Making sense of **sugar**

ABSugar

UNALA
Unión de Azucareros Latinoamericanos
União do Açucar Latino-americano - UNALA -

SUGAR: MORE THAN SWEETNESS

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MAKING SENSE OF SUGAR

Making Sense of Sugar is a website that aims to inform and educate people about sugar and the role it can play in the diet in order that people can make informed choices about what they consume.

Based on robust science and facts, the website provides information about sugar in a way which is simple, straightforward and informative. The www.makingsenseofsugar.com/lat website includes information on the different types of sugars, as well as simple guidance on identifying sugars on food and drink labels and tips on healthy eating and staying active.

Working together with UNALA, the Latin American Sugar Producers Association, AB Sugar has developed the Latin American version of the Making Sense of Sugar website. The current UNALA member organizations or enterprises are from Argentina, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Mexico, and Nicaragua.

Making Sense of Sugar has been developed and funded by AB Sugar, with operations in 10 countries and around 32,000 employees. For more information on Making Sense of Sugar visit www.makingsenseofsugar.com/latam or follow us on Twitter @senseofsugar.

A CLOSER LOOK AT SUGAR

There is much confusion around the role of sugar as an ingredient and the role it can play in the diet.

With this booklet, we want to provide factual and helpful information and over the following pages we take a look in more detail at why you may choose to use or consume this ingredient.

THROUGHOUT THIS BOOKLET WHEN WE REFER TO SUGAR IT MEANS SUCROSE…

Which is a natural ingredient that is extracted from sugar cane and sugar beet.

SUGAR = SUCROSE

What SUGAR IS

The **most common sugars** found in food and drinks are:

Sucrose

is often called **table sugar**. Made up from glucose and fructose, it is extracted from **sugar cane** or **sugar beet** and is naturally present in most **fruits** and **vegetables**

Glucose & fructose

are found in **fruits**, **vegetables** and **honey**

Lactose

is commonly called milk sugar because it is found in **milk** and **dairy** products

Maltose

is also commonly known as malt sugar, found in **malted drinks** and **beer**

Calorie comparison

Sugar has **four calories** per gram, which compares to protein (**four calories**), alcohol (**seven calories**) and fat (**nine calories**).

Fat
9 calories per gram — 9

Alcohol
7 calories per gram — 7

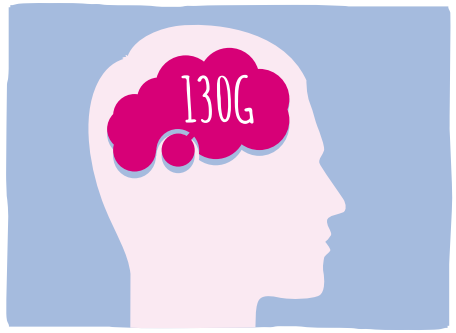
Protein
4 calories per gram — 4

Starch (carbohydrate)
4 calories per gram — 4

Sugars (carbohydrate)
4 calories per gram — 4

The body does not distinguish between sugars used in food and drink manufacturing or in the home, and those found naturally in fruits and vegetables. For example, sucrose in an apple is broken down in exactly the same way as the sucrose in your sugar bowl. However, the rate which the sucrose is absorbed can vary depending on if the source is a solid or a liquid food, for example, an apple or apple juice.

Carbohydrates comprising sugars and starches are broken down in the body into glucose. Sugars are an important source of energy with glucose being the most important for the body. Our brain requires around **130 grams of glucose** per day to keep functioning.



DID YOU KNOW: SOURCES OF CARBOHYDRATES TO FUEL YOUR MUSCLES AND BRAIN INCLUDE STARCHY FOODS, E.G. BREAD, RICE, POTATOES, PASTA, PULSES AND CEREALS

If you are a diabetic and managing your blood glucose levels, sugar has a medium Glycaemic Index (GI) of 65. Low GI foods are defined as 55 or below. Anyone unsure as to what they can eat, we recommend seeking advice from your General Practitioner (family doctor).

Where sugar COMES FROM

Sugar cane is grown in tropical and sub-tropical parts of the world, including South Africa, Brazil, Colombia, Guatemala, India, Mauritius, Mexico and Central America and the West Indies. It is an enormous grass, growing as high as five metres and the sugar is stored in its long stalk as a source of reserve food for the plant.

Sugar beet is a root crop and is grown in more temperate parts of the world. This plant stores sugar not in its stalk, but in its root. It is grown throughout Europe, the United States, Canada, Chile and many more countries.

Why we use sugar

Whether it's preservation, mouthfeel, texture, colour, flavour enrichment or any of the many functionalities sugar provides, there is so much more to sugar than simply sweetness, for which there is no one substitute.

Let's take a look at some examples of sugar in action...

Sugar is a **preservative.** In jams and other preserves, sugar binds water molecules making them unavailable for microorganisms. This helps prevent the growth of moulds (bacteria).

Sugar is used within the **fermentation process** as a food source to produce ethanol, carbon dioxide and water. In baking and brewing, fermentation is a critical process. In bread making this speeds up the rising/leavening process. In alcoholic beverage production, fermentation delivers the target alcohol and sweetness level.

Sugar particle size can be chosen to adjust the **mouthfeel** of products, such as fudges, icings, fondants and chocolate. The sugar crystal size can also be chosen to add crunch and visual texture on the top of products as well as glazes and icings creating a glossy surface finish.

Sugar helps to produce a soft and delicate crumb **structure** for a cake, the snap of a biscuit or the development of small crystals for smooth and creamy fudge.

Sugar depresses the **freezing point** of frozen products including ice creams, sorbets and frozen baked products. This results in slower and smaller ice crystal formation which delivers a smoother texture in the mouth from frozen or when defrosted.

Brown sugars introduce their own **colour** to a finished product. The process of caramelisation in the production of toffees or the Maillard reaction, sometimes called the 'browning reaction', develops a recognisable golden-brown finish to baked breads as well as enhancing the visual appearance of products.

Sugar alternatives

There are a range of sugars and sweeteners to suit your choice preferences; ranging from taste, function and cost.

Agave and honey are often popular alternatives to sugar when used to sweeten drinks, drizzle over yoghurts or use within baking, so how do they differ from sugar?

Agave syrup or agave nectar is made from the agave plant. It is sweeter than sugar, has a lower GI than sugar, but it does have a higher content of fructose.

Sucrose is 50% fructose, whereas agave nectar contains around 84% fructose, although exact amounts can vary by brands.

Honey is produced from bees by regurgitating flower nectar and letting it evaporate. It has similar uses to agave as well as being slightly sweeter than sugar, so you can use less.

DID YOU KNOW: In some countries, agave syrup and honey are both termed as "added sugars", just like table sugar. They both contain the sugars glucose, fructose and/or sucrose in varying amounts. **At 21 calories per teaspoon, both are higher in calories than sugar which is 16 calories**

How to find out what is in YOUR FOOD & DRINKS

When it comes to sugars, you can find lots of useful information on how much sugars are in a product by taking a closer look at the different food and drink labels.

When looking at labels, the sugars most commonly present in food and drinks are **glucose, fructose, sucrose, lactose and maltose – collectively they are known as 'sugars'** and this term is used in nutritional labelling **'carbohydrate – of which sugars'**.

Sugars have to be declared as ingredients in the ingredients list or as an ingredient that contains sugars, such as fruit juice.

Nutritional information

Nutrition Information	
Typical values	Per 100g
Energy	2105kJ
Energy	505kcal
Fat of which saturates	25g 16g
Carbohydrate of which sugars	62g 38g
Protein	5g
Salt	1g

Ingredients list

Wheat Flour (54%), Vegetable Oil, Wholemeal (Wheat) (16%), Sugar, Cultured Skimmed Milk, Partially Inverted Sugar Syrup, Raising Agents (Sodium Bicarbonate, Tartaric Acid, Malic Acid), Salt.

DID YOU KNOW: The first place you are able to find out whether a product contains sugars is in the ingredients list. All the ingredients that have been used to make the product will be shown **in order of weight**

Reference Intake label
You can find out about sugars typically on the front-of-pack where you may find a Reference Intake label.

Per 200ml serving

Calories	Total sugars	Total fat	Saturated fat	Sodium
72 kcal	18g	0g	0g	14mg
4%	20%	0%	0%	1%

of an adult's reference intake
Typical values per 100g: Energy 214kJ/51kcal

Let's take a look at some labels to see how you can identify sugars and calories...

Glass of vanilla almond milk (190ml)

The sugars in this glass of almond milk are added during the manufacturing process as there is no naturally occuring lactose.

Vanilla almond milk			
NUTRITIONAL INFORMATION			
Serving size - 1 glass			(190ml)
Calories			284.5kj (67.5 kcal)
Protein			0.8g
Fats (Lipids)			1.9g
Saturated Fat			0.2g
Polyunsaturated Fat			0.5g
Monounsaturated Fat			1.2g
Trans Fatty Acids			0g
Cholesterol			0mg
Carbohydrates			11.8g
Sugars			11.2g
Dietary Fibre			0.4g
Sodium			111.1mg
Potassium			24.8g
*NRV			
Vitamin A	13%	Riboflavina	21%
Vitamin B12	57%	Vitamin D	20%
Calcium	37%	Magnesium	4%
Vitamin E	43%	Zinc	5%

*NRV: The NRV percentages (Nutritional Reference Value) are based on the NOM-051-SCFI/SSA1-2010 recommendations.

DID YOU KNOW: Products with labels of **"low sugar content", "no added sugar"** or **"light"** does not necessarily mean that the product will have fewer calories than their 'sugary' equivalents

Blackberry jam (1 teaspoon 15g)

The majority of the **sugars** in this blackberry jam are naturally occuring from the blackberries.

Blackberry jam	100g	1 serving
NUTRITIONAL INFORMATION Serving size - 1 teaspoon (15g) Servings per container: 17 approx.		
Calories (kcal)	214	32
Protein (g)	0.5	0.1
Total Fat (g)	0.2	0
Total Carbohydrates (g)	52.6	7.9
Total Sugars (g)	52.6	7.9
Sodium (mg)	15	2.3

A teaspoon of blackberry jam contains 32 calories (2% of the GDA (Guideline Daily Amount) and 7.9g of sugars (9% of the GDA for sugars).

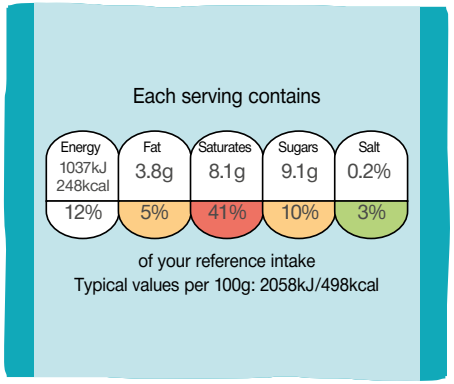
Counting calories

Not only can you find out what sugars are in a product by looking at food and drink labels, you can also find out how many calories (energy) you are putting into your body.

Changing what goes into YOUR FOOD & DRINKS

There are many reasons why food and drink producers may reformulate their products; consumer choice and taste, market conditions and regulatory environment, through to product innovation and cost considerations.

Many of you will have seen changes to the composition of some manufactured food and drinks in terms of their nutrient and energy intakes. These changes have ranged from reducing calories, salt, trans-fatty acids, saturated fatty acids and sugars.



Changing the composition of a product can be far from simple when trying to remove, reduce or replace one ingredient as it may concern a range of factors as part of the recipe process. When looking at reducing or trying to replace the sugar content specifically within products, there are four main areas for consideration; functionality, impact on calories, shelf life and food safety and regulations.

1. Functionality

Sugar is an ingredient and product with multifunctional properties (structure, texture, flavour, sweetness and preservative)[1] and there is currently no one single ingredient that can replace the range of different functions it performs.

When reformulating a product, the formulation (composition) matrix[2] manages the complex balance between ingredients, calorie content and product functionality.

2. Impact on calories

In some foods, when reducing or removing sugar it may not result in a calorie reduction, as generally sugar is often replaced by other carbohydrates such as starches (four calories per gram) or fat (nine calories per gram).

Drinks are often different as the sweetness can be replaced by intense sweeteners and water to provide the bulk within the product.

DID YOU KNOW: ANY IMPACT OF CHANGING THE COMPOSITION OF FOOD AND DRINK PRODUCTS ALSO DEPENDS ON THE **CONSUMERS' OTHER FOOD AND DRINK CHOICES** AS PART OF THEIR WIDER DIET

[1] The functions of sugar: sweetness, bulk, texture, mouthfeel, crystallinity, size, preservative, water holding capacity, colour, flavour, crumb texture, stability, preservative, humectancy, water holding capacity, microbial stability, microbial safety

[2] Which consists of the recipe and the steps in the process to make the product

3. Shelf life and food safety

Removing or reducing functional ingredients, such as salt and/or sugar can have a significant negative effect on water activity (aW)[3] in a product. This effect can shorten shelf life and affect the products stability from both a food safety and product quality perspective.

DID YOU KNOW: THE REASON THAT MANY PRODUCTS SUCH AS SOME KETCHUPS AND JAMS NOW CARRY **A RECOMMENDATION TO STORE IN THE FRIDGE** AFTER OPENING IS DUE TO THE PRODUCT NOT BEING ABLE TO RELY ON A HIGH PERFORMING PRESERVATIVE

[3] Water Stability (aW) is the water that is freely available for microbial activity

[4] What can you use to replace sucrose? * EEC additive regulations limit the use of these in some products

Sucrose function	Possible replacement
Sweetness	High intensity sweeteners*, polyols*
Mouthfeel/Texture	Hydrocolloids, polyols*, sugars
Structure	Bulking agents, polyols*, fibres
Colour	Colours
Flavour	Flavours
Stability/Preservation	Benzoates, etc.
Humectancy	Polyols

4. Regulations

There are alternative[4] ingredients, including sweeteners, that can be used to replace some of the functionality of sugar. Alongside some of the technological barriers that manufacturers may face, there are regulatory limits on the application of certain ingredients and sweeteners in food and drinks to replace sugar, including the amount that can be used (upper limits), type of food and drink to be reformulated and mandatory labelling statements.

Country food additives legislation provides clear guidance for food and drink manufacturers on when alternative ingredients, including sweeteners, can replace sugar in different food preparations.

Consumer choice

As consumers, many of us have a wide choice of 'sugar free' and 'sugar-reduced' products to choose from. In these types of products, the sweetness will typically come from intense sweeteners and/or from bulky sweeteners such as Isomalt.

SUGAR MYTHS

You may hear and read lots about sugar and sugars, but how do you separate fact from fiction? We have addressed some of the most common myths to help.

MYTH **Sugar has no role in the diet**

Sugars are an important source of energy with glucose being the most important for the body. For example, our brain requires around 130 grams of glucose per day to keep functioning. You can find glucose in all sorts of foods including fruit, vegetables and honey.

MYTH **Sugar has more calories than other ingredients**

Calories are essentially a measure of the amount of energy in food and drinks. When we eat or drink, we are putting energy (or calories) into our body. Different food and drinks provide different amounts of energy. This information can typically be found on food and drink labels, as well as within nutritional information panels.

Sugar has four calories per gram, which compares to protein (four calories), alcohol (seven calories) and fat (nine calories).

MYTH **Sugar is an 'empty' calorie**

'Empty calories' is a concept often used to refer to food and drinks that supply energy without other nutrients. However, since calories themselves provide your body with energy there is no such thing as an 'empty calorie' – a calorie is a calorie.

MYTH **Some sugars are better for you than others**

No sugars are better or worse for you; whether its naturally present in a food, for example a piece of fruit, or used during the manufacturing process. The body breaks down sugar in exactly the same way, independently of their source. However, the rate of which the sucrose is absorbed can vary depending on if the source is solid or liquid food, for example, an apple or apple juice.

MYTH **Brown sugar is better for you than white sugar**

Both brown and white sugar is a form of sucrose and contain the same number of calories at four calories per gram.

MYTH **Sugars are hidden in food and drinks**

Food labels on the back (or side) of a pack always show the list of ingredients (in descending order of weight), as well as the total sugars contained in the product per 100g or per 100ml of product. Labels sometimes also show this information per portion or as per the country's daily dietary amount guidelines.

When looking at labels, sugars most commonly present in food and drinks are glucose, fructose, sucrose, lactose and maltose – collectively they are known as 'sugars' and this term is used in nutritional labelling on pack: 'carbohydrate – of which sugars'.

When it comes to identifying 'added sugars' (if they have been added during food and drink manufacturing), you will not be able to find these listed on a label. This is because it is not possible to accurately analyse the amount of 'added sugars' in a food or drink product as you cannot distinguish naturally occurring sugars from added sugars in a laboratory given they are the same molecules. Additionally, you may find during the product manufacturing process that the sugars initially added at the start are converted into another ingredient by the final product.

To give you some examples, when you make beer the sugars (glucose and fructose) from the malt are fermented to make alcohol which is not actually a sugar. Alternatively when sugars are combined with other ingredients to enhance the flavour/or colour of a product, it can be very difficult to determine where the sugars come from i.e. have they been added? Do they occur naturally? Or have they been combined during the cooking process?

However, some countries are exploring how 'added sugars' could be calculated and shown on labels. For example, the US has started to introduce 'added sugars' on the labels of pre-packaged food and drink products, and the US Food & Drug Administration (FDA) is continuing to work with manufacturers to meet these new labelling requirements. 'Added sugars' are calculated based on product manufacturers' proprietary recipes as a baseline.

MYTH **Sugar substitutes are not safe**

Sugars and sweeteners are both safe – the choice depends on your preference and use.

Sweeteners can offer you an alternative choice but cannot replicate all of the other functions that sugar can provide such as texture, preservation, etc. Instead sugar alternatives can only replace the sweetness of sugar and the majority has zero calories.

MYTH **Sugar causes obesity and diabetes**

Current scientific evidence does not suggest that sugar directly causes conditions such as obesity or diabetes. Both of these conditions are due to a complex range of factors such as being overweight, leading a sedentary lifestyle and in some cases genetics[5].

However like protein, starch, fat and alcohol, sugar is a source of calories in the diet and if we consistently consume more 'energy' or calories than our bodies use, this can lead to an accumulation of excess body fat. This can then result in obesity which can increase the risk of type 2 diabetes.

NOTE: Scientific evidence contained within a report published by the UK's Scientific Advisory Committee on Nutrition (SACN) found no direct link between intake and diabetes. However, it suggests a greater risk is associated with a higher intake of sugars-sweetened beverages[6].

MYTH **Sugars rot your teeth**

All food and drinks that contain fermentable carbohydrates (e.g. sugary foods such as cookies, cakes, soft drinks and candy as well as less obvious foods, such as bread, crackers, bananas and breakfast cereals), can increase the risk of tooth decay[7].

Fermentable carbohydrates (including sugars) are broken down by the bacteria in your mouth to produce acid and this acid can then dissolve away some of the enamel surface of your teeth. Brushing your teeth with fluoride toothpaste twice a day and keeping sugary food and drinks for mealtimes, rather than as a snack, is the best way to protect them. It's important to remember that it is both the frequency[8] of consumption and the amount that can have an impact on tooth decay.

NOTE: The World Dental Federation[9] (DFI) suggest that the risk of dental caries increases if consuming excessive amounts of sugar from snacks, processed food and soft drinks, eg. more than four times a day and/or more than 50 grams (approx. 12 teaspoons) per day. They also recommend awareness of not only sugars added to food but also those naturally presented in honey, syrups, fruit juices and fruit juice concentrates.

MYTH **Sugar is addictive**

Current scientific evidence does not support the idea that sugar (or any other foodstuff) can be addictive[10]. Certain food and drinks of course can be pleasurable to consume, but it is important not to confuse this with clinical addiction.

[5] WHO: https://www.who.int/news-room/fact-sheets/detail/diabetes
[6] SACN (2015) Carbohydrates and Health: www.gov.uk/government/publications/sacn-carbohydrates-and-health-report
[7] Bowen et al. (2018) Oral Biofilms: Pathogens, matrix and polymicrobial interactions in microenvironments. Trends Mircobial.; 26(3):229-242
[8] van Loveren (2019) Sugar Restriction for Caries Prevention: Amount and Frequency. Which Is More Important? Caries Res. 53(2):168-175
[9] World Dental Federation https://www.fdiworlddental.org/oral-health/risk-factors
[10] University of Gothenburg: https://neurofast.gu.se/consensus

Making sense of sugar

AB Sugar is committed to playing its part in helping find real, workable solutions to tackling issues such as obesity, as well as helping consumer confusion about what a balanced diet really means based on accurate information and robust science.

As part of this, we launched our **'Making Sense of Sugar'** campaign in 2014 with the aim of providing factual information based on robust science to help inform and educate people in the UK about sugar and the role it can play in the diet. The campaign has now expanded to have a global focus and has been launched in Malawi, Spain, Tanzania and Zambia, and now most recently Latin America.

This campaign forms part of our **'Global Mind, Local Champions'** sustainability framework which is made up of three broad pillars of sustainability: building rural communities, thriving and healthy communities and consuming resources responsibly. The thriving and healthy communities pillar includes the commitment launched in April 2018 to provide access to objective scientific advice on sugar, the diet and health, to over 25 million people around the world by 2030. This is an ambitious aspiration but we believe to tackle the obesity crisis we are facing globally, requires such ambition and profile.

To read the latest facts and stats, debunked myths, and top tips on healthy eating and staying active, visit www.makingsenseofsugar.com or follow us @senseofsugar

GLOSSARY

Added sugars (e.g. glucose, fructose, sucrose) and syrups (honey, high fructose corn syrup) that are added to food or drinks when they are manufactured or prepared.

Calories are a measure of the amount of energy in food and drinks. When we eat or drink, we are putting energy (or calories) into our body. Different food and drinks provide different amounts of energy. This information can often be found on food and drink labels.

Carbohydrates are key components in the diet, comprising sugars, starchy carbohydrates and dietary fibre. Starchy carbohydrates provide an important source of energy and fibre is important for digestive health.

For dietary purposes, carbohydrates have also been described as:

1. **Sugars** – intrinsic and extrinsic
2. **Complex carbohydrates** – starch and dietary fibre

Most foods contain some form of carbohydrate.

Energy imbalance is when energy (calories) input is greater than or less than energy output and vice versa. When energy input is greater than energy output this leads to weight gain. When energy output is greater than energy input this leads to weight loss.

Fermentable carbohydrates are carbohydrates that can be broken down by the bacteria in your mouth to produce acid. This acid can then dissolve away some of the enamel surface of your teeth leading to decay.

Sugars are a type of fermentable carbohydrate as well as some starches. These include "sugary" foods, such as cakes, soft drinks and candy, but less obvious foods would be items such as crackers, bread and bananas.

Free sugars are sugars added to food and drinks by manufacturers, cooks or consumers, and also sugars found naturally in honey, syrups and fruit juice. Sugars found for example in fruits and vegetables (fresh, frozen or dried) and in milk and products such a plain yogurt and cheese are not classed as free sugars.

Glucose is the most important form of sugar found in the blood and the body's main source of energy and is found in fruit, vegetables and honey. Glucose is also called blood glucose or blood sugar.

The body breaks down most carbohydrates from the food we eat and converts them to glucose. When the body doesn't need to use the glucose for energy, it stores it in the liver and muscles. This stored form of glucose is made up of many connected glucose molecules and is called glycogen. When the body needs a quick boost of energy or when the body is not getting glucose from food, glycogen is broken down to release glucose into the bloodstream to be used as fuel for the cells.

Glycaemic Index (GI) tells us whether a food raises blood glucose levels quickly, moderately or slowly. Different carbohydrates are digested and absorbed at different rates, and GI is a ranking of how quickly each carbohydrate-based food and drink makes blood glucose levels rise after eating them. The GI index runs from 0-100 and usually uses glucose, which has a GI of 100, as the reference. Slowly absorbed carbohydrates have a low GI rating (55 or below), and include most fruits, vegetables, milk, some wholegrain cereals and bread, pulses and basmati rice. Not all low-GI foods could be viewed as 'healthy' – chocolate is an example; it has a low-GI because of its fat content, which slows the absorption of the carbohydrate. GI ranking can be a means to help manage diabetes. However, be mindful, combining foods with different GIs alters the overall GI of a meal.

Molasses is a dark, sweet syrup resulting from the sugar making process from either sugar cane or sugar beet. When processing sugar cane or sugar beet, firstly it is crushed and the juice is extracted. The juice is then boiled down to form sugar crystals which are removed from the liquid. Molasses is then this dark, sweet syrup left after the sugar has been removed from the juice.

Reformulation is when food or drink manufacturers change the composition of a food or drink product. Many changes to the composition of manufactured food and drinks are in terms of their nutrient and energy intakes; ranging from reducing calories, salt, trans-fatty acids, saturated fatty acids and sugars.

Total sugars are the value given on food labels, includes all sugars, regardless of the source. In other words, it includes those naturally present and those added to food or drinks.

Nutrition labels on the back of packs typically provide information about total sugars – this includes both the free sugars and naturally occurring sugars. Total sugars information on back-of pack nutrition labels appears as 'carbohydrate – of which sugars'.

NB: The European Food Safety Authority (EFSA) defines sugars as total sugars, including both endogenous (sugars naturally present in foods such as fruit, vegetables, cereals and lactose in milk products) and added sugars (EFSA, 2009).

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