Sugar Consumption

Edited by Justin Healey

ISSUES IN SOCIETY
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**Exploring issues – worksheets and activities**
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Sugar Consumption is Volume 417 in the ‘Issues in Society’ series of educational resource books. The aim of this series is to offer current, diverse information about important issues in our world, from an Australian perspective.

KEY ISSUES IN THIS TOPIC
Sugar has become ubiquitous in our modern diet in a variety of forms, and is most notably present in popular processed foods and sugary drinks. This title explains the latest consumption guidelines and data, detailing the amount of sugar added to common food and beverage items, the excessive consumption of which can lead to serious health conditions such as obesity, diabetes, tooth decay and heart disease.

The book offers helpful advice on reducing unhealthy sugar intake through personal dietary behaviours such as how to identify sugars on food labels; it also presents perspectives in the ongoing debate over government policy approaches including a proposed sugar tax.

How much sugar is it OK to eat, what are its health impacts, and how can we manage its consumption? Excessive sweetness has unsavoury consequences – how are you watching your sugar intake?

SOURCES OF INFORMATION
Titles in the ‘Issues in Society’ series are individual resource books which provide an overview on a specific subject comprised of facts and opinions.

The information in this resource book is not from any single author, publication or organisation. The unique value of the ‘Issues in Society’ series lies in its diversity of content and perspectives.

The content comes from a wide variety of sources and includes:

- Newspaper reports and opinion pieces
- Website fact sheets
- Magazine and journal articles
- Statistics and surveys
- Government reports
- Literature from special interest groups

CRITICAL EVALUATION
As the information reproduced in this book is from a number of different sources, readers should always be aware of the origin of the text and whether or not the source is likely to be expressing a particular bias or agenda.

It is hoped that, as you read about the many aspects of the issues explored in this book, you will critically evaluate the information presented. In some cases, it is important that you decide whether you are being presented with facts or opinions. Does the writer give a biased or an unbiased report? If an opinion is being expressed, do you agree with the writer?

EXPLORING ISSUES
The ‘Exploring issues’ section at the back of this book features a range of ready-to-use worksheets relating to the articles and issues raised in this book. The activities and exercises in these worksheets are suitable for use by students at middle secondary school level and beyond.

FURTHER RESEARCH
This title offers a useful starting point for those who need convenient access to information about the issues involved. However, it is only a starting point. The ‘Web links’ section at the back of this book contains a list of useful websites which you can access for more reading on the topic.
It seems as though no other substance occupies so much of the world’s land, for so little benefit to humanity, as sugar.

According to the latest data, sugarcane is the world’s third most valuable crop after cereals and rice, and occupies 26,942,686 hectares of land across the globe. Its main output – apart from commercial profits – is a global public health crisis, which has been centuries in the making.

The obesity epidemic – along with related diseases including cancer, dementia, heart disease and diabetes – has spread across every nation where sugar-based carbohydrates have come to dominate the food economy.

So at this time, it pays to step back and consider the ancient origins of sugar, to understand how it has grown to present an imminent threat to our landscapes, our societies and our health.

STEPPING BACK

Human physiology evolved on a diet containing very little sugar and virtually no refined carbohydrate. In fact, sugar probably entered into our diets by accident. It is likely that sugarcane was primarily a ‘fodder’ crop, used to fatten pigs, though humans may have chewed on the stalks from time to time.

Evidence from plant remnants and DNA suggests that sugarcane evolved in South East Asia. Researchers are currently hunting for early evidence of sugarcane cultivation at the Kuk Swamp in Papua New Guinea, where the domestication of related crops such as taro and banana dates back to approximately 8,000 BC. The crop spread around the Eastern Pacific and Indian Oceans around 3,500 years ago, carried by Austronesian and Polynesian seafarers.

The first chemically refined sugar appeared on the
scene in India about 2,500 years ago. From there, the technique spread east towards China, and west towards Persia and the early Islamic worlds, eventually reaching the Mediterranean in the 13th century. Cyprus and Sicily became important centres for sugar production. Throughout the Middle Ages, it was considered a rare and expensive spice, rather than an everyday condiment.

The first place to cultivate sugarcane explicitly for large-scale refinement and trade was the Atlantic island of Madeira, during the late 15th century. Then, it was the Portuguese who realised that new and favourable conditions for sugar plantations existed in Brazil, where a slave-based plantation economy was established. When Brazilian sugarcane was introduced in the Caribbean, shortly before 1647, it led to the growth of the industry which came to feed the sugar craze of Western Europe.

SLAVE TRADE
This food – which nobody needed, but everyone craved – drove the formation of the modern of the world. There was a huge demand for labour to cultivate the massive sugar plantations in Brazil and the Caribbean. This need was met by a transatlantic slave trade, which resulted in around 12.570,000 human beings being shipped from Africa to the Americas between 1501 and 1867. Mortality rates could reach as high as up to 25% on each voyage, and between 1 million and 2 million dead must have been thrown overboard.

And of course, goods such as copper and brass, rum, cloth, tobacco and guns were needed to purchase slaves from the African elites. These were secured through the expansion of industrial production, particularly in the English Midlands and South West. Modern-day banking and insurance can trace its origins to the 18th century Atlantic economy.

Meanwhile, the slaves working the plantations suffered miserable lives. When they were finally emancipated in 1834 in the British Empire, it was the slave owners who were fully compensated – not the slaves. Much of this money was used to build Victorian infrastructure, such as railways and factories.

MODERN DAY SCOURGES
In many ways, the story of sugar and tobacco are closely aligned. Both products were initially produced through slave labour, and were originally seen to be beneficial to health. And although both sugar and tobacco have ancient origins, it was their sudden, mass consumption from the mid-17th century onwards that created the health risks we associate with them today.

The idea of ‘industrial epidemics’ of non-communicable diseases, being driven by the profit motives of major corporations, rings true for both. And while tobacco is widely acknowledged to be addictive, sugar can also drive behavioural responses that are indistinguishable from addiction.

But in the 21st century, the grip of sugar is stronger than comparable scourges like tobacco, or even alcohol. Sugar is not only ubiquitous – it is potentially responsible for approximately 20% of the caloric content of modern diets – but also central to the world’s economy and cultural heritage.

Perhaps a better comparison is our reliance on fossil fuels. Fossil fuels are not just a vice or bad habit, but central to the way we live, and to the geography and politics of the territories where it is sourced. Likewise, the rise of sugar has been key to global trade and socioeconomic development, slavery and the African Diaspora and modern cultural norms.

The evolutionary and historical origins of sugarcane may hold insights into why sugar dominates modern culture, and what we can do to mitigate its malign influence. Like many great challenges of the 21st century, such as climate change, the science identifying the problem seems clear.

What’s lacking is the public and political will to address it, in ways such as the proposed sugar tax and prominently displayed health warnings. With sugar still deeply part of our food system – in 2013, sugar crops made up 6.2% of world’s agricultural yield and 9.4% of its total monetary value – such bold socio-economic measures are needed to make the necessary changes possible.

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How sugar is used in food

NATURAL AND ADDED SUGAR
Sugar is naturally present in food like fruit, vegetables and milk; it can also be added as free sugars during preparation and at the table. Some foods, like jam, also contain a mixture of natural and free sugars.

USES FOR SUGAR
Sugar is used for a number of purposes:
- Bulk and volume
- Colour
- Fermentation
- Flavour enhancement
- Gelling
- Mouthfeel (a product’s physical and chemical interaction in the mouth)
- Preserving
- Rising
- Softness.

TYPES OF FOODS
Sugar has a range of properties which help in the production of foods and beverages to change their look, taste, size, colour and feel, including:
- Bread (enhancing flavour, rising, softness, colour)
- Baking (enhancing flavour, rising, colour, softness, bulk/volume)
- Fruit drink and soft drink (enhancing flavour, mouthfeel, preserving)
- Ice cream (lowering freezing point)
- Jam (enhancing flavour, gelling, preserving)
- Sauces and dressings (enhancing flavour, mouthfeel, preserving)
- Wine and beer (alcohol fermentation)
- Yoghurt (enhancing flavour).

LABELLING OF SUGARS
On packaged foods, total sugar (the combination of natural sugar and added sugar), is included in the Nutrition Information Panel. Sugars are a type of carbohydrate and are included as part of the carbohydrates in the Nutrition Information Panel as well as being listed separately. The amount of sugars in the Nutrition Information Panel should include naturally occurring sugars, as well as added sugar.

Note: products with ‘no added sugar’ nutrition claims may contain high levels of natural sugars.

REFERENCES
- Sugar Research Advisory Service
  www.srasanz.org

Compiled by The Spinney Press.

The many different names for sugar

 Added sugars in foods and beverages can be listed on food labels under over 40+ different names. Below is a list compiled in a consumer guide by CHOICE

- Agave nectar/syrup
- Barley malt
- Beet sugar
- Blackstrap molasses
- Brown sugar
- Cane sugar
- Carob syrup
- Caster sugar
- Coconut sugar
- Coffee sugar crystals
- Confectioner’s sugar
- Corn syrup
- Date sugar/syrup
- Demerara
- Dextrose
- Evaporated cane juice
- Fructose
- Fruit juice
- Fruit juice concentrate
- Glucose
- Golden syrup
- Grape sugar/syrup
- High-fructose corn syrup (HFCS)
- Honey
- Icing sugar
- Invert sugar
- Lactose
- Malt
- Maltose
- Maple syrup
- Molasses
- Muscovado
- Palm sugar
- Panela
- Powdered sugar
- Rapadura
- Raw sugar
- Rice syrup
- Sucrose
- Sugar
- Treacle
- Turbinado
- White sugar

Source: CHOICE, Added sugars on food labels.
HEALTH CHECK: HOW MUCH SUGAR IS IT OK TO EAT?

The sugar content of your favourite snacks might surprise you, cautions Flinders University academics Kacie Dickinson and Louisa Matwiejczyk

Consuming too much energy – whether from fat or carbohydrates, including sugar – will make you gain weight. If left unchecked, this excess weight increases your risk of lifestyle-related diseases such as diabetes, heart disease and some cancers.

In recognition of this, the World Health Organisation (WHO) recommends adults and children limit their intake of ‘free sugars’ to less than 10% of their total energy intake. Below 5% is even better and carries additional health benefits.

Free sugars refer to monosaccharides (such as glucose) and disaccharides (sucrose or table sugar) added to foods and drinks by the manufacturer, cook or consumer. It also refers to sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.

Free sugars are different from sugars found in whole fresh fruits and vegetables. There is no scientific evidence that consuming these sugars leads to health problems. So the guidelines don’t apply to fresh fruit and vegetables.

If you’re an average-sized adult eating and drinking enough to maintain a healthy body weight (roughly 8,700 kilojoules per day), 10% of your total energy intake from free sugar roughly translates to no more than 54 grams, or around 12 teaspoons, per day.

But more than half of Australians (52%) usually exceed the WHO recommendations. Most sugar we eat (around 75%) comes from processed and pre-packaged foods and drinks. The rest we add to tea, coffee and cereal, and other foods we cook.

Sugary drinks account for the largest proportion of Australians’ free sugar intake. A single can or 600ml bottle of soft drink can easily exceed the WHO recommendation, providing around 40-70g sugar. One teaspoon equates to 4.5g white sugar, so soft drinks range from 8.5 to 15.5 teaspoons.

More insidious sources of sugar are drinks marketed as ‘healthier’ options, such as iced teas, coconut water, juices and smoothies. Some medium-sized smoothies have up to 14 teaspoons of sugar (63.5g) in a 475ml drink. Flavoured milks are also high in free sugars (11 teaspoons in a 500ml carton) but can be a good source of calcium.

Other foods high in sugar are breakfast cereals. While some sugar is derived from dried fruit, many popular granola mixes add various forms of sugar. Sugar content for one cup of cereal ranges from 12.5g for creamy honey quick oats to 20.5g for granola. A cup of some types of cereal can contain 30% to 50% of your daily free sugar allowance.

A surprise for many is the added sugars in savoury foods including sauces and condiments. Tomato and barbecue sauce, salad dressing and sweet ‘n’ sour stir fry sauces contain one to two teaspoons of sugar in each tablespoon (20ml).

Popular ‘health foods’ and sugar-free recipes can be particularly misleading as they can contain as much sugar as their sweet alternatives. Usually this is referring to ‘sucrose-free’ (what we know as white sugar) and doesn’t exclude the use of other sugar derivatives such as rice malt syrup, agave or maple syrup, typical of popular sugar-free recipes. These are still forms of sugar and contribute to energy intake and unhealthy weight gain when consumed in excess.

We know treats such as chocolate, pastries and ice cream do contain sugar, but just how much might surprise you. A chocolate-coated ice cream will contribute five teaspoons of sugar, or almost half the daily limit.

Sugar added to foods and drink
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Can have different names depending on where it comes from. When reading labels, alternative names for sugar include:

- Sucrose
- Glucose
- Corn syrup
- Maltose
- Dextrose
- Raw sugar
- Cane sugar
- Malt extract
- Fruit juice concentrate
- Molasses.

The main ingredient is sugar if any of these are listed as the first three ingredients. Note that products with 'no added sugar' nutrition claims may still contain high levels of natural sugars, also considered as free sugars. A good example of this is fruit juice: the sugar content of 200ml of sweetened orange juice (21g) is 7g higher than unsweetened juice (14g).

So how can you cut down on your added sugars?

First, eat fewer foods with free sugars. Reduce your intake of sweets such as chocolate and lollies, cakes, biscuits, sugar-sweetened soft drinks, cordials, fruit drinks, vitamin waters and sports drinks.

Second, make some swaps. Swap your cereal for a lower-sugar variety and limit the amount of sugar you add. Drink plain tap water and swap brands for sugar-free or those with lower added sugar. Swap fruit juices for whole fruits, which also give you fibre and other health-promoting nutrients.

Finally, read the labels on packaged food and drink. If the product has more than 15g of sugar per 100g, check to see if sugar is one of the main ingredients. If it is, use the nutrient information panel to compare and choose products containing less sugar.

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WHO calls on countries to reduce sugars intake among adults and children

A new World Health Organization guideline recommends adults and children reduce their daily intake of free sugars to less than 10% of their total energy intake. A further reduction to below 5% or roughly 25 grams (6 teaspoons) per day would provide additional health benefits.

Free sugars refer to monosaccharides (such as glucose, fructose) and disaccharides (such as sucrose or table sugar) added to foods and drinks by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.

“We have solid evidence that keeping intake of free sugars to less than 10% of total energy intake reduces the risk of overweight, obesity and tooth decay,” says Dr Francesco Branca, Director of WHO’s Department of Nutrition for Health and Development. “Making policy changes to support this will be key if countries are to live up to their commitments to reduce the burden of non-communicable diseases.”

The WHO guideline does not refer to the sugars in fresh fruits and vegetables, and sugars naturally present in milk, because there is no reported evidence of adverse effects of consuming these sugars.

Background

Non-communicable diseases (NCDs) are the leading causes of death and were responsible for 38 million (68%) of the world’s 56 million deaths in 2012. More than 40% of those deaths (16 million) were premature (i.e. under the age of 70 years). Almost three quarters of all NCD deaths (28 million), and the majority of premature deaths (82%), occurred in low- and middle-income countries. Modifiable risk factors such as poor diet and physical inactivity are some of the most common causes of NCDs; they are also risk factors for obesity – an independent risk factor for many NCDs – which is also rapidly increasing globally. A high level of free sugars intake is of concern, because of its association with poor dietary quality, obesity and risk of NCDs.

Free sugars contribute to the overall energy density of diets, and may promote a positive energy balance. Sustaining energy balance is critical to maintaining healthy body weight and ensuring optimal nutrient intake. There is increasing concern that intake of free sugars – particularly in the form of sugar-sweetened beverages – increases overall energy intake and may reduce the intake of foods containing more nutritionally adequate calories, leading to an unhealthy diet, weight gain and increased risk of NCDs. Another concern is the association between intake of free sugars and dental caries. Dental diseases are the most prevalent NCDs globally and, although great improvements in prevention and treatment of dental diseases have occurred in the past decades, problems still persist, causing pain, anxiety, functional limitation (including poor school attendance and performance in children) and social handicap through tooth loss. The treatment of dental diseases is expensive, consuming 5-10% of health care budgets in industrialised countries, and would exceed the entire financial resources available for the health care of children in most lower income countries.

Much of the sugars consumed today are ‘hidden’ in processed foods that are not usually seen as sweets. For example, 1 tablespoon of ketchup contains around 4 grams (around 1 teaspoon) of free sugars. A single can of sugar-sweetened soda contains up to 40 grams (around 10 teaspoons) of free sugars.

Worldwide intake of free sugars varies by age, setting and country. In Europe, intake in adults ranges from about 7-8% of total energy intake in countries like Hungary and Norway, to 16-17% in countries like Spain and the United Kingdom. Intake is much higher among children, ranging from about 12% in countries like Denmark, Slovenia and Sweden, to nearly 25% in Portugal. There are also rural/urban differences. In rural communities in South Africa intake is 7.5%, while in the urban population it is 10.3%.

Reducing sugars intake to less than 10% of total energy: a strong recommendation

The recommendations are based on analysis of the latest scientific evidence. This evidence shows, first, that adults who consume less sugars have lower body weight and, second, that increasing the amount of sugars in the diet is associated with a weight increase. In addition, research shows that children with the highest intakes of sugar-sweetened drinks are more likely to be overweight or obese than children with a low intake of sugar-sweetened drinks.

The recommendation is further supported by evidence showing higher rates of dental caries (commonly referred to as tooth decay) when the intake of free sugars is above 10% of total energy intake compared with an intake of free sugars below 10% of total energy intake.

Based on the quality of supporting evidence, these recommendations are ranked by WHO as ‘strong’. This means they can be adopted as policy in most situations.

Further reduction to less than 5% of total energy intake: a conditional recommendation

Given the nature of existing studies, the recommendation of reducing intake of free sugars to below 5% of total energy is presented as ‘conditional’ in the WHO system for issuing evidence-based guidance.

WHO issues conditional recommendations even when the quality of evidence may not be strong on issues of public health importance. A conditional recommendation is one where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but these trade-offs need to be clarified; therefore, stakeholder dialogue and consultations are needed before the recommendation is implemented as policy.

Updating the guideline on free sugars intake is part of WHO’s ongoing efforts to update existing dietary goals to prevent NCDs. The sugars guidelines should be used in conjunction with other nutrient guidelines and dietary goals, in particular those related to fats and fatty acids, including saturated fat and trans-fat.

In March 2014, WHO opened a public consultation on the then draft sugars guideline to seek inputs from all stakeholders. More than 170 comments were received from representatives of government
Recommendations

- WHO recommends a reduced intake of free sugars throughout the lifespan (strong recommendation1).
- In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake2 (strong recommendation).
- WHO suggests a further reduction of the intake of free sugars to below 5% of total energy intake (conditional recommendation3).

Remarks

- 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.
- For countries with a low intake of free sugars, levels should not be increased. Higher intakes of free sugars threaten the nutrient quality of diets by providing significant energy without specific nutrients.
- These recommendations were based on the totality of evidence reviewed regarding the relationship between free sugars intake and body weight (low and moderate quality evidence) and dental caries (very low and moderate quality evidence).
- 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 minimise 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.
- Although exposure to fluoride reduces dental caries at a given age, and delays the onset of the cavitation process, it does not completely prevent dental caries, and dental caries still progresses in populations exposed to fluoride.
- Intake of free sugars is not considered an appropriate strategy for increasing caloric intake in individuals with adequate energy intake if other options are available.
- These recommendations do not apply to individuals in need of therapeutic diets, including for the management of severe and moderate acute malnutrition. Specific guidelines for the management of severe and moderate acute malnutrition are being developed separately.

NOTES

1. Strong recommendations indicate that “the desirable effects of adherence to the recommendation outweigh the undesirable consequences” (20). This means that “the recommendation can be adopted as policy in most situations” (20).
2. Total energy intake is the sum of all daily calories/kilojoules consumed from food and drink. Energy comes from macronutrients, such as fat (9kcal/37.7kJ per gram), carbohydrate (4kcal/16.7kJ per gram) including total sugars (free sugars + intrinsic sugars + milk sugars) and dietary fibre, protein (4kcal/16.7kJ per gram) and ethanol (i.e. alcohol) (7kcal/29.3kJ per gram). Total energy intake is calculated by multiplying these energy factors by the number of grams of each type of food and drink consumed and then adding all values together. A percentage of total energy intake is therefore a percentage of total calories/kilojoules consumed per day.
3. Conditional recommendations are made when there is less certainty “about the balance between the benefits and harms or disadvantages of implementing a recommendation” (20). This means that “policy-making will require substantial debate and involvement of various stakeholders” (20) for translating them into action.

The World Health Organization (WHO) recently revised Sugar Intake Recommendations state:

**WHO** recommends a reduced intake of free sugars throughout the lifecourse (strong recommendation).

- **In both adults and children, WHO recommends reducing the intake of free sugars to less than 10% of total energy intake (strong recommendation).**
- **WHO suggests a further reduction of the intake of free sugars to below 5% of total energy intake (conditional recommendation).**

To summarise the evidence and detail behind the recommendations Australian and New Zealand experts have helped answer the questions below.

**QUESTIONS AND ANSWERS**

1. **What are the differences between the newly revised 2015 and the previous 2003 WHO recommendations?**

   The recommendation to reduce free sugars to less than 10% of total energy has not changed. The 10% limit was first recommended in 1989 and maintained by a WHO/FAO Consultation in 2002. According to the WHO evidence-based guidance system, the recommendation to limit free sugar intake to less than 10% of total energy is based on moderate quality evidence from observational studies of dental caries.

   What is new in the 2015 WHO guidelines is the addition of a ‘conditional’ recommendation to reduce free sugars to less than 5% of total energy, in order to provide additional dental health benefits. A ‘conditional’ recommendation is one that is based on lower quality evidence. There are only three studies to support reducing free sugars to less than 5%, and these are population ecological studies conducted during periods of war in which the availability of free sugar was limited. The quality of this evidence is considered by WHO as ‘very low’.

2. **The guidelines are based on ‘free sugars’. What does this mean? Are ‘free sugars’ the same as the sugar you see on a packaged food label like breakfast cereal?**

   Free sugars are those added to foods by the manufacturer, cook or consumer. Examples include sucrose (table sugar), glucose, fructose, honey or syrups, and the WHO also include fruit juices and fruit juice concentrates. The nutrition information panel on food products does not provide free sugars content but instead lists ‘total sugars’ which include naturally occurring sugars such as those from fruit and milk. To roughly estimate the amount of free sugars in a packaged food, refer to the ingredients list. Free sugars may also be estimated by calculation based on nutrient composition databases that provide sucrose and glucose content.

3. **What is the health rationale for reducing intake of free sugars throughout the lifecourse?**

   “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. This recommendation is classified by the WHO as ‘strong’ and is based on moderate and low quality studies”.

4. **What is the health rationale for limiting free sugars intake to 10% of total energy intake (total kilojoules or calories)?**

   “The WHO’s recommendation to limit intake of free sugars to less than 10% of total energy is based on...”
positive associations between sugar intake and dental caries seen in observational studies. The overall quality of the evidence was considered moderate though positive associations were observed in developed and developing countries and in both children and adults.\(^1\)

5. **What is the health rationale for reducing free sugars to less than 5% of total energy?**

“The recommendation to further limit free sugars intake to less than 5% of total energy 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 less than 5% of total energy intake.”\(^1\)

WHO is making recommendations at a population level given the options available and based the evidence for an effect on dental caries. In effect if consumers attempt to meet the target, they will automatically reduce frequency of free sugars consumption which at an individual level is most effective to prevent caries. This is especially important in childhood where if caries establishment can be avoided or reduced, the risks are lower in adulthood. The document also notes that dental caries can occur throughout life and attempts to reduce risk throughout the life course are important.

6. **Reducing free sugars to 5% of total energy is a conditional recommendation. What does this mean?**

According to the WHO evidence-based guideline system, a ‘conditional’ guideline is one that has a weaker evidence base. In the case of reducing free sugars to less than 5% of energy, there are only three studies to support it and these are population ecological studies conducted during periods of war in which the availability of free sugar was limited. The WHO issues conditional recommendations where the desirable effects of adhering to the recommendation probably outweigh the undesirable effects but the trade-offs need to be clarified, and dialogue and consultation with stakeholders is needed before it is implemented as policy in individual countries.

7. **Are Australians and New Zealanders currently meeting the WHO target of 10% energy intake coming from free sugars?**

The mean intake of total sugars by Australians is about 20% of dietary energy.\(^2\) About half comes from naturally occurring sugars in dairy foods and fruit; the other half comes from free sugars (or added sugars). This suggests that about half of the population is adhering to the WHO free sugar target of 5% of energy intake. Since the WHO target of 10% energy intake coming from free sugars is conditional, it is important for consumers to be aware of the evidence base and to consult with stakeholders before implementing it as policy in individual countries.

<table>
<thead>
<tr>
<th>10% added sugar adult food plan (based on 8,000kJ and 2,000 calories)</th>
<th>5% added sugar adult food plan (based on 8,000kJ and 2,000 calories)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breakfast</strong></td>
<td><strong>Breakfast</strong></td>
</tr>
<tr>
<td>½ cup rolled oats</td>
<td>½ cup rolled oats</td>
</tr>
<tr>
<td>1 cup reduced fat (1-2%) milk</td>
<td>1 cup reduced fat (1-2%) milk</td>
</tr>
<tr>
<td>3 tsp honey</td>
<td>2 tsp honey</td>
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<tr>
<td><strong>Morning snack</strong></td>
<td><strong>Morning snack</strong></td>
</tr>
<tr>
<td>½ grapefruit</td>
<td>½ grapefruit</td>
</tr>
<tr>
<td><strong>Lunch</strong></td>
<td><strong>Lunch</strong></td>
</tr>
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<td>2 slices of wholegrain bread</td>
<td>2 slices of wholegrain bread</td>
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<td>2 tsp margarine</td>
<td>2 tsp margarine</td>
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<tr>
<td>100g canned salmon</td>
<td>100g canned salmon</td>
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<tr>
<td>½ cup mixed salad</td>
<td>½ cup mixed salad</td>
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<tr>
<td><strong>Afternoon tea</strong></td>
<td><strong>Afternoon tea</strong></td>
</tr>
<tr>
<td>200g plain yoghurt, ½ banana</td>
<td>200g plain yoghurt, ½ banana</td>
</tr>
<tr>
<td><strong>Dinner</strong></td>
<td><strong>Dinner</strong></td>
</tr>
<tr>
<td>60g beef strips</td>
<td>60g beef strips</td>
</tr>
<tr>
<td>1½ cups stir-fry noodles</td>
<td>1½ cups stir-fry noodles</td>
</tr>
<tr>
<td>2 cups stir-fry vegetables</td>
<td>2 cups stir-fry vegetables</td>
</tr>
<tr>
<td>1 tsp oil</td>
<td>1 tsp oil</td>
</tr>
<tr>
<td>¼ cup stir-fry sauce</td>
<td>¼ cup stir-fry sauce</td>
</tr>
<tr>
<td><strong>Dessert</strong></td>
<td><strong>Dessert</strong></td>
</tr>
<tr>
<td>½ cup reduced-fat vanilla ice cream</td>
<td>½ cup reduced-fat vanilla ice cream</td>
</tr>
<tr>
<td>½ cup strawberries</td>
<td>½ cup strawberries</td>
</tr>
<tr>
<td>1 piece (8g) milk chocolate</td>
<td></td>
</tr>
<tr>
<td><strong>Nutritional information</strong></td>
<td><strong>Nutritional information</strong></td>
</tr>
<tr>
<td>8,570kJ (2,040 calories), 105g protein, 62g fat, 16g saturated fat, 250g total carbohydrates, 104g total sugars, 50g added sugars, 25g fibre, 1,742mg sodium</td>
<td>8,400kJ (2,000 calories); 106g protein; 60g fat; 228g total carbohydrates; 82g sugars; 25g added sugars; 25g fibre; 1,765mg sodium</td>
</tr>
</tbody>
</table>

*Table taken from directly from [4].*
8. What does 10% and 5% of free sugars look like for an adults or children’s diet?

Adult:
Based on an average adult energy requirement of 8,000kJ or 2,000 calories, 10% of total energy equates to 800kJ’s (200 calories). As there is 17kJ in every gram of sugar (sugar is pure carbohydrate), 800kJ ÷ 17kJ = 47g of sugar. There is approximately 4g sugar in a level metric teaspoon, therefore 47g ÷ 4g = 11.8g (12 teaspoons)
• 10% of energy in an adult is 47g, or 12 teaspoons of free sugars
• Following the same calculations above:
  5% of energy in an adult is 23.5g of sugar, or 6 teaspoons.

Children:
There is no sanctioned average daily energy requirement for children to use in food labelling in Australia and New Zealand, and energy requirements vary depending on age and size. As an example, we can use the estimated average energy requirement for an 8 year old child (the median age of children 2-18 years) and assume a moderate activity level (1.6 PAL). The Nutrient Reference Values for Australia and New Zealand gives this as 7,550kJ (average of boys and girls). Using the same calculations as above, 10% of energy is 44g or 11 teaspoons sugar and 5% of energy is 22g or 5.5 teaspoons.
• 10% of energy in an eight year old child is 44g, or 11 teaspoons of free sugars
• 5% of energy in an eight year old child is 22g, or 5.5 teaspoons of free sugars

9. How do I know how much ‘free sugars’ I am consuming?
Free sugars are contained in sweet tasting processed, packaged as well as home cooked foods. If you are consuming a lot of sugar-sweetened drinks, sweet snacks (e.g. biscuits, cakes) and confectionery, you are consuming a lot of free sugars.

The ingredients list of food products will tell you if free sugars have been added but calculating free sugar content is complex as this information is not available on the nutrition information panel. Free sugars, as defined by the WHO, must be calculated from nutrient databases by subtracting the naturally occurring sugars (not part of fruit syrups, juice or syrups) from the total sugars content.

It is perhaps most helpful to look at whole foods and the whole diet rather than grams of free sugars to determine whether a food or a diet is healthy, and to follow the National guidelines:

For Australians, the Dietary Guidelines state to “Limit intake of foods and drinks containing added sugars such as confectionery, sugar-sweetened soft drinks and cordials, fruit drinks, vitamin waters and sports drinks” and for New Zealanders the Food and Nutrition Guidelines state to “Prepare foods or choose pre-prepared foods, drinks and snacks, with little added sugar; limit your intake of high-sugar foods”.

SUMMARY

• Recommendations 1 and 2, to reduce free sugars intake throughout the lifecourse and to reduce free sugars intake to less than 10% of total energy intake has not changed from since 1989 WHO recommendations.
• Australians and New Zealanders are currently consuming on average about 10% energy as free sugars.
• The ‘strong’ recommendation to reduce free sugars throughout the lifecourse is based on the relationship between free sugars and body weight (low and moderate quality evidence) and dental caries (moderate quality evidence).
• The ‘strong’ recommendation to limit free sugars intake to less than 10% of total energy is based on moderate quality evidence from observational studies of dental caries.
• A ‘conditional’ recommendation to further limit free sugars intake to less than 5% of energy intake for additional health benefits is based on very low quality evidence from ecological studies of dental caries.
• Free sugars refer to those added to foods by the manufacturer, cook or consumer. Examples include sucrose (table sugar), glucose, fructose, honey or syrups, and also include fruit juices and fruit juice concentrates.

REFERENCES

The Sugar Research Advisory Service (SRAS) aims to provide an evidence-based view on the role of carbohydrates, and particularly sugars, in nutrition and health. SRAS is funded through the Australian and New Zealand sugar industries.

Sugar Research Advisory Service (7 January 2015).
Consumption of added sugars exceeds recommendations

One in two Australians (52 per cent) usually exceed the World Health Organization’s recommendation that free sugars contribute to less than 10 per cent of total energy intake, according to new data from Australian Bureau of Statistics.

Director of Health, Louise Gates, said the new ABS report showed the average amount of free sugars consumed was 60 grams per day (equivalent to 14 level teaspoons of white sugar).

Free sugars are the added sugars from food and beverage processing and preparation as well as honey and the sugar naturally present in fruit juice.

“The groups most likely to exceed the WHO recommendation were children and young people aged 9-13 and 14-18 years with close to three-quarters of them usually deriving 10 per cent or more of their energy from free sugars,” said Ms Gates.

“The highest consumption of free sugars was among males aged 14-18 years who averaged 22 teaspoons per day, while the top 10 per cent of male teenagers have at least 38 teaspoons of free sugars per day.”

Key findings

- In 2011-12, Australians consumed an average of 60 grams of free sugars per day (equivalent to 14 teaspoons of white sugar). The majority of free sugar intakes comes from added sugars with an average 52 grams (or 12 teaspoons), with 7 grams of free sugars coming from honey and fruit juice.
- Intakes of free sugars were highest among teenage males (aged 14-18 years), who consumed an average 92 grams per day. The top 10% of the 14-18 year old males were estimated to usually consume at least 160 grams (or 38 teaspoons) of free sugars per day.
- Just over half of all Australians aged 2 years and over exceeded the WHO recommendation to limit energy from free sugars to less than 10% of dietary energy. Children and teenagers were most likely to exceed the recommendation with almost three-quarters of 9-13 and 14-18 year olds usually consuming 10% or more of their dietary energy from free sugars. The highest 10% of 14-18 year olds were deriving at least 23% of their energy from free sugars. Adults aged 51-70 years were least likely to exceed the recommendation (38% of males and 35% of females).
- The majority (81%) of free sugars were consumed from the energy-dense, nutrient-poor ‘discretionary’ foods and beverages. Just over half (52%) of free sugars in the diet were consumed from beverages, with the leading beverages being soft drinks, sports and energy drinks (19%), fruit and vegetable juices and drinks (13%) and cordial (4.9%). The leading foods were confectionary and cakes/muffins (each contributing 8.7%).

“The highest consumption of free sugars was among males aged 14-18 years who averaged 22 teaspoons per day, while the top 10 per cent of male teenagers have at least 38 teaspoons of free sugars per day.”

Beverages were the source of just over half of the free sugars, with soft drinks, sports and energy drinks providing 19 per cent, followed by fruit and vegetable juices with 13 per cent. The leading food sources of free sugars were muffins, cakes or scones and confectionary (each contributing 8.7 per cent), followed by free sugars in honey, jams (and similar spreads), ice confection and plain sugar.

More details are available in Australian Health Survey: Consumption of Added Sugars (cat. no. 4364.0.55.011), available for free download from the ABS website, www.abs.gov.au

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Australian Bureau of Statistics
ADDED SUGARS AND FREE SUGARS

Australian Bureau of Statistics explains the data behind our high sugar consumption, sourced from the Australian Health Survey

The 2013 Australian Dietary Guidelines (ADG) advises Australians to limit their intakes of foods and beverages containing added sugars. Diets high in added sugars may displace nutritious foods with energy-dense, nutrient poor foods, and are associated with weight gain and dental caries.

Added sugars include sucrose, fructose, dextrose, lactose and sugar syrups such as glucose syrup which are added during manufacture of foods or added by the consumer in the preparation of food and beverages.

The term ‘free sugars’ extends the definition of added sugars to include sugars naturally present in honey, fruit juice and fruit juice concentrates. In 2015 the World Health Organisation (WHO) issued a recommendation that both adults and children reduce their intake of free sugars to less than 10% of total dietary energy to help reduce the significant non-communicable disease burden from unhealthy weight gain and dental caries.

How much sugar was consumed?

In 2011-12, Australians consumed an average of 105 grams of total sugars per day. Just over half of this was free sugars (60 grams, equivalent to approximately 14 level teaspoons of white sugar), with the balance (45 grams) being the intrinsic sugars within intact fruit plus the naturally occurring sugar in milk. The majority of free sugar intakes comes from added sugars with an average of 52 grams (or 12 teaspoons), with 7 grams of free sugars coming from honey and fruit juice (see Figure 1).

The total amount of sugar consumed increased throughout childhood years peaking in the 14-18 years age group for males and 9-13 years for females, then declined in successively older adult age groups. The peaks in total sugar intakes amongst teenagers are driven almost entirely by the consumption of free sugars, evident from the relatively constant intake of intrinsic sugars from intact fruit plus natural milk sugar across age groups.

At 14-18 years, the average daily intakes of free sugars were 92 grams for males and 70 grams for females (22 and 17 teaspoons respectively). The lowest free sugar consumption was by the 2-3 year olds who had around 39-42 grams (or 9-10 teaspoons) per day, reflecting the overall smaller quantity of food consumed by young children. Similarly, the declining amounts of free sugars consumed in older adult age groups in part reflects the lower volume of food consumed by older adults, but also the types of foods consumed.

While the average provides an overall summary of consumption for a group, the distribution of usual consumption highlights the wide variation in amounts consumed. For instance, the amount of free sugars consumed by the top 10% (or 90th percentile) of the 14-18 year old males was at least 160 grams (38 teaspoons) per day, followed by 9-13 year old males, where the amount of free sugars consumed by the top 10% was at least 145 grams (34 teaspoons) per day, while the top 10% of 19-30 year old males had at least 138 grams (33 teaspoons) per day. In contrast, the median consumption (which represents the midpoint in the distribution) for most age groups was around half the amount of the 90th percentile.

Among females, the top 10% (or 90th percentile) of the 9-13 year olds had at least 119 grams (28 teaspoons) per day, with the top 10% of the 14-18 year old females usually having at least 113 grams (27 teaspoons) per day. The median amount for these age groups was equivalent to around 17 and 16 teaspoons respectively.
Dietary energy from free sugars

Dietary energy is sourced from the macronutrient components of the diet and may include the energy from fat, alcohol, protein, fibre and carbohydrate (including sugars and starch). In 2011-12, Australians derived an average of 10.9% of their dietary energy from free sugars, exceeding the WHO recommendation that both adults and children consume less than 10% of energy from free sugars.2,7

Just over half (52%) of the population usually exceeded the recommendation, with the highest rates among child and teenage groups. Close to three-quarters of 9-13 and 14-18 year olds usually derived 10% or more of their dietary energy intake from free sugars, with the top 10% of this age group usually consuming at least 23% of energy from free sugars – over twice the recommendation. Males and females aged 51 to 70 years were the least likely to exceed the recommendation (38% of males and 35% of females this age).

The WHO have also made a further conditional recommendation that free sugar intakes be reduced to below 5% of total energy intake.2 Overall, nine out of ten people (89%) exceeded this recommendation, with the most likely to exceed being children and teenagers (aged between 4 and 18 years) where...

FIGURE 1: TOTAL SUGARS, FREE SUGARS AND ADDED SUGARS – AVERAGE CONSUMPTION\textsuperscript{(a)(b)}, 2011-12

(a) Based on Day 1. See Glossary for definition.  
(b) Persons aged 2 years and over.  
See Glossary for detailed inclusions of each definition.  
* Not directly measured – calculated from the difference between the measured sugar components.

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Added sugars include sucrose, fructose, dextrose, lactose and sugar syrups such as glucose syrup which are added during manufacture of foods or added by the consumer in the preparation of food and beverages.
almost all (97%) usually derived 5% or more of their energy from free sugars. Adults aged 51-70 year olds were least likely to exceed the recommendation with 81% consuming 5% or more of total energy from free sugars.

Sources of free sugars

Just over half (52%) of all free sugars consumed were from beverages, led by soft drinks, sports and energy drinks (19%), fruit juice and fruit drinks (13%), with the sugar added to beverages such as tea and coffee contributing 7.3% and cordials 4.9%.

The overall contribution of beverages to free sugars consumption ranged from around 40% for young children and older adults to around 60% for 19-30 year olds. Fruit and vegetable juices were the leading source.

### MALES 2 YEARS AND OVER – TOTAL SUGARS, FREE SUGARS AND INTRINSIC AND MILK SUGARS – AVERAGE INTAKE

![Graph showing average intake of total sugars, free sugars, and intrinsic + milk sugars for males 2 years and over.](Graph)

### FEMALES 2 YEARS AND OVER – TOTAL SUGARS, FREE SUGARS AND INTRINSIC AND MILK SUGARS – AVERAGE INTAKE

![Graph showing average intake of total sugars, free sugars, and intrinsic + milk sugars for females 2 years and over.](Graph)

### MALES 2 YEARS AND OVER – USUAL CONSUMPTION OF FREE SUGARS: SELECTED PERCENTILES

![Graph showing usual consumption of free sugars for males 2 years and over.](Graph)

### FEMALES 2 YEARS AND OVER – USUAL CONSUMPTION OF FREE SUGARS: SELECTED PERCENTILES

![Graph showing usual consumption of free sugars for females 2 years and over.](Graph)
contributor among 2-3 and 4-8 year olds (25% and 18% of all free sugars respectively), whereas soft drinks, sports and energy drinks were the leading source in 14-18 year olds (28%) and 19-30 year olds (27%). The relatively high proportion of free sugars from soft drinks, sports and energy drinks in the 14-18 years group was driven by the males who consumed 35% of their free sugars from these beverages compared with 19% for the females aged 14-18 years. Alcoholic beverages contributed 5.2% of the free sugars among the 19-30 years olds (mostly from pre-mixed drinks). In older age groups the contribution of beverages to free sugar declined mainly due to lower consumption of soft drinks, although higher proportions of free sugar came from the sugar added to beverages (mainly tea and coffee).

In terms of food sources of free sugars, the highest contributors were Cakes, muffins, scones and cake-type desserts (8.7%); Confectionery and cereal/nut/fruit/seeds bars (8.7%) and Sugar products and dishes (excluding where added to a beverage) (7.6%). In contrast to the pattern from beverages, younger children and older adults consumed a higher proportion of their free sugars from foods, and together, these three non-beverage groups contributed around 30% of all free sugars for both the younger and older age groups. Sweet biscuits and frozen milk products each contributed 4% of all free sugars, and similarly with the leading food sources, they contributed relatively more to free sugars intakes for younger children and older adults than to the 14-50 year olds.

Given the types of food and beverage categories contributing to free sugars consumption, it is not surprising that discretionary foods accounted for the majority (81%) of free sugars. The leading foods contributing to the 19% of free sugars from non-discretionary food sources were fruit and vegetable juice which contributed 6.4%, breakfast cereals (2.5%), flavoured milks and milkshakes (2.3%) and yoghurt (1.8%).

**Added sugars include sucrose, fructose, dextrose, lactose and sugar syrups such as glucose syrup which are added during manufacture of foods or added by the consumer in the preparation of food and beverages.**
ENDNOTES
4. All references to teaspoons within this publication refer to a level teaspoon of white sugar.
5. The definitions of free sugars, intrinsic sugars and sugars from milk are based on WHO concepts and terminology. See Glossary for definitions.
6. Usual intakes are modelled estimates which account for the day-to-day variation in intake of individuals the amounts of (or proportions of energy of) free sugar usually consumed by a given proportion of the population. See the AHS Users’ Guide for more details.
7. The percentage of energy from free and added sugars was estimated by multiplying each gram of free and added sugars by a conversion factor of 16 to determine the kilojoules of energy.
8. The category ‘flavoured milk drinks and beverage bases’ was a grouping to capture the free sugars in the AUSNUT foods: Flavoured milk and milkshakes, Dairy milk substitutes, unflavoured, Dairy milk substitutes, flavoured, Other beverage flavourings and prepared beverages (includes products such as Milo, breakfast beverages), chai latte, bubble tea, tea mix powders, coffee mixes and coffees prepared from coffee mix, and coffees prepared with soy milk.
9. Sugar added to a beverage was measured by summing the free sugar within the AUSNUT major food group ‘Sugar products and dishes’ where those food records also had the ‘beverage with additions’ combination code. While this category includes toppings and jam spreads, over 98% of the free sugar with the ‘beverage with additions’ combination code was sugar. The balance of the free sugar in ‘Sugar products and dishes’ (i.e. the proportion not consumed in a beverage) was made up of: sugar (30%, with three quarters of that being added to cereal), jams (33%), water ice confection (13%) and sugar-based desserts (10%).
10. Foods categorised as discretionary were defined for the AHS using criteria-based decision rules (see AHS Users’ Guide for details) but are generally described as energy-dense and nutrient-poor and associated with being high in saturated fat, added salt, added sugars or alcohol.

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Less Australians drinking sweetened drinks

LESS AUSTRALIANS ARE DRINKING SWEETENED DRINKS, ACCORDING TO A REPORT BY THE AUSTRALIAN BUREAU OF STATISTICS

New results from the Australian Health Survey and the 1995 results, show that the proportion of people consuming sweetened drinks decreased from just under half (49 per cent) in 1995 to 42 per cent in 2011-12. This decrease was driven by a drop in the proportion of consumers of sugar-sweetened beverages from 43 per cent in 1995 to 34 per cent in 2011-12, while over the same time period, the proportion of people consuming artificially sweetened (intense-sweetened) beverages increased from eight per cent to ten per cent.

Among sweetened beverage consumers, the amount consumed varies widely. While the median amount of sweetened beverages consumed on the day prior to interview was around the size of a typical can (375mls), the top ten per cent highest consumers of sweetened beverages consumed more than one litre on the day, peaking at 1.5L for males aged 19-30 years.

“Among consumers of sugar-sweetened beverages, the average intake of sugar from these beverages was equivalent to 13 teaspoons, or 54 grams,” said Louise Gates, Director of Health from the ABS. “The average intake for males aged 14-18 years who consumed sugar-sweetened beverages was 16 teaspoons, or 68 grams.”

“The average intake for males aged 14-18 years who consumed sugar-sweetened beverages was 16 teaspoons, or 68 grams.”

Proportion of consumers and amount consumed varied within the population. Aboriginal and Torres Strait Islander people were more likely to consume sweetened beverages than non-indigenous people (56 per cent compared with 42 per cent). Their median intake was also higher at 455mls or one and a half cans of sweetened beverages.

The 2011-13 Australian Health Survey (AHS) is the largest and most comprehensive health survey ever conducted in Australia. The survey, conducted throughout Australia, collected a range of information about health-related issues, including health status, risk factors, health service usage and medications. In 2011-13, the AHS incorporated the National Nutrition and Physical Activity Survey (NNPAS).

It involved the collection of detailed physical activity information using self-reported and pedometer collection methods, along with detailed information on dietary intake and foods consumed from over 12,000 participants across Australia. The nutrition component is the first national nutrition survey of adults and children (aged 2 years and over) conducted in over 15 years.

For further information see Australian Health Survey: Nutrition First Results – Foods and Nutrients, 2011-12 (cat. no. 4364.0.55.007), available for free download from the ABS website, www.abs.gov.au

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Top sources of free sugars

| Soft drinks, sports and energy drinks | 19% |
| Fruit and vegetable juices | 13% |
| Muffins, cakes, scones, confectionery | 8.7% |
| Confectionery and cereal/nut/fruit/seed bars | 8.7% |
| Sugar product and dishes | 7.6% |
| Tea and coffee | 7.3% |
| Cordials | 4.9% |
| Sweet biscuits and frozen milk products | 4% |

PERCENTAGE OF AGE GROUPS EATING MORE SUGAR THAN HEALTHY

| 2-3 years: 50% | 19-30 years: 60% |
| 4-8 years: 68% | 31-50 years: 45%-50% |
| 9-13 years: 70%-80% | 51-70 years: 35% |
| 14-18 years: 75% | 71+ years: 45% |

Source: Australian Bureau of Statistics.
Australians still eating too much sugar, teenagers particularly at risk, research shows

Three-quarters of Australian teenagers exceed the World Health Organization’s recommended daily intake of added sugars, new research shows. Emily Bourke reports for ABC News

The alarm-raising research by Sydney University, published in the British Journal of Nutrition, found especially bad habits in children and adolescents, with 76 per cent of teenagers exceeding the guidelines for daily sugar intake.

The research indicated that in the past 20 years, there was little to no change in the eating habits of Australians and in their consumption of sugar, despite the higher level of awareness around portion control and warnings about sugar-enriched foods.

Sydney University’s Professor of Public Health Nutrition, Timothy Gill, said their research was the first time they had been able to calculate fairly accurately the amount of sugar being consumed by the Australian population.

“And it was quite alarming,” he said.

Professor Gill said they were not surprised to find that teenagers and pre-teens were consuming sugar-rich foods.

“That’s the market that these sorts of foods, particularly soft drinks, are highly targeted to,” Professor Gill said.

“It is surprising the rest of the population is having such a high level, but most disturbing is just the amount of sugar and particularly the amount of sugar-sweetened beverages, which are being consumed by teenagers.

“And most depressing is the fact that compared to a survey back in 1995, we’ve been trying to compare the levels of consumption – we can’t directly compare them – but it does appear that we haven’t seen much improvement in that time.”

‘A double whammy’ as less calories needed, junk food intake the same

What the researchers saw was that the key sources of sugar had not changed.

“Sugar-sweetened beverages still provide such a large proportion of the sugars consumed – around 25 per cent for the whole of the population – but amongst teenagers, it rises up to about 33, 34 per cent of all the sugar being consumed from sugar-sweetened beverages,” he said.

“We have seen some small improvements, particularly in the very young children.

“And at the other end of the spectrum, the elderly are also perhaps improving their diets compared to 20 years ago.”

Professor Gill said the findings were distressing to the team because over the years since 1995, the amount of calories required by the general population had fallen.

“We’re becoming less physically active, so it’s becoming harder to get all the right sorts of foods within our daily energy allowance, our daily calorie allowance,” he said.

“And so the more discretionary sweets or junk food that are consumed, the less of the right sort of foods are consumed.

“So you’re getting a double whammy: you’re getting a reduction in the consumption of fruits, vegetables, meats, milks and other fresh produce, which contribute the sorts of nutrients that are needed, particularly during the adolescent growth years.

“And you’re getting on top of that an additional load of sugar and salt and other things that come within these foods, which we know are detrimental to our health.”

‘Australia should be following UK footsteps with sugar tax’

Professor Gill said people could not go on believing they were only “having a little bit” when it came to junk food.

“[People think,] ‘we’re just having two or three biscuits a day, or a can of soft drink a day. It’s not doing us any harm.’ But clearly it’s contributing to excess calories; clearly it’s excluding more appropriate foods,” he said.

“And I think the time has come where we’ve just got to accept that whilst these foods have a role in our diet, they’re a very, very small role. And we need to restrict them quite severely.”

He said one problem was that the food supply industry was dominated by highly processed foods that are attractive and palatable.

“And they’re very cheap, as well as being aggressively marketed,” Professor Gill said.

“I suppose this comes up at a time when the UK have decided to impose a tax upon soft drinks to send a price signal that these very high sugar-rich foods are perhaps not that good for our health.

“And I can’t see any reason why we shouldn’t be following suit in Australia. In fact, I’m very disappointed that we didn’t lead.”

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Sugar sweetened Aussies: over 50 per cent exceed consumption guidelines

More than half of us are exceeding the World Health Organization’s recommended daily intake of added sugars, according to a University of Sydney study examining Australia’s sugar intake.

Fifty five per cent of participants in the study consumed over the recommended 10 per cent of daily energy from added sugar, honey and syrups, and sugar in fruit juice, defined as ‘free sugars’ by WHO.

The research, published in the British Journal of Nutrition, reveals especially bad habits in children and adolescents, with 76 per cent of those aged 9-13 years exceeding the guidelines for daily sugar intake.

The study is based on a 24 hour recall of eating habits from a representative sample of over 8,000 participants in the most recent 2011-2012 Australian Health Survey.

Professor of Public Health Nutrition, Timothy Gill said this and other recent studies show disturbing trends in adolescent eating patterns.

“Whilst we have seen some improvements in the diets of young children, older teens and males in particular are consuming a large amount of added sugar from products such as soft drinks,” said Professor Gill.

“This is particularly concerning as these foods not only add a lot of calories and provide little or no nutrition, but they also displace more nutritious foods such as vegetables and fruits or milk which are important for teenagers in this stage of rapid development.”

Lead author and dietician Dr Jimmy Louie said on a whole the study’s results aren’t dissimilar to the last analysis based on the 1995 National Nutrition Survey.

“It’s concerning that we haven’t seen much of a decline in the percentage of energy from added sugar among Australians between 1995 and 2012,” said Dr Louie, Honorary Associate in the Sydney Medical School.

“For a long time we criticised food manufacturers for producing core foods like bread, yoghurt and breakfast cereal high in added sugar, but this study shows that up to 80 to 90 per cent of our added sugar intake is coming from what should be occasional food or treats.”

PERCENTAGE OF AGE GROUP THAT CONSUMED 10% OR MORE OF DAILY ENERGY FROM FREE SUGARS
(added sugar, honey and syrups, and sugar in fruit juices)

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<tr>
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How did so much sugar end up in our food?

**NUTRITIONIST JENNIFER MURRANT INVESTIGATES THE RISE OF SUGAR IN OUR DIET**

Just how did so much sugar end up in our food?

A growing collection of documentaries depict the epidemic of obesity and chronic disease as a result of our food choices. For example, there is *Supersize Me; Super Juice Me; The Men Who Made Us Fat; Food Matters*; and most recently *That Sugar Film*. Some of these are criticised due to the lack of ‘lab’ style data, but the results and messages seem very consistent. Junk (processed) food makes us sick and healthy food helps to restore and maintain our health. This picture is increasingly being supported by research.

The first way to take charge of our health is to become aware of the way in which the food industry works and how such large quantities of sugar have crept into most packaged products on supermarket shelves, as well as fast food restaurants.

The three-part documentary aired in 2012, *The Men Who Made Us Fat* (by Jacques Peretti), discusses a more political cause for what it terms ‘the obesity epidemic’. Just to recap, or for those that haven’t seen it, key factors in the rise of obesity over the past forty years according to this documentary are as follows:

- In the 1970s in America there was a push towards maximum agricultural production, many small farms were lost to industrialised farming methods. Corn was particularly abundant.
- It was discovered (by a Japanese scientist) that corn could be converted to a very sweet syrup, called High Fructose Corn Syrup (HFCS), with a higher ratio of fructose to glucose than table sugar, as well as being sweeter and ⅓ cheaper than sugar. This was then, for economic reasons quickly taken up as a sugar replacement for many food and beverage companies, substantially increasing profit margins. This product is now ubiquitous in processed foods and soft drinks.
- Simultaneously in the UK, the concept of ‘snacking’ was introduced, with marketing campaigns encouraging...
snacking on sugary bars between meals, increasing not only calorie intake but also dramatically increasing proportion of sugar consumed by individuals. 
- The prevalence of heart disease during the 1970s was blamed on high saturated fats. The food industry quickly saw an opportunity to produce and market ‘low-fat’ foods, altering the saturated fat to transfat by hydrogenation processes (now known to be far more dangerous than saturated fat) and adding sugar to compensate for compromised taste. Obesity continued to escalate, as did cardiovascular disease and other chronic diseases. 
- Professor John Yudkin vehemently believed sugar played a bigger part in disease than fats. He published a book, in 1972, called Pure, White and Deadly. Professor Yudkin was discredited for his work and his findings dismissed. 
- Portion sizes increased as a marketing tool packaged as ‘value’. Low-cost nutrient devoid foods such as popcorn, fries, soda came in a ‘jumbo’ size for relatively small price increase. This resulted in increased profit margins for food companies and the population became accustomed to larger portions. Then came the concept of ‘bundling’ again pitched as value as they added in yet more high-sugar, low-nutrient foods. 
- Mounting evidence that excess sugar in processed foods was being presented to governments but was generally ignored. 
- A reported prepared by JP Morgan in 2003 warned investors that manufacturers of unhealthy foods were vulnerable to financial losses. This certainly motivated people into action, but the concerns were profits and shareholdings, not public health. 
- The increasing public interest in health led food manufacturers to label accordingly, perhaps fortified with vitamins, but there was not a reduction in sugar. In the UK the food industry successfully fought a proposal for mandatory ‘traffic light labelling’ to help consumers readily discern high sugar, calorie and fat meals. This became a voluntary measure taken up by Sainsbury’s but declined by Tesco’s. It seemed the risk of people finding out a food was unhealthy and then choosing not to buy it was too high. 

A comment made on this documentary that struck was that one of the great strengths of supermarkets was their responsiveness to consumer demand. 

That puts us back in charge 
The only way this situation will be reversed is through education and through us as individuals making different choices. 

Whilst it is not difficult to see that the government and food industry bear considerable responsibility for the health crisis we currently face, with so many competing interests, it is difficult to see a clear solution. The food companies employ millions of people, are answerable to their shareholders and of course enjoy enormous profits. Our health is a long way down the list of priorities. Therefore, it seems that whilst the government and food industry may have created this situation, only we can fix it. 

Another key figure in the growing awareness of the dangers of sugar is Professor Robert Lustig who has posted a number of informative lectures on YouTube. In 2009 he posted a lecture called ‘Sugar: The Bitter Truth’ which has had over 5 million views. It is highly recommended. Professor Lustig describes sugar as a toxin, akin to tobacco and alcohol and says it should come with warnings and taxes. He goes further than calories though, citing fructose, in particular, as a poison when consumed in excess, due to its ability to switch off satiety centres in the brain, interfere with leptin and other hormones associated with

There are very few people who would argue with the fact that the western world consumes an excessive amount of sugar, although some may be shocked at just how much.
negative feedback control.

It is important to note that when fructose occurs in whole foods, such as fruit and vegetables, it is not dangerous as the fibre and other nutrients reduce the absorption and help metabolise this substance. Professor Lustig’s lectures give clear scientific explanations of the different ways sugars behave in the body and why not all calories are the same.

The point of calories not being the same is also referred to in the recent popular documentary, *That Sugar Film*. During this experiment Damon Gameau replaces his usual diet, consisting of whole foods, with packaged/processed foods which are marketed as healthy, with the intention of matching the estimated daily sugar intake of Australian people, being 42 teaspoons per day.

Gameau claimed that his calorie intake didn’t change, but the type of calories did. The outcome was predictably that he gained weight, experienced mood swings, fatigue and developed signs of fatty liver through raised liver enzymes, particularly ALT (Alanine Transaminase).

Whilst I would not consider any of the foods eaten by Damon Gameau in the documentary to be healthy, it is disturbing that a number of people do. The results were by no means a shock and to go back to our initial point, the evidence shown in this growing collection of documentaries appears very consistent. Nutrient-poor, fibre-poor, sugar-laden foods are harmful and make us sick.

Over recent years, there has been an enormous amount of attention given to the dangers of sugar, somewhat vindicating to those of us who have been saying this for decades. However demonising all sugars and conflicting information may be confusing. We do, after all, require a constant supply of glucose to function, with our brains being particularly dependent on this substance.

Sugars do occur naturally in foods, or are converted from foods (carbohydrates). Certainly added sugars should be minimised and the biggest source of these added sugars are hidden in processed foods.

To simplify and sum up, there are very few people who would argue with the fact that the western world consumes an excessive amount of sugar, although some may be shocked at just how much. If the sugar comes in its natural form, that is fruit and vegetables, and is consumed as a whole food it is unlikely to be a problem for most people. The nutrients, fibre and sugars will be utilised by the body and satiety will prevent overconsumption.

If the sugars (whether in the form of sucrose or HFCS) are added to foods with few nutrients and little to no fibre, blood sugar will spike, the liver will struggle to metabolise the fructose portion, satiety will not occur through disruption of hormones such as leptin and all of these factors will encourage overeating whilst simultaneously leaving the body and brain undernourished.

This is why a mango is different to a Mars bar and dates are different to Coca-Cola.

My concern about these suggestions is that during a lapse of will power, which is highly likely in any deprivation type diet, people may think that if it is all the same they may as well have a Mars bar or Coke, when they would be much better to satisfy their cravings with a mango or a date.

---

On its own, a little sugar is not bad for you – but you do need to consider how much and how often you eat it. In moderation, sugar is unlikely to cause harm and make low fat, high fibre foods taste better. A spread of jam on multigrain toast or a handful of sweets is hardly going to destroy the nutritional value of a whole diet.

But sugar is a refined food, supplying no vitamins, minerals or fibre. The only nourishment that sugar has to offer is kilojoules (calories). Because it’s easy to overconsume, too much sugar can lead to overweight which then sets the scene for health problems such as heart disease, diabetes or cancer. And it does play a role in tooth decay.

Sugar is hidden
Only about 25 per cent of the total sugar we ingest is sugar that we consciously add to foods, for example in tea, coffee or in home baking. The remaining 75 per cent comes from the everyday packaged foods and drinks we consume such as soft drink, juices, cereals, biscuits and sweets.

**WHERE’S THE SUGAR?**

<table>
<thead>
<tr>
<th>FOOD</th>
<th>SUGAR (G)</th>
<th>SUGAR (TSP)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drinks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soft drink, 1 can</td>
<td>40.9</td>
<td>10.0</td>
</tr>
<tr>
<td>Fruit juice drink, orange, 1 glass</td>
<td>28.8*</td>
<td>7.0</td>
</tr>
<tr>
<td>Flavoured milk, 300ml carton</td>
<td>28.2</td>
<td>5.8</td>
</tr>
<tr>
<td>Cordial (made up), 1 glass</td>
<td>22.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Orange juice 100%, 1 glass</td>
<td>18.5*</td>
<td>4.5</td>
</tr>
<tr>
<td>Plain milk, 1 glass</td>
<td>12.1</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Cakes and biscuits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Danish pastry, 1</td>
<td>16.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Tim Tam, 2 biscuits</td>
<td>15.6</td>
<td>3.5</td>
</tr>
<tr>
<td>Muffin, 1</td>
<td>13.3</td>
<td>3.0</td>
</tr>
<tr>
<td>Doughnut, 1</td>
<td>6.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Milk Arrowroot, 2 biscuits</td>
<td>3.6</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Cereals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit Loops, 1 bowl</td>
<td>11.7</td>
<td>3.0</td>
</tr>
<tr>
<td>Muesli, untoasted, 1 bowl</td>
<td>12.9*</td>
<td>3.0</td>
</tr>
<tr>
<td>Sultana Bran, 1 bowl</td>
<td>10.2*</td>
<td>2.5</td>
</tr>
<tr>
<td>Corn Flakes, 1 bowl</td>
<td>2.6</td>
<td>0.5</td>
</tr>
<tr>
<td><strong>Confectionery</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mars Bar, 1 bar</td>
<td>34.8</td>
<td>8.5</td>
</tr>
<tr>
<td>Milk chocolate, 6 squares</td>
<td>16.7</td>
<td>4.0</td>
</tr>
<tr>
<td>Hard-boiled sweets, 3</td>
<td>8.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Muesli bar, fruit, 1 bar</td>
<td>6.9*</td>
<td>1.5</td>
</tr>
<tr>
<td>Liquorice, 1 strip</td>
<td>4.8</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Ice creams and desserts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoghurt, fruit, 200g tub</td>
<td>25.6*</td>
<td>6.0</td>
</tr>
<tr>
<td>Paddle Pop, 1</td>
<td>22.1</td>
<td>5.5</td>
</tr>
<tr>
<td>Ice cream, 1 scoop</td>
<td>9.9</td>
<td>2.5</td>
</tr>
</tbody>
</table>

*Also includes natural sugars from fruit.

So a sedentary woman who eats 7,500 kilojoules (1,800 calories) a day would be able to consume 45 grams of sugar. This translates to 11 level teaspoons of sugar a day – not much when you realise that one 60 gram chocolate bar has 33 grams of sugar. Most of us have to halve what we eat now.

The more active you are, the more sugar you can eat. A 16 year old active boy who burns off 12,600 kilojoules (3,000 calories) a day could tuck into some 20 teaspoons of sugar a day.

**Tip:** On a label, ‘sugars’ means the total of what’s natural (say from fruit or milk) PLUS what’s added. You can’t tell how much is added sugar. Look at the ingredient list and see if some form of sugar is near the top of the list.

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Sugar can appear as glucose, dextrose, fructose, sucrose, maltose or fruit juice concentrate.

**Sugar on labels – What to aim for**

**Juices**
Look for ‘No added sugar’ types at 8 to 9 per cent (this is 8 grams per 100g in the ‘Per 100g’ column) but compare brands – some regular juices have less sugar than ‘No added sugar’ types depending on their natural sweetness.

**Cereals**
Look for 15 per cent or less sugars OR Look for 25 per cent or less sugars for cereals with dried fruit (Sultana Bran, Just Right) as these have natural sugars as well as added. Compare brands and buy the lowest sugar percentage you see.

**Fruit yoghurt**
15 per cent less sugars (natural unflavoured yoghurt has around 8 per cent sugars to start with).

**4 ways to cut back on sugar**
1. Watch what you drink from soft drink, energy drinks, sports drinks, cordial and juice. Opt for water to quench your thirst instead.
2. Cut back on sweet ‘junk food’ like lollies, fruit straps, chocolate, cakes and fancy ice creams. Save these treats for special occasions and make them small.
3. Between meals, snack on fresh fruit or nuts or yoghurt or cheese and crackers instead of sweet biscuits, chocolate or muffins. Sweeten your cereal with banana, chopped fresh fruit or a handful of sultanas.
4. Don’t stress about the sugar from fruit yoghurt, flavoured milk, canned fruit, sugar on porridge or jam on toast – they’re the smallest contributors and make healthy food taste good. Jam is high in sugar (65 per cent) but you only spread 2 teaspoons on your toast, so you consume a small 6 grams of sugar. Soft drink has 10 per cent sugar but you drink a lot of it. A 370ml can stacks on 40 grams of sugar.

Only about 25% of the total sugar we ingest is sugar that we consciously add to foods, for example in tea, coffee or in home baking. The remaining 75% comes from the everyday packaged foods and drinks we consume such as soft drink, juices, cereals, biscuits and sweets.
BREAKFAST CEREALS UP TO ONE THIRD SUGAR: NEW ANALYSIS SHOWS
HEALTH GROUPS CALL FOR CLEAR LABELLING

**Obesity Policy Coalition** is urging cereal manufacturers to adopt better labelling, after a recent survey revealed sugar makes up more than 35% of the ingredients of some popular brands.

Australian cereal manufacturers are potentially misleading consumers by promoting healthy sounding statements on their packaging despite sugar making up more than 35% of the ingredients of some popular brands, a recent survey has revealed.

The Obesity Policy Coalition (OPC) analysed the labels of 20 popular breakfast cereals and found that the majority of products carried healthy sounding claims such as a ‘source of fibre’, ‘69% wholegrain’ and ‘no artificial flavours’ – though some contained more than one third sugar.

“Many breakfast cereals contain high levels of sugar, but manufacturers use all sorts of creative phrases on their labels to give consumers the impression they’re a nutritious choice for breakfast. It’s as though they are prepared to tell consumers only half the story.”

Jane Martin, Executive Manager of the OPC, believes consumers deserve the right to a clearer picture about what they are eating and the Coalition is urging all cereal manufacturers to adopt Australia’s voluntary Health Star Rating labelling system.

Ms Martin says: “For example, many breakfast cereals contain high levels of sugar, but manufacturers use all sorts of creative phrases on their labels to give consumers the impression they’re a nutritious choice for breakfast. It’s as though they are prepared to tell consumers only half the story.

“Many parents would be horrified to learn that for every three mouthfuls of Nutri-Grain, one is just sugar, while a small bowl contains twice as much sodium as a small packet of chips.

“The Health Star Rating System was introduced more than a year ago to help consumers compare the overall nutritional quality of products at a glance. The system helps consumers better understand a product’s overall health rating so they can make informed choices, but our research has revealed very few cereals, as yet, carry the star label,” Ms Martin says.

“Clearer labelling through such a system is a vital step in helping consumers make healthier choices in an environment where approximately 63% of Australian adults and 25% of Australian children are overweight or obese.

“Nutrition panels can also provide helpful information if people know what the information means. When it comes to sugar, for example, knowing foods containing over 15 grams of sugar per 100 grams are considered ‘high’ in sugar helps people decide whether that’s a product they want to eat. Similarly for salt, a product with over 400mg of sodium per 100 grams is considered high in salt.

“Another thing for consumers to be aware of is that currently it is not possible to distinguish between ‘added sugars’ and sugars derived from natural sources, such as dried fruit. It would be great to see this disclosed by manufacturers.

“We commend those companies who have already incorporated the voluntary Star Rating System on their packaging including Sanitarium, Uncle Tobys, Coles and Woolworths,” said Ms Martin.
Cereal offenders – what’s hiding in your cereal?

- Average sugar content of all 20 cereals analysed was 19.8g per 100g – that’s almost 20 per cent sugar. This equates to about 5 teaspoons of sugar.
- Cereals with front-of-pack nutrition content claims that also contain high levels of sugar include Kellogg’s Coco Pops (36.5g per 100g), Kellogg’s Nutri-Grain, Kellogg’s Just Right (28.7g) and Uncle Toby’s Fruity Bites Wildberry (24.8g).
- The cereals with the most sugar were Kellogg’s Frosties (41.3g per 100g), Kellogg’s Froot Loops (38g) and Kellogg’s Coco Pops (36.5g) – all of which are heavily promoted to children.
- Top 5 cereal brands sold in supermarkets by value (according to Retail World, December 2014) are: Weetbix, Nutri-Grain, Uncle Toby’s Plus, Coco Pops, and Special K.

About the survey

In February 2015, the OPC reviewed 20 popular breakfast cereals examining sugar, salt and health claims on the packaging.


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**SURVEY RESULTS: FRONT-OF-PACK CLAIMS MADE BY 10 POPULAR CHILDREN’S BREAKFAST CEREALS**

<table>
<thead>
<tr>
<th>CEREAL PRODUCT</th>
<th>Any health claims/nutrition content claims on the pack? e.g. ‘source of calcium’ ‘fibre’ etc?</th>
<th>Sugar per 100g (g)</th>
<th>Teaspoons per 100g</th>
<th>Sodium per 100g (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coco Pops</td>
<td>“Nutritious grains of puffed rice with cocoa”</td>
<td>36.5</td>
<td>9</td>
<td>465</td>
</tr>
<tr>
<td>Fruit Loops</td>
<td>“No artificial flavours, No artificial colours”</td>
<td>38</td>
<td>9.5</td>
<td>400</td>
</tr>
<tr>
<td>Frosties</td>
<td>No</td>
<td>41.3</td>
<td>10</td>
<td>320</td>
</tr>
<tr>
<td>Nutri-Grain</td>
<td>“Iron man fuel. Made with corn, oats and wheat”</td>
<td>32</td>
<td>8</td>
<td>600</td>
</tr>
<tr>
<td>Cheerios</td>
<td>“69% wholegrain. No artificial colours or flavours”</td>
<td>19.9</td>
<td>5</td>
<td>300</td>
</tr>
<tr>
<td>Cornflakes</td>
<td>“Contains vitamin C, iron and zinc”</td>
<td>8.1</td>
<td>2</td>
<td>550</td>
</tr>
<tr>
<td>Fruity Bites</td>
<td>(wildberry) “Source of fibre”</td>
<td>24.8</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>Crunchy Nut Clusters</td>
<td></td>
<td>28.9</td>
<td>7</td>
<td>360</td>
</tr>
<tr>
<td>Rice Bubbles</td>
<td>“7 vitamins and minerals”</td>
<td>10.6</td>
<td>2.5</td>
<td>530</td>
</tr>
<tr>
<td>Crispix</td>
<td>“No artificial colours or flavours”</td>
<td>24</td>
<td>6</td>
<td>725</td>
</tr>
</tbody>
</table>

**FRONT-OF-PACK CLAIMS MADE BY 10 POPULAR BREAKFAST CEREALS FOR ADULTS**

<table>
<thead>
<tr>
<th>CEREAL PRODUCT</th>
<th>Any health claims/nutrition content claims on the pack? e.g. ‘source of calcium’ ‘fibre’ etc?</th>
<th>Sugar per 100g (g)</th>
<th>Teaspoons per 100g</th>
<th>Sodium per 100g (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just Right</td>
<td>“Low in salt. High in fibre. Goodness of wholegrain”</td>
<td>28.7</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>Special K</td>
<td>“99% fat free. New three grain recipe containing fibre and protein”</td>
<td>14.5</td>
<td>3.5</td>
<td>490</td>
</tr>
<tr>
<td>Sultana Bran</td>
<td>“High in fibre and whole grain”</td>
<td>22.7</td>
<td>5.5</td>
<td>270</td>
</tr>
<tr>
<td>All Bran</td>
<td>“Very high in fibre. 44% of your daily fibre needs”</td>
<td>13.6</td>
<td>3</td>
<td>380</td>
</tr>
<tr>
<td>Vita Brits</td>
<td>“99% wholegrain. No added sugar”</td>
<td>0.4</td>
<td>Less than 1</td>
<td>400</td>
</tr>
<tr>
<td>Weet Bix</td>
<td>“97% wholegrain. Low in sugar. High in iron. B vitamins and folate”</td>
<td>3.3</td>
<td>Less than 1</td>
<td>290</td>
</tr>
<tr>
<td>Vogel’s Ultra Bran</td>
<td>“Low GI. Soy and linseed”</td>
<td>14.1</td>
<td>3.5</td>
<td>320</td>
</tr>
<tr>
<td>Carman’s Original</td>
<td>“Low GI. Wheat-free. Naturally sweetened with honey”</td>
<td>8</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Fruit Free Muesli</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lowan Original</td>
<td>“Low in salt and sugar. High in complex carbohydrates. High in fibre. No artificial flavours,</td>
<td>4.3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>Muesli</td>
<td>colours or preservatives”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Be Natural Apple &amp;</td>
<td>“No artificial flavours, colours or preservatives”</td>
<td>22.7</td>
<td>5.5</td>
<td>195</td>
</tr>
<tr>
<td>Raisin Cereal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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How much sugar is in what we drink?

HEALTHY BODIES NEED HEALTHY DRINKS, SAYS THE DEPARTMENT OF HEALTH

SUGAR CONTENT EXAMPLES

<table>
<thead>
<tr>
<th>DRINK</th>
<th>Average quantity of sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER – no sugar and essential for health and hydration</td>
<td>0</td>
</tr>
<tr>
<td>MILK (low fat) 250ml (1 cup) – natural sugar</td>
<td>14g, 3 teaspoons</td>
</tr>
<tr>
<td>100% FRUIT JUICE 250ml (1 cup) natural sugar – but drinking too much can cause tooth decay</td>
<td>24g, 6 teaspoons</td>
</tr>
<tr>
<td>FLAVOURED MILK (small) 300ml natural AND added sugar – drinking too much can lead to increased weight gain</td>
<td>28g+, 7 teaspoons</td>
</tr>
</tbody>
</table>

The following types of drinks are very high in added sugar. Drinking too much can lead to increased weight gain and tooth decay.

<table>
<thead>
<tr>
<th>DRINK</th>
<th>Average quantity of sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRUIT JUICE DRINK 250ml</td>
<td>27g+, 6.5 teaspoons</td>
</tr>
<tr>
<td>ENERGY DRINK 600ml</td>
<td>36g+, 8.5 teaspoons</td>
</tr>
<tr>
<td>SOFT DRINK (Can) 375ml</td>
<td>38g+, 9 teaspoons</td>
</tr>
<tr>
<td>SOFT DRINK (Buddy) 600ml</td>
<td>64g+, 15 teaspoons</td>
</tr>
<tr>
<td>SOFT DRINK 1.25 litre bottle – 1,250ml</td>
<td>140g+, 33 teaspoons</td>
</tr>
</tbody>
</table>

DAILY INTAKE?
There is much debate about ‘daily intake’ of sugar.

What we know:
- The Australian Dietary Guidelines recommend limiting intake of foods and drinks containing added sugars.
- Soft drinks, and other high added sugar drinks such as energy drinks, flavoured mineral waters, fruit drinks and sports drinks can contain amounts of sugar in excess of dietary needs. Therefore any high-added sugar drinks which are consumed may contribute to increased weight gain and tooth decay.
- When lots of sugary drinks are consumed on a regular basis – the body can’t use all the sugar and turns it into fat.
- High blood sugar levels and increased weight gain can place strain on key organs such as the heart and kidneys.

High blood sugar levels and increased weight gain can place strain on key organs such as the heart and kidneys.

HIGH ADDED SUGAR DRINKS
Drinking too many high added sugar drinks can contribute to:
- Tooth decay
- Weight gain.

Being overweight can contribute to:
- Heart disease
- Diabetes
- Other chronic diseases.

DIET AND LOW SUGAR (SOFT) DRINKS
- Still contain high levels of acids and additives such as flavours and colours. Drinking soft drink (sugary and diet) regularly can contribute to the erosion of tooth enamel surfaces which then leads to tooth decay.

FURTHER INFORMATION
- Australian Guide to Healthy Eating
  – www.health.gov.au
- Better Health Channel
  – www.betterhealth.vic.gov.au
- Australian Dietary Guidelines
  – www.eatforhealth.gov.au

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Why are sugary soft drinks so bad for you?

Sugar soft drinks are packed full of ‘empty kilojoules’ which means they contain a lot of sugar but have no nutritional value. A 600ml bottle of soft drink contains 16 teaspoons of sugar and about 1,000 unnecessary kilojoules.

Sugary drinks provide excess kilojoules which can lead to weight gain and obesity. This is because people do not generally reduce how much they eat to allow for the extra kilojoules in the sugary drink.

Being overweight or obese can lead to health problems like type 2 diabetes, heart disease and some types of cancer.

How much sugar is in a packet?

Most packets of sugar contain 4 grams, roughly equivalent to one teaspoon.

What about fruit juice?

We recommend avoiding all sugary drinks that provide unnecessary kilojoules and have no other nutritional value, such as soft drinks, energy drinks, and fruit drinks that contain added sugar.

Fruit juice, which by law must have more than 95% juice, can offer other nutritional benefits such as vitamin C and other nutrients. A standard serve of fruit juice is 125ml or ½ cup, according to the Australian Dietary Guidelines. If you have juice, limit it to this amount or better still, drink water and eat the whole fruit instead – it’s more filling and has the added benefit of fibre.

* Beware – some sugary drinks have added vitamins to appear healthy and some can look like wholesome fruit juice, so just make sure you check the label for added sugars.

How do I know how much sugar is in a drink?

All packaged drinks have a nutrition information panel on the label that tells you the amounts of certain nutrients (e.g. carbohydrate, sugar, protein, fat) in that product per serve and per 100ml. For example, a 250ml serve of Coca-Cola (a small glass) contains 27g sugar.

Remember some packets contain more than one serve, so you may need to multiply the ‘per serve’ amount provided by the number of serves in the packet.

* Remember that the ‘sugars’ listed includes ‘added sugar’ (like that added to soft drinks) and ‘natural sugar’ (like the naturally occurring sugar (lactose) in milk). The main ingredient in sugary soft drink is added sugar. For other products, also looking at the ingredients list helps determine if sugar has been added to the product or is naturally occurring.

Why recommend low fat milk if sugar is the issue?

Full-fat dairy products, including full-cream milk, contribute significant amounts of unhealthy saturated fat to the Australian diet. Saturated fat is the type of fat that clogs your arteries and increases your risk of heart disease. Choosing low-fat dairy products is a simple way to reduce the amount of saturated fat you and your family are eating.

Is it okay to have ‘diet’ soft drink instead?

Although diet soft drinks do not contain the same level of kilojoules as sugar-sweetened versions, we still recommend choosing water or low-fat milk instead. Water is the preferred source for hydration and low fat milk provides important nutrients such as calcium and protein, especially for children.

Diet soft drinks have been associated with overeating and weight gain. It is not clear whether this is because chemicals in artificial sweeteners stop you feeling full, or whether people feel free to eat more because they have had a diet drink.

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Fact check: do higher food star ratings always mean a healthier choice?

MORE STARS ON THE LABEL DOES NOT ALWAYS MEAN A HEALTHIER PRODUCT, ACCORDING TO THIS ABC NEWS FACT CHECK

- The claim: The Federal Government says its health star rating system for food and drink products is simple and “the more stars, the healthier”.
- The verdict: Whilst experts agree that the system is valuable and useful when comparing foods within the same category, it produces anomalies when comparing products in different categories, such as comparing yoghurt and fruit juice. More stars does not always mean a healthier product.

The Federal Government’s health star rating system for food products has attracted much controversy since its unofficial unveiling in February 2014. Ten months later the Assistant Health Minister Fiona Nash formally launched a website and an education campaign.

A second phase of the education campaign began in June 2015. The marketing slogan is: “The more stars, the healthier the choice.” But some health experts say it’s not so straightforward and the system can cause confusion for consumers.

So what is going on behind the star ratings? ABC Fact Check investigates.

How are the ratings calculated?
The Federal Government’s website for the rating system says the star labels provide an “at-a-glance overall rating of the healthiness of the food product”. Stars are awarded to packaged foods depending on the balance between good and bad nutrients they contain.

The process is complex and a comprehensive overview is given in the Government’s guide for the food industry. Essentially, foods are broken up into categories – food, beverages, oils, spreads, and dairy products. Dairy products are classified further, depending on calcium content.

The system has a calculator that then awards foods and drinks ‘baseline’ (or negative) points depending on how much energy, saturated fat, sodium and total sugars they contain per 100 grams or 100 millilitres.

The guide says these aspects were chosen because they are the risk factors for obesity and diet-related chronic disease. The sum of these negative points is then modified by awarding positive points for the good nutrients the food contains: the protein, fibre, fruit, vegetable, nut or legume content.

The calculator produces a final score which is converted to one of 10 star ratings, ranging from half a star to five stars.

Todor Vasiljevic, a Professor of Food Science at Victoria University, told Fact Check the star system provides a way for consumers to “visualise a nutritional label” in a way similar to the established star ratings for energy efficiency on appliances.

So far there are said to be over 1,000 products on supermarket shelves bearing the star labels.

Are all nutrients rated equally?
The Government guide says the stars are calculated so foods lower in saturated fat, sugar, salt and energy are assigned higher ratings than similar foods with “an appreciably higher content of these nutrients”.

Likewise, foods with a high fibre content are assigned a higher rating than similar foods with “an appreciably lower” fibre content.

However, the ratings do not score all nutrients the same way and the points awarded will vary depending on the type of food and the type of nutrient.

Megan Cobcroft is a food policy analyst with the NSW Department of Health and a member of the Dietitians Association of Australia, the national body for the dietetics profession. She supports the way the calculator awards star ratings within particular categories.

“Dairy, for example, is treated as a different category to other type of drinks, recognising that milk is a core food and provides important nutrients in the diet,” she said.

This is why many brands of plain dairy milk score five stars, despite the naturally occurring levels of fat and sugar (in the form of lactose). The ratings calculator pays more attention to saturated fat than sugars.

A spokeswoman from the Federal Department of Health explained the reasoning behind this to Fact Check: “One gram of saturated fat does not provide an equivalent amount of energy or nutrition as one gram of sugar and it would therefore be inappropriate to allocate equivalent baseline points for both.”

“Similarly, in most cases 10g of sugar would contribute far less to ill health than 10g of sodium and it would therefore not be appropriate to allocate equivalent baseline points for ‘risk’ when the risk posed is vastly different,” she said.

Some unusual results
Because of the way it assigns weightings to nutrients, the ratings system has produced some peculiarities.

Full-cream unsweetened natural yoghurts can score lower than sugary fruit yoghurts, while fruit juices score four or five stars despite being high in sugar because they receive positive points for fruit content.

Rosemary Stanton, a nutritionist and visiting fellow at the University of New South Wales, told Fact Check the algorithm used by the ratings calculator needs a bit of tweaking to fix these kinds of anomalies.
"I think it needs to be changed to have a lot more penalty on sugar and probably more penalty on sodium as well as the sodium quota is really low," Dr Stanton said.

She suggested discretionary foods should get extra “negative” points from the ratings calculator.

In an article published by The Conversation, Professor in Public Health Nutrition at Deakin University, Mark Lawrence, and Christina Pollard from the school of public health at Curtin University pointed out that Coles home brand Greek-style yoghurt received one and a half stars "even though it is clearly healthy" while the supermarket chain's home brand strawberry flavoured soft licorice received two and a half stars.

**Foods in different categories**

The guide for industry says the health star rating system “is designed to assist consumers to discriminate between foods in the same food category and to compare foods across different food categories”.

Bruce Neal, the senior director of the food policy division for the George Institute for Global Health and a Professor of Medicine at the University of Sydney, says the calculator does not fulfil the second of these goals.

The George Institute has been following the stars and cataloguing the ratings of thousand of products through its website and app called FoodSwitch.

Dr Neal told Fact Check the “key thing most people don’t understand about the system” is that it allows like-with-like comparisons only.

If looking at potato chips, for example, it will help consumers choose which are the healthiest.

“But what it won’t do is enable you to choose between chips and yoghurt,” Dr Neal said.

“This is clearly a problem with the system – most people, when they use the system assume the number of stars basically tell you how healthy this product is compared to everything else.”

Despite this concern, Dr Neal said the easy-to-read star system is still an improvement on previous nutrition panels on the back of foods.

Dr Cobcroft said that since shoppers tend to look for one type of product at a time (for example, in the cereal aisle), the stars work to help people make healthier choices.

“It would only be in situations when someone is looking for a snack across a range of products when it could have the potential to mislead,” Dr Cobcroft said.

The health star ratings website also states the types of comparisons that can be made when using the system.

In a list of frequently asked questions, it says “as the calculations used to determine each produce's rating are specific to each of the six food categories, the system is not designed, for example, to compare yoghurt with frozen lasagna or frozen chips with cereal.”

**Peer pressure**

Experts told Fact Check a benefit of the rating system is the potential for product reformulation.

Dr Neal said in a competitive market, manufacturers will try to change their nutrient composition to get higher stars.

“If you have the rice bubbles with 2.5 stars and your competitors all have 3.5 stars, your days are probably numbered,” he said.

“So probably at least as big health impacts will be derived from manufacturers reformulating their foods so there is a bit less salt, a bit less sugar, etc, to get a better star rating,” he said.

The system produces some anomalies when foods of different types are being compared.

**HERE’S WHAT YOU SHOULD LOOK FOR ON THE FRONT OF PACKAGED FOOD LABELS:**

Under the system, the star ratings are based on nutritional information, including:

- Energy (kilojoules).
- Risk nutrients – saturated fat, sodium (salt) and sugars. These are linked to increased risk of obesity and chronic disease, such as cardiovascular disease and type 2 diabetes, if consumed in excess of recommended guidelines.
- Positive nutrients – dietary fibre, protein and the proportion of fruit, vegetable, nut and legume content.

Jane Martin, the executive manager for the Obesity Policy Coalition (OPC), a group of public health agencies aiming to support obesity prevention in Australia, described this potential for product reformulation as “stealth public health action”.

“It is a way of reducing across the population levels of salt, or fat, or sugar ... and even small changes across the population can have a big impact on disease,” she said.

However, Dr Stanton told Fact Check not all reformulations were necessarily healthy.

She said some manufacturers were already substituting sugar in their products for pear juice or fruit puree – which have the vitamins and fibre stripped out – so they can receive positive “modifying points”, instead of being penalised for containing sugar.

**Products with no stars**

In their article, Professor Lawrence and Dr Pollard said a weakness of the system is that because it’s voluntary, food manufacturers can decide whether a product will display health stars or not.

“Understandably, although manufacturers might be happy to display stars on foods that attract between two and five stars, they are less likely to put one or half a star on their products,” they said.

Unless every manufacturer adopts the star labels, consumers will never...
be able to make proper comparisons.

Dr Cobcroft was more optimistic that manufacturers would apply the labels correctly.

“The companies that have publicly announced are putting it on all products, even ones that aren’t rating healthy,” she said.

Cereal producer Kellogg’s Australia received attention in April when the company announced it would apply the rating to all its products, including for example its Crispix cereal that scores only 1.5 stars.

Comparing packaged foods with fresh foods
Another concern among experts is that stars are only applied to processed, packaged foods. Professor Lawrence told Fact Check since there are no stars on fresh products, it may mislead a consumer to think a packaged product is a healthier option.

The Federal Government’s dietary guidelines recommend eating from five food groups every day: vegetables and legumes; fruit; grains and cereals; lean meats and poultry, fish, eggs, tofu, nuts and seeds; and milk, yoghurt and cheese.

Some of these items may be pre-packaged and could carry the stars – such as frozen fish or vegetables – but most fresh produce will not bear the ratings.

“So you have processed, discretionary foods appearing in supermarkets, many of which have more stars than five-food-group foods, which is just the antithesis of what the guidelines are trying to recommend,” Professor Lawrence said.

Kellie Bilinski, a spokeswoman from the Dietitians Association of Australia (DAA), said she was concerned the stars could become a “marketing ploy” for processed foods – and lead people to choose them over fruit and vegetables just because they had stars.

A product labelled with a half-star rating can appear to have some health benefits. And it can encourage manufacturers to substitute ingredients, such as fruit juice for sugar, in order to obtain a higher rating without the same level of health benefit.

The decision to exclude fruit and vegetables from the star rating calculations was an intentional one. Although some pre-packaged varieties may choose to adopt the stars, the calculator was not designed to accommodate these foods.

A document on the health star rating website catalogues complaints about any potential quirks in the ratings calculator. It says that during the development stage, it was decided that “giving all vegetables a five-star rating would impact on ratings for other food products and create a lack of differentiation for many processed foods”.

The OPC’s Ms Martin, who worked in the initial working group involved in creating the star system, said a decision was made based on extensive qualitative and quantitative research to exclude fruit and vegetables, as people overwhelmingly knew they should be having these as part of a balanced diet.

But Dr Neal said he would support the stars being applied to fresh fruit and vegetables “because then it would give people additional information and bring home the message a bit harder”.

Dr Stanton suggested a different approach to remedy these concerns. She told Fact Check the ratings calculator could be changed so discretionary junk foods could automatically be awarded extra negative baseline points.

“[Discretionary foods] don’t really have nutrients that are important at all so giving them stars is putting them into an area that they shouldn’t be, making them look like they have some sort of health halo.”

Room for improvement?
The majority of experts contacted by Fact Check agreed the health star ratings are a useful tool that could lead to change provided consumers know how to use them correctly.

Stars only allow for comparisons between similar products, and they are meant to be considered along with the dietary guidelines.

A spokeswoman from the Federal Department of Health told Fact Check the use of the star rating
on a product doesn’t mean a food is healthy.

“Just because a food has a high star rating doesn’t mean it contains all of the nutrients necessary for a healthy diet,” she said.

DAA spokeswoman Dr Bilinski said “there are going to be criticisms of it … and I still think people need to be educated and read labels for themselves, but it certainly is a step in the right direction to make people aware of what foods they consume”.

The OPC’s Ms Martin told Fact Check that “although not 100 per cent perfect”, the star system is “a really important tool for consumers to cut through the marketing spin”.

“I think it surprises people to find Coco Pops have the same number of stars as Nutri-Grain and that is what it is designed to do,” she said.

Experts also agreed there could be changes to improve the ratings – for example, by making it apply to more products and by reviewing the ratings algorithm to make sure it is in line with public health messages.

Professor Lawrence and Dr Pollard, who are more critical of the star system, have advocated for stars to apply to five food group foods only, and for health warnings to be displayed on discretionary foods.

“This change would provide food manufacturers with stronger incentive to reformulate discretionary foods to avoid attracting health warning symbols on their product labels,” they wrote.

The star system is due for review in 2016. In the meantime, potential anomalies can be reported to the Health Star Rating Advisory Committee, with a register of complaints showing the system has already been altered in some ways.

The verdict

The Federal Government’s marketing material says its health star rating system for food and drink products is simple and “the more stars, the healthier”.

Experts contacted by Fact Check say that this is not always so.

The system produces some anomalies when foods of different types are being compared. For example, a “clearly healthy” full-cream yoghurt receives fewer stars than licorice confectionery. It can also lead to consumers believing that fresh fruit and vegetables, which are not rated, are less healthy than processed and packaged foods.

A product labelled with a half-star rating can appear to have some health benefits. And it can encourage manufacturers to substitute ingredients, such as fruit juice for sugar, in order to obtain a higher rating without the same level of health benefit.

More stars does not always mean a healthier product.

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7 TYPES OF SUGAR – WHICH IS HEALTHIER?

FOODWATCH ADVICE BY ACCREDITED NUTRITIONIST CATHERINE SAXELBY

Last week on the radio, the announcer asked me if there was a ‘good’ sugar – one that would satisfy her sweet tooth but that was ‘healthier’ than regular white sugar. She figured if there were ‘good’ carbs and ‘bad’ carbs there must be some sugars that would get the nod of approval from nutritionists.

So I thought it might be helpful to list the many different types of sugar and whether they’re any healthier for you or not (spoiler: there’s not much between them). Here’s my rundown of the 7 key types of sugar:

Sugar means CANE sugar in Australia

Historically, sugar was the predominant sweetener in Australia and it came from sugar cane as opposed to European sugar which is extracted from the sugar beet.

Sugar cane grew prolifically in the hot coastal areas of northern Australia and was an important industry, with huge sugar mills and major ports for transporting the stuff to cities as well as exporting it overseas.

Various sugars in Australia come from sugar cane grass, which is milled and refined to extract the sugar. Sugar cane is crushed in the mill and the resulting juice is purified and then boiled to produce a thick syrup. From this syrup, raw sugar crystals are extracted, usually via centrifuge, leaving a dark, sticky liquid called molasses behind.

If you’ve ever been to a fresh food market, you can watch a vendor feeding lengths of cut cane between two rotating drums that press and squeeze out the natural sweet juice it contains. With a few ice cubes, this makes a sweet pleasant juice on hot days – one can see how the ancient people would have noticed and desired the sugar from this sweet tall grass.

7 sugars compared

1. **White granulated sugar** is one of the world’s purest foods. It’s 99.9 per cent sucrose, refined from the natural sugars that occur in the sugar cane but with all ‘impurities’ such as mineral ash and polyphenols completely removed.

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2. **Caster sugar** has the same composition as granulated sugar, but the crystals are smaller so it dissolves quickly. It’s best for baking, especially light sponges and meringues.

3. **Icing sugar** is white sugar ground to a fine powder so it dissolves quickly and makes smooth icing.

   All three sugars have the same moderate Glycemic Index or GI of 65, which is much lower than pure glucose at 100.

4. **Raw sugar** and **coffee sugar crystals** are made from cane juice and are golden in colour. In nutrition, they are virtually identical to white sugar – at 99 per cent sucrose, they have a few minerals but not enough to give a great health advantage over white sugar.

5. **Brown sugar** contains 95 per cent sucrose and 5 per cent molasses, which adds a lovely toffee flavour and moistness but no great nutritional benefits over white sugar. The same applies to muscovado, demerara, rapadura and black sugars which are often preferred for baking. There’s a little potassium, calcium, magnesium and other minerals but they’re not present in great quantities. Well, not enough to make me sit up and take notice when I’m only consuming a teaspoon here and there.

Sugar compared to fructose and glucose powder:

6. **Fructose powder** contains the same kilojoules as sugar but,
being slightly sweeter, can be used in smaller quantities to achieve the same degree of sweetness. Now marketed as a ‘natural cane sugar-free’ sugar replacement, it has a low GI of anywhere from 15 to 19 which used to be its unique selling proposition.

Fructose is metabolised differently to sugar and glucose and doesn’t trigger the hormones that regulate appetite and food intake – which some research suggests means that it’s much more likely to be converted into body fat. Note too that it has other drawbacks, such as causing abdominal discomfort.

Brands of fructose: Fruisana and Sweetaddin.

7. Glucose powder is a white crystalline powder with a GI at the maximum of 100. It is the standard by which other carbs are ranked. At 100, this means that glucose is rapidly absorbed into the bloodstream and stimulates a fast insulin response. Glucose powder is not as sweet as regular white sugar so is fed to invalids as they can take in more food without being put off by the excessive sweetness.

Athletes often notice glucose (under the term dextrose so you don’t associate it with glucose or sugar!) marketed to them to use when they need instant energy. Like glucose jelly beans, it will quickly raise blood glucose levels and replenish blood glucose. Glucose is the simplest form of sugars and is the sugar in blood, your body’s primary source of energy.

Brands of glucose: Glucodin and Glucose-D.

**Nutrition facts for white sugar**

**Per serve:**
One level teaspoon white sugar or 4g supplies 68kJ (16 calories), no protein, no fat and 4g of carbohydrate, 4g of sugars, 2g fructose and 2g glucose.

**Per 100g:**
1,700kJ (310 calories), no protein, no fat and 100g of carbohydrate, 100g of sugars, 50g fructose and 50g glucose.

**Bottom line**

Despite their different colours and flavours, the nutritional value of these sugars is very similar. Sugar is sugar, whether white, brown or raw. All sugars are pretty much of a muchness. One teaspoon of any has around 68 kilojoules (16 calories).

They are all sources of sucrose OR glucose OR fructose OR combinations of these three but very little in the way of vitamins, minerals or antioxidants.

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Dietary guidelines around the globe suggest we LIMIT consumption of sugar and foods with added sugars. You don’t need to avoid sugar completely for good health, but it’s sensible to cut back on foods that are correspondingly low in nutrition and easy to overeat – soft drinks, lollies, pastries or sweets, for example.

Foods such as flavoured yoghurts or flavoured milks have a better nutrient profile and give you important nutrients (protein, calcium) along with the sugar they contain.

With 68 kilojoules (16 calories) in every level teaspoon, use only small amounts of sugar to enhance the flavour of nutritious foods – a spread of jam on grainy bread, a sprinkle of sugar over high-fibre cereal or a sugar syrup to poach fresh fruit. But watch the large intakes that come from soft drinks, juices, confectionery, chocolate, ice creams and pastries.

Catherine Saxelby is an accredited nutritionist, food commentator, blogger and award-winning author.

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**Source:** Food manufacturers’ NIP on pack, except for GI values from the website.

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**SUGAR** | **kJ** | **% sugars** | **GI**
--- | --- | --- | ---
Glucose powder | 1,700 | 97 | 100
White sugar | 1,700 | 100 | 65
Caster sugar | 1,700 | 100 | 65
Icing sugar | 1,700 | 100 | 65
Raw sugar | 1,700 | 99 | 65
Demerara sugar | 1,690 | 99 | 65
Coffee crystals | 1,690 | 99 | 65
Brown dark sugar | 1,630 | 96 | 65
Fructose powder | 1,700 | 100 | 15

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WHY FINDING A REAL ALTERNATIVE TO SUGAR IS SO DIFFICULT

Stephen Euston asks: why has a sugar substitute eluded us for so long, and are we any closer to a solution?

So much for the decades in which fats and oils were public enemy number one on our dinner plates. There is more and more evidence that sugar – or more precisely, carbohydrate – is behind our increasing rates of obesity and heart disease. Even if the mechanisms by which this occurs are still not well defined, there are endless calls for reducing its quantities in the foods we eat. Most recently in the UK this led to the chancellor, George Osborne, announcing a tax on sugary soft drinks.

Had we ever come up with a proper substitute for sugar, of course, we wouldn’t need to have this debate. In our sweetness-addicted era, it is one of science’s greatest challenges. So why has it eluded us for so long, and are we any closer to a solution?

Replacing the sweetness of sugar in foods is actually relatively straightforward. The first synthetic sweetener, saccharine, was discovered accidentally by a young Russian chemist named Constantin Fahlberg in 1879 while studying coal-tar derivatives, when he unknowingly got it on his hands and licked his fingers. Saccharine became widely used around World War I, when natural sugar was in short supply. In the 1960s scientists discovered several more artificial sweeteners in similarly serendipitous ways, including aspartame and acesulfame K.

As well as these discoveries, there are naturally occurring sweeteners that we have actually known about for much longer (see table below). The Guarani peoples of modern-day Brazil and Paraguay have been using the leaves of the stevia plant as a sweetener for about 1,500 years. And the seeds of the West African katemfe fruit, which contain a sweet chemical called thaumatin, have been on our radar since the 19th century.

Sweet but sour
Yet while we have plenty of options for sweetness, there are several difficulties associated with using non-sugar sweeteners in foods. There have been various cancer scares over the years, which have affected stevia, saccharine and aspartame, among others. Some artificial sweeteners have also been linked to type 2 diabetes.

To compound this, governments class all non-sugar sweeteners as additives, which means they are assigned an E-number – even stevia and thaumatin. In an era where consumers have become increasingly wary of these numbers even when there aren’t specific health risks, manufacturers have been moving towards so-called ‘clean-label’ products that are free of them. This puts these sweeteners at a disadvantage.

Aside from health and labelling, sugars have chemical functions in foods that make them difficult to replace. Sugar solutions freeze at a lower temperature than pure water, for instance. In products like ice cream, this is critical to maintaining a soft texture at freezer temperatures.

Sugars play an important role in giving products like bread, cakes and even wine their darker colour, through what chemists call non-enzymatic browning reactions. Artificial sweeteners are not good at reproducing either of these.

Then there is aftertaste. This arises from the mechanism by which sweetness is detected in the

<table>
<thead>
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<th>Discovered</th>
<th>Sweetness</th>
<th>EU approved</th>
<th>Bitter aftertaste?</th>
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<td>1991</td>
<td>10,000</td>
<td>2010</td>
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</tr>
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</table>

‘Sweetness’ is relative to sugar – stevia is 275 times as sweet.
taste buds. One problem is that the structural features of any sweet molecule that allow them to bind to the sweetness receptors on the tongue are similar to the ones that bind to our bitterness receptors. This is why some sweeteners leave a bitter aftertaste, which is of course undesirable to some consumers.

But looking at the previous table again, for sweeteners that don’t have a bitter aftertaste there is another issue. Artificial sweeteners bind more strongly to the sweetness receptors and have a different and longer-lasting taste profile to sugar, and so are perceived as tasting different by consumers.

All in all, although non-sugar sweeteners are a multi-billion-pound industry, these drawbacks help to explain why they are nowhere near eclipsing sugar. In 2014 sugar (sucrose) accounted for 78% of all sweetener sales. Artificial sweeteners made up 8%, with acesulfame K the market leader. Natural alternatives like stevia, which was banned in the US and EU until fairly recently, made up 1%.

(The rest of the market comprises everything from glucose to syrups).

Where sweeteners go from here

The cancer evidence against non-sugar sweeteners has turned out to be thinner than feared. Cancer Research UK and the US National Cancer Institute both say there is no increased risk regarding artificial sweeteners. Stevia’s years in the wilderness were the result of an anonymous complaint about the cancer risks to the US authorities commonly thought to have come from artificial-sweetener producers, but it has since been rehabilitated. As for type 2 diabetes, the evidence linking it to artificial sweeteners is inconclusive and we need more research – so far it has all been done on animals.

On the physical issues, food scientists have had to think creatively. When it comes to texture, for instance, manufacturers add protein texturisers instead – soy, for example. Or you can turn to other substances that have a similar effect as sugar on the freezing properties of water – the sugar alcohol erythritol is one option.

Manufacturers seek to overcome the aftertaste issue by mixing sweeteners. We perceive the aftertaste of different sweeteners over differing timescales, so one sweetener can be used to mask the aftertaste of a second. It is common to use stevia in combination with acesulfame K, for instance.

Another increasingly common ploy is to mix sugar and other sweeteners together. This helps explain why the use of non-sugar sweeteners in new product launches rose from 3.5% in 2009 to 5.5% in 2012. It also explains why stevia is rocketing. Food analysts Mintel and Leatherhead forecast it will have become the most widely used non-sugar sweetener by as early as next year.

In the absence of a Holy Grail for sugar replacement, this could be as good as it gets any time soon. No wonder the authorities are beginning to intervene to save us from our sweet tooth instead.

Stephen Euston is Professor, Heriot-Watt University.
SUGAR AND YOUR HEALTH

Better Health Channel explains the health impacts of sugar in this fact sheet

Summary
- Sugar is a form of carbohydrate that the body converts to glucose.
- Limit soft drinks as they are linked to obesity in children.
- Small amounts of sugar, as part of a meal, are okay.
- Limit foods and drinks with high amounts of added sugar. Choose foods with naturally occurring sugars such as fresh fruits.

Sugars are carbohydrates. Like all carbohydrates, they provide a source of energy in our diet. Sugar is a term that includes all sweet carbohydrates, although the term most often is used to describe sucrose or table sugar, a ‘double sugar’. The body breaks down carbohydrates into simple sugars such as glucose, that can be readily used in the body.

There are several different sugars. Sugars occur naturally in some foods, such as fruit and dairy products, and are also added to a wide variety of foods. Sugar can take many different forms, including white, raw or brown sugar, honey or corn syrup.

Too much sugar in the diet can contribute to health problems like obesity and tooth decay. Refined (or processed) sugar provides a quick, simple source of energy, but it doesn’t contain other nutrients such as vitamins and minerals.

Sugars are popular in the processed food industry because they add taste, colour, bulk and thickness to food products. They also prevent mould forming and act as a preservative.

SUGAR IN MODERATION
A ‘moderate’ intake of refined sugar can be an acceptable part of a healthy diet. Experts define a moderate intake as about 10 per cent of the total energy intake per day. However, people who consume a lot of sugary food and drinks at the expense of more nutritious food choices, may be taking in a lot of ‘empty calories’.

Adding a little sugar to nutritious grain foods, such as wholegrain bread and cereals, may encourage people to eat more of these foods by making them more tasty.

SUGAR AND OBESITY
There has been a lot of debate about the link between high sugar intake and being overweight or obese. But there is general agreement that energy (kilojoules) above the body’s needs will be stored as fat.

Sugar is a form of carbohydrate and it provides the same amount of energy or kilojoules (kJ) per gram as other forms of carbohydrates found in breads, rice, pasta and fruits.

One gram of carbohydrate provides 16kJ of energy. One gram of fat provides 37kJ. Therefore, fats in food contribute double the energy than the equivalent amounts provided by sugar.

HAVING TOO MUCH SUGAR
Although sugar provides less energy than fat, it can contribute to the ‘energy density’ (number of kilojoules) of foods and drinks. It’s easy to overindulge in foods, especially drinks, with high sugar content.

Having too much sugar is not the only reason for obesity or being overweight, but it does add to the amount of kilojoules in food. Eating too much of any food, without doing enough exercise, will cause you to become overweight.

SOFT DRINKS ARE HIGH IN SUGAR
Sweetened drinks are heavily advertised, cheap and commonly available. In Australia, the consumption of soft drinks, which are sweetened with sugar, has increased by 30 per cent in 10 years.

The standard serving size for soft drink has also increased. Ten years ago, soft drink was available in 375ml cans. Soft drinks are now commonly sold in 600ml bottles, which provide up to 16 teaspoons of sugar.

For an average 14 year old girl, a 600ml bottle of soft drink alone will provide more than 12 per cent of her daily energy needs. This means she would exceed the recommended energy intake from refined sugar with just one drink.

Studies of children in the United States found that drinking more sweetened soft drink was linked to increasing overweight and obesity. It’s best to keep these drinks to a minimum.

FATS IN SWEET FOODS
Sugars are often found together with fats in foods like chocolate, biscuits and cakes. A high fat intake is quite
likely to contribute to being overweight or obese because fat is very ‘energy-dense’.

It is a healthy choice to limit both the fat and the sugar content in the foods you eat. Lots of commercially produced sweet foods contain high levels of saturated fat, which will increase your blood cholesterol levels and your risk of heart disease.

**CARBOHYDRATES AND GLUCOSE**

Your body breaks down carbohydrates and converts them into a simple sugar called glucose. This ready form of energy is carried through the blood and delivered to every cell.

The supply of glucose needs to be constant and dependable, so your body has developed a number of systems to ensure this supply. For instance, the pancreas secretes a hormone called insulin that regulates the amount of glucose in the blood.

Insulin allows glucose to enter body cells. It also helps with the storage of excess glucose in the liver, which supplements blood glucose levels if they start to fall. A person with diabetes has either insufficient or inefficient insulin, which means their blood glucose levels tend to be too high.

**A SMALL AMOUNT OF SUGAR IS SAFE FOR PEOPLE WITH DIABETES**

There is no evidence that a diet high in sugar directly causes either type 1 or type 2 diabetes. However, being overweight or obese is a risk factor for type 2 diabetes and perhaps someone who is overweight might also eat a lot of sugar.

In the past, people with diabetes were told to avoid eating all foods containing refined sugar. This was because it was believed the sugar would have a bad effect on their blood glucose levels. However, more recent research on the glycaemic index (see below) has shown that sugar affects blood glucose levels less than some other more starchy foods, like refined bread and breakfast cereal.

People with diabetes can have a small amount of sugar in their diet. If you are adding sugar, it is best to add it to healthier foods such as wholegrain breads and cereals. For example, adding one to two teaspoons of regular jam spread on wholegrain bread is okay.

People with diabetes should limit or avoid foods in which the main ingredient is sugar, such as sweets and cakes. It is also important to maintain a healthy weight to manage diabetes.

**GLYCAEMIC INDEX**

A food’s ‘glycaemic index’ (GI) refers to how quickly the carbohydrate is broken down and absorbed into the bloodstream. ‘High GI’ foods enter the bloodstream more quickly than ‘low GI’ foods, causing a greater increase in the level of blood glucose (this is known as the body’s ‘glycaemic response’).

Recent studies have suggested a link between foods with a high GI and a number of conditions including:

- Abdominal obesity

A ‘moderate’ intake of refined sugar can be an acceptable part of a healthy diet. Experts define a moderate intake as about 10 per cent of the total energy intake per day. However, people who consume a lot of sugary food and drinks at the expense of more nutritious food choices, may be taking in a lot of ‘empty calories’.

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• Type 2 diabetes
• High cholesterol
• Hypertension (high blood pressure)
• Heart disease.

There is often no direct relationship between a food’s glycaemic index and the degree of processing, or level of fibre or even sugar in the food. There are books and websites available giving details of the GI of a wide range of foods.

A healthy diet can include moderate amounts of sugar together with a range of low GI carbohydrate choices.

PEOPLE WITH DIABETES NEED LOW GI FOODS

The glycaemic index is a useful tool for people with diabetes to help regulate their glucose levels. People with type 2 diabetes need the glucose in their diet to be absorbed slowly. They need to eat foods with a low GI. At least one low GI food is recommended at each meal.

The quantity of carbohydrate foods eaten will also affect blood glucose levels. Talk to your dietitian about the recommended quantities of carbohydrate-based foods you need.

People respond differently to different foods, regardless of the food’s glycaemic index. If you have diabetes, you will need to monitor your blood glucose levels regularly.

SUGAR AND ATTENTION DEFICIT HYPERACTIVITY DISORDER

There is no evidence to suggest a direct link between attention deficit hyperactivity disorder (ADHD) and the consumption of sugar.

TOOTH DECAY AND SUGAR

Sugar and tooth decay are closely linked. Dental plaque is a clingsy film made up of food particles, bacteria and mucous. The bacteria in plaque depend on sugars to produce acids, which break down the enamel and start tooth decay.

All carbohydrates contribute to this process, not just sugar, but large amounts of sugar in sweets and soft drinks are most likely to contribute to decay. Other nutritious foods (like dried fruits) also allow the bacteria in plaque to produce acids. Sticky sugars that cling to the teeth are worse than sugars that are easily swallowed, such as fresh fruit.

Ways to reduce the risk of tooth decay include:
• Cut down on sticky, sugary foods like lollies.
• Drink water instead of cordials, soft drinks and juices.
• Allow at least two hours between meals.
• Brush and floss regularly after meals.
• Drink fluoridated water or use fluoride treatments.
• Visit the dentist regularly.

WHERE TO GET HELP
• Your doctor
• Dietitians Association of Australia
  Tel. 1800 812 942
• Dentist

THINGS TO REMEMBER
• Sugar is a form of carbohydrate that the body converts to glucose.
• Limit soft drinks as they are linked to obesity in children.
• Small amounts of sugar, as part of a meal, are okay.
• Limit foods and drinks with high amounts of added sugar. Choose foods with naturally occurring sugars such as fresh fruits.

REFERENCES

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IS SUGAR REALLY MAKING US SICK?

ABC HEALTH & WELLBEING FEATURE ARTICLE BY NICOLA GARRETT

It’s hard to know what to believe when it comes to sugar. Some say it’s toxic and directly responsible for a range of chronic diseases; others say it’s simply another form of over-consumed kilojoules. We’ve asked one of the world’s leading researchers on the topic to take us through the latest evidence.

When it comes to sugar there are a few points on which most experts agree.

Much of the sugar we consume is hidden in foods most of us eat every day. Too much sugar is bad for your teeth. We need to limit how much added sugar we consume in our diet, especially sugary drinks.

Beyond these points, it can be hard to know what to believe in the sugar debate.

Sucrose, which is made up of fructose and glucose, is the most common form of added sugar used in Australia. We’ve long been told refined sugars like, sucrose, are nothing more than empty kilojoules and aside from being bad for your teeth and contributing to extra centimetres on your waist, they’re unlikely to affect your health.

But a growing body of research links sugar consumption to significant health issues including obesity, type 2 diabetes and heart disease. This has lead to anti-sugar campaigners, such as US endocrinologist Professor Robert Lustig, to call for sugar to be regulated and taxed, much like alcohol or tobacco.

Teasing apart the hard science from the hype on this topic is difficult, so we’ve asked Professor Jim Mann, who’s spent decades studying the impact of sugars on our health, to take us through the research.

Sugar is making us fat

Obesity rates in Australia are climbing faster than anywhere else in the world, a recent study in The Lancet revealed 63 per cent of us are overweight.

This is a concern as obesity is a major risk factor for type 2 diabetes, cardiovascular disease and some cancers.

But how much can we blame sugar for our expanding waistlines?

Mann, a professor in the Department of Human Nutrition and Medicine at University of Otago in New Zealand, and his colleagues have reviewed the evidence for the revision of the WHO guidelines. They found 68 studies that directly looked at the effects of free sugars – those added to foods or naturally occurring in honey, syrups and fruit juices – on body weight.

Their analysis showed that reducing the amount of free sugars in the diet had a small but significant effect on body weight in adults – an average reduction of 0.8 kilograms.

Interestingly, they found that an increase in sugar intake was associated with a corresponding 0.75kg increase in body weight.

This parallel effect, the authors suggested, was due to changes in the amount of energy (kilojoules) consumed, since replacing sugars

WHAT DO THE GUIDELINES SAY?

- The World Health Organization is currently reviewing its guidelines regarding sugar, but since 2002 it’s recommended we limit our intake of free sugars – those added to foods or naturally occurring in honey, syrups, and fruit juices but NOT the sugars found naturally in fresh fruit, vegetables and milk – to no more than 10 per cent of our total daily energy intake.

- The Australian dietary guidelines recommend we limit our intake of foods that contain added sugars, such as soft drinks, sports drinks, fruit drinks, cordials, confectionery, sweet biscuits and cakes, etc.
with other carbohydrates did not result in any change in body weight.

Mann argues sugar contributes to obesity because it is high in kilojoules and you can consume a lot of it without even realising it, especially if you’re consuming it in the form of sweetened drinks.

“If [sugar] is taken in liquid form it seems that the body or the brain is incapable of detecting those calories and converting that into a feeling of satiety.”

“Whereas if you have sugar or any other calories in solid form it seems that the body says ‘right I’ve just had some calories and sugar’.”

“If we have a diet that has a lot of sugar then you are going to gain weight because it’s just so easy to have those calories.”

Sugar’s links to blood pressure and cholesterol

However there are those that believe the adverse effects of sugar go beyond the kilojoules and the inevitable weight gain.

Lustig refers to sugar as a toxic ‘poison’, and believes it is solely responsible for a number of chronic diseases, including heart disease, cancer and type 2 diabetes.

His theory is that excessive amounts of sugar drive up insulin secretion that triggers the body to use the sugar either as fuel or to store as fat. As well, insulin blocks the hormone leptin, which sends signals to the brain to tell us when we’ve had enough to eat, which essentially means that if we don’t have enough of it we’ll just keep on eating.

This is why Lustig wants sugar to be regulated like tobacco and alcohol, but many consider his views to be extreme, or at the very least, overstated.

Yet there is some evidence sugar has an effect beyond calories and weight gain. In particular, 7 can be particularly detrimental, says Mann.

In their recent review of studies Mann and his colleagues found sugar had a negative effect on blood pressure and cholesterol, which was independent of any weight gain.

“It does seem that sugar has a small effect on BP and lipids, it may mean that in susceptible individuals it has a bigger effect but overall there is definitely an effect”.

Despite this, Mann doesn’t describe sugar as a toxic substance.

“There probably is more to sugar than just calories but maybe Lustig has overstated the cause,” he says.

And the big question is that if there is an effect of sugar beyond calories we don’t actually know how important the effect of that is globally, he says.

“How big a contribution does the non-calorie component of sugar contribute to the epidemic of ill health that we have?”

What about type 2 diabetes?

Most experts say any link between sugar and type 2 diabetes is indirect and more to do with the weight gain that comes from the extra kilojoules many of us consume as sugar. Being overweight is a known risk factor for type 2 diabetes. But in recent years there’s been some evidence suggesting sugary drinks can increase your diabetes risk.

“There is data that suggests that sugar increases the risk of diabetes, but how big that risk is remains to be seen,” Mann says.

In a study of more than 90,000 women, those who had one or more sugar-sweetened soft drinks a day were twice as likely to have developed type 2 diabetes during the study compared with those who did not consume sweetened drinks. But many of these women had also gained weight.

However, researchers from the Stanford School of Medicine in the US examined data on sugar and diabetes rates from 175 countries and found a link between sugar and diabetes that was independent of obesity rates.

For every additional 150 calories of sugar per person per day, the prevalence of diabetes in the population rose by 1 per cent, even after taking into account obesity, physical activity, and other types of calories.
While the findings do not prove that sugar causes diabetes the researchers say that the findings provide support for studies that have suggested that sugar affects the liver and pancreas in ways that other types of food or obesity do not.

**Is sugar directly linked to heart disease?**

As well as evidence showing that sugar directly increases blood pressure and cholesterol, both known risk factors for heart disease, research suggests there could be a more direct link between added sugars and heart disease.

A recent US paper, based on a study that followed a large number of adults for over 14 years, found that consuming added sugars significantly increased the risk of death from heart disease.

Over the course of the study, participants who consumed 25 per cent or more of their daily calories as sugar were more than twice as likely to die from heart disease as those whose diets included less than 10 per cent added sugar.

Other research showed that women with diets that had a high glycemic load (increased blood glucose associated with sugar intake) had an increased risk of coronary heart disease, with those in the highest bracket of consumption having a more than two-fold increased risk over 10 years of follow-up.

And a study that followed 40,000 men for two decades found that those who had one can of sugary drink per day had a 20 per cent higher risk of having a heart attack or dying from a heart attack than men who rarely consumed sugary drinks.

But these studies alone aren’t enough to prove that sugar causes heart disease, as it’s not clear that the link is directly attributable to sugar and not another confounding factor.

In a scientific statement on cardiovascular disease and sugar the American Heart Association suggests: “No data suggest that sugar intake per se is advantageous, and some data suggest it may be detrimental. “Taken in total [the studies] indicate that high sugar intake should be avoided. Sugar has no nutritional value other than to provide calories.”

**Sugar and cancer**

While some cancers have been linked to sugar it is hard to say just exactly what the link is, says Mann.

“When it comes to causes of cancer sugar may be very relevant but the link is likely to be indirect,” says Mann.

“Sugar contributes to obesity and of course obesity is a major risk factor for a number of very important cancers like postmenopausal cancers, and colorectal cancers,” he says.

**The bottom line**

So after going through all the research, Mann’s view is that we should all adopt the WHO guidelines and reduce the amount of sugars we consume in our diet to no more than 10 per cent of our total energy.

“We’re not going to be able to cut out sugar entirely, that’s impossible and nor should you. But people should get most of their sugar from natural sources, and by natural I don’t mean honey, or cane sugar, I mean sugar that occurs naturally in fruit and vegetables.

“I buy into these WHO guidelines because I was part of developing them. Definitely reduce to 10 per cent or less.”

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AUSTRALIAN SUGARY DRINKS TAX could prevent thousands of heart attacks and strokes and save 1,600 lives

Sugary drinks are high in energy and lead to weight gain and obesity, write Gary Sacks, Jane Martin and Lennert Veerman

Last month the United Kingdom announced a sugar tax on soft drinks. The tax will come into effect in 2018, with the funds to be used to address childhood obesity. The move has been applauded by public health groups internationally. Unsurprisingly, the tax is strongly opposed by powerful groups in the food industry, and the announcement resulted in shares in Coca-Cola temporarily plunging.

In our new research published today in PLOS ONE, for the first time we have modelled the impact of such a tax in Australia. Over 25 years, a 20% rise in the price of soft drinks and flavoured mineral waters would save 1,600 lives. It would also prevent 4,400 heart attacks and 1,100 strokes.

Overall, the savings to the health-care system would add up to A$609 million.

It’s time for Australia to follow the UK’s lead and increase the price of sugary drinks.

What’s wrong with sugary drinks?
The evidence of the negative health impact of these products is clear, particularly with respect to dental health. Sugary drinks are also associated with increased energy intake and, in turn, weight gain and obesity.

Obesity is a leading risk factor for type 2 diabetes, heart disease and some cancers.

Soft drinks are very popular, particularly among children and adolescents. So there is much to be gained, from a population health perspective, from limiting their consumption.

Many countries have already recognised the potential to improve population health by taxing sugary drinks. In recent years, Hungary, Mexico, France and Chile have all implemented a tax. The UK announcement follows a similar one by South Africa earlier in 2016.

Potential impact in Australia
Our PLOS ONE research examined the potential impact of a 20% rise in the prices of sugar-sweetened carbonated soft drinks and flavoured mineral waters on health, health-care expenditure and potential revenue.

As expected, the tax would result in people decreasing their consumption of sugary drinks. The influence of a price increase would be greatest on those who drink a lot of sugary drinks, so the greatest impact would be on younger age groups. This is an important result that is difficult to achieve through other obesity-prevention measures.

The decreases in consumption would result in small declines in the prevalence of obesity of about 0.7% in men and 0.3% in women.

When the health benefits of these changes are modelled for the whole population over their lifetime, the influence of the tax is substantial. The research estimates that it would reduce the number of new type 2 diabetes cases by approximately 800 per year.

Twenty five years after the introduction of the tax, there would be 4,400 fewer cases of heart disease and 1,100 fewer strokes. An estimated 1,600 people would be alive as a result of the tax. Overall, the savings to the health-care system would add up to A$609 million.

Twenty five years after the introduction of the tax, there would be 4,400 fewer cases of heart disease and 1,100 fewer strokes. An estimated 1,600 people would

Case for an Australian tax on sugar-sweetened beverages
A tax on sugar-sweetened beverages (SSBs) to increase their retail price and reduce consumption has been advanced as a potentially powerful policy intervention to improve diets and reduce the burden of chronic disease in Australia.

A tax on SSBs is proposed here as a viable and recommended policy initiative, forming part of a comprehensive suite of measures to address diet-related disease. This is because there is evidence that a tax on SSBs has the potential to:

1. Effectively discourage consumption of a product that contributes substantially to the poor diets and chronic disease risk of Australians

2. Decrease sales of unhealthy beverages and influence demand for healthier alternatives, such as water and low-fat milk

3. Encourage beverage manufacturers to reformulate their beverages to reduce sugar content

4. Convey the message that the government recognises that these products are a matter of concern for public health, and

5. Raise considerable revenue which may contribute to health promotion initiatives.

1. SSB includes all non-alcoholic water based beverages with added sugar, such as sugar-sweetened soft drinks, energy drinks, fruit drinks, sports drinks and cordials, excluding 100% fruit juices.

Source: Obesity Policy Coalition, Summary from The Case for an Australian Tax on Sugar-Sweetened Beverages. Last updated June 2016.
be alive as a result of the tax. Overall, the savings to the health-care system would add up to A$609 million.

Even taking into account declines in consumption, the revenue collected from the tax would be more than A$400m annually. This would provide the government with a significant pool of funds to subsidise healthy food for low-income Australians, contribute to childhood obesity-prevention programs and support the promotion of healthy eating.

If other beverages with added sugar not included in this study (such as energy drinks, fruit drinks, milk-based drinks and cordials) were also taxed, the revenue and health benefits would be even greater.

At a time when the cost of preventable disease is threatening to overwhelm the health system, a tax on sugary drinks is an essential element of a comprehensive approach to address poor diets and overweight and obesity.

High sugary drink consumption in Australia

The World Health Organisation (WHO) recently released revised guidelines for sugars, recommending that energy from ‘free sugar’ (added by manufacturers, cooks or the consumer) is limited to less than 10% overall.

A recent analysis of added sugar in the Australian population found that most adults and children exceed the WHO recommendation, with sugary drinks accounting for the largest proportion of added sugar.

Just looking at supermarket retail sales, Australians bought around 1.1 billion litres of sugary drinks in 2015 at a cost of A$2.2 billion. This doesn’t include what is bought from fast-food outlets, cinemas, vending machines, hotels and convenience stores.

In many remote indigenous communities, sugary drink consumption is particularly high. Evidence to Senate Estimates revealed that, in the last financial year, remote indigenous communities were buying 1.1 million litres of sugary soft drink through community stores. This elicited a response from Indigenous Affairs Minister Nigel Scullion who said:

*I think in remote communities and very remote communities, sugar is just killing the population.*

### SUMMARY OF FINDINGS

A 20 per cent sugary drinks tax can prevent:

<table>
<thead>
<tr>
<th>Health issue</th>
<th>Per year</th>
<th>After 25 years*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 2 diabetes</td>
<td>800 fewer cases</td>
<td>16,000 fewer cases</td>
</tr>
<tr>
<td>Stroke</td>
<td>70 fewer cases</td>
<td>1,100 fewer cases</td>
</tr>
<tr>
<td>Heart disease</td>
<td>240 fewer cases</td>
<td>4,400 fewer cases</td>
</tr>
</tbody>
</table>

*As prevalence of weight-related health issues declines over time, estimated number of cases prevented annually also declines.

### Strong public support

The sugary drinks industry, represented by the Australian Beverages Council, has widely criticised a tax on sugary drinks.

But the majority of Australians support such a tax. A survey in 2012 showed that two-thirds (65%) of respondents were in favour of a tax on soft drinks if the money was used to reduce the cost of healthy food.

This strong public support, together with the substantial health benefits and extra revenue that could be expected from the tax, should make it a highly attractive policy option for the Australian government.

At a time when the cost of preventable disease is threatening to overwhelm the health system, a tax on sugary drinks is an essential element of a comprehensive approach to address poor diets and overweight and obesity.

Gary Sacks is Senior Research Fellow, WHO Collaborating Centre for Obesity Prevention, Deakin University.

Jane Martin is Executive Manager of the Obesity Policy Coalition; Senior Fellow, Faculty of Medicine, Dentistry and Health Sciences, University of Melbourne.

Lennert Veerman is Senior Research Fellow, School of Population Health, The University of Queensland.
SUGAR TAX DOESN’T HELP FIGHT OBESITY

The chief executive of the New Zealand Food and Grocery Council, Katherine Rich, has told Australian Food News that the UK’s announced sugar tax will not help fight obesity.

Under the UK tax, drinks which contain more than five grams of sugar per 100 millilitres of sugar are expected to be taxed the equivalent of AUD 34 cents per litre. Drinks with over eight grams of sugar per 100 millilitres are expected to incur the equivalent of AUD 45 cents per litre.

The UK Federal Government says all money raised from the tax will be spent on funding school sport. British Chancellor George Osborne said delaying the implementation of the tax until 2018 will give companies “plenty of time” to reformulate beverages so they avoid the tax.

The tax on soft drinks in the UK, due to come into effect in 2018, is not the answer according to Katherine Rich who cites Mexico’s sugar tax, introduced in 2014, as a prime example of failure on the obesity front.

Nielsen Research figures have revealed that consumption of soft drink in Mexico has only dropped by 0.39 per cent since the country introduced its tax in 2014.

“To put this decline in percentage terms into perspective, it’s a fraction of the more than 4 per cent decline in consumption of carbonated drinks seen in the New Zealand market over the past 12 months – which occurred without any tax at all,” says Rich.

“Those clinging to the pipedream that the Mexico tax is what success looks like as a public health intervention need to realise that the tiny reduction in litres amounts to not even one sip per person,” Rich says.

Despite Rich’s argument, organisations such as the Australian National Heart Foundation are applauding the UK Government’s decision to introduce the new tax.

“lt is vital the Australian Government takes a strong policy and regulatory stance on sugary drinks that echoes community concern over the role play in our growing obesity crisis,” said CEO of the Australian National Heart Foundation Professor Garry Jennings after the UK’s tax was announced.

Although the Australian National Heart Foundation believes no single intervention of itself will overcome childhood obesity, it says the Australian Federal Government should explore options for a “healthy levy” on sugar-sweetened beverages, with the funds raised to be used to promote healthier lifestyles.

Health promotion and education advocated over sugar tax

The NZFGC’s Katherine Rich however believes other obesity-tackling measures, such as including promoting healthier beverages, could be implemented without the need for any sugar tax.

“In Australia and New Zealand, the major reformulation programs of the main companies has meant there are more zero/lowsugar drinks available now than at any time, and what’s more consumers are making the shift,” Rich says.

“Ten years ago one in every ten drinks purchased was low-calorie and now here in New Zealand it’s close to one in three,” she says.

Education programs are vital too according to Rich.

“In New Zealand, the Heart Foundation goes into schools to teach about healthy eating and a separate programme helps school canteens offer healthier foods,” says Rich.

“In 2009 industry and the government agreed to remove sugar-sweetened drinks from schools as part of a voluntary agreement. Also, a government-funded health organisation, the Health Promotion Agency, has campaigns to get the message out too,” she says.

Soft drink manufacturers may sue over tax

Meanwhile, in the UK, major beverage companies are now believed to be in talks with the UK Government and are potentially considering legal action.

The proposed British tax will not include fruit juices and milkshakes which beverage companies may seek legal redress by demonstrating that soft drinks are being unfairly targeted.
Obesity is a major public health problem in Australia. More than one in four adults are now classified as obese, up from one in ten in the early 1980s. And about 7% of children are obese, up from less than 2% in the 1980s. Obesity not only affects an individual’s health and wellbeing, it imposes enormous costs on the community, through higher taxes to fund extra government spending on health and welfare and from forgone tax revenue because obese people are more likely to be unemployed.

In our new Grattan Institute report, *A sugary drinks tax: recovering the community costs of obesity*, we estimate community or ‘third party’ costs of obesity were about A$5.3 billion in 2014/15. We propose the government put a tax on sugar-sweetened beverages to recoup some of the third-party costs of obesity and reduce obesity rates. Such a tax would ensure the producers and consumers of those drinks start paying closer to the full costs of this consumption – including costs that to date have been passed on to other taxpayers. There is the added benefit of raising revenue that could be spent on obesity-prevention programs.

The scope of our proposed tax is on non-alcoholic, water-based beverages with added sugar. This includes soft drinks, flavoured mineral waters, fruit drinks, energy drinks, flavoured waters and iced teas.

While a sugary drinks tax is not a ‘silver bullet’ solution to the obesity epidemic (that requires numerous policies and behaviour changes at an individual and population-wide level), it would help.

**WHY FOCUS ON SUGARY DRINKS?**

Sugar-sweetened beverages are high in sugar and most contain no valuable nutrients, unlike some other processed foods such as chocolate. Most Australians, especially younger people, consume too much sugar already. People often drink excessive amounts of sugary drinks because the body does not send appropriate ‘full’ signals from calories consumed in liquid form. Sugar-sweetened beverages can induce hunger, and soft drink consumption at a young age can create a life-long preference for sweet foods and drinks. We estimate, based on US evidence, about 10% of Australia’s obesity problem is due to these sugar-filled drinks.

Many countries have implemented or announced the introduction of a sugar-sweetened beverages tax including the United Kingdom, France, South Africa and parts of the United States. The overseas experience is tax reduces consumption of sugary drinks, with people mainly switching to water or diet/low-sugar alternatives.

There is strong public support in Australia for a sugar-sweetened beverages tax if the funds raised are put towards obesity prevention programs, such as making healthier food cheaper. Public health authorities, including the World Health Organisation and the Australian Medical Association, as well as advocates such as the Obesity Policy Coalition, support the introduction of a sugar-sweetened beverages tax.

**WHAT THE TAX WOULD LOOK LIKE**

We advocate taxing the sugar contained within sugar-sweetened beverages, rather than levying a tax based on the price of these drinks, because: a sugar content tax encourages manufacturers to reduce the sugar content of their drinks, it encourages consumers to buy drinks with less sugar, each gram of sugar is taxed consistently, and it deters bulk buying. The tax should be levied on manufacturers or importers of sugar-sweetened beverages, and overseas evidence suggests it will be passed on in full to consumers.

We estimate a tax of A$0.40 per 100 grams of sugar in sugary drinks, about A$0.80 for a two-litre bottle of soft drink, will raise about A$400-$500 million per year. This will reduce consumption of sugar-sweetened beverages by about 15%, or about 10 litres per person on average. Recent Australian modelling suggests a tax could reduce obesity prevalence by about 2%.

Low-income earners consume more sugar-sweetened beverages than the rest of the population, so they will on average pay slightly more tax. But the tax burden per person is small – and consumers can also easily avoid the tax by switching to drinks such as water or artificially sweetened beverages.

People on low incomes are generally more responsive to price rises and are therefore more likely to switch to non-taxed (and healthier) beverages, so the tax may be less regressive than predicted. Although a sugar-sweetened
beverages tax may be regressive in monetary terms, the greatest health benefits will flow through to low-income people due to their greater reduction in consumption and higher current rates of obesity. The revenue could also be spent on obesity programs that benefit the disadavantaged, reducing the regressivity of the tax.

While the beverage and sugar industries are strongly opposed to any tax on sugar, their concerns are overblown. Most of the artificially sweetened drinks and waters, which will not be subject to the tax, are owned by the major beverage companies.

A sugar-sweetened beverages tax will reduce domestic demand for Australian sugar by around 50,000 tonnes, which is only about 1% of all the sugar produced in Australia. And while there may be some transition costs, this sugar could instead be sold overseas (as 80% of Australia’s sugar production already is).

A tax on sugary drinks is a public health reform whose time has come.

Stephen Duckett is Director, Health Program, Grattan Institute. Trent Wiltshire is an Associate, Grattan Institute.

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<table>
<thead>
<tr>
<th>BEVERAGE</th>
<th>Sugar content (grams/100ml)</th>
<th>Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>375ml can soft drink</td>
<td>10g/100ml</td>
<td>$0.15</td>
</tr>
<tr>
<td>2L soft drink</td>
<td>10g/100ml</td>
<td>$0.80</td>
</tr>
<tr>
<td>600ml sports drink</td>
<td>6g/100ml</td>
<td>$0.14</td>
</tr>
<tr>
<td>200ml fruit drink (6 pack)</td>
<td>10g/100ml</td>
<td>$0.48</td>
</tr>
<tr>
<td>1.25L flavoured mineral water</td>
<td>7g/100ml</td>
<td>$0.35</td>
</tr>
<tr>
<td>250ml energy drink</td>
<td>11g/100ml</td>
<td>$0.11</td>
</tr>
</tbody>
</table>

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SEVEN ESSENTIAL TIPS TO BREAKING UP WITH SUGAR

As we come to the end of the year, many of us start to look back – and reflect. The year has been defining – even redefining – in many ways. Politics, technology and culture have all seen major leaps and in some cases, hurdles. In public health, it’s been a big year for sugar. Alessandra Demaio reviews the year in sugar news, and offers some helpful tips on how to reduce sugar intake for the new year.

Global recognition is building for the very real health concerns posed by large and increasing quantities of hidden sugar in our diets. This near-ubiquitous additive found in products from pasta sauces to mayonnaise has been in the headlines and in our discussions. The seemingly innocuous sweet treat raises eyebrows from community groups to policy makers – and change is in the air.

Let’s review some of the sugar-coated headers from the past 12 months:

• The global obesity epidemic continued to build while more than two in three Australian adults faced overweight or obesity – and almost one in four of our children.
• Science around sugary drinks further solidified, with consumption now linked to obesity, childhood obesity, heart disease, diabetes (type-2), dental caries and even lower fertility.
• Australians were estimated to consume a staggering 76 litres of sugary drinks each since January alone, and new reports highlighted that as much as 15% of the crippling health costs associated with obesity could result from sugary drinks consumption.
• Meanwhile around the planet, more countries took sound policy measures to reduce sugar consumption in their citizens. France, Belgium, Hungary, Finland, Chile, the UK, Ireland, South Africa and many parts of the United States implemented, continued or planned the implementation of pricing policies for sugary drinks.

In short, the over-consumption of sugar is now well recognised as a public health challenge everywhere. With all this in mind and a New Year ahead, it’s time to put big words into local action. With resolutions brewing, here are seven helpful tips to breaking up with sugar in 2017.

1. UNDERSTAND SUGAR

When it comes to sugar, things can get pretty confusing. Below, I shed some light on the common misunderstandings, but let’s recheck sugar itself – in simplest terms.

Sugar is a type of refined carbohydrate and a source of calories in our diet. Our body uses sugar and other sources of calories as energy, and any sugar that is not used is eventually stored as fat in our liver or on our bellies.

‘Free sugars’ are those added to products or concentrated in the products – either by us or by the manufacturer. They don’t include sugars in whole fruits and vegetables, but more on that later. For a range of health reasons, the World Health Organization recommends we get just 5% of our daily calories from free sugars. For a fully grown man or woman, this equates to a recommended limit to sugar consumption of roughly 25 grams – or 6 teaspoons. For women, it’s a little less again.

Consume more than this, and our risk of health problems rises.

2. QUIT SOFT DRINKS

With 16 teaspoons of sugar in a single bottle serving – that’s more than 64 grams – there’s nothing ‘soft’ about soft drinks. Including all carbonated drinks, flavoured milks and energy drinks with any added sugars, as well as fruit drinks and juices, sugary drinks are a great place to focus your efforts for a healthier 2017. Sugary drinks provide no nutritional value to our diets and yet are a major source of calories.

What’s more concerning, evidence suggests that when we drink calories in the form of sugary drinks, our brains don’t recognise these calories in the same way as with foods. They don’t make us feel ‘full’ and could even make us hungrier – so we end up eating (and drinking) more. In this way, liquid calories can be seen as even more troubling than other forms of junk foods. Combine this with studies that suggest the pleasure (and sugar spike) provided by sugary drinks may make them hard to give up – and it’s not difficult to see why many of us are drinking higher amounts, more often and in larger servings. This also makes cutting down harder.

The outcome is that anything up to one-seventh of the entire public cost of obesity in Australia could now result from sugary drinks. In other words, cut out the sugary drinks and you’ll be doing your own health a favour – and the health of our federal and state budgets.

3. EAT FRUIT, NOT JUICE

When it’s wrapped in a peel or a skin, fruit sugars are not a challenge to our health. In fact, the sugars in fruit are nature’s way of encouraging us to eat the fruit to begin with. Fruits like oranges, apples and pears contain important fibres. The ‘roughage’ in our foods, this fibre is healthy in many ways but there are three in particular I will focus on. First, it slows our eating down; it is easy to drink a glass of juice squeezed from seven apples, but much harder to eat those seven pieces whole. Second, it makes us feel full or satiated. And third, it slows the release of the sugars contained in fruit into our blood streams, thus allowing our bodies to react and use the energy appropriately, reducing our chances of weight gain and possibly even diabetes.
Juice, on the other hand, involves the removal of most of those fibres and even the loss of some of the important vitamins. What we don’t lose though, is the 21 grams or more than five teaspoons of sugar in each glass.

In short, eat fruit as a snack with confidence. But enjoy whole fruit, not juice.

4. SUGAR BY ANY OTHER NAME
High-fructose corn syrup, invert sugar, malt sugar and molasses – they all mean one thing: sugar.

As the public awakens to the health challenges posed by sugar, the industry turns to new ways to confuse consumers and make ‘breaking up’ more difficult. One such way is to use the many alternative names for sugar – instead of the ‘s’ word itself. Be on the lookout for:

  * Evaporated cane juice, golden syrup, malt syrup, sucrose, fruit juice concentrate, dextrose and more ...

5. EAT WHOLE FOODS WHERE POSSIBLE
Tomato sauce, mayonnaise, salad dressings, gravies, taco sauces, savoury biscuits and breakfast cereals – these are just some of the many foods now often packed with hidden, added sugars.

A study found that 74% of packaged foods in an average American supermarket contain added sugars – and there is little evidence to suggest Australia would be dramatically different. Added to food to make it more enjoyable, and moreish, the next tip when avoiding such a ubiquitous additive is to eat whole foods.

It’s hard to hide sugar in plain flour, or a tomato, or frozen peas. Buying and cooking with mostly whole foods – not products – is a great way to ensure you and your family are not consuming added sugars unaware.

6. SEE BEYOND (UN)HEALTHY CLAIMS
Words like ‘wholesome’, ‘natural’ and ‘healthy’ are clad on many of our favourite ingredients. Sadly, they don’t mean much.

Even products that are full of sugar, like breakfast cereals and energy bars, often carry claims that aim to confuse and seduce us into purchase. Be wary – and be sure to turn the package over and read the ingredients and nutrition labelling where possible (and if time permits).

7. BE OKAY WITH SOMETIMES
The final but crucial message in all of this is that eating or drinking sugar is not a sin. Sugar is still a part of our lives and something to enjoy in moderation. The occasional piece of cake, or late night chocolate – despite the popular narrative painted by industry to undermine efforts for true pricing on sugar – these occasional sweet treats are not the driving challenge for obesity. The problem is that sugary drinks, and sugar in our foods, have become every day occurrences.

With this in mind, let’s not demonise sugar but instead let’s see it for what it is. Enjoy some juice or bubbles from time to time but make water the default on an everyday basis. With the average can of cola containing 39 grams or 9 teaspoons of sugar, be OK with sometimes.

BITTER TRUTH
Let’s be honest, most countries now face serious health challenges from obesity. Even more concerning, so do our kids. While no single mission will be the panacea to a complex problem, using 2017 to set a new healthy goal of giving sugar the kick would be a great start.

Understand sugar, be aware of it, minimise it and see it for what it is – a special treat for a rare occasion.

This New Year’s, make breaking up with sugar your planned resolution.

“Hey sugar – it’s not me, it’s you ...”

Alessandro R Demaio is Global Health Doctor; Co-founded NCDFREE & festival21; Assoc. Researcher, University of Copenhagen.

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The Exploring Issues section comprises a range of ready-to-use worksheets featuring activities which relate to facts and views raised in this book. The exercises presented in these worksheets are suitable for use by students at middle secondary school level and beyond. Some of the activities may be explored either individually or as a group.

As the information in this book is compiled from a number of different sources, readers are prompted to consider the origin of the text and to critically evaluate the questions presented.

Is the information cited from a primary or secondary source? Are you being presented with facts or opinions?

Is there any evidence of a particular bias or agenda? What are your own views after having explored the issues?

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MULTIPLE CHOICE 55
Brainstorm, individually or as a group, to find out what you know about sugar and its consumption.

1. What is sugar, and how does the human body utilise it?

2. What is obesity, and how does it relate to sugar consumption?

3. What are carbohydrates, and why are they important?

4. What do the letters ‘GI’ stand for in relation to sugar consumption?
Complete the following activity on a separate sheet of paper if more space is required.

“Many countries have implemented or announced the introduction of a sugar-sweetened beverages tax including the United Kingdom, France, South Africa and parts of the United States. The overseas experience is tax reduces consumption of sugary drinks, with people mainly switching to water or diet/low-sugar alternatives.”

Duckett, S and Wiltshire, T, *Sugary drinks tax could recoup some of the costs of obesity while preventing it.*

Consider the above statement, and in the space below explain how a proposed tax on sugar-sweetened beverages would function in Australia, citing examples from other countries. Also discuss whether or not you believe a sugar tax on beverages would help to reduce obesity in Australia, and why.
DISCUSSION ACTIVITIES

Complete the following activity on a separate sheet of paper if more space is required.

“Only about 25 per cent of the total sugar we ingest is sugar that we consciously add to foods, for example in tea, coffee or in home baking. The remaining 75 per cent comes from the everyday packaged foods and drinks we consume such as soft drink, juices, cereals, biscuits and sweets.”

Saxelby, C, Sugar.

Form into groups of two or more people to identify how much sugar you are consuming. Use the space provided below to compile a list of all the foods you have consumed over the past week. Include the types of sugars these foods contain, and whether they are natural or added sugars. Calculate the approximate amount of sugar you have consumed and whether this falls within the recommended dietary guidelines. Determine if you need to reduce your sugar intake to conform with the guidelines, and propose ways in which this could be done. Discuss your findings with other groups in the class.
MULTIPLE CHOICE

Complete the following multiple choice questionnaire by circling or matching your preferred responses. The answers are at the end of the following page.

1. A 375ml can of soft drink contains approximately how many teaspoons of sugar?
   a. 1-2
   b. 3-4
   c. 5-6
   d. 7-8
   e. 9-10
   f. 11-12

2. Sucrose is made up of which of the following sugars?
   a. Fructose and glucose
   b. Lactose and fructose
   c. Fructose and maltose
   d. Glucose and dextrose
   e. Lactose and maltose
   f. Maltose and dextrose

3. Which of the following are types of sweeteners? (select all that apply)
   a. Agave
   b. Stevia
   c. Maple syrup
   d. Aspartame
   e. Honey
   f. Saccharin
   g. Sodium

4. In what year was the first synthetic sweetener, saccharine, discovered by Constantin Fahlberg?
   a. 1879
   b. 1909
   c. 1929
   d. 1979
   e. 1999
   f. 2009

5. White sugar contains what percentage of sucrose?
   a. .9%
   b. 10.9%
   c. 19.9%
   d. 49.9%
   e. 79.9%
   f. 99.9%
   g. 100%

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6. Respond to the following statements by circling either ‘True’ or ‘False’:

a. Throughout the Middle Ages, sugar was considered a rare and expensive spice, rather than an everyday condiment. True / False

b. Sugar in Australia is predominantly extracted from sugar beet. True / False

c. Glucose powder is a low GI white crystalline sweetener. True / False

d. The first chemically refined sugar appeared on the scene in India about 2,500 years ago. True / False

e. Drinking too many high added sugar drinks can contribute to tooth decay and weight gain. True / False

f. Your body breaks down carbohydrates and converts them into a simple sugar called glucose. True / False
Sugar is a refined food, supplying no vitamins, minerals or fibre. The only nourishment that sugar has to offer is kilojoules (calories) (Saxelby, C, Sugar). (p.24)

Only about 25% of the total sugar we ingest is sugar that we consciously add to foods, for example in tea, coffee or in home baking. The remaining 75% comes from the everyday packaged foods and drinks we consume such as soft drink, juices, cereals, biscuits and sweets (ibid). (p.24)

Australian cereal manufacturers are potentially misleading consumers by promoting healthy sounding statements on their packaging despite sugar making up more than 35% of the ingredients of some popular brands (Obesity Policy Coalition, Breakfast cereals up to one third sugar: new analysis shows. Health groups call for clear labelling). (p.26)

Diet and low sugar (soft) drinks still contain high levels of acids and additives such as colours and flavours. Drinking soft drink (sugary and diet) usually can contribute to the erosion of tooth enamel surfaces which then leads to tooth decay (Department of Health, How much sugar is in what we drink?). (p.28)

Sugary soft drinks are packed full of ‘empty kilojoules’ which means they contain a lot of sugar but have no nutritional value (Cancer Council Victoria, Rethink sugary drink: FAQ). (p.29)

Historically, sugar has been the predominant sweetener in Australia and it came from sugar cane as opposed to European sugar which is extracted from the sugar beet (Saxelby, C, 7 types of sugar – which is healthier?). (p.34)

Glucose is the simplest form of sugars and is the sugar in blood, your body’s primary source of energy (ibid). (p.35)

Despite their different colours and flavours, the nutritional value of sugars is very similar. Sugar is sugar, whether white, brown or raw. One teaspoon of any has around 68 kilojoules (16 calories) (ibid). (p.35)

The first synthetic sweetener, saccharine, was discovered accidentally by a young Russian chemist named Constantin Fahlberg in 1879 while studying coal-tar derivatives, when he unknowingly got it on his hands and licked his fingers. Saccharine became widely used around World War I, when natural sugar was in short supply (Euston, S, Why finding a real alternative to sugar is so difficult). (p.36)

The Guarani peoples of modern-day Brazil and Paraguay have been using the leaves of the stevia plant as a sweetener for about 1,500 years (ibid). (p.36)

Sugars are popular in the processed food industry because they add taste, colour, bulk and thickness to food products. They also prevent mould forming and act as a preservative (Better Health Channel, Sugar). (p.38)

For an average 14 year old girl, a 600ml bottle of soft drink alone will provide more than 12% of her daily energy needs. This means she would exceed the recommended energy intake from refined sugar with just one drink (ibid). (p.38)

Science around sugary drinks has further solidified, with consumption now linked to obesity, childhood obesity, heart disease, diabetes (type-2), dental caries and even lower fertility (Demaio, AR, Seven essential tips to breaking up with sugar). (p.49)

In 2016, Australians were estimated to consume a staggering 76 litres of sugary drinks each, and new reports highlighted that as much as 15% of the crippling health costs associated with obesity could result from sugary drinks consumption (ibid). (p.49)
Added sugars
Refined sugars which are added during the cooking, preparation and manufacturing of food. Added sugars often come without helpful nutrients and may increase the energy of a food or drink. Examples include sucrose, fructose, dextrose, lactose and sugar syrups such as glucose syrup.

Alternative sweeteners
Two groups of alternative sweeteners are available under a range of different brand names: non-nutritive sweeteners (also called 'artificial' or 'intensive' sweeteners) and nutritive sweeteners. Advantages include: low-joule foods and drinks that contain non-nutritive sweeteners (e.g. soft drinks, cordials) can add variety without affecting your blood glucose levels; small amounts will not greatly affect blood glucose levels and can increase your food choices. Disadvantages include: some ‘diet’ products containing them may still be high in saturated fat and therefore not suitable to include in your menu plan e.g. ‘sugar-free’ (carbohydrate-modified) chocolate; many nutritive sweeteners listed have a laxative effect and can cause diarrhoea.

Carbohydrates
Carbohydrates can be found in most of the food we eat and provide the major part of energy in our diet. They are broken down by the body into simple sugars to be used for energy. The brain also requires the simple sugar, glucose, as its main energy source. It is important to choose carbohydrates that are also nutrient-rich.

Daily Intake Guide
The Daily Intake Guide is the reference for an acceptable intake of nutrients including: energy, protein, fat, saturated fats, carbohydrates, sodium, sugars, and dietary fibre. It is based on the recommended amounts of nutrient and energy required for the average adult.

Dietary energy
Dietary energy is measured in kilojoules and consists of the energy provided by protein, fat, alcohol and carbohydrates.

Free sugars
The World Health Organization (WHO) defines free sugars as monosaccharides and disaccharides added to foods and drinks by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates.

Glycaemic Index (GI)
The GI refers to a measure of the rate at which blood sugar levels are affected after eating a particular food. It can only be measured in goods containing carbohydrates. ‘High GI’ foods enter the bloodstream more quickly than ‘low GI’ foods, causing a greater increase in the level of blood glucose (glycaemic response).

Health Star Rating
This Australian government initiative was introduced in 2014 to assist consumers to make better food choices. The voluntary rating system is designed for processed packaged foods, and is calculated by using an online calculator.

The Health Star Rating system comprises three principle elements: Health Star Rating, energy declaration and nutrient content declarations.

Naturally occurring sugars
Naturally occurring sugars are found in fruit, vegetables, legumes and milk.

Non-nutritive sweeteners
Non-nutritive sweeteners are essentially kilojoule-free and therefore have no effect on blood glucose levels. There are several varieties that can be found in the supermarket simply by checking the nutrition panel on the product for these codes: Saccharin (954), Cyclamate (952), Aspartame (951), Sucralose (955), Acesulphame K (950), Alitame (956), Neotame (961), Stevia (960).

Nutritive sweeteners
Nutritive sweeteners are usually different types of carbohydrate. Therefore they are not kilojoule-free and have different effects on blood glucose levels. Products containing nutritive sweeteners may sometimes be labelled as ‘carbohydrate modified’. Different varieties include: fructose (no code), LoGicane (no code), Sorbitol (420), Mannitol (421), Xylitol (965), Maltitol (967), Isomalt (953), Polydextrose (1200), Maltodextrin (no code), Thaumatin (957).

Sucrose
Sucrose is a disaccharide made up of fructose and glucose. It occurs both naturally in foods and as added sugar.

Sugar
 Sugars are types of carbohydrates found in foods that provide a source of energy in our diet. The term, sugar includes all sweet carbohydrates, although most often it is used to describe sucrose or table sugar, a ‘double sugar’.

Sugar-sweetened beverages
There are a range of different definitions for sweetened beverages both nationally and internationally. Generally SSBs refers to non-alcoholic water-based beverages with added sugar, including sugar-sweetened soft drinks and flavoured mineral waters, fortified waters, energy and electrolyte drinks, fruit and vegetable drinks, and cordials. This term does not tend to include milk-based products, 100% fruit juice or non-sugar sweetened beverages (i.e. artificial, non-nutritive or intensely sweetened).

Total sugars
The combination of natural and added sugars that make up the overall sugar intake.
WEB LINKS

Websites with further information on the topic

Australian Bureau of Statistics  www.abs.gov.au
Australian Food and Grocery Council  www.afgc.org.au
Better Health Channel  www.betterhealth.vic.gov.au
CHOICE  www.choice.com.au
Diabetes Australia  www.diabetesaustralia.com.au
Foodwatch  www.foodwatch.com.au
Junkbusters  www.junkbusters.com.au
LiveLighter  www.livelighter.com.au
Nutrition Australia  www.nutritionaustralia.org
Obesity Policy Coalition  www.opc.org.au
Parents’ Voice  www.parentsvoice.org.au
Rethink Sugary Drink  www.rethinksugarydrink.org.au
Sugar Research Advisory Service  www.srasanz.org
World Health Organization  www.who.int/nutrition

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