that the definition of free sugars now includes:

- the terms sieved, mashed, crushed, pressed and any other processes that result in the cellular structure no longer being intact

- powders, freeze dried and fully dehydrated products where the cellular structure of the fruit and vegetables are no longer intact

The definition of free sugars now excludes the terms chopped, sliced, diced and grated.

For stewing, stewed fruit or vegetables no longer intact should be considered as containing free sugars.

For canned and frozen, free sugars content depends on other processes, for example whether chopped or puréed.

6. Limitations

Remit

6.1 SACN has a risk assessment role. The role of policy making is outside its remit. However, SACN's code of practice notes that "where required, SACN may advise on possible practical solutions, but does not develop policy on behalf of government". DHSC made a direct request to SACN to consider the issues outlined in this position statement. As part of deliberations, SACN has considered previous statements made by COMA. It is noted that the remits of SACN and COMA differed, with the latter having some risk management role.

Approach

6.2 This was a rapid piece of work and evidence was not systematically searched. Instead, a pragmatic approach was taken to identifying relevant evidence. It is possible, therefore, that some relevant sources of information may not have been identified.

Evidence considered

6.3 A comprehensive scoping search was carried out for free sugars definitions used by countries and non-UK expert bodies globally. It was difficult to do this search systematically due to the reliance on grey literature sources (such as official non-UK expert body websites). It is possible, therefore, that some relevant data sources may not have been included.

6.4 The main issue under consideration in this statement is how different processing of fruit and vegetables leads to a continuum of effect to the disruption of the cellular structure.

This ranges from entirely intact to entirely broken down (no longer intact). The lack of evidence on the specific effect of different processing methods on the extent to which free sugar is released from the cellular structure of different fruit and vegetables. This meant SACN had to make assumptions about free sugars content, based on pragmatic decisions.

6.5 The interpretation of terms used by non-UK expert bodies and countries was reliant on published information. Relevant text in this statement was checked for accuracy by the World Health Organization (WHO), European Food Safety Authority (EFSA) and Pan American Health Organization (PAHO), but not by other countries or non-UK expert bodies.

6.6 Given the complexity of the topic, it was difficult to determine whether the documents used for extraction were the most up to date. In addition, a limited number of documents identified through the scoping search were not in a format that allowed automated English translation and therefore could not be extracted due to time constraints.

6.7 The National Diet and Nutrition Survey (NDNS) assessment was limited to pre-existing subcategories due to time constraints.

6.8 It was not possible to consider sugar intakes in the NDNS data by ethnicity due to the survey sample size.

6.9 Due to the limited timeframe for this statement, it was not possible to model the effect of different definitions of free sugars on estimated intakes in different population groups. However, NDNS data indicates that proposed changes are likely to have minimal effect on estimates of free sugars intake.

Terminology

6.10 There may be cooking or processing terms that have not been explicitly mentioned in this statement. However, it is assumed that the resulting effect that these have on the cellular structure of fruit and vegetables will enable them to be readily assigned to group 1 or 2 processes, as set out in chapters 5 and 7.

7. Conclusions

7.1 SACN is providing practical advice on this issue at the request of DHSC, while recognising that final policy implementation decisions remain with government.

Dietary recommendations

7.2 Average intakes for all population groups in the UK fail to meet dietary recommendations for free sugars and fruit and vegetables. Improving population compliance with dietary recommendations would have important and wide-ranging health benefits. So SACN reiterates its existing recommendations for children and adults to consume:

- no more than 5% of daily energy intake from free sugars
- at least 5 portions of a variety of fruit and vegetables each day

7.3 The main source of free sugars in the UK diet is added sugars. While processed fruit and vegetables are currently a minor source of free sugars, it is important to provide consistency and clarity in the definition.

Grouping processes that affect free sugars

7.4 The overarching definition of free sugars in the UK aligns with those of non-UK expert bodies. However, limited additional nuance on what is included or excluded from definitions is available from non-UK expert bodies. The UK has been progressive in aiming to define free sugars to assess intakes in dietary surveys and to incorporate it into policy tools such as the nutrient profiling model (NPM).

7.5 There is a lack of evidence on the effect of different processing methods on the cellular structure of different fruit and vegetables. There is also a lack of evidence on the implications for the release of free sugars. SACN has made the following pragmatic conclusions on processes resulting in free sugars based on:

- its previous deliberations on this issue
- reflections on existing UK advice and that of non-UK expert bodies
- information on UK dietary intake
- policy implementation issues brought to its attention

7.6 SACN concludes that processes should be split into the following 2 groups.

Group 1 processes - processes resulting in free sugars. All the naturally occurring sugars in fruit and vegetables that have undergone these processes should be considered free sugars. This is because the cellular structure will no longer be intact.

Group 2 processes - processes not resulting in free sugars. None of the naturally occurring sugars in fruit and vegetables that have undergone these processes should be considered free sugars. This is because there will be no or minimal effect on the cellular structure.

Group 1: processes that result in free sugars

Group 1 processes resulting in free sugars include:

- liquidising, blending, pulping, sieving (to create, for example, juices, smoothies, pastes and purées) and instances of stewing where the fruit or vegetable is no longer intact (such as apples and tomatoes)
- processes that produce concentrates, extruded products, powders, freeze dried products and fully dehydrated products
- other processes that result in the cellular structure no longer being intact, releasing free sugars - this includes mashing, pressing and crushing

Group 2: processes that do not result in free sugars

Group 2 processes not resulting in free sugars include:

- simple processes where the cellular structure remains largely intact, such as chopping, slicing, dicing and grating
- drying, when the cellular structure remains largely intact (for example, dried apricots or raisins)

The processes listed in groups 1 and 2 are not intended to be exhaustive.

What this means for the definition of free sugars

7.7 In summary, the definition of free sugars now includes:

- the terms ‘sieved’, ‘mashed’, ‘crushed’ and ‘pressed’ and any other processes that result in the cellular structure no longer being intact
- powders, freeze dried and fully dehydrated products where the fruit and vegetables are no longer intact

The definition of free sugars now excludes the terms ‘chopped’, sliced’, diced’ and ‘grated’.

For stewing, stewed fruit or vegetables no longer intact should be considered as containing free sugars.

For canned and frozen foods, free sugars content depends on other processes, for example whether the product is chopped or puréed.

7.8 SACN recognises that there will be a continuum of effects. However, it considers that where the fruit or vegetable's cellular structure is likely to be damaged and it is no longer intact, it should be assumed that all the sugars within it are defined as free sugars.

7.9 The NDNS data indicates that SACN's proposed clarifications to the definition are likely to have minimal effect on estimates of free sugars intake. It will be important to monitor the effect of these clarifications to the definition and associated policies on estimated intakes of free sugars and fruit and vegetables.

7.10 SACN has made research recommendations to address important gaps in the evidence (see below). SACN would be content to reconsider this issue if further evidence comes to light that challenges the conclusions of this position statement.

8. Research recommendations

8.1 A number of limitations in the available evidence on free sugars were identified (see chapter 6). Further research is required on:

- methods to measure the percentage of sugars released from different fruit and vegetables undergoing different processing methods
- a system to grade levels of processing, based on the resulting concentration of free sugars

9. Roles, membership and acknowledgements

SACN’s role and membership

The role of SACN is to provide independent scientific advice on and risk assessments of nutrition and related health issues. It advises the 4 UK health departments, and other government departments and agencies.

Membership of SACN and the register of members' interests at the time of publication is provided in the relevant annual report, which is available on the SACN webpage, alongside SACN's code of practice.

SACN secretariat

SACN is supported by a scientific secretariat based at DHSC. Members of SACN's secretariat involved in the production of this report were:

- Dr Rachel Allen
- Dr Adrienne Cullum
- Rebecca Hillier
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- Gillian Swan

Observers

Departmental representatives and advisers attend SACN meetings as official observers. Observers for this report were:

- Dr Jennifer Garry (DHSC)
- Emma Jeffcock (DHSC)
- Caroline Litts (Food Standards Scotland)
- Dr Brídín Nally (Food Standards Agency in Northern Ireland)
- Jenny Rosborough (DHSC)
- Dr Sarah Rowles (Welsh Government)

Acknowledgements

SACN would like to acknowledge the World Health Organization (WHO), European Food Safety Authority (EFSA) and Pan American Health Organization (PAHO) for reviewing the content from their own publications.

10. Suggested citation

Scientific Advisory Committee on Nutrition, 2026. Free sugars in processed fruit and vegetables: SACN position statement.

11. Abbreviations

COMA: Committee on Medical Aspects of Food and Nutrition Policy

DHSC: Department of Health and Social Care

CVD: cardiovascular disease

EAR: estimated average requirement

EFSA: European Food Safety Authority

FAO: Food and Agriculture Organization

FSA: Food Standards Agency

IMD: index of multiple deprivation

NAFLD: non-alcoholic fatty liver disease

NDNS: National Diet and Nutrition Survey

NMES: non-milk extrinsic sugars

NPM: nutrient profiling model

OHID: Office for Health Improvement and Disparities

PAHO: Pan American Health Organization

RCT: randomised controlled trial

SSB: sugar-sweetened beverages

T2DM: type 2 diabetes mellitus

UL: tolerable upper intake level

WHO: World Health Organization

12. Glossary

Food processing terms are explained below. Where food processing terms are based on standard terms used by the UK Food Standards Agency (FSA, 2010) or Codex (Codex

Committee on Fresh Fruits and Vegetables, 2022; FAO and WHO, 2026), this is noted in brackets.

Blending

For the purposes of this statement, blending refers to the process which turns solid and liquid ingredients or components into a smooth texture (such as a soup or purée).

Concentration or evaporation

Increase in certain contents by removal of water and other constituents. This happens in the case of milk with reduction of water content by action of evaporation (under vacuum or not), but still in liquid form (FSA).

Drying (dehydration)

Transformation of moist food into its solid-dry form due to the subtraction of water (adapted FSA). Dried fruit and vegetables have a percentage of moisture removed; dehydrated fruit and vegetables have almost all water removed.

Extruded fruit products

Extruded fruit products are snacks shaped using heat and pressure to make bars, twists, belts, bites and cables.

Extrusion or extrusion-cooking

Thermal process during which the product's internal water content, abruptly steamed, leads to the breaking-up of the product, combined with special shaping by passing through an orifice. Forming by passing through an extrusion hole, more often in connection with a cooking step (FSA).

Fresh fruits and vegetables

Fruits and vegetables whose physical and textural characteristics have not been changed or processed in any manner including by salting, freezing, cooking, juicing, sugaring, hydrating, smoking, dehydrating or drying. They may undergo post-harvest practices to maintain freshness, shelf life and to facilitate transportation, storage and handling without affecting their raw nature as when harvested (Codex standards for fresh fruits and vegetables).

Fruit nectar

Fruit nectar is the unfermented but fermentable product obtained by adding water, with or without the addition of sugars, honey and/or syrups, and/or food additive sweeteners, to fruit juice, concentrated fruit juice, water-extracted fruit juice, fruit purée, concentrated fruit purée, or to a mixture of these products. Aromatic substances, volatile flavour components, pulp and cells - all of which must be recovered from the same kind of fruit and be obtained by suitable physical means - may be added (FAO and WHO, 2026).

Fruit or fruit-vegetable purée

Product obtained from fruits, with eventual addition of vegetables or legumes, that have been ground, pressed, blended, sieved or mashed to the consistency of a soft creamy paste or thick liquid. Cooking may be or not a step in the preparation of purées (adapted FSA).

Fruit or vegetable juice concentrate

Product obtained by concentrating (reducing the water content of) fruit or vegetable liquid products (they may or may not contain fibres or particles) (adapted FSA).

Fruit or vegetable powder

Powders obtained by dehydrating (and sometimes grinding) fruit or vegetables or grinding fruits or vegetables (adapted FSA).

Grating

Reducing to fragments, or shreds by rubbing against an abrasive surface (adapted FSA).

Crushing

Reducing to fragments or shreds by passing through a crusher (adapted FSA).

Intact fruit or vegetables

For the purpose of this statement, intact refers to fruit or vegetables where the cellular structure has not been broken down. Intact fruit or vegetables can be whole, cut, sliced or diced into pieces but must remain recognisably intact.

Juicing

Transforming into a juice (liquid) by physical or enzymatic action or a combination of the 2 (particularly applicable to fruit or vegetables) (adapted FSA).

Maceration

Reducing the size of feed or food materials using mechanical means in the presence of water or other liquids (FSA).

Mincing or chopping or cutting

Cutting or chopping into very small pieces (usually said for soft solids), by using one or more knives (FSA).

Paste

Texture of any moist but fairly stiff mixture, typically made from a powder dispersed in a liquid or by mincing food with soft but firm texture (adapted FSA).

Pulping or mashing

Process transforming food (in general fruit or vegetables) from whole or pieces into purée. It is often based on the action of a rotating shaft combined with cylindric mash drums (FSA).

Sieving

Passing a substance through a mesh to separate larger from smaller particles.

Slicing

Cutting into slices with a knife or blade (adapted FSA).

Stewing

Cooking by slowly boiling (usually in a covered pan) (adapted from FSA).

Vegetable purée or paste

Product obtained from vegetables that have been ground, pressed, blended, sieved or mashed to the consistency of a soft creamy paste or thick liquid. Cooking may be or not a step in the preparation of purées (FSA).

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Annex 1: countries with a free sugars definition

14.1 Where a country states it uses an existing free sugars definition that is UK, WHO or EFSA, the definition is only provided below where it differs to the definitions outlined in chapters 1 and 3.

Australia

14.2 The Food Standards Australia New Zealand (FSANZ) (Food Standards Australia New Zealand, 2025) and the Australian national dietary survey (Australian Bureau of Statistics, 2023) uses WHO's definition of free sugars with adapted wording. The definition used is:

> "Free sugars include all sugars defined as added sugars [plus] the sugar component of honey, fruit juice and fruit juice concentrates."

Austria

14.3 The Austrian Agency for Health and Food Safety (AGES) includes a webpage on the WHO sugar recommendations (AGES, 2026). It defines free sugars as:

> "All types of sugar that are added to food and drinks. But also the sugar that occurs naturally in honey, syrup, fruit juice concentrates and fruit juices."

Canada

14.4 Canada’s Dietary Guidelines use WHO's definition for free sugars with adapted wording (Health Canada, 2019). It defines free sugars as:

> "Monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates. Free sugars do not include the naturally occurring sources of sugars found in intact or cut fruit and vegetables, and (unsweetened) milk."

Germany

14.5 The quantitative recommendation on sugar intake in Germany was issued as a joint consensus statement of German Nutrition Society (DGE), German Obesity Society (DAG) and German Diabetes Society (DDG) and uses WHO's free sugars definition (Ernst and others, 2019).

14.6 In addition, the German Dortmund Nutritional and Anthropometric Longitudinally Designed (DONALD) cohort uses WHO's definition (Perrar and others, 2024) and the German National Nutrition Survey II (NVS II) reports intake of free sugars according to WHO's definition (Heuer, 2018).

Ireland

14.7 Ireland uses WHO's definition of free sugars for dietary guidelines (Food Safety Authority of Ireland (FSAI), 2021; FSAI, 2020) and refers to both WHO's and EFSA's definitions for intake monitoring purposes (FSAI, 2025).

14.8 The ‘Food Reformulation Task Force: Monitoring Sugar in Processed Foods’ by the FSAI uses ‘free sugars’ and/or ‘added sugars’ based on WHO's and EFSA's definitions (FSAI, 2011).

Mexico (personal communication with PAHO)

14.9 The Department of Economy and the Department of Health incorporated the WHO's phrasing into their food labelling legislation, expanding it to also include vegetable juices (United Mexican States Ministry of Economy and Ministry of Health, 2010). Free sugars are defined as:

> "Available monosaccharides and disaccharides added to foods and non-alcoholic beverages by the manufacturer, plus the sugars naturally present in honey, syrups, and fruit or vegetable juices."

New Zealand

14.10 The FSANZ and the Eating and Activity Guidelines for New Zealand Adults uses WHO's definition with adapted wording (FSANZ, 2025; New Zealand Ministry of Health, 2020). It defines free sugars as:

> "Sugars that are not bound within a plant cell. This includes all sugars added to food during preparation, and they are naturally present in honey, syrups and fruit juices. Free sugars are digested and enter the blood stream more quickly than sugars that are intrinsic, or still bound within a plant cell."

Nordic and Baltic countries

14.11 The Nordic Nutrition Recommendations (NNR) uses EFSA's definition with adapted wording (Nordic Council of Ministers, 2023). It defines free sugars as:

> "Free sugars are added sugars (refined sugars such as sucrose, fructose, glucose, starch hydrolysates (glucose syrup, high-fructose syrup), and other isolated sugar preparations used as such or added during food preparation and manufacturing) plus sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates."

Pan American Health Organization

14.12 The PAHO Healthy Diet recommendations uses WHO's definition with adapted wording (PAHO, 2019). It defines free sugars as:

> "All sugars added to foods or beverages by manufacturers, cooks, or consumers, as well as sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrates."

14.13 The PAHO Nutrient Profile Model (NPM) uses WHO's definition with adapted wording and recommendation of free sugars intake to define products that should be subject to different regulations, including front-of-package labelling, marketing restrictions, school and other food environments regulations and taxation of unhealthy foods and non-alcoholic beverages (PAHO, 2016). If defines free sugars as:

> "Monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook, and/or consumer plus sugars that are naturally present in honey, syrups and juices."

14.14 The PAHO NPM method for estimating free sugars when neither added sugars nor free sugars are declared, is provided in paragraph 3.14.

Portugal

14.15 The Portuguese National Food, Nutrition and Physical Activity Survey uses the following definition for free sugars (IAN-AF, 2018):

> "Sugars added to foods by industry, catering or consumers, besides sugars naturally present in honey, syrups and fruit juices."

14.16 The methodological notes of the survey (IAN-AF, 2018) and the following paper (Marinho and others, 2020) uses WHO's definition with adapted wording:

> "Free sugars are monosaccharides and disaccharides added to foods by industry, restaurants or the consumer, plus sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates."

14.17 The Generation XXI birth-cohort uses WHO's definition of free sugars (Sosa and others, 2024).

14.18 The Portuguese Food Wheel does not include a free sugars definition but states the following (National Program for the Promotion of Healthy Eating (PNPAS) of the Directorate-General for Health (Portugal), 2020):

> “Carefully reading labels is essential when selecting foods with a low sugar content. The term "sugars" encompasses, for example, sucrose (common table sugar), glucose, dextrose, fructose, maltose, lactose, invert sugar, honey, molasses, and syrup of...”

Slovenia

14.19 The Slovenian Nutrition Guidelines 2025 use the WHO's definition of free sugars (Republic of Slovenia (Ministry of Agriculture Forestry and Food and Ministry of the Environment Climate and Energy and Ministry of Health), 2026).

Spain

14.20 The Spanish Healthy and Sustainable Dietary Recommendations do not include a free sugars definition, but advise that consuming fruit juices is not a substitute for whole fruits (Spanish Agency for Food Safety and Nutrition (AESAN), 2022).

14.21 The Report of the Scientific Committee of the Spanish Agency for Food Safety and Nutrition (AESAN) refers to the EFSA 2022 free sugars recommendations and notes that free sugars are those (Scientific Committee of AESAN, 2022):

> “Added to foods or present freely in fruit juices.”

Switzerland

14.22 The Swiss dietary guidelines do not refer to free sugars but use the term ‘added sugar’ instead, which is consistent with WHO's definition for free sugars (Swiss Society for Nutrition (SGE) and Federal Food Safety and Veterinary Office (FSVO), 2024). This term includes the following:

> “Various types of sugar from the group of monosaccharides and disaccharides that are consumed just as they are or else added during food preparation and manufacture. These include retail sugars (sucrose) as well as fructose, glucose, sugars derived from honey, fruit juice, syrups and many more."

14.23 The first comprehensive, nationally representative nutrition survey conducted in Switzerland used the UK's (Swan and others, 2018) definition of free sugars (Chatelan and others, 2019) with the following summarised wording:

> "Sugars added during food manufacturing and preparation [and] sugars naturally present in honey, syrups, fruit juices/nectars, fruit concentrates, puréed fruit, fruit canned in syrup, and alcoholic drinks."

The Netherlands

14.24 The latest dietary reference values and recommendations (translated) cite, and are consistent with, WHO's definition (Health Council for the Netherlands (HCNL), 2026). It uses the following adapted wording:

> "Free sugars are those added during the production or preparation of food or consumed as such. These can be isolated sugar preparations such as sucrose, fructose, glucose, glucose syrup, fructose-rich syrup, but also honey, syrups, fruit juices and fruit juice concentrates."

Annex 2: fruit and vegetable recommendations of countries with a free sugars definition

15.1 Annex 2 provides the fruit and vegetable recommendations of the countries that have adopted the free sugars definition.

Australia

15.2 The Australian Dietary Guidelines (National Health and Medical Research Council, 2013) recommend that “a variety of foods should be consumed from each of the five food groups (including vegetables and legumes/beans; and fruit)”.

Individuals should “enjoy plenty of vegetables, including different types and colours, and legumes/beans, and enjoy fruit”.

More specifically, the guidelines recommend “consuming at least five serves of vegetables per day (75g per serve) is recommended for Australian adults, while amounts recommended for children and adolescents depend on their age and sex”. They also recommend “consuming at least two serves of fruit per day (150g per serve) is recommended for adults, while amounts recommended for children and adolescents depend on age and sex”.

Of potential relevance to free sugars, these guidelines note:

> “Vegetables, including legumes/beans, and fruit should be eaten in their whole food forms to maximise the impact on a range of health benefits. Fruit should mostly be eaten fresh and raw because of the low fibre content of fruit juice and the high energy density and 'stickiness' (which may have implications for dental caries) of dried fruit."
>
> “Some vegetables are suitable to eat raw, while it is best to cook others to make them more palatable and digestible. Dried legumes should be cooked. Some processed fruits and vegetables, such as those that are canned or frozen in natural juices, are nutritious alternatives as long as they are produced without added salt, sugar (including concentrated fruit juice) or fat (in particular saturated fat).”
>
> “Overcooking of vegetables should be avoided. Tinned and/or frozen varieties are nutritious alternatives to raw produce.”

New Zealand

15.3 The Eating and activity guidelines for New Zealand adults (New Zealand Ministry of Health, 2020) recommend to “enjoy a variety of nutritious foods every day including plenty of vegetables and fruit”. They note that “seasonal fresh vegetables and fruit are a great choice in a healthy eating pattern”. They also note that “frozen and canned vegetables and fruit are other good options”.

Of potential relevance to free sugars, these guidelines note:

> “If choosing canned vegetables or fruit, look for those with the least sodium (salt) or sugar by comparing the labels of similar foods.”
>
> “Store vegetables and fruit carefully to keep their flavour, quality and nutrients.”
>
> “Wash vegetables and fruit before eating them. When possible, wash rather than peel them so that you eat the nutrients that are in and near the skin of vegetables and fruit.”
>
> “Lightly cooking vegetables and fruit (rather than overcooking) helps them retain more nutrients.”
>
> “Fruit juice is a high-sugar drink as it contains all the naturally occurring sugar found in the many pieces of fruit required to make one glass of juice.”

> “The Ministry of Health recommends eating fresh fruit and drinking plain water rather than drinking fruit juice. Fruit is more filling than juice and provides available vitamins, phytonutrients (beneficial chemicals), fibre and much less sugar than juice.”
>
> “Dried fruit has had most of its water removed, but also concentrating all the sugar. Without the water, it can be easier to eat numerous pieces at one time so it becomes a very high-sugar snack, sticks more easily to teeth and increases the risk of cavities. We recommend limiting the amount of dried fruit included in the diet.”
>
> "To choose and/or prepare foods and drinks … that are mostly ‘whole’ and less processed [and] with little or no added sugar."

Austria

15.4 The Austrian nutritional recommendations (Austrian Agency for Health and Food Safety (AGES), 2025) recommend to “eat 5 portions of vegetables and fruit a day, ideally 3 portions of vegetables and 2 portions of fruit”. They note that “one portion of vegetables or fruit is equivalent to a fist, to eat some of the vegetables raw (e.g. in the form of salads) and consider the seasonal and regional availability when selecting the types of fruit and vegetables. The more colourful and varied, the better”.

Canada

15.5 Canada’s Dietary Guidelines (Health Canada, 2019) recommend that vegetables and fruit should be consumed regularly. They note that “the regular intake of plant-based foods - vegetables, fruit, whole grains, and plant-based proteins - can have positive effects on health”.

Of potential relevance to free sugars, these guidelines note:

> “Dried fruit is sticky and often adheres to teeth. The sugars contained in foods like dried fruit can contribute to dental decay. If dried fruit is consumed, it should only be consumed with meals.”
>
> “Vegetables, fruit, whole grains and protein foods are nutritious foods to encourage. Frozen, canned, or dried foods (such as legumes) are always convenient options, especially when fresh food is out of season, costly, unavailable, or takes too long to prepare. Nutritious foods to encourage should have little to no added sodium and saturated fat, and little to no free sugars.”

> “To help reduce the intake of free sugars, the majority of total sugars intake should come from nutritious foods, such as intact or cut fruit and vegetables, and unsweetened milk.”

> “Sugary drinks are beverages that can contribute to excess free sugars when consumed regularly. These include soft drinks, fruit-flavoured drinks, 100% fruit juice, flavoured waters with added sugars, sport and energy drinks, and other sweetened hot or cold beverages, such as iced tea, cold coffee beverages, sweetened milks, and sweetened plant-based beverages. While 100% fruit juice, sweetened milks or fortified soy beverage provide nutrients to the diet, these products can increase the intake of free sugars. Water, unsweetened milk or fortified soy beverage, and fruit should be offered instead.”

Germany

15.6 The German Nutrition Society (Deutsche Gesellschaft für Ernährung (DGE), 2024a) recommends having at least 5 servings of fruit and vegetables per day, preferably in their respective harvest season. Fruit should be eaten with peel where possible, alongside fresh, cooked and raw vegetables, and fresh salad. Eating a varied diet increases the probability that you are well supplied with all nutrients. In addition to the daily 5 portions of fruit and vegetables, 2 glasses (200ml per glass) of fruit or vegetable juice can also be drunk during the week.

Of potential relevance to free sugars, these recommendations note:

> “The body can better utilize certain nutrients from cooked vegetables, such as β-carotene from carrots or lycopene from tomatoes. Therefore, eat vegetables both cooked and in the form of raw vegetables and salad. The more colorful, the better.”

> “Fruit and vegetables are also suitable for storage as frozen products, in jars or cans, as well as fruit and vegetable juices.”

> “Dried fruit can replace a portion of fruit a day. However, the portion size is smaller because the sugar and calorie content is higher.”

> “Smoothies are concentrated fruit juices or fruit purées that can vary greatly in their composition. Their water content is lower than that of juice and the sugar content and energy density are usually higher. Smoothies and juices provide less fiber and secondary plant substances and do not fill you up as well as eating whole fruit.”

> “Fruit and vegetables with blemishes and stains also provide you with nutrients. Processed into soups, sauces or smoothies, only the "inner values" count anyway.”

Mexico

15.7 The dietary and physical activity guidelines in the context of overweight and obesity in the Mexican population (National Academy of Medicine, 2015) recommends consuming at least 400g of fruits and vegetables daily. This is based on the international recommendation from WHO.

Pan American Health Organization

15.8 The Pan American Health Organization (PAHO, 2019) recommends that for adults, a healthy diet includes “at least 400g (the equivalent of five servings) of fruits and vegetables per day, excluding potatoes, sweet potatoes, cassava, and other tubers”.

Slovenia

15.9 The Slovenian Nutrition Guidelines (Republic of Slovenia (Ministry of Agriculture Forestry and Food, Ministry of the Environment, Climate and Energy and Ministry of Health), 2026) recommend “a predominantly plant-based diet, with a high intake of vegetables and fruit”. They also recommended to “consume at least 200g of fruit per day (range 100–300g), distributed across two to three distinct meals”. The guidelines add that “a variety of fruits, including berries, should be consumed, preferably fresh or thawed”. It is also recommended to “consume at least 300g of vegetables per day, including green leafy vegetables, cruciferous vegetables, and green-yellow vegetables”.

Of potential relevance to free sugars, these guidelines note:

> “Canned fruit intake is positively associated with [cardiovascular disease] (CVD) and all-cause mortality” (adverse health effect).

> “High salted, pickled, or canned vegetable intake is associated with adverse health effects (CVD, stomach cancer, etc.).”

> “Intake of products prepared with free or added sugars (e.g., canned fruits) should be limited.”

> “Fruit juice does not count towards the recommended daily fruit intake due to its low fibre content and high sugar concentration.”

> “Limit intake of fruit juice to up to 200 ml per day. Avoid the consumption of [sugar-sweetened beverages] (SSBs) (such as sweet, carbonated drinks, concentrated fruit juices, fruit nectars).”

> “Although 100% fruit juice offers hydration and some nutrients, it has sugar levels comparable to SSBs and is low in fibre, which may contribute to overconsumption and does not provide the same satiety or nutritional benefits as whole fruits.”

> “Fresh, unprocessed fruit should be chosen instead of fruit juices.”

> “Limiting fruit juice consumption is recommended to maintain a healthy weight.”

Ireland

15.10 The Scientific Recommendations for Healthy Eating Guidelines in Ireland (Food Safety Authority in Ireland (FSAI), 2011) recommend to “eat plenty of different coloured vegetables, salad and fruit – at least five a day”. It is noted that “200ml is the agreed serving of cooked or tinned fruit and cooked vegetables and pulses (peas, beans, lentils)”.

The Food Pyramid (Ireland Department of Health, 2012) recommends “5-7 servings a day of vegetables, salad and fruit”.

Of potential relevance to free sugars, the guidelines and Food Pyramid note:

> “Limit fruit juice to unsweetened, once a day.”

> “Smoothies can count towards your fruit and vegetable intake, but try and choose only fruit and/or vegetable based smoothies.”

> “Count fruit juice and smoothies as only one serving each day as they may be low in fibre.”

> “Sugar can be taken sparingly to sweeten high fibre, nutritious foods such as stewed fruit and wholegrain cereals such as porridge.”

> “Fruit is filling, fairly low in calories and contains no fat, and is a great choice for an in-between meal snack. Fruit can also be whisked with a glass of reduced-fat milk to make a smoothie. However, having whole fruit provides more fibre, is more filling and always a better choice than a drink of unsweetened juice.”

> “Cooking affects the goodness contained in vegetables, so over-cooking should be avoided as many vitamins are lost this way. Steaming, microwaving or stir-frying (small amounts of oil) are great ways to cook vegetables. Frozen or tinned vegetables are just as good as fresh.”

Nordic countries

15.11 The Nordic Nutrition Recommendations (Nordic Council of Ministers, 2023) recommend to “consume a variety of vegetables, fruits, and berries, 500-800 grams, or more, per day in total. A variety of different types of both vegetables and fruits (including berries) should be consumed, with emphasis on dietary fibre contribution (potatoes and pulses are not included). Limit intake of products prepared with added/free sugars. Low to moderate intake of fruit juice may be part of a healthy diet. Intake of fruit juice should be limited for children”. It noted that “high consumption of vegetables, fruits and berries (500-800 grams/day) reduces the risk of several cancers, CVD, all cause mortality”.

Of potential relevance to free sugars, these recommendations note:

> “Fruit and vegetable products with added sugar should be limited.”

> “High intake of fruit juices should be avoided.”

> “The nutrient content of fruit juice might be similar to the nutrient content of the fruits (or berries), although some juices contain no or a lower amount of dietary fibre.”

Spain

15.12 The Spanish Healthy and Sustainable Dietary Recommendations (Spanish Agency for Food Safety and Nutrition (AESAN), 2022) recommend a minimum of 5 servings a day. This should include at least 3 servings of vegetables and 2 to 3 servings of fruits. The recommended vegetable portion is 150g to 200g, and the recommended fruit portion is 120g to 200g of fresh fruit. The guidelines also recommend increasing consumption of cruciferous vegetables, dark green leafy vegetables, citrus fruits and red fruits.

The report of the Scientific Committee of the AESAN on sustainable dietary and physical activity recommendations for the Spanish population adds further detail (Scientific Committee of AESAN, 2022). It recommends to “consume fresh vegetables and fruits as a snack, avoiding, in this case, fruit and vegetable juices, fruits in syrup and dried”. It also recommends to “consume fresh seasonal vegetables and fruits, avoiding the canned”.

Of potential relevance to free sugars, these recommendations note:

> “Consuming fruit juices is not a substitute for whole fruits.”
>
> “Prefer buying fresh seasonal, local, and minimally processed products (e.g., frozen).”
>
> “To make the most of and not waste, vegetables and fruits can be used as part of other culinary preparations.”
>
> “Prefer eating whole pieces of seasonal and local fruits and vegetables, and of different varieties and colours.”

Switzerland

15.13 The Swiss dietary recommendations for adults (Swiss Society for Nutrition (SGE) and Federal Food Safety and Veterinary Office (FSVO), 2024) recommend “5 portions of fruit and vegetables per day, including 3 portions of vegetables and 2 portions of fruit”. The recommendations notes that “1 portion equals 120 grams; in other words, a handful” and “seasonal fruits and vegetables are preferable, as colourful as possible”. The recommendations also note that “from time to time you can replace 1 portion of vegetables/fruit with 2 decilitres of vegetable juice or fruit juice (100 percent with no added sugar). Don’t have more than four portions per week, because fruit juice loses some of the valuable substances found in unprocessed fruit and vegetables”.

Of potential relevance to free sugars, these recommendations note:

> “Sweetened beverages and fruit juice drinks (with added sugar or sweeteners) are not suitable as thirst-quenchers and should be drunk only occasionally and in small quantities.”
>
> “Fruit should preferably be enjoyed fresh and raw. Raw vegetables should ideally be on the menu every day, too.”
>
> “Buy fruit and vegetables that are as fresh as possible and don’t store them for long. This will help retain nutrients and reduce food waste. If fruit and vegetables nevertheless get a bit “past their best”, be creative and turn them into compotes, soups, oven-roasted vegetables or gratins.”
>
> “Frozen as well as fresh fruit and vegetables are good choices because they are processed as soon as they are picked, thus largely retaining their vitamins and minerals. Although tinned fruits and vegetables are less nutritious, they are handy to have in your store cupboard. Products with no added sugar or salt are better.”

> “Fruit juice also provides a relatively large amount of sugar without making much difference to how full up you feel.”

Portugal

15.14 Portugal’s food wheel (National Program for the Promotion of Healthy Eating (PNPAS) of the Directorate-General for Health (Portugal), 2020) recommends that “vegetables are essential for a balanced diet, with a recommendation of 3 to 5 portions daily” and “fruits advised at 3 to 5 portions per day”.

The 'Guiding choices for healthy eating' document, available on the What Health Portugal website, notes to “eat at least 5 portions of a variety of fruit and vegetables every day. You can choose fresh, frozen, canned, dried, or juiced. Choose vegetables from all colours of the rainbow, as each colour provides a different range of nutrients. One portion of vegetables can be measured with your two hands cupped together of non-starchy vegetables and one portion of fruit can be measured with one cupped hand”.

Of potential relevance to free sugars, these documents note:

> “Fruit juice and smoothies also count towards your fluid consumption, nevertheless they are a source of free sugars and so you should limit consumption to no more than a combined total of 150ml per day (1 glass).”

Netherlands

15.15 The Dutch guidance Wheel of five 2026 (Netherlands Nutrition Centre, 2026) recommends “consuming at least 250 grams of vegetables daily. These 250 grams only include the vegetables as you eat them, so raw or cooked, for example”. It also recommends “eating 200 grams of fruit every day. Choosing different types of fruit means you get all the nutrients you need from fruit”.

Of potential relevance to free sugars, this guidance notes:

> "Vegetables include “fresh and precut vegetables, frozen vegetables and vegetables in tins and jars (without added sugar and salt)."
>
> "Fruit includes “fresh and precut fruit alongside frozen fruit” and “dried fruit (with no added sugar), but no more than a handful per day, as dried fruit contains a lot of sugar.”
>
> "Eating fruit whole is better than drinking fruit in liquid form.”

“Fruit juices and smoothies often contain less fibre and nutrients, but a lot of sugar (and therefore calories). On top of that, they are also less filling, because juices and smoothies go down far quicker than if you were to eat the same amount of fruit.”