Consumption of sugars in the Netherlands

What is the intake of sugars by the Dutch population and has it changed in recent years?

The results of the fifth Dutch National Food Consumption Survey 2012-2016 compared to the results of previous surveys.

Cosun
Nutrition Center

What is the intake of sugars in The Netherlands and has it changed over time? The results of the Dutch National Food Consumption Survey 2012-2016, undertaken by the National Institute for Public Health and the Environment (RIVM), were used to document current sugar intake and provide answers to these and other questions. The results were also compared with findings from earlier surveys. This fact sheet presents the findings of this analysis.

A few definitions

In order to properly interpret the data, it is helpful to clarify a few sugar-related terms. Sugar usage is often wrongly interpreted as sugar intake. This is incorrect: data on sugar usage also includes sugar intended, for example, for animal feed and non-food products like soap, bee feed, cosmetics and even car tyres. Sugar usage also includes sugar that is lost during storage and transportation as well as sugar that is processed in imported and exported goods (like chocolate). In the Netherlands, the export of sugar and sweets exceeds the import [2].

In restaurants, stores, and homes, sugar is frequently lost through preparation, storage, and disposal of items like stale cookies, flat soda, and leftovers. The best estimate of actual sugar consumption is achieved by establishing sugar intake through food consumption research. Sugar intake is the estimate of actual sugar consumption obtained from food frequency questionnaires and based on self-reporting.

There is some confusion about sugar-related terms and not all dietary guidelines use the same definitions [3]. That is why **Table 1** contains the definitions of different sugar-related terms as used by the Cosun Nutrition Center.

The most important results of the fifth Dutch National Food Consumption Survey (VCP) 2012-2016 [1]:

- In 2012-2016, the average intake of monosaccharides and disaccharides* by people aged 1-79 in the Netherlands was 110 g/day, which corresponds to 21 percent of energy intake.
- The average intake of monosaccharides and disaccharides was lower in 2012-2016 than in 2007-2010. In the three previous surveys (conducted in 1987-1998), the intake of monosaccharides and disaccharides was relatively stable.
- Of the 110 grams of sugars consumed by the average Dutch person per day, 60 grams are added sugars. That is equivalent to 240 kcal and comprises 11.3% of the total daily energy intake. The consumption of added sugar has decreased by four kilos per year among people aged 7-69 years in the Netherlands compared to the previous survey (2007-2010).

*Naturally present and added to food

Table 1. Definitions of a few sugar-related terms.

Carbohydrates	Carbohydrates are made up of the elements carbon, hydrogen and oxygen. Carbohydrates fall into three main groups: monosaccharides and disaccharides (i.e. sugars), oligosaccharides (such as maltodextrin) and polysaccharides (such as amylose and starch). Non-digestible carbohydrates (i.e. fibres) are not included in carbohydrate intake because the enzymes in the gastrointestinal tract of humans are unable to digest them.
Sugars	All monosaccharides and disaccharides with the exception of polyols (sugar alcohols like xylitol).
Monosaccharides and disaccharides	Monosaccharides: glucose (dextrose), fructose (fruit sugar) and galactose. Disaccharides: sucrose (granulated sugar), lactose (milk sugar), maltose (malt sugar) and trehalose.
Added sugars	All monosaccharides and disaccharides that are added during food production and preparation. It is assumed that all unrefined white and brown sugar, honey, syrup and molasses are added during food production or preparation. This is why these fall under added sugars. Naturally present monosaccharides and disaccharides in unprocessed products (fruits, vegetables, legumes, potatoes, fish, meat, poultry and eggs) and in juices, fruit concentrates and bread do not fall under the term, nor does lactose in dairy products.
Free sugars	Free sugars include all added sugars, in addition to sugars that are naturally present in fruit juices and concentrated fruit juice.
Naturally present sugars	Sugars that are naturally present in dairy products (lactose), vegetables and fruits do not fall under the categories of added or free sugars.

Source: [4, 5, 6]

Dutch National Food Consumption Surveys

On behalf of the Ministry of Health, Welfare and Sport, the National Institute for Public Health and the Environment (RIVM) collects data on the food consumption and nutritional status of the Dutch population in the Dutch National Food Consumption Survey (VCP). Since 1987, these polls have been conducted on a regular basis. VCP 1987–1988 (VCP 1), VCP 1992 (VCP 2), VCP 1997–1998 (VCP 3), VCP 2007–2010, and VCP 2012–2016 are the five surveys that have been finished to date. This fact sheet was created using information from the most recent VCP (2012-2016) regarding dietary intake of carbohydrates, (added and free) monosaccharides, and disaccharides. Data from the first four surveys are used as well to examine the trend in the dietary consumption of monosaccharides and disaccharides through time. Because different methods were used for the various surveys, comparing intake data has limits. Additionally, different age groups were included in different surveys.

Using additional calculations of survey data, an estimate has been made of the intake of added and free monosaccharides and disaccharides.

Old and new surveys

The note-taking method, which involved documenting food intake over the course of two consecutive days in a diary, was used to collect data on food consumption from surveys up until 2003. Since 2003, data have been gathered utilizing two 24-hour recall questionnaires filled out by qualified dieticians on two non-consecutive, distinct days. While children aged 1 to 15 were interviewed at home with a parent or guardian, adults were interviewed over the phone. These methodological variations may account for the variations in survey findings between those conducted before and after 2003 [7]. The age distribution has been standardised to include people aged 7 to 69 by the RIVM in order to allow comparisons between the fourth and fifth surveys.

Underreporting

Food consumption in the fourth and fifth surveys is measured using a recall method, which means that it is based on people's memory. In practice, respondents tend to also provide socially desirable answers, which can lead to over- and underreporting of certain foods. In the first three surveys, food intake is established using a two-day note-taking method. This method is susceptible to socially desirable answers and over- and underreporting. In the first survey, the average energy intake was 2308 kcal/day, while it was 2212 kcal/day in the second and 2190 kcal/day in the third. In other words, there was a downward trend in energy intake during the period 1987-1998. Low or too low energy intake can be a consequence (in full or in part) of underreporting due to socially desirable answers [1].

NEVO online

The Dutch Food Composition Database (NEVO), version 2016/5.0, was used to convert the consumption data from the fifth survey into nutrient intake. NEVO online contains data on the composition of foods and dishes consumed frequently by a large percentage of the Dutch population and that significantly contribute to the intake of energy and nutrients. Data on nutritional composition always lag behind real composition, which is after all variable. A change in composition is not immediately included in the NEVO. Additionally, due to natural fluctuation, various production techniques, home preparation techniques, and storage times, food composition varies. Regular updates are made to the NEVO database [8].

See: www.nevo-online.rivm.nl

Contribution of the energy-providing nutrients to total energy intake.

Carbohydrates contribute to 45 percent of the average Dutch person's total energy consumption (**Figure 1**). Alcohol, fats, proteins, and to a lesser extent, fibres, are the primary sources of energy. Starch, or complex carbs, make up 24% of the 45% of total carbohydrates. As a result, monosaccharides and disaccharides (sugars) account for the remaining 21% of caloric consumption. 11% of the 21% monosaccharides and disaccharides are added to meals. Free sugars are all monosaccharides and disaccharides added by the producer, cook or consumer and sugars naturally present in honey, syrups, fruit juices and fruit concentrate. Free sugars account for about 13% of the total energy intake. The remaining sugars (8% of total energy intake) are sugars found naturally in food and do not fit into the categories of added or free sugars. More information on the consumption of carbohydrates and (added and free) sugars, their role in dietary energy intake, and the food categories that contribute most to overall intake can be found in the remaining sections of the fact sheet.

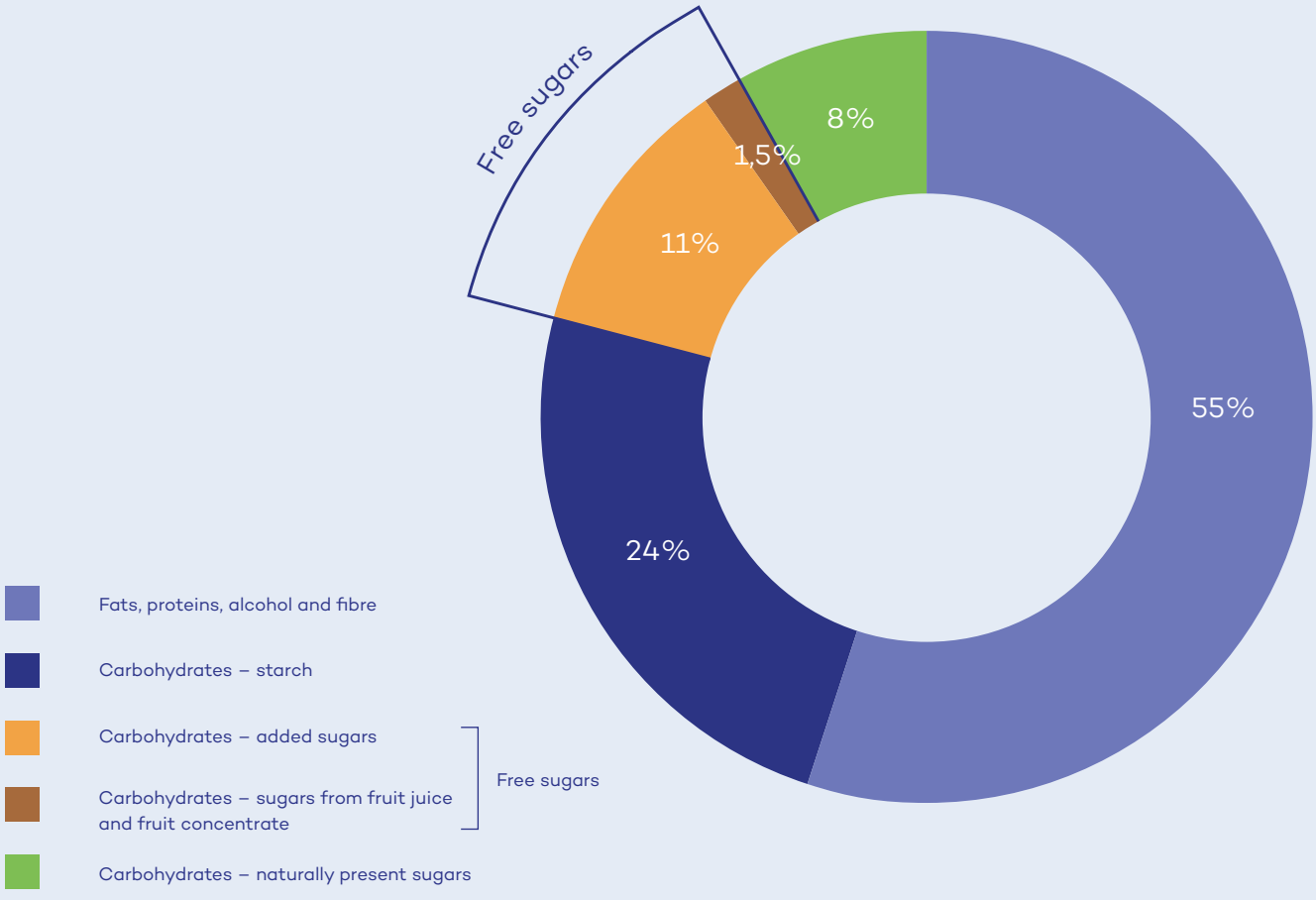

Figure 1. Distribution of energy-providing nutrients consumed by the average Dutch person.

How many carbohydrates do we consume in the Netherlands?

According to the most recent survey, the average intake of carbohydrates is 237 grams per day. This corresponds to 45% of an average energy intake of 2192 kilocalories (kcal). The intake of digestible carbohydrates meets the recommendations of the Health Council of the Netherlands, which assumes that at least 40% of energy is from carbohydrates, without setting an upper limit [9]. This recommendation does not distinguish between different types of digestible carbohydrates (monosaccharides, disaccharides and polysaccharides). Proteins contribute 15% of energy on average, while fats contribute 35%. These amounts also fall within the recommendations of the Health Council of the Netherlands.

Carbohydrate intake increases with age. Among adults, carbohydrate intake, both absolute (g) and relative intake (en%), decreases with age. **Table 2** shows that both the highest consumption rate of carbohydrates (54.9 en% for boys and girls aged 1-3 years) and the lowest (40.7 en% for men aged 51-70 years), expressed in energy percentage, are above the lower limit of the recommendations of the Health Council of the Netherlands (**Table 2**).

Table 2. Average intake of total carbohydrates, polysaccharides in grams per day (g/d) and energy percentage (en%) and average intake of dietary fibre (g/d).

Age	Male	Female
Total carbohydrates (g/d (en%))		
1-3 years	177 (54.9)	170 (54.9)
4-8 years	241 (53.1)	213 (53.5)
9-13 years	277 (51.0)	226 (51.6)
14-18 years	291 (49.3)	230 (50.1)
19-30 years	299 (46.4)	227 (47.6)
31-50 years	284 (40.7)	213 (44.2)
51-70 years	248 (42.5)	193 (42.3)
71-79 years	221 (41.0)	179 (42.4)
Polysaccharides (g/d (en%))		
1-3 years	78 (24.1)	74 (23.9)
4-8 years	112 (24.7)	99 (24.9)
9-13 years	137 (25.1)	111 (25.3)
14-18 years	150 (25.3)	117 (25.4)
19-30 years	164 (25.3)	120 (25.3)
31-50 years	163 (24.7)	114 (24.4)
51-70 years	141 (23.3)	102 (22.8)
71-79 years	120 (22.0)	91 (21.5)
Dietary fibres* (g/d)		
1-3 years	13.4	12.4
4-8 years	16.5	14.7
9-13 years	19.1	16.1
14-18 years	20.5	16.9
19-30 years	22.6	17.6
31-50 years	24.3	18.2
51-70 years	22.9	18.6
71-79 years	21.4	18.8

Source: [1]
*From food and supplements

Table 3. Average intake of monosaccharides and disaccharides in grams per day (g/d) and energy percentage (en%).

Age	Male	Female
Monosaccharides and disaccharides (g/d (en%))		
1-3 years	102 (30.7)	98 (31.4)
4-8 years	129 (28.4)	116 (28.6)
9-13 years	137 (25.8)	114 (26.0)
14-18 years	138 (24.0)	111 (24.3)
19-30 years	135 (21.0)	106 (22.1)
31-50 years	123 (17.7)	98 (20.1)
51-70 years	109 (17.4)	92 (19.8)
71-79 years	99 (19.0)	88 (20.6)

Source: [1]

What is the current sugar intake in the Netherlands?

According to the most recent survey, the average intake of monosaccharides and disaccharides is 110 grams per day. This is equivalent to 40 kg annually per person of the Dutch population aged 1-79 years. This intake corresponds to 21% of average energy intake.

According to **Table 3**, children consume more monosaccharides and disaccharides (both in g/d and en%). Out of the eight age groups children in the age range of 1-3 had the highest intake of monosaccharides and disaccharides. The average energy percentage decreases with age and stabilises somewhat from 30 years of age. Men in all age groups have a higher intake of monosaccharides and disaccharides in grams per day (g/d) than women, although the difference with children aged 1-3 years is relatively minor.

The absolute intake of monosaccharides and disaccharides in men increases up until the age of 18, after which it starts to decline. The Health Council of the Netherlands does not have any guidelines for monosaccharide and disaccharide intake [10].

Minimise consumption of sugar-containing beverages

For children and men, non-alcoholic beverages contribute most to the intake of monosaccharides and disaccharides. Among women, this product category ranks third. One of the dietary guidelines established by the Health Council of the Netherlands in 2015 is to 'minimise consumption of sugar-containing beverages'. Sugar-containing beverages include not only dairy and other beverages with added sugars, but also fruit juices. It is a well-known fact that liquid sugars are less filling than solid sugars. This makes it easy to consume too many calories, which in turn increases the risk of becoming overweight [10].

Which foods are the main source of sugars?

In the most recent survey, the consumed foods are separated into 18 major groups. The most important groups that influence the consumption of monosaccharides and disaccharides are listed in **Table 4**. Non-alcoholic beverages are the main source of monosaccharides and disaccharides in both children and adult males, followed by dairy products (**Table 4**). Fruits, nuts, and olives are the foods that women consume the most monosaccharides and disaccharides from, followed by dairy products. 90% of the monosaccharides and disaccharides children consume each day come from the top five. Among adults this is around 80%.

Table 4. Top 5 foods that contribute the most to the intake of monosaccharides and disaccharides (naturally present and added), as identified in the 2012-2016 survey.

Food group	Contribution (%)
Boys aged 1-18 years	
1. Non-alcoholic beverages	31.0
2. Dairy products	22.4
3. Sugar and confectionery	16.3
4. Fruits, nuts and olives	12.2
5. Cakes and sweet biscuits	8.7
Girls aged 1-18 years	
1. Non-alcoholic beverages	30.1
2. Dairy products	21.1
3. Sugar and confectionery	15.3
4. Fruits, nuts and olives	14.0
5. Cakes and sweet biscuits	9.9
Men aged 19-79 years	
1. Non-alcoholic beverages	21.4
2. Dairy products	19.8
3. Sugar and confectionery	16.3
4. Fruits, nuts and olives	12.4
5. Cakes and sweet biscuits	11.1
Women aged 19-79 years	
1. Non-alcoholic beverages	20.2
2. Dairy products	17.8
3. Sugar and confectionery	17.0
4. Fruits, nuts and olives	14.2
5. Cakes and sweet biscuits	12.1

Source: [1]

Have we been consuming more sugar in recent years?

The average intake of monosaccharides and disaccharides in the period 1987-1998 was relatively stable. In the period 2007-2016, the intake of monosaccharides and disaccharides decreased significantly (**Table 5** and **Figure 2**). This applies to both absolute intake and the contribution to energy intake among both children and adults.

Survey comparison

In order to compare the last two surveys, the sampling has been standardised to age 7-69 (Table 5). This provides a good indication of the differences between 2007-2010 and 2012-2016. The difference in age range in the first three surveys has probably not caused any significant effects because the respondents in these surveys originated from a representative panel of households with a housewife/househusband under the age of 75 years. As a result of this selection criterion, the majority of older respondents will be similar. However, the ages of the oldest partner of the housewife/househusband in the three first surveys differ.

Table 5. Average intake of monosaccharides and disaccharides in grams per day (g/d) and energy percentage (en%) as identified in the five surveys.

Survey executed:	Age range	Number of persons in the sampling	Monosaccharides and disaccharides (g/day)	Monosaccharides and disaccharides (en%)
1987-1988	1-85	5898	128	22.5
1992	1-92	6218	122	22.5
1997-1998	1-97	5958	125	23.3
2007-2010	7-69	3819	120	21.3
2012-2016	7-69	2801	112*	20.4*

Source: [11, 12, 1]

* The age range has been aligned with the 2007-2010 survey (to achieve an equivalent comparison), namely ages 7-69 years. As a result, the values deviate from the 110 g monosaccharides and disaccharides (21 energy percent) that apply to the entire sampling of the 2012-2016 survey (aged 1-79).

The horizontal dotted line in the table indicates when the food consumption research method was changed.

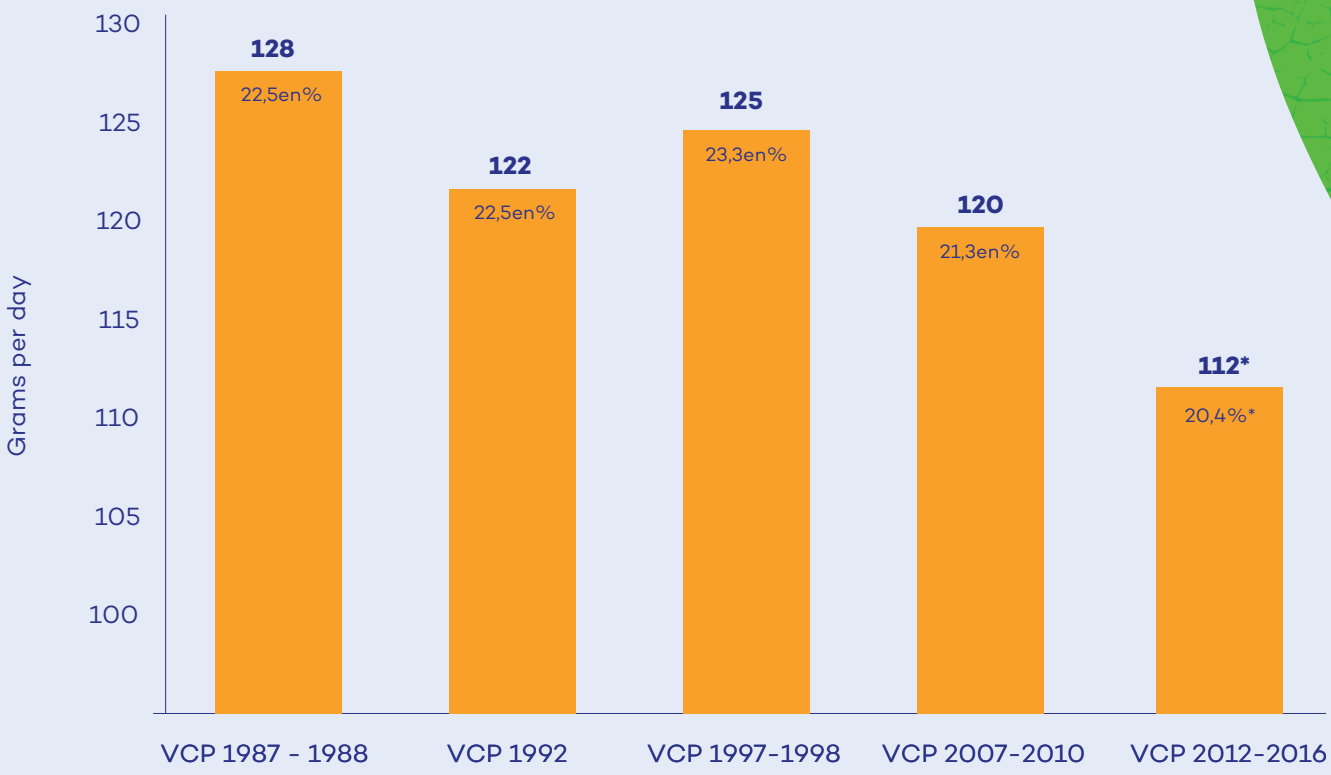

Figure 2. A visual representation of Table 5. Trend in monosaccharide and disaccharide intake over the years.

* The age range has been aligned here with the VCP 2007-2010 (to achieve an equivalent comparison), namely ages 7-69 years. As a result, the values deviate from the 110 g monosaccharides and disaccharides (21 energy percent) that apply to the entire sampling of the 2012-2016 survey (ages 1-79).

How much added sugar and free sugar do we consume?

The average intake of added sugars is 60 grams per day. This constitutes 11.3% of daily energy intake. For free sugars, the average intake is 67.7 grams per day (12.8 en%). The absolute intake of added and free sugars is on average higher in men than in women (**Table 6**). The exception to this is children aged 1-3 years. The contribution of added and free sugars to energy intake is highest among children aged 4-8 years. The average energy percentage of added and free sugars decreases with age. Added and free sugars contribute least to the energy intake in the average diet of those aged 71-79.

The Health Council of the Netherlands does not have any guidelines for added and free sugars [10].

Table 6. Average intake of added and free sugars in grams per day (g/d) and energy percentage (en%).

Age	Male	Female
Added sugars (g/d (en%))		
1-3 years	45.8 (12.7)	47.2 (14.1)
4-8 years	81.0 (16.6)	71.0 (17.0)
9-13 years	88.4 (15.9)	70.6 (15.3)
14-18 years	87.8 (14.8)	66.4 (14.0)
19-30 years	81.4 (13.0)	59.4 (12.3)
31-50 years	67.8 (10.6)	50.5 (10.4)
51-70 years	55.5 (8.9)	42.7 (9.1)
71-79 years	49.1 (8.0)	38.7 (8.5)
Free sugars		
1-3 years	54.9 (15.6)	57.7 (17.4)
4-8 years	92.1 (19.0)	80.6 (19.5)
9-13 years	99.3 (17.9)	79.3 (17.4)
14-18 years	97.6 (16.6)	75.2 (15.8)
19-30 years	90.7 (14.6)	67.6 (13.9)
31-50 years	75.5 (12.0)	57.0 (11.8)
51-70 years	62.8 (10.1)	48.7 (10.4)
71-79 years	55.4 (9.0)	44.2 (9.8)

Which foods are the main source of added and free sugars?

Among children, there is no difference in the top five between added sugars and free sugars. Among adults, the only difference is the order (**Tables 7** and **8**). Among children, non-alcoholic beverages are the primary source of added and free sugars, followed by sugar and confectionery. This also applies to adults as regards free sugars. With added sugars, the opposite applies among adult men: sugar and confectionery rank first, followed by non-alcoholic beverages. Among children, the top five comprise around 95% of added and free sugars, while this percentage among adults is 90%.

Table 7. Top 5 foods that contribute most to the intake of added sugars.

Food group	Contribution (%)
Boys aged 1-18 years	
1. Non-alcoholic beverages	36.6
2. Sugar and confectionery	26.7
3. Dairy products	15.5
4. Cakes and sweet biscuits	13.1
5. Sauces and seasonings	3.1
Girls aged 1-18 years	
1. Non-alcoholic beverages	35.4
2. Sugar and confectionery	25.7
3. Dairy products	15.8
4. Cakes and sweet biscuits	14.8
5. Sauces and seasonings	3.0
Men aged 19-79 years	
1. Non-alcoholic beverages	29.4
2. Sugar and confectionery	22.8
3. Dairy products	18.6
4. Cakes and sweet biscuits	12.7
5. Sauces and seasonings	7.6
Women aged 19-79 years	
1. Non-alcoholic beverages	27.8
2. Sugar and confectionery	22.1
3. Dairy products	17.8
4. Cakes and sweet biscuits	13.5
5. Sauces and seasonings	8.1

Source: [1]

Table 8. Top 5 foods that contribute most to the intake of free sugars.

Food group	Contribution (%)
Boys aged 1-18 years	
1. Non-alcoholic beverages	44.4
2. Sugar and confectionery	23.7
3. Dairy products	13.7
4. Cakes and sweet biscuits	11.3
5. Sauces and seasonings	3.1
Girls aged 1-18 years	
1. Non-alcoholic beverages	43.6
2. Sugar and confectionery	22.5
3. Dairy products	13.8
4. Cakes and sweet biscuits	12.8
5. Sauces and seasonings	3.0
Men aged 19-79 years	
1. Non-alcoholic beverages	30.8
2. Sugar and confectionery	26.5
3. Dairy products	16.8
4. Cakes and sweet biscuits	11.4
5. Sauces and seasonings	7.6
Women aged 19-79 years	
1. Non-alcoholic beverages	26.7
2. Sugar and confectionery	25.0
3. Dairy products	19.7
4. Cakes and sweet biscuits	12.0
5. Sauces and seasonings	8.1

Source: [1]

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Cosun Nutrition Center, May 2019

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Cosun Nutrition Center

The Cosun Nutrition Center is the nutritional science knowledge centre for plant-based nutrition from the Royal Cosun cooperative agri-food organisation dedicated to all plant-based products and ingredients within Cosun. The Cosun Nutrition Center participates in scientific research in plant-based nutrition and makes scientific insights available to professionals in the field of nutrition, health and sustainability.

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