Australian Health Survey: Consumption of Added Sugars

Australia

2011-12

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MEDIA RELEASE

27 April 2016 Embargo 11.30am (Canberra time)

Consumption of added sugars exceeds recommendations

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

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."

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, http://www.abs.gov.au.

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IN THIS RELEASE

This publication is the fifth release of information from the nutrition component of the 2011-12 National Nutrition and Physical Activity Survey (NNPAS). It is intended to update the Nutrition First Results and Usual Nutrient Intakes publications using new information about the added sugar content of foods developed by Food Standards Australia New Zealand. It contains tables and analysis including the usual intakes of added sugars, and types of foods and beverages contributing to added sugars. It also includes comparisons with the World Health Organisation (WHO) 2015 guideline on sugars consumption which makes recommendations about the amount of energy from 'free sugars', which are a broader definition of added sugar that counts the sugar in fruit juice and honey. Although both added sugars and free sugars are included in the Excel table sets, the commentary focuses on free sugars for consistency with the WHO definition.

Usual intakes are modelled estimates of the amounts (or proportions) usually consumed by population groups, which is different from the actual amount reported by respondents on a given day. Analysis of usual intakes is therefore a preferred method of estimating the proportion of the population who in the long-run would consume above or below a target amount. They are also useful for estimating the amounts usually consumed by defined proportions (percentiles) of the population, such as the 75th or 90th percentiles.

Analysis of the 2011-12 NNPAS suggests that, like other nutrition surveys, the results are affected (biased) by some under-reporting of food intake by participants in the survey. Therefore, estimates of the amounts of sugar reported in this publication may underestimate of the true level of sugars consumed. See the AHS Users' Guide for more information on under-reporting.

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%).

ADDED SUGARS AND FREE SUGARS

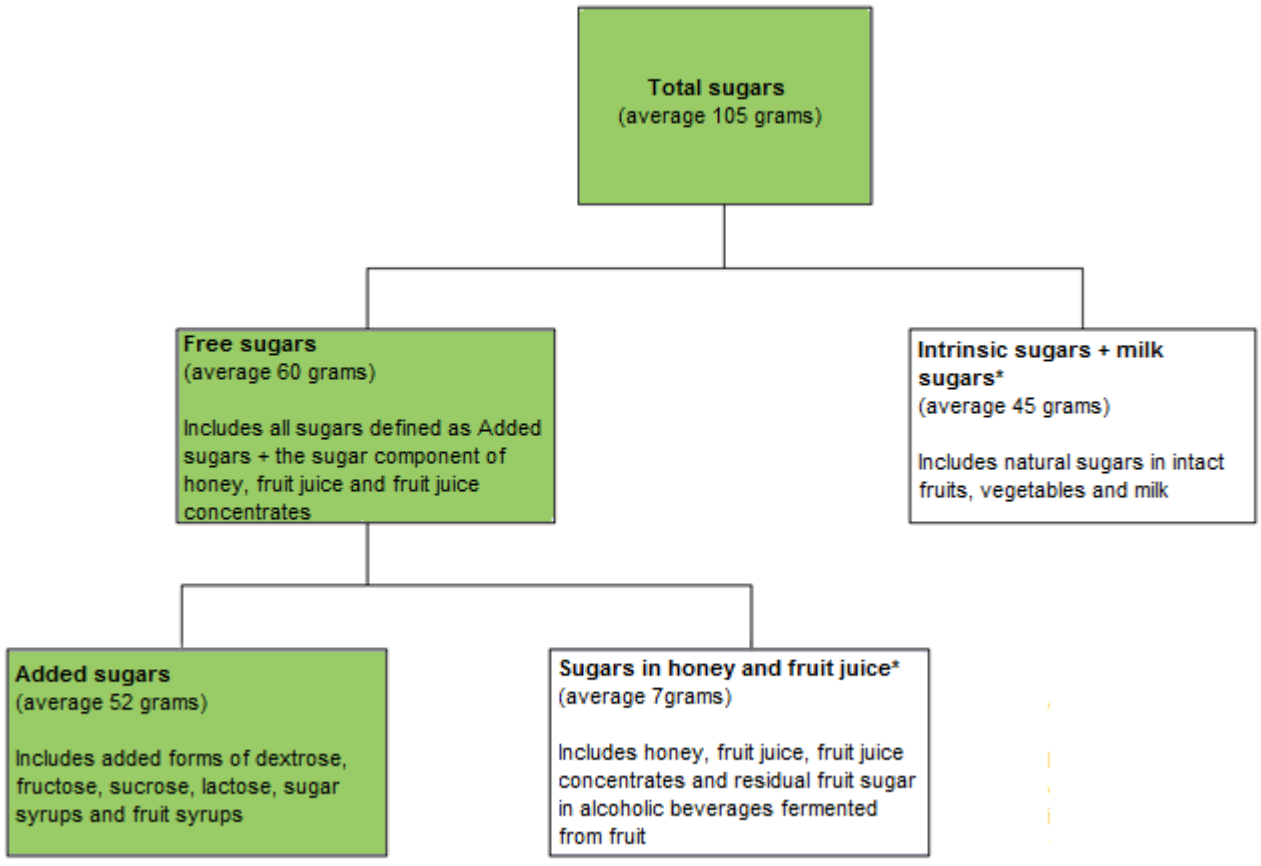
The 2013 Australian Dietary Guidelines (ADG) advises Australians to limit their intakes of foods and beverages containing added sugars.[1] Diets high in added sugars may displace nutritious foods with energy-dense, nutrient poor foods, and are associated with weight gain and dental caries.[1,2] Added 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.[3]

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.[2]

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[4]), with the balance (45 grams) being the intrinsic sugars[5] within intact fruit plus the naturally occurring sugar in milk. 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 (see Figure 1).

Figure 1: Total sugars, free sugars and added sugars - average consumption(a)(b), 2011-12

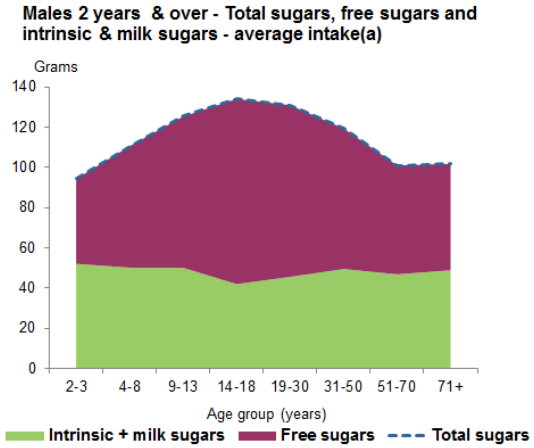


(a) Based on Day 1. See Glossary for definition.
(b) Persons aged 2 years and over.
Source: National Nutrition and Physical Activity Survey, 2011-12
See Glossary for detailed inclusions of each definition.
* Not directly measured - calculated from the difference between the measured sugar components.

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.

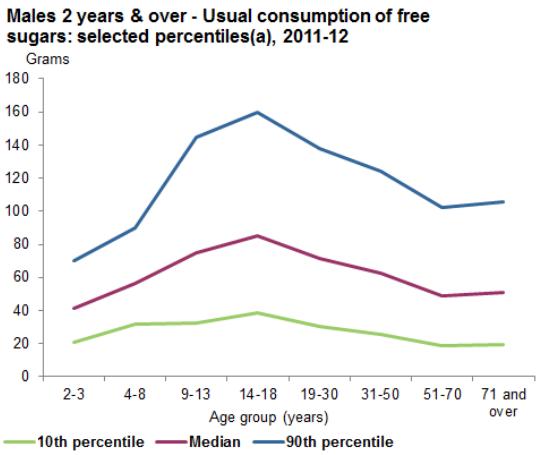
At 14-18 years, the average daily intakes of free sugars were 92 grams for males and 70 grams for females (22 and 17 teaspoons respectively). The lowest free sugar consumption was by the 2-3 year olds who had around 39-42 grams (or 9-10 teaspoons) per day, reflecting the overall smaller quantity of food 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.

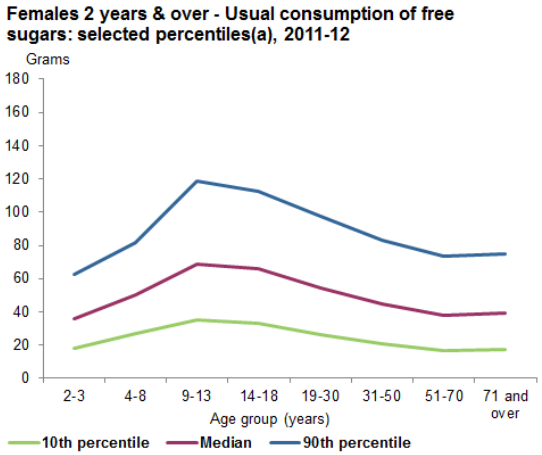


(a) Based on Day 1. See Glossary for definition.
Source: National Nutrition and Physical Activity Survey, 2011-12

While the average provides an overall summary of consumption for a group, the distribution of usual consumption[6] highlights the wide variation in amounts consumed. For instance, the amount 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.



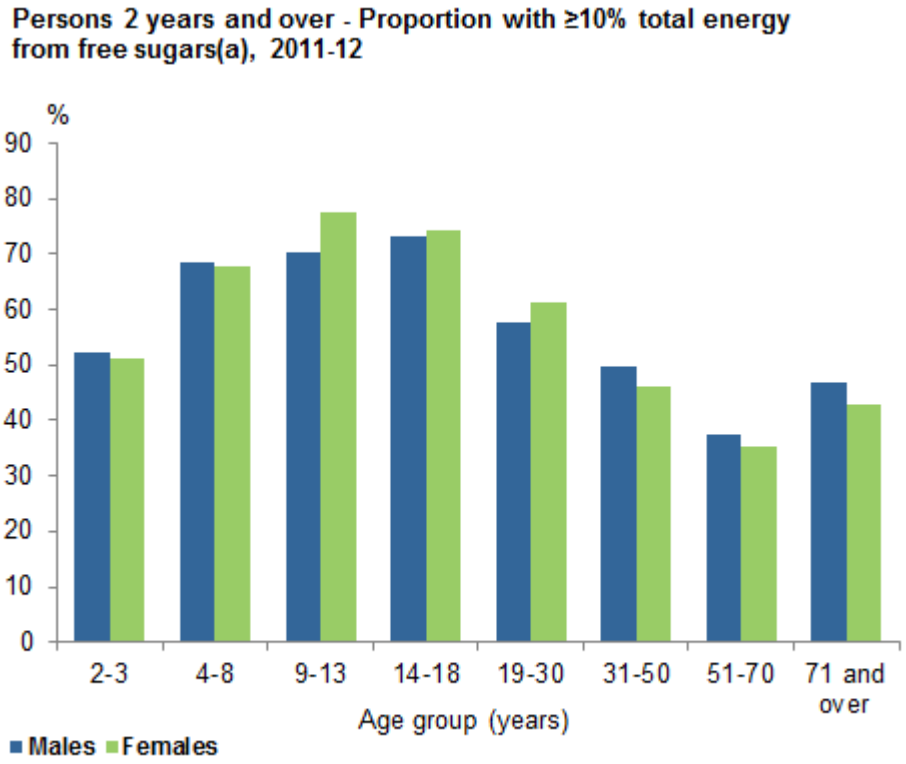


(a) Usual intake. See Glossary for definition.
Source: National Nutrition and Physical Activity Survey, 2011-12

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

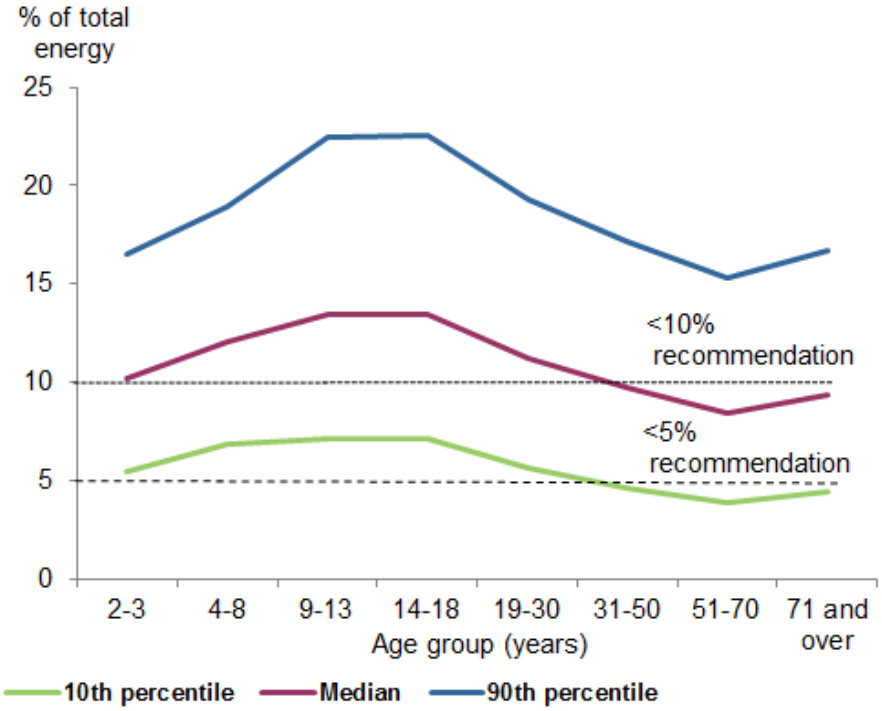
usually exceeded the recommendation, with the highest rates among child and teenage groups. Close to three-quarters of 9-13 and 14-18 year olds usually derived 10% or more of their dietary energy intake from free sugars, with the top 10% of this age group usually consuming at least 23% of energy from 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).



(a) Usual intake. See Glossary for definition.
Source: National Nutrition and Physical Activity Survey, 2011-12

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 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.

Persons 2 years & over - Usual proportion of energy from free sugars: selected percentiles(a), 2011-12



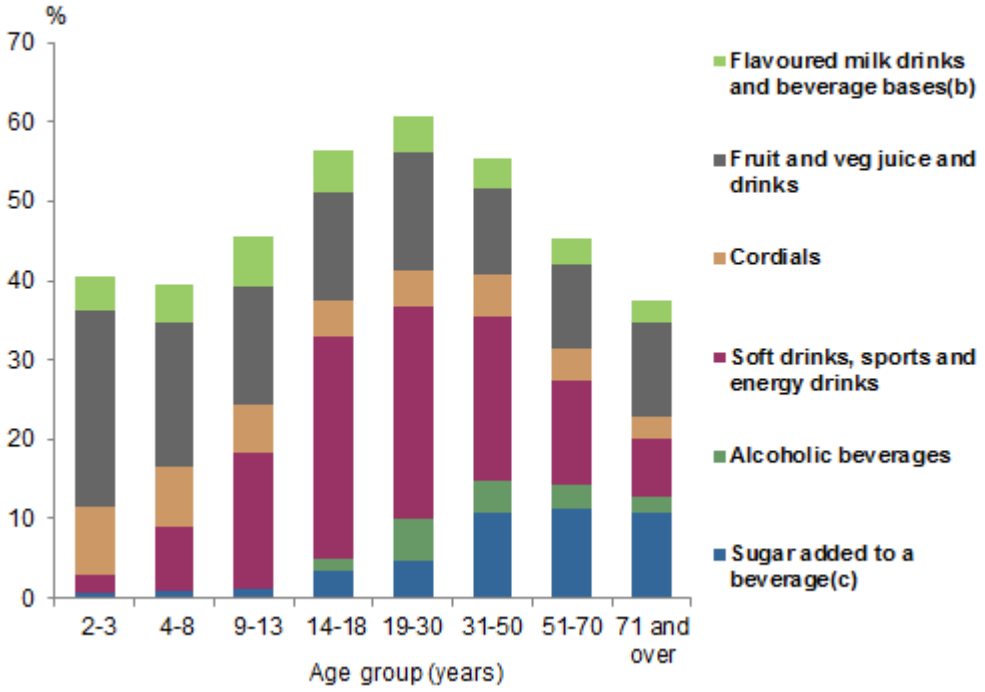
(a) Usual intake. See Glossary for definition.
Source: National Nutrition and Physical Activity Survey, 2011-12

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%.

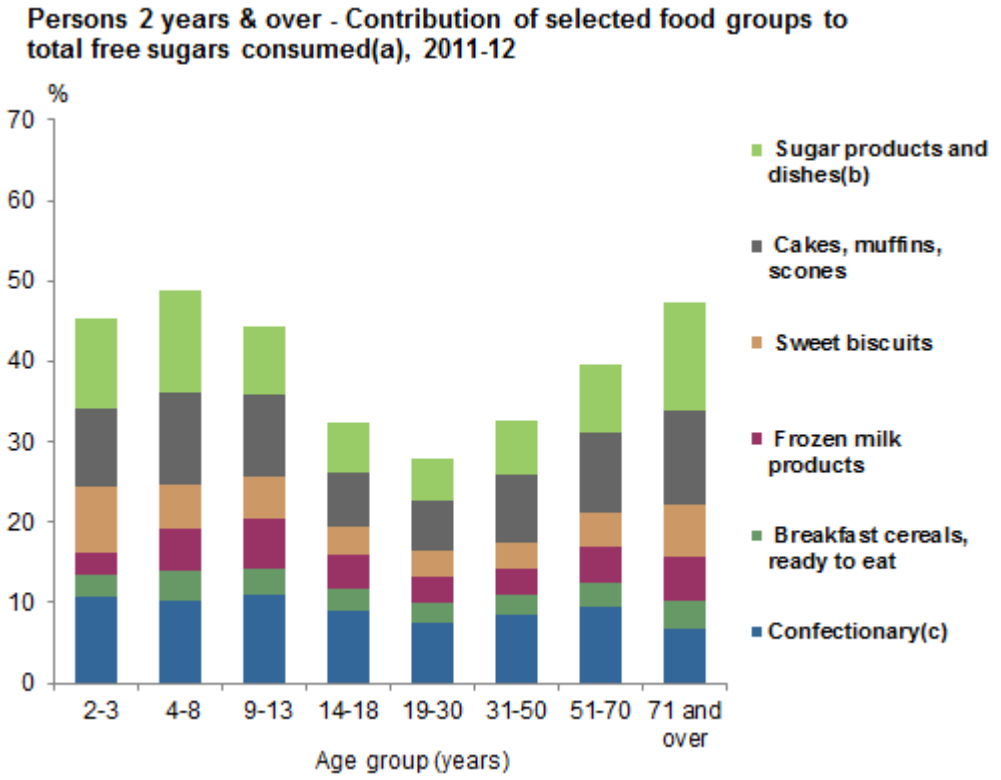
The overall contribution of beverages to free sugars consumption ranged from around 40% for young children and older adults to around 60% for 19-30 year olds. Fruit and vegetable juices were the leading contributor among 2-3 and 4-8 year olds (25% and 18% of all free sugars respectively), whereas soft 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 & coffee).

Persons 2 years & over - Contribution of beverages to total free sugars consumed(a), 2011-12



(a) Based on Day 1. See Glossary for definition.
(b) Includes tea and coffee powders, beverage bases, and breakfast beverages. See Endnote 8 for details.
(c) See Endnote 9 for details.
Source: National Nutrition and Physical Activity Survey, 2011-12

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/seed 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.



(a) Based on Day 1. See Glossary for definition.
(b) Excluding sugar, honey and syrup added to beverages. See Endnote 9.
(c) Includes nut/seed/fruit bars
Source: National Nutrition and Physical Activity Survey, 2011-12

Given the types of food and beverage categories contributing to free sugars consumption, it is not surprising that discretionary foods[10] 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%).

ENDNOTES

1 National Health and Medical Research Council, 2013, *Eat for Health: Australian Dietary Guidelines.* Canberra: Australian Government. <https://www.nhmrc.gov.au/guidelines-publications/n55>, Last accessed 19/04/2016

2 World Health Organization, 2015, *Guideline: Sugars intake for adults and children.* Geneva: WHO. <http://www.who.int/nutrition/publications/guidelines/sugars_intake/en/>, Last accessed 19/04/2016

3 Food Standards Australia New Zealand, 2016, *Determining the amount of added Sugars and free sugars in foods listed in the AUSNUT 2011-13 dataset*. Canberra: Australian Government. <http://www.foodstandards.gov.au/science/monitoringnutrients/ausnut/>, Last accessed 19/04/2016

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.

ABBREVIATIONS

The following symbols and abbreviations are used in this publication:

ABS	Australian Bureau of Statistics
AHS	Australian Health Survey
AMPM	Automated Multiple-Pass Method
AUSNUT	Australian Food, Supplement and Nutrient Database
FSANZ	Food Standards Australia New Zealand
mg	milligram
g	gram
g/day	grams per day
kJ	kilojoule
MoE	Margin of Error
NCI	National Cancer Institute
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NNPAS	National Nutrition and Physical Activity Survey
SEIFA	Socio- Economic Indexes for Areas
WHO	World Health Organisation

GLOSSARY

The definitions used in this survey are not necessarily identical to those used for similar items in other collections. Additional information is contained in the Australian Health Survey: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

24-hour dietary recall

This was the methodology used to collect detailed information on food and nutrient intake in the National Nutrition and Physical Activity Survey (NNPAS). The 24-hour dietary recall collected a list of all foods, beverages and dietary supplements consumed the previous day from midnight to midnight, and the amount consumed. For more information, see the 24-hour Dietary Recall chapter of the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

Added sugars

The definition for added sugars is based on the definition of 'sugars' in Clause 1 of Standard 2.8.1 of the Australia New Zealand Food Standards Code.

"Sugars means –

a) hexose monosaccharides and disaccharides, including dextrose, fructose, sucrose and lactose; or
b) starch hydrolysate; or
c) glucose syrups, maltodextrin and similar products; or
d) products derived at a sugar refinery, including brown sugar and molasses; or
e) icing sugar; or
f) invert sugar; or
g) fruit sugar syrup; derived from any source,

but does not include –

h) malt or malt extracts; or
i) sorbitol, mannitol, glycerol, xylitol, polydextrose, isomalt, maltitol, maltitol syrup or lactitol."

Maltodextrin was not reported as part of total sugars in AUSNUT 2011-13 and thus could not be considered in this analysis. Honey, fruit juices and fruit juice concentrates are not included in this Standard and as such were not considered 'added sugars' for this definition of added sugars.

For more information see: *Developing the Added Sugars and Free Sugars datasets* available from Food Standards Australia New Zealand http://www.foodstandards.gov.au/science/monitoringnutrients/ausnut/

Australian Dietary guidelines

The National Health and Medical Research Council 2013 Australian Dietary Guidelines use the best available scientific evidence to provide information on the types and amounts of foods, food groups and dietary patterns that aim to:

- promote health and wellbeing
- reduce the risk of diet-related conditions
- reduce the risk of chronic disease.

The Guidelines are for use by health professionals, policy makers, educators, food manufacturers, food retailers and researchers.

The content of the Australian Dietary Guidelines applies to all healthy Australians, as well as those with common diet-related risk factors such as being overweight. They do not apply to people who need special dietary advice for a medical condition, or to the frail elderly.

Australian Health Survey (AHS)

The Australian Health Survey 2011-13 is composed of three separate surveys:

- National Health Survey (NHS) 2011-12
- National Nutrition and Physical Activity Survey (NNPAS) 2011-12
- National Health Measures Survey (NHMS) 2011-12.

In addition to this, the AHS Survey contains a Core dataset, which is produced from questions that are common to both the NHS and NNPAS. See The Structure of the Australian Health Survey for details.

Automated Multiple-Pass Method (AMPM)

The method used to collect the 24 hour food recall in the 2011-12 NNPAS was the Automated Multiple-Pass Method (AMPM) developed by the Agricultural Research Service of the United States Department of Agriculture (USDA). ABS with assistance from Food Standards Australia New Zealand (FSANZ) adapted the AMPM instrument to reflect the Australian food supply. See the Users' Guide for more information

Carbohydrate

Carbohydrates usually provide the major part of energy in human diets. Carbohydrates are comprised of the elements of carbon, hydrogen and oxygen. Data for total carbohydrates include starch, sugars and related substances (sugar alcohols and oligosaccharides). Sugar alcohols and oligosaccharides are included in 'Total carbohydrates' but not in starch and sugar sub-totals. Therefore, total carbohydrate does not always equal the sum of sugars and starch.

Day 1 / Day 2 intake

Day 1 intake refers to information collected from the first 24-hour dietary recall, while Day 2 refers to information from the second 24-hour recall. In the 2011-12 NNPAS, Day 1 intake information was collected from all respondents, with a second 24-hour recall (Day 2) collected from around 64% of respondents. Nutrient intakes derived from 24-hour recall data do not represent the usual intake of a person because there is variation in day-to-day intakes. The second 24-hour recall is used to estimate and remove within-person variation in order to derive a usual nutrient intake distribution for the population. Usual nutrient intakes represent intakes over a long period of time.

Disaccharides

Disaccharides are sugars composed of two monosaccharides. Sucrose, maltose, galactose and lactose are examples of disaccharides.

Dietary energy

Dietary energy is measured in kilojoules (kJ) and consists of the energy provided by protein, fat, alcohol and carbohydrate (comprising sugars and starch). Small amounts of additional energy are from dietary fibre and organic acids.

Discretionary foods

The Australian Dietary Guidelines describes discretionary foods as being: "foods and drinks not necessary to provide the nutrients the body needs, but that may add variety. However, many of these are high in saturated fats, sugars, salt and/or alcohol, and are therefore described as energy dense. They can be included sometimes in small amounts by those who are physically active, but are not a necessary part of the diet". For more information, see the Discretionary Foods chapter of the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

Free sugars

Free sugars, as defined by the WHO, refers to 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. For more information see WHO/FAO (2003) Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO Expert consultation

For information on the process for calculating free sugars for AUSNUT foods see *Developing the Added Sugars and Free Sugars datasets* available from Food Standards Australia New Zealand http://www.foodstandards.gov.au/science/monitoringnutrients/ausnut/

Intrinsic sugars

Intrinsic sugars are defined by the WHO as the sugars incorporated in the structure of intact fruit and vegetables. In this analysis, intrinsic sugars plus milk sugars are estimated from total sugars minus free sugars. See WHO Guideline http://apps.who.int/iris/bitstream/10665/149782/1/9789241549028_eng.pdf

Lactose

Lactose is a disaccharide and is the sugar found naturally in milk products. Lactose is made up of two monosaccharides; glucose and galactose.

Margin of Error (MoE)

Margin of Error (MoE) describes the distance from the population value that the sample estimate is likely to be within, and is specified at a given level of confidence. Confidence levels typically used are 90%, 95% and 99%. For example, at the 95% confidence level the MoE indicates that there are about 19 chances in 20 that the estimate will differ by less than the specified MoE from the population value (the figure obtained if the entire population had been enumerated). In this publication, MoE has been provided at the 95% confidence level for proportions of persons and usual daily proportions of energy from macronutrients. For more information see the Technical Note of this publication.

Median

The median is the middle value in a set of observations. In this release, median usual intakes for each age and sex group are shown as the 50th percentile of the range of observations simulated by the NCI method.

Mean

The mean is the sum of the value of each observation in a dataset divided by the number of observations. This is also known as the arithmetic average. In this release, mean usual intakes for each age by sex group are calculated from the distribution of usual nutrient intakes simulated by the NCI method.

Milk sugars

Milk sugars are the natural sugars present in milk. In this analysis, intrinsic sugars + milk sugars are estimated from total sugars – free sugars.

Monosaccharides

Monosaccharides are the simplest forms of sugars. Examples are glucose (also sometimes called dextrose) and fructose.

National Nutrition and Physical Activity Survey (NNPAS)

The National Nutrition and Physical Activity Survey focused on collecting information on:

- dietary behaviour and food avoidance (including 24-hour dietary recall)
- selected medical conditions that had lasted, or were expected to last, for six months or more
    - cardiovascular and circulatory conditions
    - diabetes and high sugar levels
    - kidney disease
- blood pressure
- female life stages
- physical activity and sedentary behaviour (including eight-day pedometer component)
- use of tobacco
- physical measurements (height, weight and waist circumference).

NCI method

The NCI method is a statistical model developed by the National Cancer Institute of the USA. In this publication, the model has been used to estimate the distribution of long term or usual intakes for each age and sex group, using the two days of dietary intake data for all respondents in that age and sex group. For more information, see the Overview of the NCI Method chapter of the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

Nutrient

Nutrients are chemical substances provided by food that are used by the body to provide energy, structural materials, and biochemical cofactors to support the growth, maintenance, and repair of body tissues. Major sources of nutrients are available in AHS: Nutrition First Results - Foods and Nutrients, 2011-12 (cat. no. 4364.0.55.007).

Nutrient Database (AUSNUT)

The Nutrient Database used to derive energy and nutrient estimates for the 24-hour dietary recall data was developed by Food Standards Australia New Zealand. See AUSNUT 2011-13.

Percentage contribution to energy intake

Percentage contribution to energy intake refers to the proportion of energy that a food or macronutrient contributes to each person's total energy intake. In the NNPAS, the energy from each macronutrient was estimated by multiplying each gram of a particular macronutrient by a conversion factor to determine the kilojoules of energy. For more information, see the Nutrient Intake chapter of the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001). For more information on the way in which percentage usual contribution to total energy intake has been calculated using the NCI method, see the Model implementation: data used and model specification chapter of the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

SEIFA

SEIFA is based on the 2006 Index of Relative Socio-Economic Advantage and Disadvantage. A lower quintile/decile (e.g. the first quintile/decile) indicates an area with relatively greater disadvantage and lack of advantage in general. A higher Index of Advantage and Disadvantage (e.g. the fifth quintile/tenth decile) indicates an area with relative lack of disadvantage and greater advantage in general.

Sucrose

Sucrose is a natural form of sugar found in many foods. It is also known as table sugar. Sucrose is a disaccharide comprising of glucose and fructose.

Total sugars

Total sugars are the sum of fructose, glucose, sucrose, maltose, lactose and galactose.

Under-reporting

Under-reporting refers to the tendency (bias) of respondents to underestimate their food intake in self-reported dietary surveys. It includes actual changes in foods eaten because people know they will be asked about them, and misrepresentation (deliberate, unconscious or accidental), for example to make their diets appear more 'healthy' or be quicker to report. See the AHS Users' Guide for more information.

Usual Intakes

Usual intakes represent food and nutrient intake over a long period of time. For a single person, dietary intake varies day-to-day. A single 24-hour dietary recall does not represent the usual, or long term, intake of a person because of this variation. In the 2011-12 NNPAS, all respondents were asked for follow-up contact phone details in order to conduct a second 24-hour recall over the phone at least eight days later. A second 24-hour recall was collected from 64% of respondents. The second 24-hour recalls were used to estimate and remove within-person variation in order to derive a usual nutrient intake distribution for the population.

EXPLANATORY NOTES

INTRODUCTION

1 This publication is the fifth release of nutrition data from the 2011-12 National Nutrition and Physical Activity Survey (NNPAS). The first release was published in May 2014. The statistics presented in this publication are only a selection of the nutrition information collected from the NNPAS.

2 The 2011-12 NNPAS was conducted throughout Australia from May 2011 to June 2012. The NNPAS was collected as one of a suite of surveys conducted from 2011-2013, called the Australian Health Survey (AHS).

3 The Australian Health Survey: Consumption of Added Sugar publication contains usual (long term) added and free sugar intake information modelled from two days of 24-hour dietary recall data using the National Cancer Institute (NCI) method. For more information on the NCI method, see the Overview of the NCI Method chapter of the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

4 Usual intakes of added and free sugars are provided by age groups and sex at the national level, including comparison with the World Health Organisation (WHO) recommended intake of free sugars. More information on WHO recommendation of free sugars is available on the Sugars Intake for adults and children website.

SCOPE OF THE SURVEY

5 The National Nutrition and Physical Activity Survey (NNPAS) contains a sample of approximately 9,500 private dwellings across Australia.

6 Urban and rural areas in all states and territories were included, while Very Remote areas of Australia and discrete Aboriginal and Torres Strait Islander communities (and the remainder of the Collection Districts in which these communities were located) were excluded. These exclusions are unlikely to affect national estimates, and will only have a minor effect on aggregate estimates produced for individual states and territories, excepting the Northern Territory where the population living in Very Remote areas accounts for around 23% of persons.

7 Non-private dwellings such as hotels, motels, hospitals, nursing homes and short-stay caravan parks were excluded from the survey. This may affect estimates of the number of people with some chronic health conditions (for example, conditions which may require periods of hospitalisation).

8 Within each selected dwelling, one adult (aged 18 years and over) and, where possible, one child (aged 2 years and over) were randomly selected for inclusion in the survey. Sub-sampling within households enabled more information to be collected from each respondent than would have been possible had all usual residents of selected dwellings been included in the survey.

9 The following groups were excluded from the survey:

- certain diplomatic personnel of overseas governments, customarily excluded from the Census and estimated resident population
- persons whose usual place of residence was outside Australia
- members of non-Australian Defence Forces (and their dependents) stationed in Australia
- visitors to private dwellings.

DATA COLLECTION

10 Trained ABS interviewers conducted personal interviews with selected residents in sampled dwellings. One person aged 18 years and over in each dwelling was selected and interviewed about their own health characteristics including a 24-hour dietary recall and a physical activity module. An adult, nominated by the household, was interviewed about one child (aged two years and over) in the household. Selected children aged 15-17 years may have been personally interviewed with parental consent. An adult, nominated by the household, was also asked to provide information about the household, such as the combined income of other household members. Children aged 6-14 years were encouraged to be involved in the survey, particularly for the 24-hour dietary recall and physical activity module. For further information, see Data Collection in the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

11 All selected persons were required to have a follow-up phone interview at least eight days after the face to face interview to collect a further 24-hour dietary recall. For those who participated, pedometer data was

reported during this telephone interview.

SURVEY DESIGN

12 Dwellings were selected at random using a multistage area sample of private dwellings for the NNPAS.

The initial sample selected for the survey consisted of approximately 14,400 dwellings. This was reduced to approximately 12,400 dwellings after sample loss (for example, households selected in the survey which had no residents in scope of the survey, vacant or derelict buildings, or buildings under construction). Of those remaining dwellings, 9,519 (or 77.0%) were fully or adequately responding, yielding a total sample for the survey of 12,153 persons (aged two years and over).

NNPAS, APPROACHED SAMPLE, FINAL SAMPLE AND RESPONSE RATES

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Aust
Households approached (after sample loss)	2 227	1 983	1 988	1 551	1 545	1 155	911	1 006	12 366
Households in sample	1 666	1 371	1 525	1 211	1 334	1 003	592	817	9 519
Response rate (%)	74.8	69.1	76.7	78.1	86.3	86.8	65.0	81.2	77.0
Persons in sample	2 139	1 749	1 964	1 526	1 706	1 245	763	1 061	12 153

13 Of the 12,153 people in the final sample, 98% provided the first (Day 1), with the missing 2% of Day 1 dietary recalls being imputed. The second 24-hour dietary recall (Day 2) had 7,735 participants (64% of the total). The Day 2 24-hour dietary recall participation was slightly higher among older respondents, and sex did not appear as a factor in participation.

14 More information on response rates and imputation is provided in the AHS: Users' Guide, 2011-13 (cat. no. 4363.0.55.001).

15 To take account of possible seasonal effects on health and nutrition characteristics, the NNPAS sample was spread randomly across a 12-month enumeration period. Between August and September 2011, survey enumeration was suspended due to field work associated with the 2011 Census of Population and Housing.

WEIGHTING, BENCHMARKING AND ESTIMATION

16 Weighting is a process of adjusting results from a sample survey to infer results for the in-scope total population. To do this, a weight is allocated to each sample unit; for example, a household or a person. The weight is a value which indicates how many population units are represented by the sample unit.

17 The first step in calculating weights for each person was to assign an initial weight, which was equal to the inverse of the probability of being selected in the survey. For example, if the probability of a person being selected in the survey was 1 in 600, then the person would have an initial weight of 600 (that is, they represent 600 others). An adjustment was then made to these initial weights to account for the time period in which a person was assigned to be enumerated.

18 The weights are calibrated to align with independent estimates of the population of interest, referred to as 'benchmarks', in designated categories of sex by age by area of usual residence. Weights calibrated against population benchmarks compensate for over or under-enumeration of particular categories of persons and ensure that the survey estimates conform to the independently estimated distribution of the population by age, sex and area of usual residence, rather than to the distribution within the sample itself.

19 The NNPAS was benchmarked to the estimated resident population living in private dwellings in non-Very Remote areas of Australia at 31 October 2011. Excluded from these benchmarks were persons living in discrete Aboriginal and Torres Strait Islander communities, as well as a small number of persons living within Collection Districts that include discrete Aboriginal and Torres Strait Islander communities. The benchmarks, and hence the estimates from the survey, do not (and are not intended to) match estimates of the total Australian resident population (which include persons living in Very Remote areas or in non-private dwellings, such as hotels)

obtained from other sources. For the NNPAS, a seasonal adjustment was also incorporated into the person weights.

20 Survey estimates of counts of persons are obtained by summing the weights of persons with the characteristic of interest. Estimates of non-person counts (for example, number of organised physical activities) are obtained by multiplying the characteristic of interest with the weight of the reporting person and aggregating.

RELIABILITY OF ESTIMATES

21 All sample surveys are subject to sampling and non-sampling error. Estimates derived from models, including the NCI method, are also subject to prediction error and simulation variance.

22 Sampling error is the difference between estimates, derived from a sample of persons, and the value that would have been produced if all persons in scope of the survey had been included. For more information refer to the Technical note. Indication of the level of sampling error is given by the 95% Margin of Error (MoE).

23 In this publication, MoEs are provided for all estimates (unless noted otherwise) to assist users in assessing the reliability of these types of estimate. The estimate combined with the MoE defines a range which is expected to include the true population value with a 95% level of confidence. This is known as the 95% confidence interval. This range should be considered by users to inform decisions based on the estimate.

24 Non-sampling error may occur in any data collection, whether it is based on a sample or a full count such as a census. Non-sampling errors occur when survey processes work less effectively than intended. Sources of non-sampling error include non-response, errors in reporting by respondents or in recording of answers by interviewers, and occasional errors in coding and processing data.

25 Prediction error and simulation variance are forms of error which may occur when using a model such as the NCI method. Care was taken to ensure the input 24-hour dietary recall data was suitable for use in the model. Every effort is made to ensure an appropriate model specification is used through external literature research and statistical testing. For more information see Data Quality in the Users' Guide.

26 Where comparisons with WHO recommended intake have been made, any error in these guideline values will affect the quality of the resulting estimates. The WHO recommends both adults and children to reduce their intake of free sugars to less than 10% of total energy intake.

27 Of particular importance to nutrition surveys is a widely observed tendency for people to under-report their food intake. This can include:

- actual changes in foods eaten because people know they will be participating in the survey
- misrepresentation (deliberate, unconscious or accidental), e.g. to make their diets appear more ‘healthy’ or be quicker to report.

Analysis of the 2011-12 NNPAS suggests that, like other nutrition surveys, there has been some under-reporting of food intake by participants in this survey. Given the association of under-reporting with overweight/obesity and consciousness of socially acceptable/desirable dietary patterns, under-reporting is unlikely to affect all foods and nutrients equally. No respondents were excluded from the sample on the basis of low total reported energy intakes (low energy reporters were included in the input data set for usual nutrient intakes). For more information see Under-reporting in Nutrition Surveys in the AHS Users' Guide, 2011-13.

28 Another factor affecting the accuracy of the 24-hour dietary recall data is that most young children are unable to recall their intakes. Similarly, parents/carers of school-aged children may not be aware of a child’s total food intake, which can lead to systematic under-reporting. Young children were encouraged to assist in answering the dietary recall questions. See the Interviews section of Data Collection for more information on proxy use in the 24-hour dietary recall module.

29 Another source of non-sampling error specific to nutrition surveys is the accuracy of the nutrient and measures database containing thousands of foods used to derive the nutrient estimates. The databases used for the 2011-12 NNPAS were developed by Food Standards Australia New Zealand (FSANZ) specifically for the survey. A complete nutrient profile of 51 nutrients was created based on FSANZ’s latest available data and from this, intakes of 44 nutrients were reported in the NNPAS at the time when the survey results were first released. Not all data was based on directly analysed foods; some data was borrowed from overseas food composition tables, food label information, imputed from similar foods, or calculated using a recipe approach. See AUSNUT

2011-13 for more information.

30 Non-response occurs when people cannot or will not cooperate, or cannot be contacted. Non-response can affect the reliability of results and can introduce bias. The magnitude of any bias depends on the rate of non-response and the extent of the difference between the characteristics of those people who responded to the survey and those who did not.

31 The following methods were adopted to reduce the level and impact of non-response:

- face-to-face interviews with respondents
- the use of interviewers, where possible, who could speak languages other than English
- follow-up of respondents if there was initially no response
- weighting to population benchmarks to reduce non-response bias.

32 By careful design and testing of the questionnaire, training of interviewers, and extensive editing and quality control procedures at all stages of data collection and processing, other non-sampling error has been minimised. However, the information recorded in the survey is essentially 'as reported' by respondents, and hence may differ from information collected using different methodology.

NCI MODEL IMPLEMENTATION

33 There are three NCI model forms that can be applied: one-part, correlated two-part and uncorrelated-two part (see Model Implementation: Data used and Model Specification in the User's Guide for more information on model forms).The one-part model was used when less than 5% of intakes had zero amounts. It was therefore used to model usual intake of added and free sugars as these nutrients were consumed nearly every day by almost everyone. Accordingly, percentage of energy from free sugars was also modelled using the one-part model form.

34 Percentage of energy from free sugars is a distribution of usual ratios. For this publication, these ratios have been first calculated on an individual basis as the total percentage of energy coming from free sugars on the intake day, divided by the total energy intake for the day. This was done for both Day 1 and Day 2 for each respondent. The NCI method was then run on these ratios in a similar way to other food groups. The group usual distribution of these ratios, output from the NCI method, are therefore usual ratio of intakes, that is the usual daily intake ratio. For more information, see Modelling Ratio, in the User's Guide.

35 In the NCI method, covariates are data items or variables that describe characteristics of the individuals within a group, which are relevant to their nutrient or food intake. Four covariates were used in this publication for all models: sex, age, weekend vs weekday, and sequence effect. The purpose of each of these covariates is outlined in Model Implementation: Data used and Model Specification in the User's Guide.

CONFIDENTIALITY

36 The *Census and Statistics Act, 1905* provides the authority for the ABS to collect statistical information, and requires that statistical output shall not be published or disseminated in a manner that is likely to enable the identification of a particular person or organisation. This requirement means that the ABS must take care and make assurances that any statistical information about individual respondents cannot be derived from published data.

ROUNDING

37 Estimates presented in this publication have been rounded. As a result, sums of components may not add exactly to totals.

38 All statistics are rounded to one decimal place in the data cubes.

ACKNOWLEDGEMENTS

39 ABS publications draw extensively on information provided freely by individuals, businesses, governments and other organisations. Their continued cooperation is very much appreciated; without it, the wide range of statistics published by the ABS would not be available. Information received by the ABS is treated in strict confidence as required by the *Census and Statistics Act, 1905*.

40 The ABS gratefully acknowledges and thanks the Agricultural Research Service of the USDA for giving permission to adapt and use their Dietary Intake Data System including the AMPM for collecting dietary intake information as well as other processing systems and associated materials.

41 FSANZ and the ABS jointly investigated and validated the use of the NCI method with the 2011-12 NNPAS. FSANZ was contracted to provide advice throughout the survey development, processing, and collection phases of the 2011-12 NNPAS, and to provide a nutrient database for the coding of foods and dietary supplements consumed. The ABS would like to acknowledge and thank FSANZ for providing their support, advice and expertise to the 2011-12 NNPAS.

42 The ABS gratefully acknowledges and thanks researchers at the National Cancer Institute (NCI) in the USA and elsewhere for developing and making available the NCI method and corresponding SAS macros, and providing expert advice on the use of the method.

PRODUCTS AND SERVICES

43 Summary results from this survey are available in spreadsheet form from the 'Downloads' tab in this release.

44 Because the NCI method produces estimates of usual added and free sugar intakes for population sub-groups and not individuals, usual intake data is not available at the unit record level.

45 Summary tables containing aggregated estimates of the prevalence of intakes above the WHO recommended intake level are available in the ‘Downloads’ tab in this release. Information on how to aggregate estimates for different age and sex groups is in Summary Tables in the Users' Guide.

RELATED PUBLICATIONS

46 Other ABS publications which may be of interest are shown under the 'Related Information' tab of this release.

47 Current publications and other products released by the ABS are listed on the ABS website. The ABS also issues a daily Release Advice on the website which details products to be released in the week ahead.

ABOUT THE NATIONAL NUTRITION AND PHYSICAL ACTIVITY SURVEY

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 2011–12, 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.

Information for the nutrition component of the NNPAS was gathered using a 24-hour dietary recall on all foods, beverages and dietary supplements consumed on the day prior to the interview. Where possible, at least eight days after the first interview, respondents were contacted to participate in a second 24-hour dietary recall via telephone interview.

This publication is the fifth release of information from the nutrition component of the NNPAS and it presents information on the usual intake of added sugars and free sugars, the proportion of energy derived from added and free sugars, as well as the relative contribution of major and sub-major food groups to added and free sugar intake.

The AHS sample included Aboriginal and Torres Strait Islander people where they were randomly selected in the general population. The AHS also included an additional representative sample of Aboriginal and Torres Strait Islander people. The National Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey (NATSINPAS) provides nutrition and physical activity results for Aboriginal and Torres Strait Islander people at the population level and provides an opportunity to compare results with the non-Indigenous population. Results for the analysis of added and free sugars of the NATSINPAS will be released in the second half of 2016.

ACKNOWLEDGEMENTS

The NNPAS has been made possible by additional funding from the Australian Government Department of Health and Ageing as well as the National Heart Foundation of Australia, and the contributions of these two organisations to improving health information in Australia through quality statistics are greatly valued.

The 2011–13 AHS, and particularly the NNPAS component, was developed with the assistance of several advisory groups and expert panels. Members of these groups were drawn from Commonwealth and state/territory government agencies, non-government organisations, relevant academic institutions and clinicians. The contributions made by members of these groups are greatly appreciated.

FSANZ was contracted to provide advice throughout the survey development, processing and collection phases of the 2011-12 NNPAS and to provide a nutrient database for the coding of foods and supplements consumed. For more information, please refer to the FSANZ website. The ABS would like to acknowledge and thank FSANZ for providing their support, advice and expertise to the 2011-12 NNPAS.

The ABS gratefully acknowledges and thanks the Agricultural Research Service of the USDA for giving permission to adapt and use their Dietary Intake Data System including the AMPM for collecting dietary intake information as well as other processing systems and associated materials.

The ABS would like to acknowledge and thank the members of the Expert Reference Group who assisted in the development of this publication:

- Commonwealth Department of Health
- Food Standards Australia New Zealand
- Department of Nutrition and Dietetics, Monash University Melbourne
- Faculty of Health Sciences, University of Sydney

- New South Wales Department of Health

Finally, the success of the 2011–13 AHS was dependent on the very high level of cooperation received from the Australian public. Their continued cooperation is very much appreciated; without it, the range of statistics published by the ABS would not be possible. Information received by the ABS is treated in strict confidence as required by the Census and Statistics Act 1905.

TECHNICAL NOTE

RELIABILITY OF THE ESTIMATES

1 Two types of error are possible in an estimate based on a sample survey: sampling error and non-sampling error. Estimates derived from models, including the NCI method, are also subject to prediction error and simulation variance. The sampling error is a measure of the variability that occurs by chance because a sample, rather than the entire population, is surveyed. Since the estimates in this publication are based on information obtained from occupants of a sample of dwellings they are subject to sampling variability; that is they may differ from the figures that would have been produced if all dwellings had been included in the survey. One measure of the likely difference is given by the standard error (SE). There are about two chances in three that a sample estimate will differ by less than one SE from the figure that would have been obtained if all dwellings had been included, and about 19 chances in 20 that the difference will be less than two SEs.

2 Another measure of the likely difference is given by the Margin of Error (MoE). The MoE describes the distance (or margin) from the estimate that the 'true' value will lie within at a given confidence level. Confidence levels typically used are 90%, 95% and 99%. For example, at the 95% confidence level the MoE indicates that there are about 19 chances in 20 that the estimate will differ by less than the specified MoE from the population value (the figure obtained if all dwellings had been enumerated). The 95% MoE is calculated as 1.96 multiplied by the SE.

3 The MoEs in this publication are calculated at the 95% confidence level. This can easily be converted to a 90% confidence level by multiplying the MoE by

$$\frac{1.645}{1.96}$$

or to a 99% confidence level by multiplying by a factor of

$$\frac{2.576}{1.96}$$

4 A confidence interval expresses the sampling error as a range in which the population value is expected to lie at a given level of confidence. The confidence interval can easily be constructed from the MoE of the same level of confidence by taking the estimate plus or minus the MoE of the estimate. Two types of error are possible in an estimate based on a sample survey: sampling error and non-sampling error.

5 The imprecision due to sampling variability, which is measured by the SE, should not be confused with inaccuracies that may occur because of imperfections in reporting by interviewers and respondents and errors made in coding and processing of data. Inaccuracies of this kind are referred to as the non-sampling error, and they may occur in any enumeration, whether it be in a full count or only a sample. In practice, the potential for non-sampling error adds to the uncertainty of the estimates caused by sampling variability. However, it is not possible to quantify the non-sampling error.

6 Prediction error is the variability attributed to the statistical accuracy of the NCI model used in this publication, including bias due to specification of the model. Simulation error is the variability due to simulating different random effects in order to generate usual distribution intakes. Although every effort is made to ensure an appropriate model specification is used, through external literature research and statistical testing, these errors are not quantified and also add to the uncertainty of the estimates.

COMPARISON OF ESTIMATES

8 Published estimates may also be used to calculate the difference between two survey estimates. Such an estimate is subject to sampling error. The sampling error of the difference between two estimates depends on their SEs and the relationship (correlation) between them. An approximate SE of the difference between two estimates (x-y) may be calculated by the following formula:

$$\mathrm{SE}(x-y)=\sqrt{[\mathrm{SE}(x)]^2+[\mathrm{SE}(y)]^2}$$

9 While the above formula will be exact only for differences between separate and uncorrelated (unrelated) characteristics of sub-populations, it is expected that it will provide a reasonable approximation for all differences likely to be of interest in this publication.

EXAMPLE OF INTERPRETATION OF SAMPLING ERROR

10 Standard errors can be calculated using the MoE. For example the MoE for the estimate of the proportion of females aged 51-70 years whose usual daily proportion of energy from free sugars was greater than or equal to 10% is +/- 3.6 percentage points. The SE is calculated by:

$$\text{SE of estimate} = \left(\frac{MoE}{1.96} \right)$$

$$= \left(\frac{3.6}{1.96} \right)$$

$$= 1.8$$

11 There are about 19 chances in 20 that the estimate of the proportion of females aged 51-70 years whose usual daily proportion of energy from free sugars was greater than or equal to 10% is +/- 3.6 percentage points from the population value.

12 Similarly, there are about 19 chances in 20 that the proportion of females aged 51-70 years whose usual daily proportion of energy from free sugars was greater than or equal to 10% is within the confidence interval of 31.6% to 38.8%.

SIGNIFICANCE TESTING

13 For comparing estimates between surveys or between populations within a survey it is useful to determine whether apparent differences are 'real' differences between the corresponding population characteristics or simply the product of differences between the survey samples. One way to examine this is to determine whether the difference between the estimates is statistically significant. This is done by calculating the standard error of the difference between two estimates (x and y) and using that to calculate the test statistic using the formula below:

$$\frac{|x-y|}{SE(x-y)}$$ where SE(x-y) is given in 8 above.

14 If the value of the statistic is greater than 1.96 then we may say there is good evidence of a statistically significant difference at 95% confidence levels between the two populations with respect to that characteristic. Otherwise, it cannot be stated with confidence that there is a real difference between the populations.

Australian Bureau of Statistics

INQUIRIES

For further information about these and related statistics, contact the National Information and Referral Service on 1300 135 070.