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AIHW

Nutrition across the life stages



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Board Chair
Mrs Louise Markus

Director
Mr Barry Sandison

Any enquiries relating to copyright or comments on
this publication should be directed to:

Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601

Tel: (02) 6244 1000

Email: info@aihw.gov.au

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Abbreviations

ABS	Australian Bureau of Statistics
ADGs	Australian Dietary Guidelines
AIHW	Australian Institute of Health and Welfare
BMI	body mass index
CSIRO	Commonwealth Scientific and Industrial Research Organisation
NHMRC	National Health and Medical Research Council
NRVs	Nutrient Reference Values
WHO	World Health Organization

Symbols

↓	decrease
g	gram
↑	increase
kg	kilogram
kJ	kilojoule
L	litre
m	metre
µg	microgram
mg	milligram
ml	millilitre
—	nil or rounded to zero
nmol	nanomoles
~	no change
n.a.	not available
pmol	picomoles

Summary

The food we eat plays an important role in our health and wellbeing. Good nutrition contributes to quality of life, helps maintain healthy body weight, protects against infection, and reduces the risk of chronic conditions and premature death. Chronic conditions—often linked with a poor diet—are the major cause of ill health in Australia.

Australia has national dietary guidelines to support optimal nutritional and health outcomes for the population. This report looks at whether Australians are meeting these guidelines, and how results differ across the life stages.

It shows that Australians of all ages generally:

- do not eat enough of the 5 food groups—vegetables, fruit, grains, meat and alternatives, and dairy products and alternatives
- eat too much food that is high in energy and low in nutrients ('discretionary food')
- eat too much sugar, saturated fat, and sodium (salt).

This suboptimal food and nutrient intake begins from an early age (as young as 2), which means good eating practices are not being established in early childhood to take forward into adulthood.

Despite this, the nutrient intake and nutrient status of Australians is generally adequate, but physical activity levels are low, and levels of overweight and obesity are high.

Leading contributors to discretionary food intake include pastries, snack foods and ice cream, while for adults, alcoholic drinks also dominate. Although sugar-sweetened drinks are leading contributors to added sugars intake, they feature lower down the list of leading discretionary foods for most age groups.

Australians do not eat according to the 5 food group recommendations

Nearly all Australians (99%) aged 2–18, and 9 in 10 adults aged 19 and over do not eat the recommended number of daily serves of vegetables.

Although intake of fruit is closest to meeting the recommended daily serves, nearly 4 in 5 adults (77%) aged 19–50 still do not eat enough fruit.

Intake of dairy products and alternatives for the younger population meets or approaches the recommended serves, but reduces substantially from age 9, with more than 80% of the population not eating enough dairy serves.

About one-third of Australians' energy comes from discretionary food, including alcohol

Discretionary foods are high in energy but low in nutrients, and are not needed to meet nutrient requirements. About one-third of Australians' energy comes from these foods and the proportion is even higher for teenagers aged 14–18, at 41%.

For children, sweet biscuits, cakes and muffins, potato and corn chips, pastries, ice cream and fried potato products are leading contributors to discretionary food intake.

For adults aged 51–70, alcoholic drinks account for more than one-fifth (22%) of discretionary food intake.

Australians consume more sugars, saturated fat and sodium than recommended

The high discretionary food intake of Australians is at the expense of more nutritious foods from the 5 food groups, and may contribute to Australians exceeding the recommendations for intake of added sugars, saturated fat and sodium.

- Soft drinks, fruit and vegetable juices and drinks, cakes and muffins, cordials and sweet biscuits are leading contributors to added sugars intake across all age groups.
- Sweet biscuits, muffins and cakes, processed meat, butter and other dairy products and chocolate confectionary are leading contributors to saturated fat intake across all age groups.
- Bread; meat, poultry and game products and dishes; cereal products and dishes; savoury sauces and condiments; and cheese are the leading contributors to sodium intake.

Australians generally get enough key nutrients in their diet

Despite not eating the recommended serves of the 5 food groups and consuming a high amount of discretionary food, the nutrient intake of Australians, as a whole, is not adversely affected. However, iron and calcium intakes for girls and women in some age groups do need to improve.

Australians are consuming less discretionary food than in the past

Since 1995, the contribution of total sugars, added sugars, total fat and saturated fat to energy intake has generally decreased. This may be a reflection of the decrease in discretionary food intake seen for most age groups. For children, intakes of grain food and meat and alternatives serves have increased. For adults, intakes of vegetable serves have decreased, while intakes of meat and alternatives serves have increased.

Although Australians are consuming less discretionary food overall, in 2011–12 alcohol made up a larger proportion of total energy intake than in 1995 for people aged 50 and over (4.1% compared with 5.6% for those aged 51–70, and 2.7% compared with 4.0% for those aged 71 and over).

Overweight and obesity levels are high and physical activity levels are low

Levels of physical activity across the population groups are generally low, and the prevalence of overweight and obesity is high, reaching 81% for males aged 51–70.

The diets of Indigenous and non-Indigenous Australians are largely similar

Overall, the diets of Indigenous and non-Indigenous Australians are similar. However, Indigenous adults in some age groups eat less fruit, vegetables and dairy products and alternatives. They also have a lower intake of fibre and a higher intake of discretionary food and added sugars than non-Indigenous adults.

Socioeconomic status and distance from a major city influence diet, physical activity and overweight and obesity

On average, Australians living in *Major cities*, or in higher socioeconomic areas, have more favourable food and nutrient intakes, higher levels of physical activity, and lower levels of overweight and obesity.

How do Australians compare across the life stages?

Males

2–3	4–8	9–13	14–18	19–30	31–50	51–70	71 and over
Five food groups—mean intake against the recommended serves							
Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖
Fruit ✔	Fruit ✔	Fruit ✖	Fruit ✖	Fruit ✖	Fruit ✖	Fruit ✖	Fruit ✖
Grains ✖	Grains ✔	Grains (9–11) ✔ Grains (12–13) ✖	Grains ✖	Grains ✖	Grains ✖	Grains ✖	Grains ✖
Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖
Dairy ✔	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖
Discretionary food—proportion (%) of energy from discretionary foods (broad recommendation is to limit intake)							
29	39	39	41	36	37	35	36
Added sugars—proportion (%) of energy from added sugars (broad recommendation is to limit intake)							
8.4	11	11	13	11	9.4	7.8	8.5
Saturated and trans fats—proportion (%) of energy from saturated and trans fats (recommended less than 10% for ages 14 and over)							
14	14	14	13	12	12	12	12
Sodium—mean intake (mg/day) as a proportion (%) of the adequate intake level (upper end of range)							
379	373	332	339	339	317	273	241
Calcium—proportion (%) of the population with intakes less than the estimated average requirement							
0.7	11	46 (9–11) 67 (12–13)	71	44	43	63	90
Iron—proportion (%) of the population with intakes less than the estimated average requirement							
8.5	5.9	3.3	8.3	2.2	2.2	2.8	3.1
Dietary folate equivalents—proportion (%) of the population with intakes less than the estimated average requirement							
—	—	0.4	1.2	2.8	2.3	2.5	1.6
Iodine—proportion (%) of the population with intakes less than the estimated average requirement							
0.1	0.1	0.3	0.8	1.5	1.6	3.5	4.2
Fibre—mean intake (g/day) as a proportion (%) of the adequate intake level							
121	112	95	80	81	83	83	84

(continued)

Males (continued)

2-3	4-8	9-13	14-18	19-30	31-50	51-70	71 and over
Physical activity— proportion (%) of the population meeting the physical activity recommendations							
73	46	19	17	57	47	41	25
Overweight and obesity— proportion (%) of the population who are overweight or obese							
24	20	32	33	55	73	81	76
Waist circumference— proportion (%) of the population with a waist circumference above the 'substantially increased risk' cut-off							
n.a.	n.a.	n.a.	n.a.	20	29	49	55
Nutrient biomarker, vitamin D—proportion (%) of the population with adequate status							
n.a.	n.a.	n.a.	76	61	75	81	84
Nutrient biomarker, red blood cell folate—mean (nmol/L) (cut-off for deficiency is below 340 nmol/L)							
n.a.	n.a.	n.a.	1,544	1,612	1,700	1,753	1,786
Nutrient biomarker, vitamin B12—mean (pmol/L) (cut-off for deficiency is below 150 pmol/L)							
n.a.	n.a.	n.a.	381	401	379	339	309
Nutrient biomarker, iron—mean (µg/L) (cut-off for deficiency is below 15 µg/L)							
n.a.	n.a.	n.a.	70	150	216	233	207
Nutrient biomarker, iodine—median urinary iodine concentration (µg/L) (cut-off for deficiency is below 100 µg/L)							
n.a.	n.a.	170	141	135	130	125	132



Females

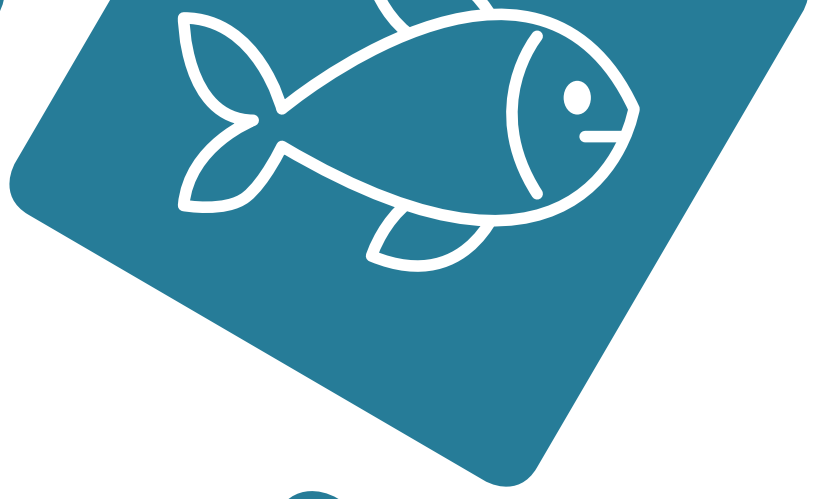
2–3	4–8	9–13	14–18	19–30	31–50	51–70	71 and over
Five food groups—mean intake against the recommended serves							
Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖	Vegetables ✖
Fruit ✔	Fruit ✔	Fruit ✖	Fruit ✖	Fruit ✖	Fruit ✖	Fruit ✖	Fruit ✖
Grains ✖	Grains ✖	Grains (9–11) ✔ Grains (12–13) ✖	Grains ✖	Grains ✖	Grains ✖	Grains ✖	Grains ✔
Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖	Meat ✖
Dairy ✔	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖	Dairy ✖
Discretionary food—proportion (%) of energy from discretionary foods (broad recommendation is to limit intake)							
32	36	40	41	35	33	31	32
Added sugars—proportion (%) of energy from added sugars (broad recommendation is to limit intake)							
8.1	11	12	12	11	8.9	7.7	8.0
Saturated and trans fats—proportion (%) of energy from saturated and trans fats (recommended less than 10% for ages 14 and over)							
14	13	14	14	13	12	12	12
Sodium—mean intake (mg/day) as a proportion (%) of the adequate intake level (upper end of range)							
362	311	283	261	250	234	214	193
Calcium—proportion (%) of the population with intakes less than the estimated average requirement							
2.4	21	54 (9–11) 84 (12–13)	90	71	67	91	94
Iron—proportion (%) of the population with intakes less than the estimated average requirement							
15	11	11	40	38	38	5.0	6.7
Dietary folate equivalents—proportion (%) of the population with intakes less than the estimated average requirement							
—	—	1.2	7.9	11	11	7.6	6.1
Iodine—proportion (%) of the population with intakes less than the estimated average requirement							
0.5	0.3	0.5	6.4	12	9.0	11	9.2
Fibre—mean intake (g/day) as a proportion (%) of the adequate intake level							
109	96	96	88	81	83	89	84

(continued)

Females (continued)

2–3	4–8	9–13	14–18	19–30	31–50	51–70	71 and over
Physical activity— proportion (%) of the population meeting the physical activity recommendations							
78	40	15	15	52	47	38	20
Overweight and obesity— proportion (%) of the population who are overweight or obese							
18	25	26	28	38	56	67	67
Waist circumference— proportion (%) of the population with a waist circumference above the ‘substantially increased risk’ cut-off							
n.a.	n.a.	n.a.	n.a.	24	42	59	63
Nutrient biomarker, vitamin D—proportion (%) of the population with adequate status							
n.a.	n.a.	n.a.	76	68	76	81	75
Nutrient biomarker, red blood cell folate—mean (nmol/L) (cut-off for deficiency is below 340 nmol/L)							
n.a.	n.a.	n.a.	1,551	1,570	1,725	1,759	1,823
Nutrient biomarker, vitamin B12—mean (pmol/L) (cut-off for deficiency is below 150 pmol/L)							
n.a.	n.a.	n.a.	355	347	374	388	370
Nutrient biomarker, iron—mean (µg/L) (cut-off for deficiency is below 15 µg/L)							
n.a.	n.a.	n.a.	35	47	68	124	128
Nutrient biomarker, iodine—median urinary iodine concentration (µg/L) (cut-off for deficiency is below 100 µg/L)							
n.a.	n.a.	166	148	116	119	108	130





Introduction



The food we eat plays an important role in health and wellbeing. Good dietary choices contribute to healthy weight, quality of life, resistance to infection, and protection against chronic disease and premature death (NHMRC 2013). Conversely, poor dietary choices are associated with ill health. A number of dietary factors are involved in the development of chronic conditions, and in some cases there is strong evidence of a direct association. These include:

- a high intake of saturated fat being linked with coronary heart disease and type 2 diabetes (WHO 2003)
- insufficient intakes of calcium and/or vitamin D being linked with osteoporosis (Ebeling et al. 2013; Hendrickx et al. 2015)
- a high intake of processed (preserved) meat being linked with colorectal cancer (WCRF & AICR 2010).

Dietary factors also play an indirect role in the development of chronic conditions, such as through the effect on body weight (obesity), high blood pressure and abnormal blood lipids.

Chronic conditions are the major cause of disease burden in Australia. Diet has been implicated in 3 chronic conditions that, combined, cause nearly half of Australia's burden of disease—cancer (19%), cardiovascular disease (15%) and musculoskeletal conditions (12%) (AIHW 2016a).

As a risk factor for ill health, overweight and obesity contributes 7.0% towards the total disease burden in Australia (AIHW 2017a), while smoking contributes 9.0%, alcohol use 4.6% and physical inactivity 2.6% (AIHW 2016a, 2017b, 2018b).

In terms of dietary risk factors, a diet low in fruit contributes 2.0% to ill health, a diet low in vegetables contributes 1.4% and a diet high in processed meat contributes 1.4% (AIHW 2016a).

So what type of food should we be eating to stay as healthy as possible? The Australian Dietary Guidelines (ADGs) provide advice about the types and amount of foods that we need to eat for health and wellbeing. No single food—apart from breast milk for about the first 6 months of life—provides all the nutrients (such as proteins, minerals and vitamins) needed for good health. The ADGs encourage the consumption of a variety of nutritious foods to meet nutrient requirements and provide overall health benefits, including lowering the risk of chronic disease (NHMRC 2013).



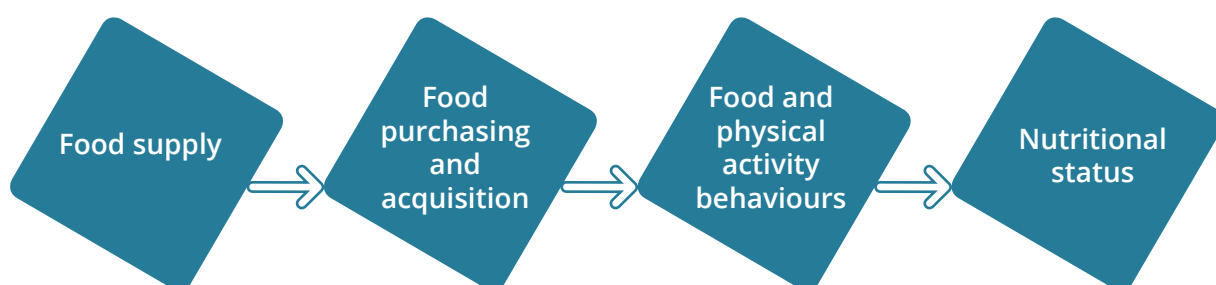
Food and nutrition monitoring

A food and nutrition monitoring system measures the supply and intake of food and health outcomes across the population. A framework developed for Australia has 4 elements:

1. food supply—availability of foodstuffs, and composition of Australian foods
2. food purchasing/acquisition—spending on food, types of food purchases, price, quantities bought, food security
3. food and physical activity behaviours—food and nutrient intakes, physical activity
4. nutritional status—biological measures (Masters et al. 2006).

Data from each element are useful for various purposes and, as a whole, help to build a complete picture of food and nutrition in Australia (Figure 1.1).

Figure 1.1: Framework for a national food and nutrition monitoring system



Source: Masters et al. 2006.

In 2012, the second edition of *Australia's food and nutrition 2012* (AIHW 2012), which was based on this monitoring framework, outlined:

- the global food system and the policy environment in Australia
- Australia's food supply
- the selection of food by consumers
- food and nutrient intakes
- the nutritional status and health of Australians.



This report updates the information on food and nutrient intakes and nutritional status and health that was included in *Australia's food and nutrition 2012*.

The purpose of this report is to investigate the adequacy of the Australian diet across various life stages, which will help inform the evidence base on nutrition-related health determinants for chronic conditions. It brings together the latest available data from various sources, including some previously published results, and includes new analysis, such as reporting by socioeconomic groups and remoteness areas.

The data, where possible, are presented according to the following demographics:

- males and females aged: 2–3, 4–8, 9–13, 14–18, 19–30, 31–50, 51–70, 71 and over (these age groups are based on the Nutrient Reference Values (NRVs) for Australia and New Zealand; data are not available for the population aged less than 2)
- remoteness area
- socioeconomic groups.

Where the data permit, intakes and outcomes for Aboriginal and Torres Strait Islander Australians have been compared with those for non-Indigenous Australians. For much of the data, this is possible up to the age group 31–50, after which the sample for the Indigenous population is too small to be broken down.

Structure of this report

The remaining chapters in the report present the following information:

- Chapter 2 provides an overview of the dietary, exercise and body weight recommendations for Australians.
- Chapter 3 presents the food and nutrition measures (indicators) that are used for the analysis in this report. These are based on the dietary recommendations.
- Chapter 4 provides an overview of the data sources used for this report.
- Chapters 5 and 6 outline the detailed findings of food and nutrient intakes and health outcomes against the identified measures.
- Chapter 7 provides an overview of differences in food and nutrient intakes and health outcomes across different socioeconomic groups and remoteness areas.
- Chapter 8 presents changes in food and nutrient intakes since past nutrition surveys.
- Chapter 9 discusses the findings in this report.

Supplementary data tables for the data presented throughout this report are available on the AIHW website at: <<https://www.aihw.gov.au/reports/food-nutrition/nutrition-across-the-life-stages/data>>.



Australian recommendations on diet, exercise and body weight

2

Nutrient Reference Values

The Nutrient Reference Values (NRVs) are reference values for Australians that represent the levels of nutrients needed to meet the known nutritional needs of the healthy population. They can be used to assess the likelihood of inadequate or excess intake in individuals or groups of people.

The NRVs are broadly specified for infants aged 0–6 and 7–12 months, children aged 1–3 and 4–8, then males and females separately for age groups 9–13, 14–18, 19–30, 31–50, 51–70 and 71 and over.

While NRVs are expressed on a per day basis, they should apply to intakes assessed over a period of about 3–4 days. The different NRVs are detailed in Box 2.1, and their specific uses in relation to dietary intake are detailed in Table 2.1.

Box 2.1: Definitions of Nutrient Reference Values

EAR Estimated average requirement

A daily nutrient level estimated to meet the requirements of half the healthy individuals in a particular life stage and sex.

RDI Recommended dietary intake

The average daily dietary intake level that is sufficient to meet the nutrient requirements of nearly all (97%–98%) healthy individuals in a particular life stage and gender group.

AI Adequate intake (used when an RDI cannot be determined)

The average daily nutrient intake level based on observed or experimentally-determined approximations or estimates of nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate.

EER Estimated energy requirement

The average dietary energy intake that is predicted to maintain energy balance in a healthy adult of defined age, gender, weight, height and level of physical activity, consistent with good health. In children and pregnant and lactating women, the EER is taken to include the needs associated with the deposition of tissues or the secretion of milk at rates consistent with good health.

UL Upper level of intake

The highest average daily nutrient intake level likely to pose no adverse health effects to almost all individuals in the general population. As intake increases above the UL, the potential risk of adverse effects increases.

Source: NHMRC & NZMoH 2006.



Table 2.1: Uses of the Nutrient Reference Values

Nutrient Reference Value	For individuals	For groups
Estimated average requirement	Use to examine the probability that usual intake is inadequate	Use to estimate the prevalence of inadequate intakes within a group
Recommended dietary intake	Usual intake at or above this level has a low probability of inadequacy	Do not use to assess intakes of groups
Adequate intake	Usual intake at or above this level has a low probability of inadequacy. When the adequate intake is based on median intakes of healthy populations, this assessment is made with less confidence	Mean usual intake at or above this level implies a low prevalence of inadequate intakes. When the adequate intake is based on median intakes of healthy populations, this assessment is made with less confidence
Upper level of intake	Usual intake above this level may place an individual at risk of adverse effects from excessive nutrient intake	Use to estimate the percentage of the population at potential risk of adverse effects from excessive nutrient intake

Source: NHMRC & NZMoH 2006.

There are 2 additional sets of reference values for selected nutrients for chronic disease prevention (Box 2.2). These relate to nutrients for which there is a reasonable body of evidence suggesting they can help prevent chronic conditions at levels substantially higher than the estimated average requirement, recommended dietary intake, or adequate intake. These reference values only apply to the population aged over 14.

Box 2.2: Nutrient Reference Values for chronic disease prevention

AMDR Acceptable macronutrient distribution range

An estimate of the range of intake for each macronutrient for individuals (expressed as a percentage contribution to energy), which would allow for an adequate intake of all the other nutrients while maximising general health outcome.

SDT Suggested dietary target

A daily average intake from food and drinks for certain nutrients that may help in prevention of chronic disease.

Source: NHMRC & NZMoH 2006.



Australian Dietary Guidelines

The Australian Dietary Guidelines (ADGs) detail the foods, food groups and dietary patterns that provide the nutrients required for optimal health and wellbeing, and to protect against chronic disease (NHMRC 2013).

Together with the Australian Guide to Healthy Eating, the ADGs translate the nutrient recommendations (NRVs) into food and lifestyle patterns for the population. Each guideline is considered to be equally important to public health outcomes.

The ADGs can be used to evaluate the eating patterns of Australians. Each guideline is presented in this section along with additional information from Australian and international sources to provide further context.



Achieve and maintain a healthy weight

To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious foods and drinks to meet your energy needs.

Being a healthy weight reduces the risk of chronic diseases, including cardiovascular disease, type 2 diabetes and some cancers. The key to maintaining a healthy weight is ensuring total energy intake does not often exceed total energy expenditure.

Physical activity

Australia's physical activity and sedentary behaviour guidelines for different population groups are specified below:

	Age group (years)			
	2–5 ^(a)	5–17 ^(b)	18–64	65 and over
Physical activity	At least 180 minutes per day	At least 60 minutes per day	At least 150 minutes over 5 sessions	At least 30 minutes per day
Sedentary or screen based activity	Should not be restrained for more than 60 minutes at a time ^(c) No more than 60 minutes sedentary screen time per day	No more than 120 minutes of screen use per day Break up long periods of sitting	Minimise and break up prolonged periods of sitting	Be as active as possible
Strength	..	Muscle strengthening activities 3 times a week	Muscle strengthening activities 2 times a week	Incorporate muscle strengthening activities

.. not applicable.

(a) This group includes those aged 5 who are not yet in full-time schooling (for example, pre-schoolers).

(b) This group includes those aged 5 who are in full-time schooling.

(c) Examples include being restrained in a stroller, car seat or high chair.

Sources: Department of Health 2014a, 2014b; Department of Health 2017; Department of Veterans Affairs and Department of Health 2005.

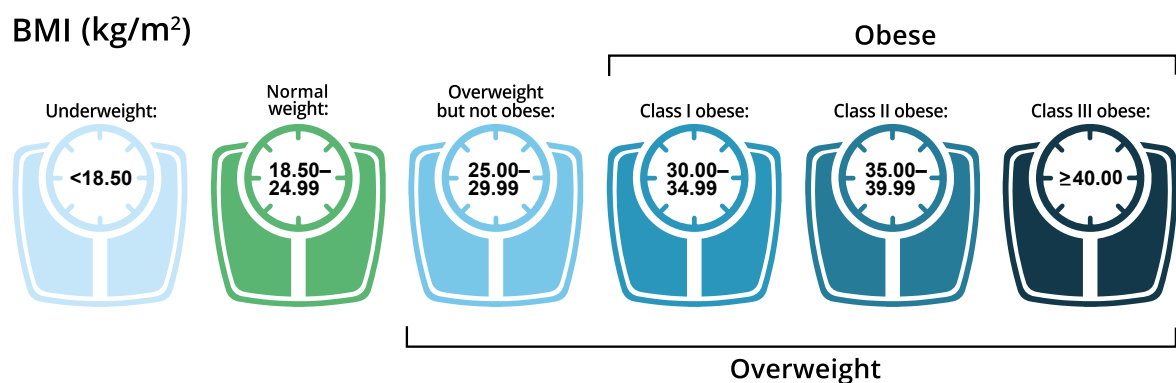


Assessing healthy weight

Overweight and obesity can be measured in a number of ways, including the commonly used body mass index (BMI). BMI is an internationally recognised measure of excess body fat at a population level for both adults and children. It is defined as a person's weight in kilograms divided by the square of their height in metres (kg/m^2). The BMI ranges are based on the effect of excessive body fat on disease and death. Figure 2.1 details the BMI ranges for adults aged 20 and over. For children and adolescents, age-related cut-offs or standard deviation scores are used (WHO 2016).

Differences in body composition mean that these classifications may not be suitable for all ethnic groups, as well as older adults. For example, an optimal BMI for life expectancy in older people is said to be $27\text{--}30 \text{ kg}/\text{m}^2$ (ANZSGM 2011; Winter et al. 2014).

Figure 2.1: Body mass index categories for adults



Source: WHO 2016.

Body fat can also be measured through waist circumference, with a higher waist measurement associated with an increased risk of chronic disease. Risk is increased at 80 cm or more for women and 94 cm or more for men, and high at 88 cm or more for women and 102 cm or more for men. As with BMI, these cut-offs may not be appropriate for all ethnic groups (WHO 2011) or children and adolescents.





Enjoy a wide variety of nutritious foods

Enjoy a wide variety of nutritious foods from the 5 food groups every day:

- plenty of vegetables, including different types and colours, and legumes/beans
- fruit
- grain (cereal) foods, mostly wholegrain and/or high fibre varieties, such as breads, cereals, rice, pasta, noodles, polenta, couscous, oats, quinoa and barley
- lean meats and poultry, fish, eggs, tofu, nuts, seeds and legumes/beans
- milk, yoghurt, cheese and/or their alternatives, mostly reduced fat (reduced fat milks are not suitable for children under 2).

And drink plenty of water.

Eating a wide variety of nutritious foods helps meet nutrient requirements and, along with Guideline 1 (achieving and maintaining a healthy weight) and Guideline 3 (limiting intake of foods high in saturated fat, added sugars and/or salt) helps reduce the risk of chronic disease.

The ADGs specify the recommended minimum number of serves from the 5 food groups, that different age and sex groups should usually consume per day (Table 2.2), which is represented visually in the Australian Guide to Healthy Eating, available at: <https://www.eatforhealth.gov.au/guidelines/australian-guide-healthy-eating>.

Also specified are standard serve sizes of foods within the 5 food groups, which, along with the 'serves per day', give an indication of the total daily amount of food required by the population (Table 2.3). People who are taller or more physically active (and not overweight or obese) may choose to consume additional serves of the 5 food groups (or unsaturated spreads and oils, or discretionary foods).

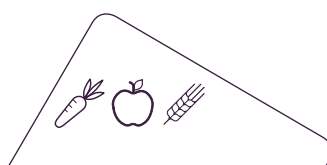


Table 2.2: Recommended minimum daily serves from the 5 food groups for various groups

Age/ population group	Vegetables and legumes/beans	Fruit	Grain (cereal) foods ^(a)	Lean meats and alternatives ^(b)	Milk, yoghurt, cheese and alternatives ^(c)
Boys					
2–3	2.5	1.0	4.0	1.0	1.5
4–8	4.5	1.5	4.0	1.5	2.0
9–11	5.0	2.0	5.0	2.5	2.5
12–13	5.5	2.0	6.0	2.5	3.5
14–18	5.5	2.0	7.0	2.5	3.5
Girls					
2–3	2.5	1.0	4.0	1.0	1.5
4–8	4.5	1.5	4.0	1.5	1.5
9–11	5.0	2.0	4.0	2.5	3.0
12–13	5.0	2.0	5.0	2.5	3.5
14–18	5.0	2.0	7.0	2.5	3.5
Pregnant	5.0	2.0	8.0	3.5	3.5
Breastfeeding	5.5	2.0	9.0	2.5	4.0
Men					
19–50	6.0	2.0	6.0	3.0	2.5
51–70	5.5	2.0	6.0	2.5	2.5
70+	5.0	2.0	4.5	2.5	3.5
Women					
19–50	5.0	2.0	6.0	2.5	2.5
51–70	5.0	2.0	4.0	2.0	4.0
70+	5.0	2.0	3.0	2.0	4.0
Pregnant	5.0	2.0	8.5	3.5	2.5
Breastfeeding	7.5	2.0	9.0	2.5	2.5

(a) Grain (cereal) foods, mostly wholegrain and/or high fibre cereal varieties.

(b) Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans.

(c) Milk, yoghurt, cheese and/or alternatives, mostly reduced fat.

Source: NHMRC 2013.



Table 2.3: Serve size of foods within the 5 food groups

Food group	Serve size
Vegetables and legumes/beans	75 g (½ cup) cooked green or <i>Brassica</i> or cruciferous vegetables
	75 g (½ cup) cooked orange vegetables
	75 g (½ cup) cooked dried or canned beans, chickpeas or lentils, no added salt
	75 g (1 cup) raw green leafy vegetables
	75 g starchy vegetables (for example, ½ medium potato, or equivalent of sweet potato, taro, sweet corn or cassava)
	75 g other vegetables (for example, 1 medium tomato)
Fruit	150 g (1 piece) of medium-sized fruit (for example, apple, banana, orange, pear)
	150 g (2 pieces) of small fruit (for example, apricots, kiwi fruit, plums)
	150 g (1 cup) diced, cooked or canned fruit ^(a)
	125 ml (½ cup) 100% fruit juice ^{(a)(b)}
	30 g dried fruit ^{(a)(b)} (for example, 4 dried apricot halves, 1½ tablespoons of sultanas)
Grain (cereal) foods, mostly wholegrain and/or high fibre cereal varieties	1 slice of bread or ½ a medium roll or flat bread (40g)
	½ cup cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa (75–120 g)
	½ cup cooked porridge (120 g), 2/3 cup wheat cereal flakes (30 g) or ¼ cup muesli (30 g)
	3 crispbreads (35 g)
	1 crumpet (60 g) or 1 small English muffin or scone (35 g)
	¼ cup flour (30 g)
Lean meats and poultry, fish, eggs, tofu, nuts and seeds, and legumes/beans	65 g cooked lean red meats (for example, beef, lamb, pork, venison or kangaroo) or ½ cup of lean mince, 2 small chops
	2 slices of roast meat (about 90–100 g raw weight)
	80 g cooked poultry (about 100 g raw weight) (for example, chicken, turkey)
	100 g cooked fish fillet (about 115 g raw weight) or 1 small can of fish, no added salt, not in brine
	2 large eggs (120 g)
	1 cup (150 g) cooked dried beans, lentils, chickpeas, split peas, or canned beans
	170 g tofu
	30 g nuts or seeds or nut/seed paste, no added salt ^(b)
Milk, yoghurt, cheese and/or alternatives, mostly reduced fat	1 cup (250 ml) milk—fresh, UHT long life or reconstituted powdered
	½ cup (120 ml) evaporated unsweetened milk
	¾ cup (200 g) yoghurt
	40 g (2 slices or 4 x 3 x 2 cm piece) hard cheese (for example, cheddar)
	½ cup (120 g) ricotta cheese
	1 cup (250 ml) soy, rice or other cereal drink with at least 100 mg of added calcium per 100 ml

(a) Preferably with no added sugar.

(b) Only to be used occasionally as a substitute for other foods in the group.

Source: NHMRC 2013.





Limit intake of foods containing saturated fat, added salt, added sugars and alcohol

- Replace high fat foods that contain predominantly saturated fats with foods that contain predominantly polyunsaturated and monounsaturated fats.
- Read labels to choose lower sodium options among similar foods and don't add salt to foods in cooking or at the table.
- Limit intake of foods and drinks containing added sugars, such as confectionary, sugar-sweetened soft drinks and cordials, fruit drinks, vitamin waters, and energy and sports drinks.
- If you choose to drink alcohol, limit intake.

This guideline partly focuses on 'discretionary food'; that is, foods high in energy but low in nutrients, and is based on evidence that these foods are associated with increased risk of obesity and/or chronic diseases. These foods are not needed to meet nutrient requirements; however, it is recognised that they can contribute to the overall enjoyment of eating. There is limited capacity for including discretionary foods within the diets of many Australians, and when consumed, serving sizes should be small.

Discretionary food includes cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

A serve of discretionary food is the amount that contains 600 kJ; for example, 2 scoops of ice cream, 2 slices of processed meat, 2–3 sweet biscuits, 1 slice plain cake or ½ small chocolate bar.



A purple diamond-shaped icon containing the word 'Guideline' in a small font and the number '4' in a large, bold font.

Encourage, support and promote breastfeeding

Breast milk contains many unique compounds that provide all the nutritional requirements to support the growth and development of infants to around 6 months of age. Breastfeeding and breast milk also provide benefits beyond nutrition.

Further details on breastfeeding recommendations are outlined in Australia's Infant Feeding Guidelines (NHMRC 2012). The guidelines specify that breastfeeding provides major health benefits to infants and their mothers. For infants, breastfeeding offers protection against infection and some chronic conditions and their risk factors, including type 1 and 2 diabetes, high blood pressure and obesity. Mothers who breastfeed also benefit from a reduced risk of ovarian and breast cancer and diabetes (Gunderson et al. 2018).

The Infant Feeding Guidelines recommend infants should be exclusively breastfed to around 6 months of age, after which solid foods are introduced. Breastfeeding can continue until the age of 12 months and beyond, if both mother and infant wish (NHMRC 2012). Exclusive breastfeeding means the child receives only breastmilk (including expressed milk) and no other fluids, food or water (with the exception of vitamins, minerals and medicines where necessary).

A purple diamond-shaped icon containing the word 'Guideline' in a small font and the number '5' in a large, bold font.

Food safety

- Care for your food—prepare and store it safely.

This guideline addresses foodborne illness and the importance of handling food correctly, and storing food at the appropriate temperature.



Food and nutrition measures

3

The national dietary recommendations provide the basis for defining the measures to be used in the analysis of food and nutrient intakes and health outcomes.

Food and nutrient intakes and physical activity

Examining food and nutrient intakes as well as levels of physical activity aligns with the ‘food and physical activity behaviours’ component of the *Framework for a national food and nutrition monitoring system*, as detailed in Chapter 1. This requires information on food and nutrient intakes, physical activity and food habits.

The NRVs and the ADGs are key tools for assessing the quality of the diet of the Australian population. Table 3.1 outlines the food, nutrition and physical activity components to be assessed, the rationale, and the measure (indicator) that will be used for the analysis in this report.

Table 3.1: Food and nutrient intake and physical activity measures

Component	Rationale	Measure
Australian Dietary Guidelines 5 food groups	A diet based on the recommended serves of the 5 food groups helps provide the nutrients required for optimal health and protect against chronic disease.	Mean number of food group serves consumed. Proportion of the population meeting the recommended serves.
Discretionary foods	The ADGs specify the limited capacity for including discretionary foods within the diets of many Australians, which includes cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks. While acknowledging that these foods can contribute to the overall enjoyment of eating, if their intake is not reduced, there needs to be a substantial increase in the level of physical activity by most Australians to counter the additional energy that comes from these foods.	Proportion of energy from discretionary foods.
Added and free sugars	A specific recommendation in the ADGs is to limit intake of foods containing added sugars. In addition, the World Health Organization (WHO) recommends that in both adults and children intakes of free sugars should represent less than 10% of total energy intake (WHO 2015). <i>Note:</i> Added sugars include monosaccharides and disaccharides added to foods and drinks by the manufacturer, cook or consumer. Free sugars also includes sugars naturally present in honey, syrups, fruit juices and fruit juice concentrates (WHO 2015).	Mean intake of added sugars. Proportion of energy from added sugars. Proportion of the population with intake of free sugars greater than or equal to 10% of energy intake.

(continued)

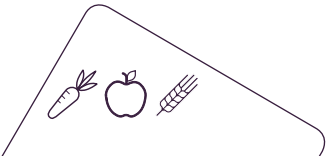


Table 3.1 (continued): Food and nutrient intake and physical activity measures

Component	Rationale	Measure
Saturated and trans fats	The ADGs recommend limiting intake of foods containing saturated fat. For the population aged 14 and over, the NRVs specify that saturated and trans fats together should be limited to no more than 10% of energy.	Proportion of energy from saturated fat and trans fat combined.
Sodium	The ADGs recommend to limit intake of foods containing added salt (sodium), and the NRVs specify a level of adequate intake. In 2017, the NRVs were updated to remove the upper level of intake for sodium for adults (and will likely be removed for children). This was previously used to assess the proportion of the population at risk of excessive intake. The upper level of intake was removed because of new evidence that highlights the difficulty in establishing a single point below which there is no risk to adverse health outcomes from high blood pressure associated with sodium intake.	Mean sodium intake against the adequate intake.
Key nutrients • calcium • iron • iodine • dietary folate equivalents • fibre	These nutrients have been identified as particularly important for different age and sex groups. The NRVs specify an estimated average requirement for calcium, iron, iodine, and dietary folate equivalents. For fibre, an estimated average requirement is not available, and an adequate intake level is specified.	Proportion of the population with usual intakes below the estimated average requirement (a reflection of the prevalence of inadequate intakes). Mean fibre intake against the adequate intake.
Breastfeeding	The Australian Infant Feeding Guidelines recommend exclusive breastfeeding to around 6 months of age, and that breastfeeding continue while introducing appropriate solid foods until 12 months and beyond, for as long as the mother and child desire.	Proportion of children exclusively breastfed to at least 2, 4 and 6 months of age. Proportion of children aged 0–6, 7–12 and 13–24 months who currently receive any breastmilk.
Physical activity	Sufficient physical activity is important to help achieve and maintain a healthy weight. Based on the physical activity guidelines, the following is used to assess sufficiency: • children aged 2–4 completing at least 180 minutes of physical activity each day • children aged 5–17 completing at least 60 minutes of physical activity each day • adults aged 18–64 completing at least 150 minutes of physical activity across 5 or more sessions each week • adults aged 65 and over completing at least 30 minutes of physical activity on 5 out of 7 days.	Proportion of the population meeting the physical activity recommendations.



Health outcomes

Looking at nutritional health outcomes aligns with the ‘nutritional status’ component of the *Framework for a national food and nutrition monitoring system*, as detailed in Chapter 1. Analysis of biomedical measures of nutritional status enables a confirmation of the findings obtained through the assessment of food and nutrient intakes against the nutrition recommendations.

Table 3.2 outlines the health outcome component to be assessed, the rationale and the measure (indicator) that will be used for the analysis in this report.

Table 3.2: Health outcome measures

Outcome component	Rationale	Measure
Overweight and obesity	Being a healthy weight reduces the risk of chronic conditions and premature death.	Proportion of the population who are overweight or obese.
Waist circumference	Nutrition and physical activity are linked to body weight, measured through BMI and waist circumference. BMI is a measure indicating nutritional status in adults. The waist circumference cut-offs indicating ‘increased risk’ and ‘substantially increased risk’ of developing chronic conditions, such as heart disease and type 2 diabetes, are 94 cm and 102 cm for men, and 80 cm and 88 cm for women.	Proportion of the population with a waist circumference above the cut-off.
Biomarkers of key nutrients: • vitamin D • folate • iodine • vitamin B12 • iron	Food consumption and food composition data can be unreliable for certain nutrients. For others, the amount of the nutrient absorbed may differ to the amount consumed. Biomedical measures provide a more accurate indication of nutritional status. Cut-offs and reference ranges have been established for population health monitoring, with the following indicating a deficiency: • red blood cell folate—mean below 340 nmol/L (WHO 2008) • vitamin B12—mean below 150 pmol/L (WHO 2008) • serum ferritin (iron)—mean below 15 µg/L (WHO 2007a) • iodine—median urinary iodine concentration below 100 µg/L, and more than 20% of the population with an iodine concentration below 50 µg/L (WHO 2007b) • vitamin D—mild deficiency is 30–49 nmol/L; deficient is below 30 nmol/L (Nowson et al. 2012).	An assessment of mean levels against the cut-off for: • red blood cell folate • vitamin B12 • iron Median urinary iodine concentration against the reference range for adequacy. Proportion of the population within the reference range for adequate vitamin D status.



Data sources

4

The data for reporting against the food and nutrition measures are, as at October 2018, the most recent available and summarised in Table 4.1. The main data source used is the Australian Bureau of Statistics (ABS) 2011–12 Australian Health Survey, which incorporated the National Health Survey, the National Nutrition and Physical Activity Survey, and the National Health Measures Survey.

For the Aboriginal and Torres Strait Islander population, the main data source used is the ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey, which incorporated the National Aboriginal and Torres Strait Islander Health Survey, the National Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey, and the National Aboriginal and Torres Strait Islander Health Measures Survey.

Also used is the ABS 2014–15 National Health Survey, which has more recent data on physical activity, overweight and obesity and waist circumference.

In addition, the 2007 Australian National Children’s Nutrition and Physical Activity Survey and the ABS 1995 National Nutrition Survey were used to evaluate trends. Further detail on these surveys, including the methods, are in Appendix A.

Data in this report are presented for all Australians, and, where available, for Indigenous and non-Indigenous Australians. When broken down by Indigenous status, the data are mostly available for those aged 31–50. Due to the small numbers in the older age groups, those data are not presented in the body of this report, but are included in the supplementary tables.

Not all data are available for the population aged 2 and over, so some measures are not reported for all NRV age groups:

- Data on iodine status are available from age 5, and are presented for the population aged 9 and over.
- For the remaining biomarkers of key nutrients, data are available from age 12, and are presented for the population aged 14 and over.
- Waist circumference is available from age 18, and are presented for the population aged 19 and over.



Table 4.1: Data sources used for reporting on *Nutrition across the life stages*

Food and nutrition component	Data source
Australian Dietary Guidelines 5 food groups	Australian Health Survey, 2011–12
Discretionary foods	Australian Aboriginal and Torres Strait Islander Health Survey, 2012–13
Added and free sugars	
Saturated and trans fats	
Sodium	
Key nutrients	
Biomarkers of key nutrients	
Breastfeeding	National Health Survey, 2014–15
Physical activity	Australian Health Survey, 2011–12 Australian Aboriginal and Torres Strait Islander Health Survey, 2012–13 National Health Survey, 2014–15
Overweight and obesity	National Health Survey, 2014–15
Waist circumference	

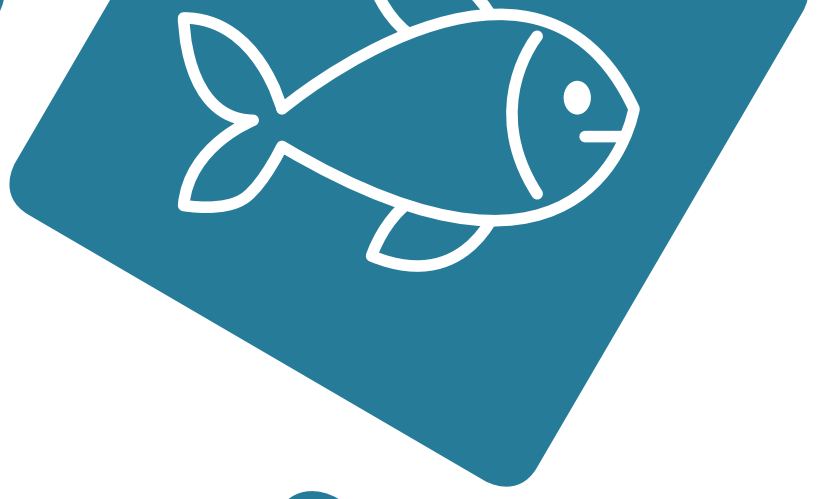
Significance testing for survey data

The observed value of a proportion or mean might vary due to the influence of chance and natural variation. To provide an indication of whether 2 results are statistically different, 95% confidence intervals have been calculated.

A 95% confidence interval describes a span of numbers around the estimate that has a 95% chance of including the true value. When comparing 2 groups, if the 2 confidence intervals do not overlap, it is unlikely that the observed difference is due to sampling error alone. Where confidence intervals do overlap in comparative rates presented in the report, the reader is advised that they are “not statistically significant”.

Results in this report are reported as different if statistically significant; otherwise they are reported as similar.





Main findings: children

5

Children aged 2–3

Overall, children aged 2–3:

- exceed the recommended minimum daily serves of fruit and dairy products and alternatives (based on average intake)
- fall short of the recommended daily serves of vegetables, grain foods and meat and alternatives (based on average intake), and almost everyone does not meet the recommended serves of vegetables
- get almost one-third (30%) of their energy from discretionary foods
- get about 8% of their energy from added sugars, and 14% from saturated and trans fats
- have an intake of sodium well above the level of adequate intake
- have a low prevalence of inadequate calcium, dietary folate equivalents and iodine intakes.

Of children aged 2–3, 3 in 4 (75%) do the recommended amount of physical activity each day, and about 1 in 5 (21%) are overweight or obese.

Indigenous children, on average, consume about one-third fewer serves of fruit than non-Indigenous children.



Five food groups

The information presented in this section for the 5 food groups is based on average/mean daily serves (Figure 5.1) and the proportion of the population with intakes below the recommended serves (Figure 5.2).

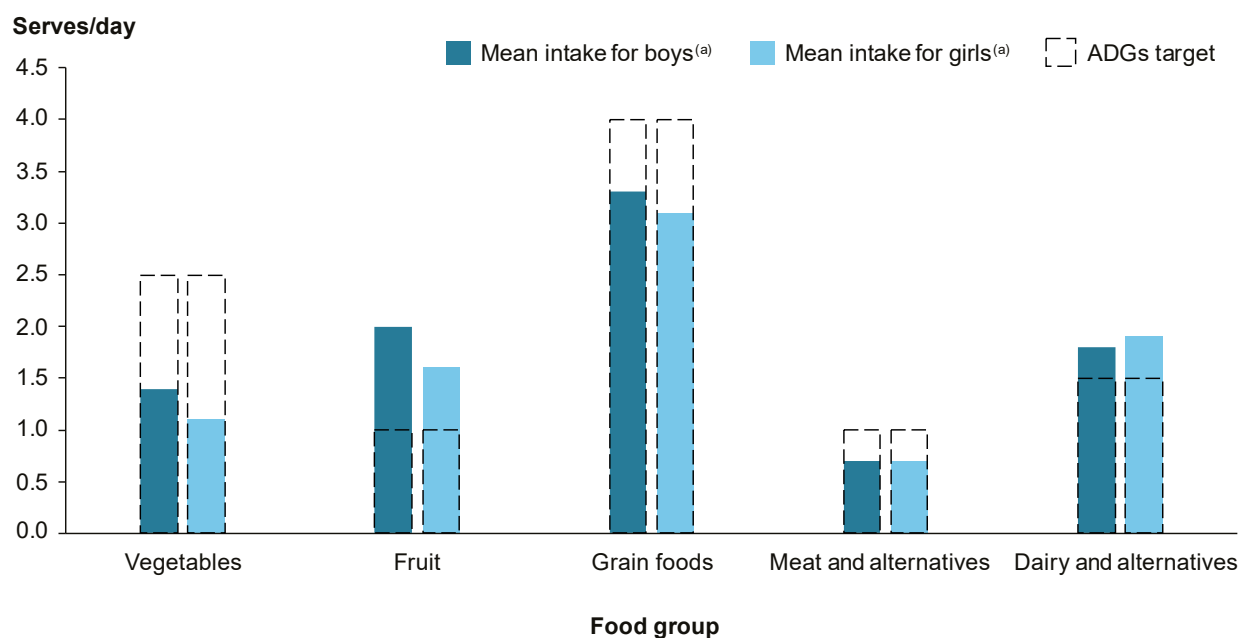
For children aged 2–3, the average daily intake of fruit and dairy products and alternatives exceeds the recommended number of serves:

- Boys consume 2.0 serves of fruit a day (double the recommended intake of 1.0 serve), while girls consume 1.6 serves.
- Both boys (1.8 serves) and girls (1.9 serves) consume about half a serve more than the recommended intake of dairy products and alternatives (1.5 serves).
- At least 3 in 5 boys and girls meet the recommended serves for both food groups.

Children aged 2–3 fall short of meeting the recommended serves of vegetables, grain foods and meat and alternatives:

- The average daily intake of vegetables is about half the recommended 2.5 serves (at 1.4 serves for boys and 1.1 serves for girls), and almost all boys (99.0%) and girls (99.9%) do not meet the recommended serves.
- The average daily intake of grain foods and meat and alternatives is about three quarters of the recommended serves, and more than 7 in 10 children do not meet the recommended serves.

Figure 5.1: Mean intake of food groups compared with the ADGs targets, by sex, aged 2–3, 2011–12

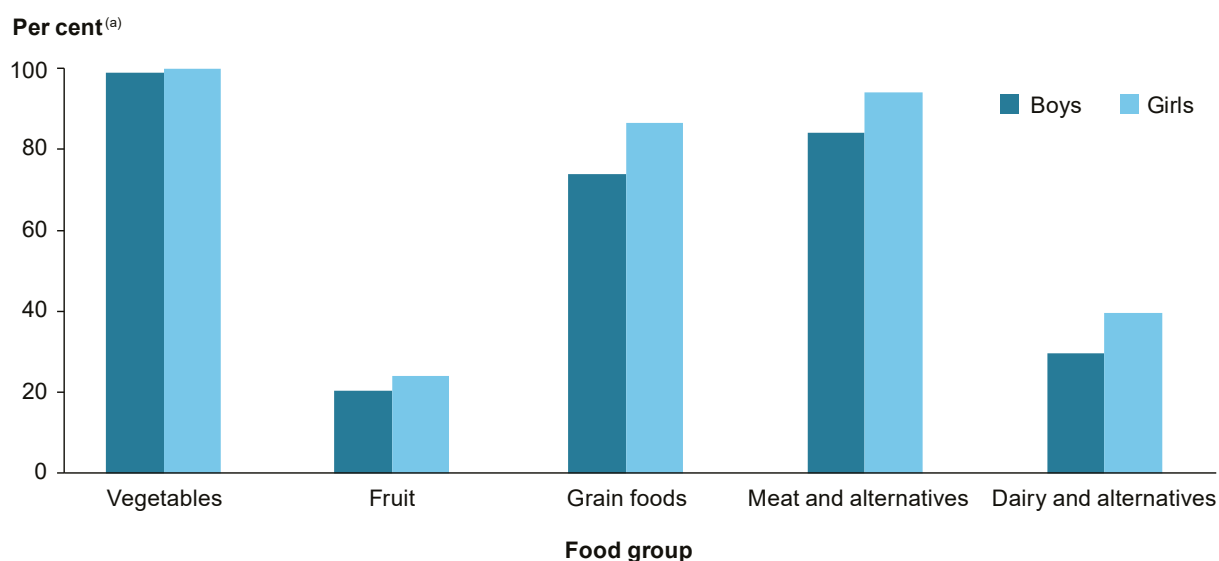


(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S1.



Figure 5.2: Proportion of the population with food group intakes below the recommended serves, by sex, aged 2–3, 2011–12

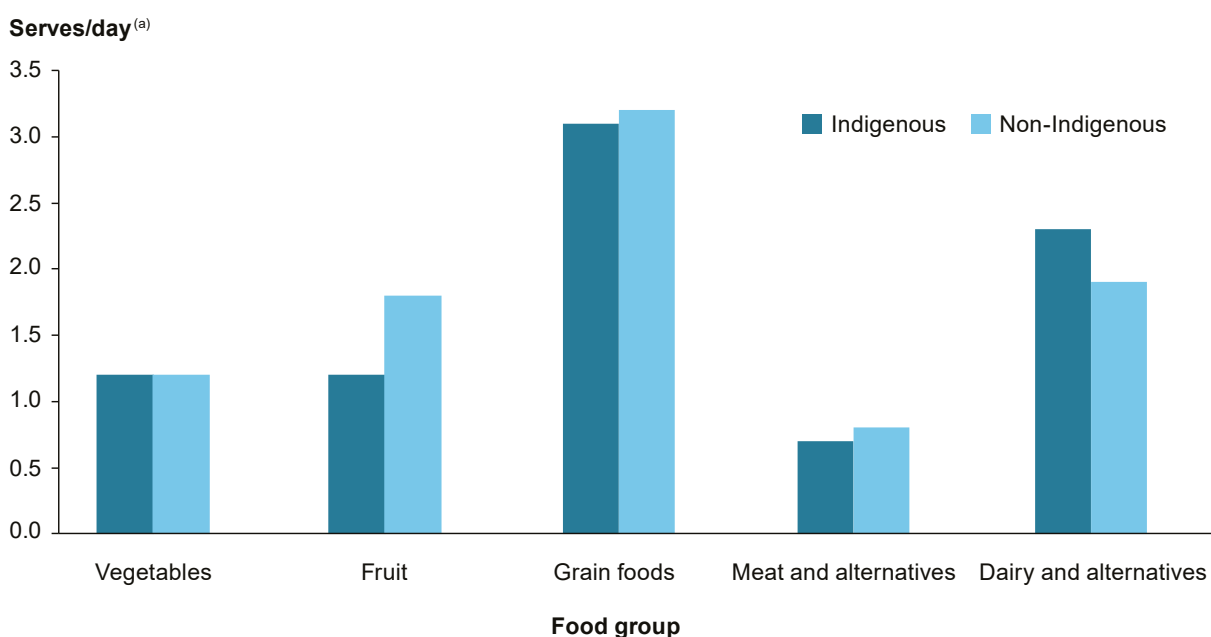


(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016d; Table S1.

Indigenous children aged 2–3 consume an average of 1.2 serves of fruit a day, which is 33% fewer serves than non-Indigenous children (1.8 serves). Average intake for the remaining food groups is similar. While intake of dairy products and alternatives appears higher for Indigenous children (2.3 serves) than for non-Indigenous children (1.9 serves), this difference is not statistically significant (Figure 5.3).

Figure 5.3: Mean intake of food groups from the ADGs, by Indigenous status, aged 2–3, 2011–13



(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016b; Table S9.

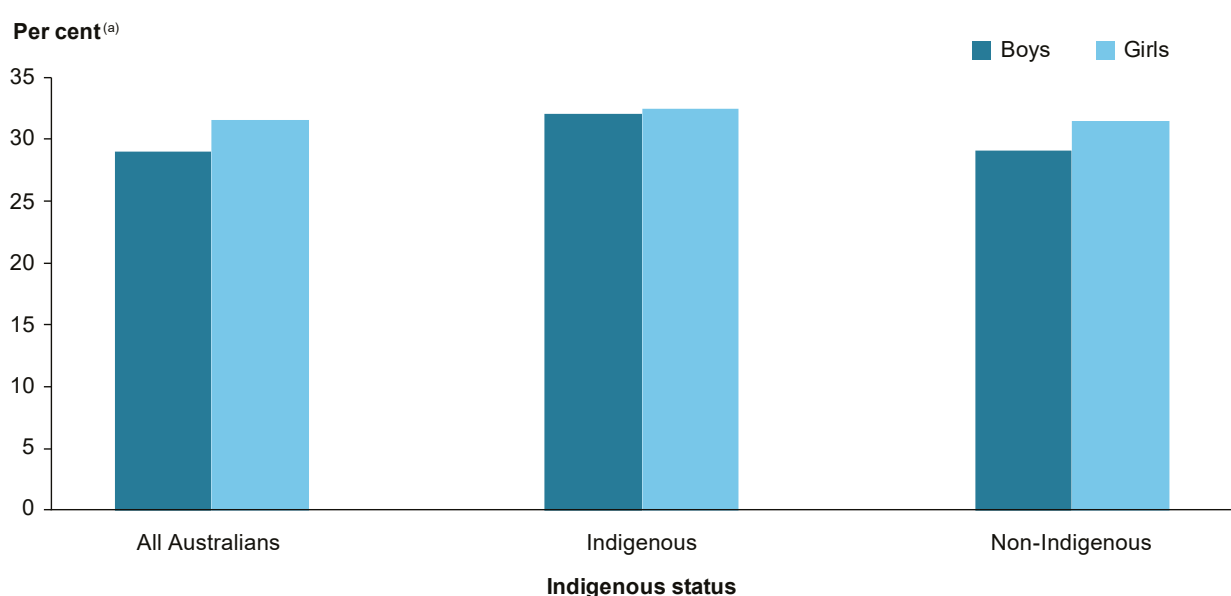


Discretionary food

Children aged 2–3 consume an average of 3.3 serves of discretionary food a day (Table S16), which contributes almost one-third (30%) to their total energy intake. The contribution of discretionary food to energy intake is similar for boys (29%) and girls (32%). Discretionary food contributes 32% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (30%). For Indigenous children, the contribution is also similar between boys (32%) and girls (33%) (Figure 5.4).

The main contributors to discretionary food intake include sweet biscuits (13%), cakes and muffins (12%), chocolate and chocolate-based confectionary (6.0%), snack foods (such as potato and corn chips) (6.0%), fried potato products (5.6%) and pastries (5.3%) (Table S18).

Figure 5.4: Proportion of energy intake from discretionary food, by sex and Indigenous status, aged 2–3, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Note: Discretionary foods include cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Sources: ABS 2014a; ABS 2015a; tables S16 and S17.

Added and free sugars

Children aged 2–3 consume an average of 32 grams of added sugars a day, which makes up 8.3% of their energy intake (8.4% for boys and 8.1% for girls). Added sugars contribute 10% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (8.3%) (Figure 5.5; tables S19 and S20).

The main contributors to added sugars intake include fruit and vegetable juices and drinks (13%), cakes and muffins (12%), cordials (10%), sweet biscuits (9.9%), yoghurt (7.7%) and chocolate and chocolate-based confectionary (6.6%) (Table S21).

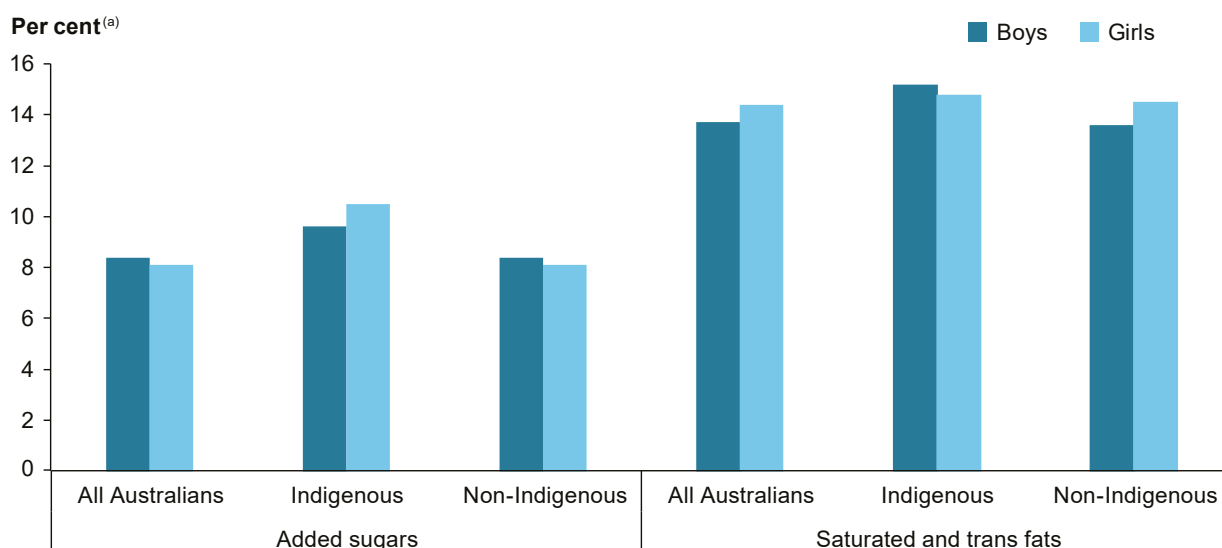
More than half of boys (52%) and girls (51%) have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19) (see Table 3.1 for the definitions of 'added sugars' and 'free sugars').



Saturated and trans fats

Saturated and trans fats contribute 14% towards the energy intake of boys and girls aged 2–3. This level of intake is a substantial deviation from the ADGs, which specifies to limit intake of foods containing saturated fat. The contribution of saturated and trans fat to energy intake for Indigenous children (15%) is similar to that for non-Indigenous children (14%) (Figure 5.5).

Figure 5.5: Proportion of energy intake from added sugars and saturated and trans fats, by sex and Indigenous status, aged 2–3, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

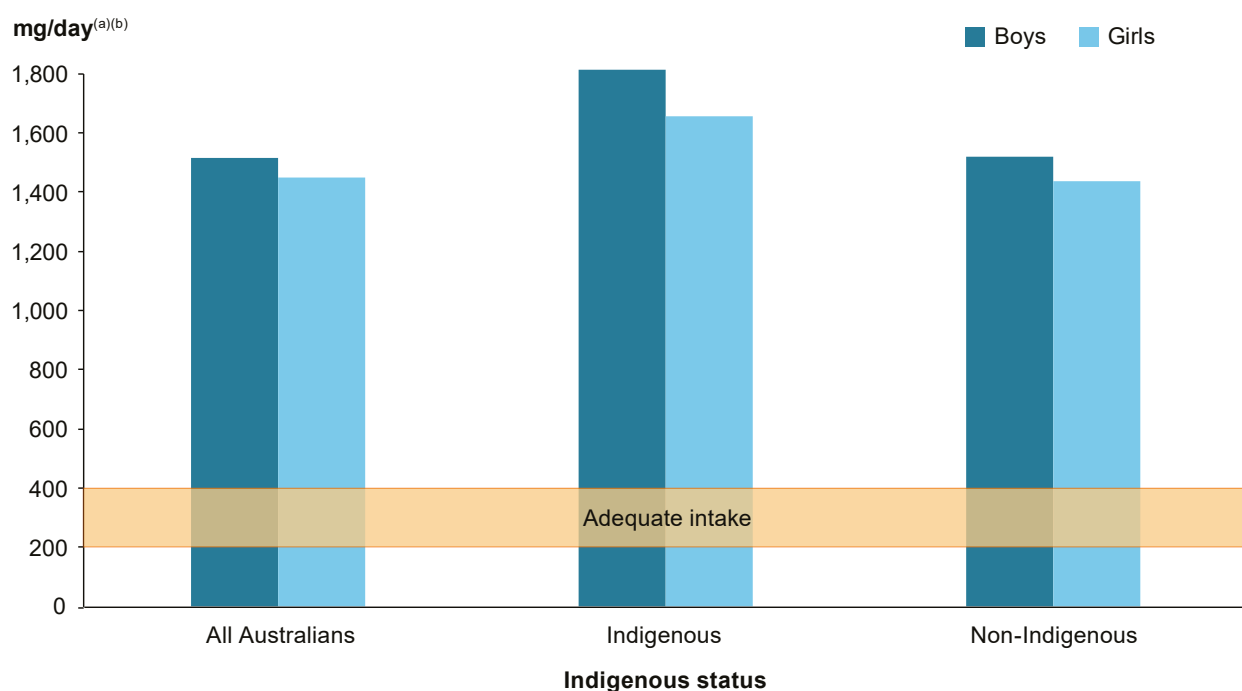
Sources: AIHW analysis of ABS 2013d; ABS 2015a; ABS 2016a; ABS 2016c; tables S19, S20, S22 and S23.

Sodium

Children aged 2–3 consume an average of 1,484 mg of sodium a day, which is well above the adequate intake level of 200–400 mg per day. Intake for boys (1,517 mg) and girls (1,448 mg) is similar. Indigenous children consume an average of 1,816 mg of sodium a day, which is similar to the intake of non-Indigenous children (1,522 mg per day) (Figure 5.6).



Figure 5.6: Mean intake of sodium, by sex and Indigenous status, aged 2–3, 2011–13



(a) Includes sodium naturally present in foods and sodium added during processing, but excludes the discretionary salt added by consumers in food prepared at home, or at the table. Excludes sodium from supplements.

(b) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S24 and S25.

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

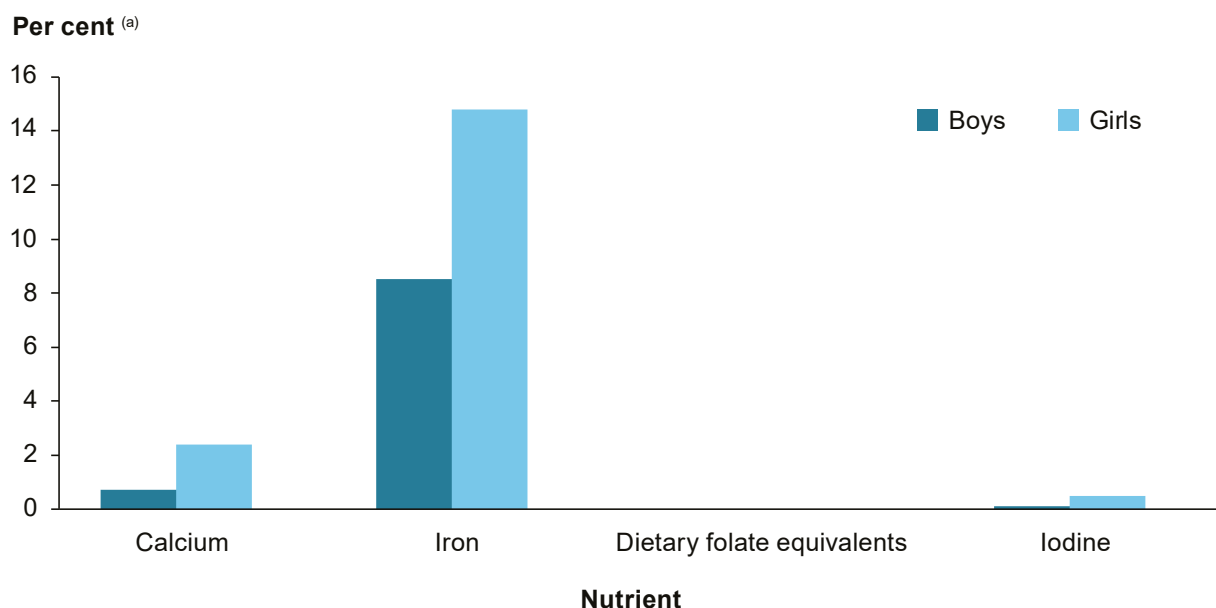
Only 2.4% or less of boys and girls aged 2–3 have inadequate calcium and iodine intakes. About 1 in 7 (15%) girls and 1 in 12 boys (8.5%) have inadequate iron intakes. Iron requirements are the same for boys and girls in this age group. All children aged 2–3 have an adequate intake of dietary folate equivalents (Figure 5.7).

Fibre

The average daily intake of fibre for children aged 2–3 exceeds the adequate intake level of 14 g per day (17 g for boys and 15 g for girls). Indigenous children consume an average of 14 g of fibre a day, which is similar to the intake of non-Indigenous children (16 g). Fibre intake for Indigenous girls falls below the adequate intake level (at 13 g/day) (Figure 5.8).



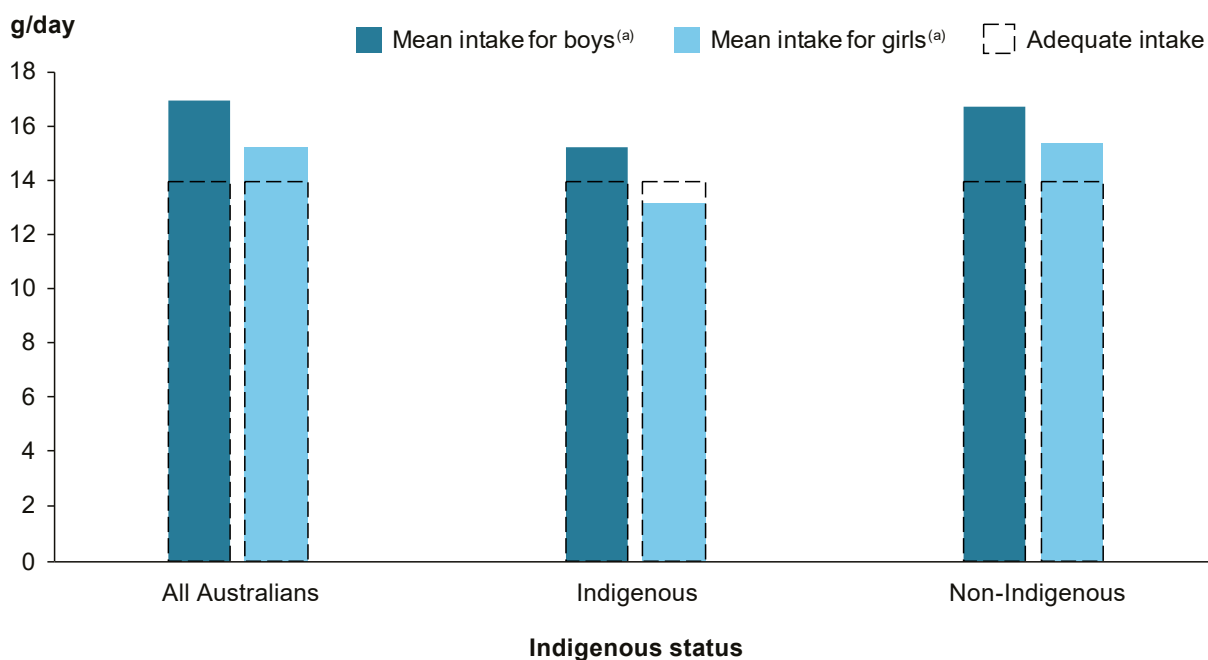
Figure 5.7: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 2–3, 2011–12



(a) Based on usual intakes (see Appendix A). Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 5.8: Mean intake of fibre compared with the level of adequate intake, by sex and Indigenous status, aged 2–3, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S27 and S28.



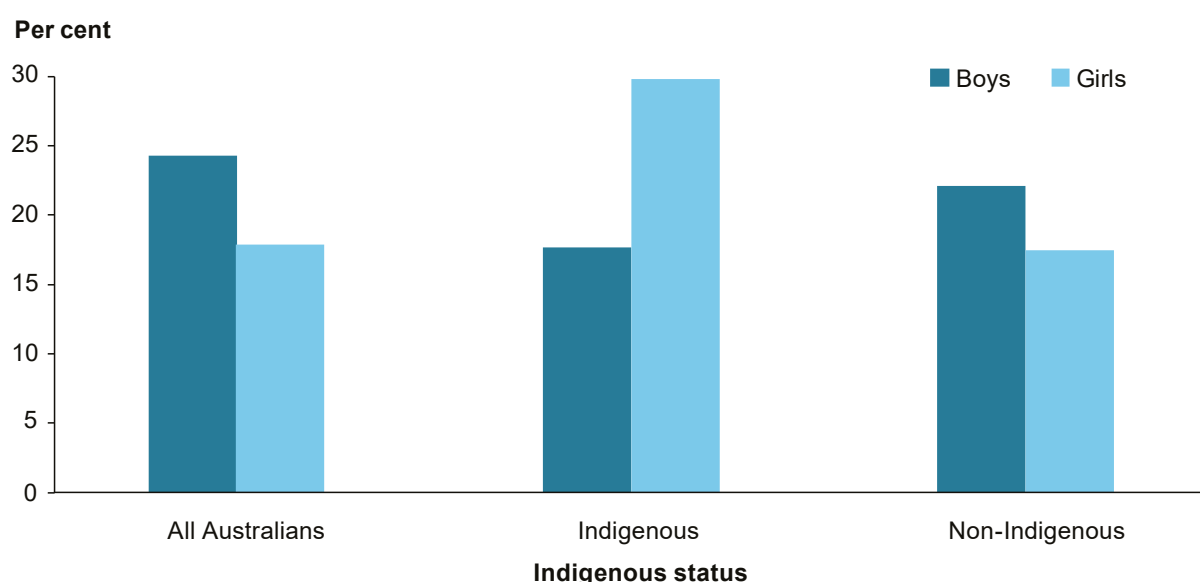
Physical activity

Of children aged 2–3, 3 in 4 (75%) do the recommended amount of physical activity, with this level being similar for boys (73%) and girls (78%). The small sample for Indigenous children aged 2–3 makes comparisons difficult as there is a high margin of error, so results should be interpreted with caution. The data available indicates there is no difference in the level of physical activity between Indigenous and non-Indigenous children (tables S29 and S30).

Overweight and obesity

About 1 in 5 (21%) children aged 2–3 are overweight or obese, with this level being similar for boys (24%) and girls (18%). Almost one-third (30%) of Indigenous girls are overweight or obese, which, while appearing higher than non-Indigenous girls (18%), is not a statistically significant difference. The prevalence of overweight and obesity in Indigenous boys (18%) is similar to non-Indigenous boys (22%) (Figure 5.9).

Figure 5.9: Prevalence of overweight or obesity, by sex and Indigenous status, aged 2–3, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.



Children aged 4–8

Overall, children aged 4–8:

- exceed the recommended minimum daily serves of fruit (based on average intake)
- fall short of the recommended daily serves of grain foods (girls only), vegetables, meat and alternatives, and dairy products and alternatives (based on average intake), and no one meets the recommended serves of vegetables
- get more than one-third (38%) of their energy from discretionary foods
- get 11% of their energy from added sugars, and 14% from saturated and trans fats
- have an intake of sodium well above the level of adequate intake
- have a low prevalence of inadequate dietary folate equivalents and iodine intakes.

About 1 in 5 (21%) girls have inadequate calcium intakes and about 1 in 10 (11%) have inadequate iron intakes.

About 2 in 5 (43%) children aged 4–8 do the recommended amount of physical activity each day and about 1 in 5 (22%) are overweight or obese.

Indigenous children, on average, consume 40% fewer serves of fruit than non-Indigenous children.



Five food groups

The information presented in this section for the 5 food groups is based on average/mean daily serves (Figure 5.10) and the proportion of the population with intakes below the recommended serves (Figure 5.11).

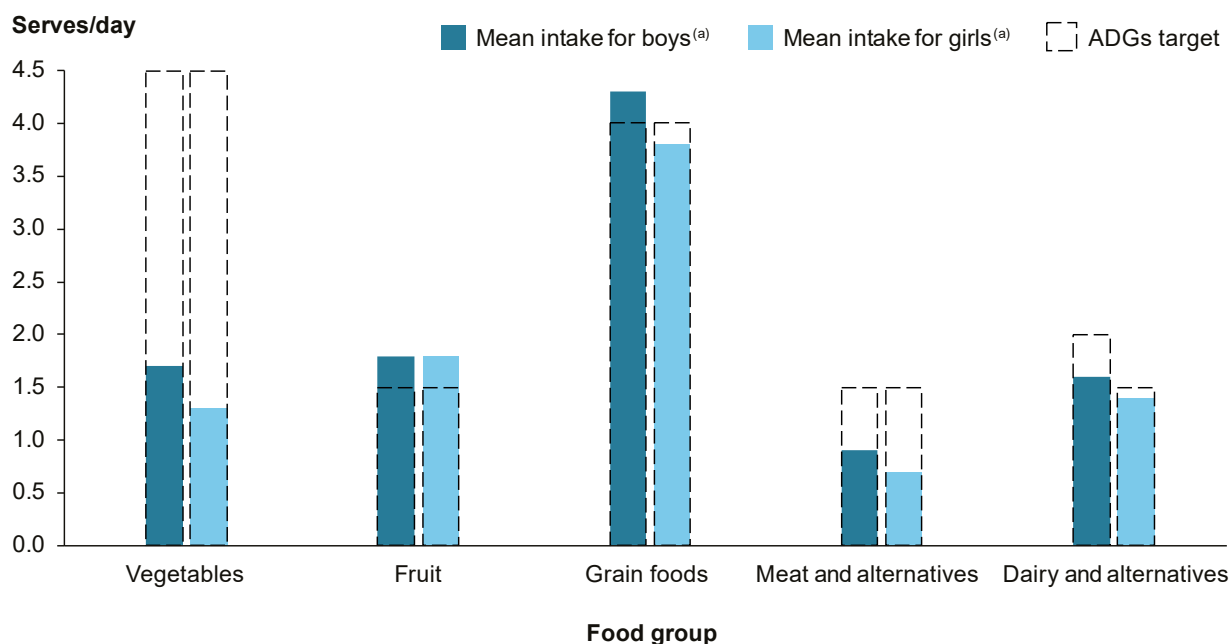
For boys:

- the average daily intake of fruit (1.8 serves) and grain foods (4.3 serves) exceeds the recommended number of serves, and about 3 in 5 meet the recommended serves for both food groups
- the average intake of the remaining food groups falls short—particularly for vegetables, with intake at less than half of the recommended 4.5 serves (at 1.7 serves) and no one meets the recommended serves.

For girls:

- the average daily intake of fruit exceeds the recommended 1.5 serves (at 1.8 serves) and more than half (56.7%) meet the recommended serves
- the average intake of the remaining food groups fall short—particularly for vegetables, with intake at less than half of the recommended 4.5 serves (at 1.3 serves) and no one meets the recommended serves.

Figure 5.10: Mean intake of food groups compared with the ADGs target, by sex, aged 4–8, 2011–12

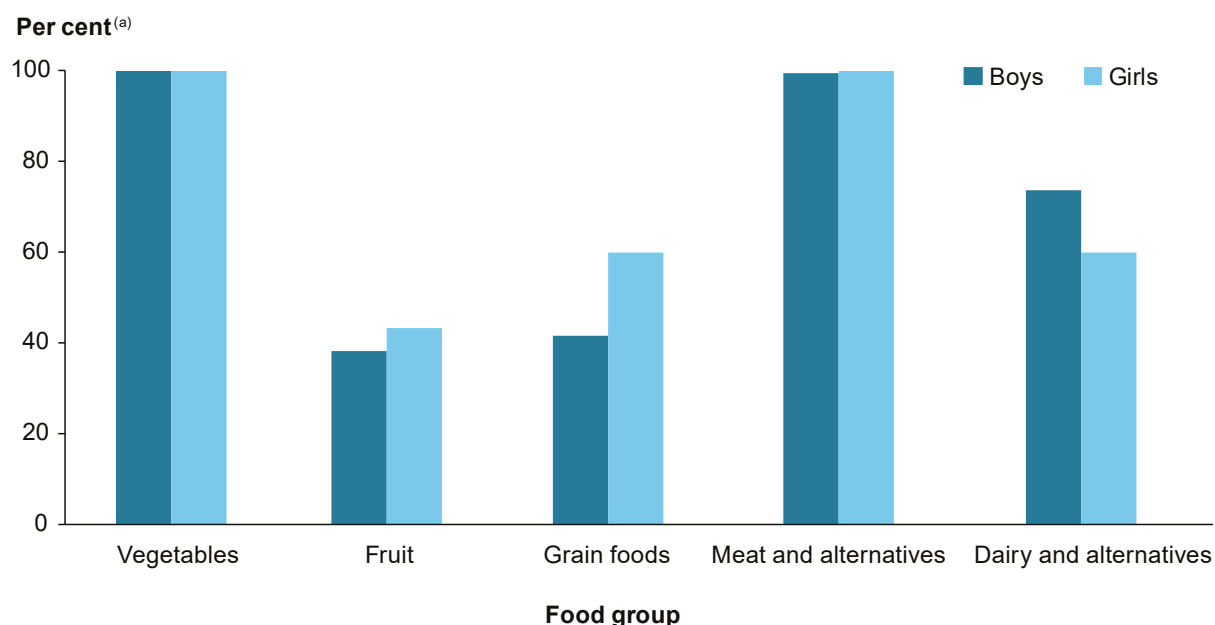


(a) Based on intake from Day 1 (see Appendix A), and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S2.



Figure 5.11: Proportion of the population with food group intakes below the recommended serves, by sex, aged 4–8, 2011–12

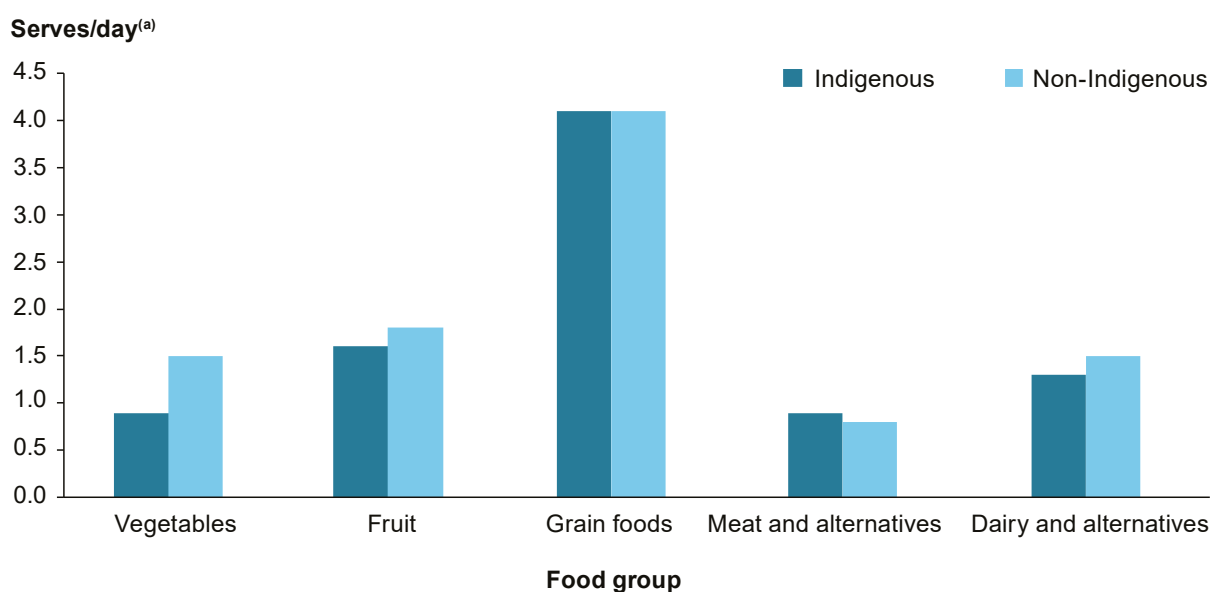


(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016d; Table S2.

Indigenous children aged 4–8 consume an average of 0.9 serves of vegetables a day, which is 40% fewer serves than non-Indigenous children (1.5 serves). Average intake for the remaining food groups is similar (Figure 5.12).

Figure 5.12: Mean intake of food groups from the ADGs, by Indigenous status, aged 4–8, 2011–13



(a) Based on intake from Day 1 (see Appendix A), and includes non-discretionary foods only.

Source: ABS 2016b; Table S10.

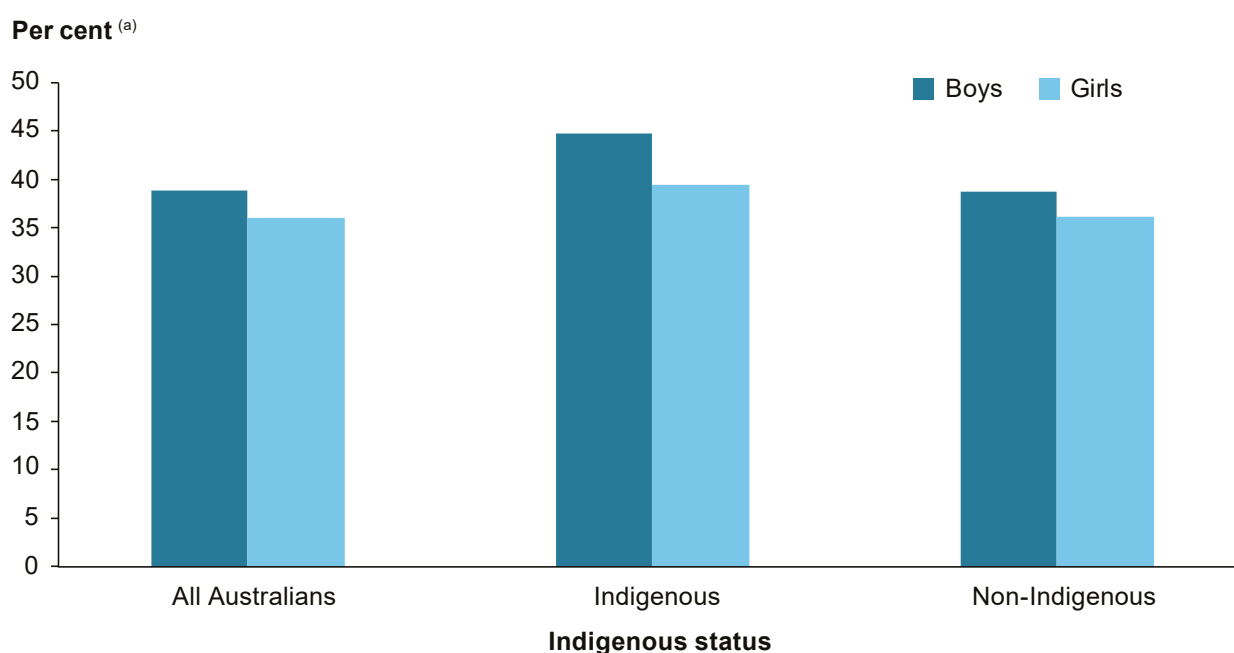


Discretionary food

Children aged 4–8 consume an average of 4.8 serves of discretionary food a day (Table S16), which contributes more than one-third (38%) to their total energy intake. The contribution of discretionary food to energy intake is similar for boys (39%) and girls (36%). Discretionary food contributes 42% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (38%). For Indigenous children, the contribution is also similar between boys (45%) and girls (39%) (Figure 5.13).

The main contributors to discretionary food intake include cakes and muffins (13%), sweet biscuits (8.3%), pastries (6.1%), snack foods (such as potato and corn chips) (9.3%), ice cream (5.9%) and sausages (5.3%) (Table S18).

Figure 5.13: Proportion of energy intake from discretionary food, by sex and Indigenous status, aged 4–8, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Note: Discretionary foods include cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Sources: ABS 2014a; ABS 2015a; tables S16 and S17.

Added and free sugars

Children aged 4–8 consume an average of 48 g of added sugars a day (52 g for boys and 44 g for girls), which makes up 11% of their energy intake. Added sugars contribute 13% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (11%) (Figure 5.14; tables S19 and S20).

The main contributors to added sugars intake include cakes and muffins (13%), fruit and vegetable juices and drinks (10%), soft drinks (9.1%), cordials (8.6%), sweet biscuits (6.5%) and ice cream (5.9%) (Table S21).

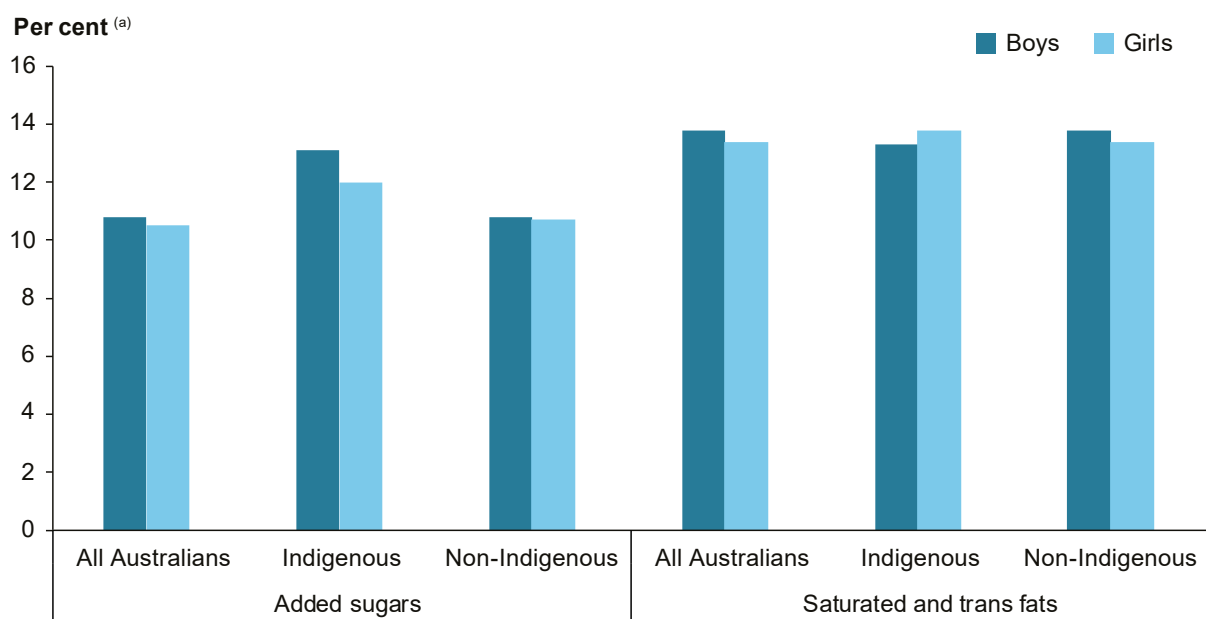
More than two-thirds of boys (69%) and girls (68%) have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).



Saturated and trans fats

Saturated and trans fats contribute 14% towards the energy intake of children aged 4–8, with the contribution being similar for boys (14%) and girls (13%). This level of intake is a substantial deviation from the ADGs, which specifies to limit intake of foods containing saturated fat. The contribution of saturated and trans fat to energy intake for Indigenous children (14%) is the same as for non-Indigenous children (Figure 5.14).

Figure 5.14: Proportion of energy intake from added sugars and saturated and trans fat, by sex and Indigenous status, aged 4–8, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

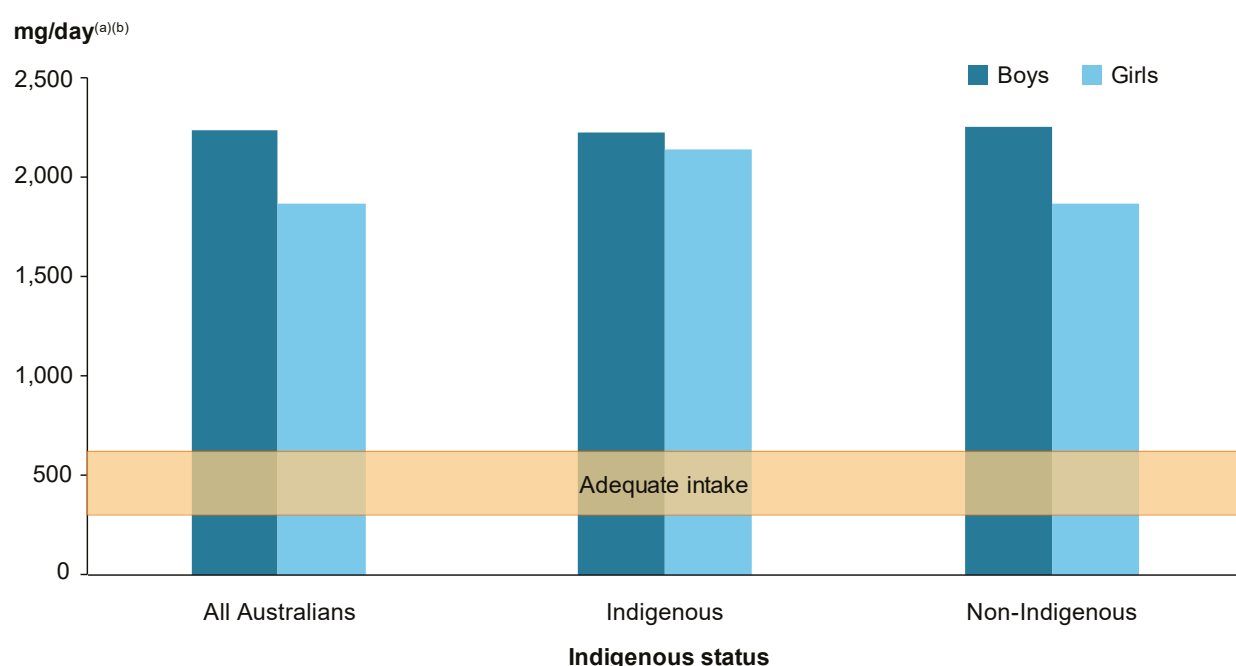
Sources: AIHW analysis of ABS 2013d; ABS 2015a; ABS 2016a; ABS 2016c; tables S19, S20, S22 and S23.

Sodium

Children aged 4–8 consume an average of 2,058 mg of sodium a day, which is well above the adequate intake level of 300–600 mg per day. Intake is higher for boys (2,236 mg) than girls (1,868 mg). Indigenous children consume an average of 2,183 mg of sodium a day, which is similar to the intake of non-Indigenous children (2,067 mg per day) (Figure 5.15).



Figure 5.15: Mean intake of sodium, by sex and Indigenous status, aged 4–8, 2011–13



(a) Includes sodium naturally present in foods and sodium added during processing, but excludes the discretionary salt added by consumers in food prepared at home, or at the table. Excludes sodium from supplements.

(b) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S24 and S25.

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

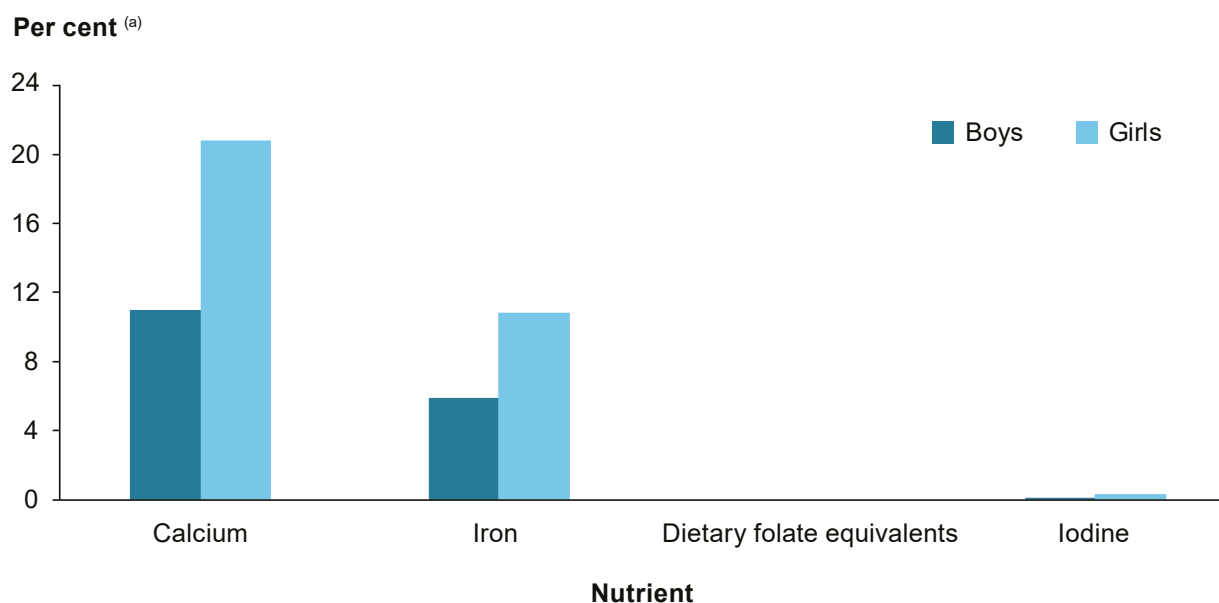
Only 0.3% or less of boys and girls aged 4–8 have inadequate iodine intakes. About 1 in 10 boys (11%) and 1 in 5 (21%) girls have inadequate calcium intakes. A total of 5.9% of boys and 11% of girls have inadequate iron intakes. Calcium and iron requirements are the same for boys and girls in this age group. All children aged 4–8 have an adequate dietary folate equivalents intake (Figure 5.16).

Fibre

The average daily intake of fibre for boys aged 4–8 (20 g) exceeds the adequate intake level of 18 g per day, but the intake for girls (17 g) is slightly below the adequate intake level. Indigenous children consume an average of 17 g of fibre a day, which is similar to the intake of non-Indigenous children (19 g). Fibre intakes of Indigenous boys and girls fall just below the adequate intake level (Figure 5.17).



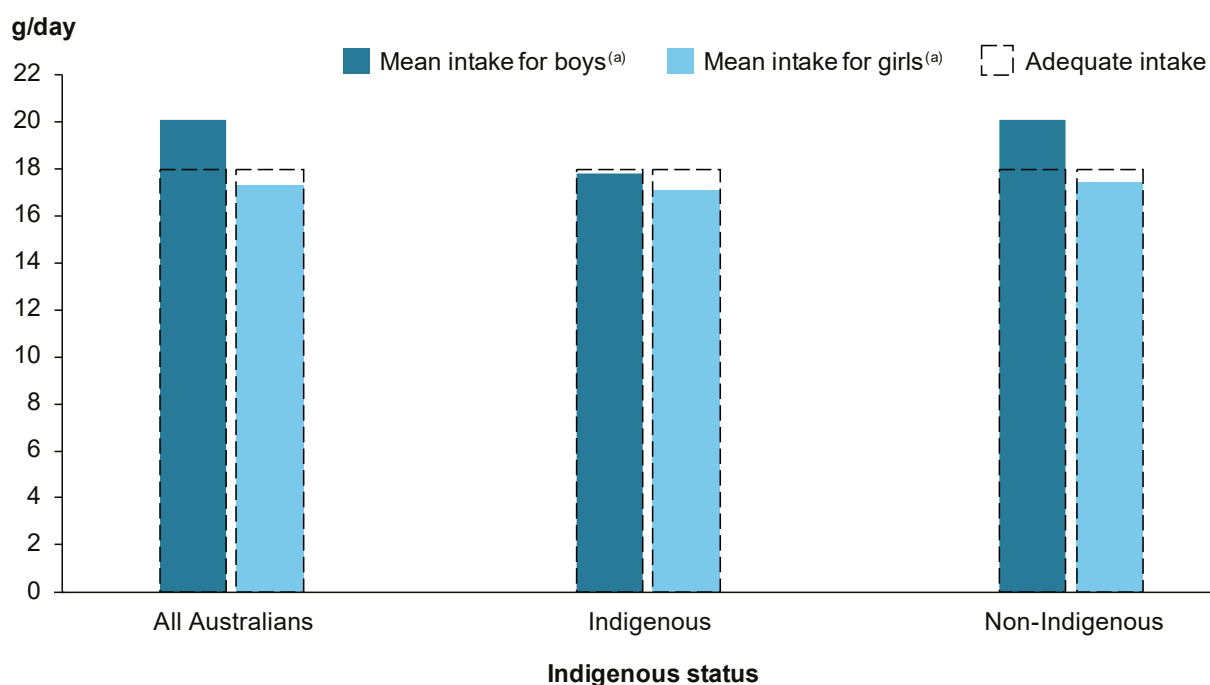
Figure 5.16: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 4–8, 2011–12



(a) Based on usual intakes (see Appendix A). Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 5.17: Mean intake of fibre compared with the level of adequate intake, by sex and Indigenous status, aged 4–8, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S27 and S28.



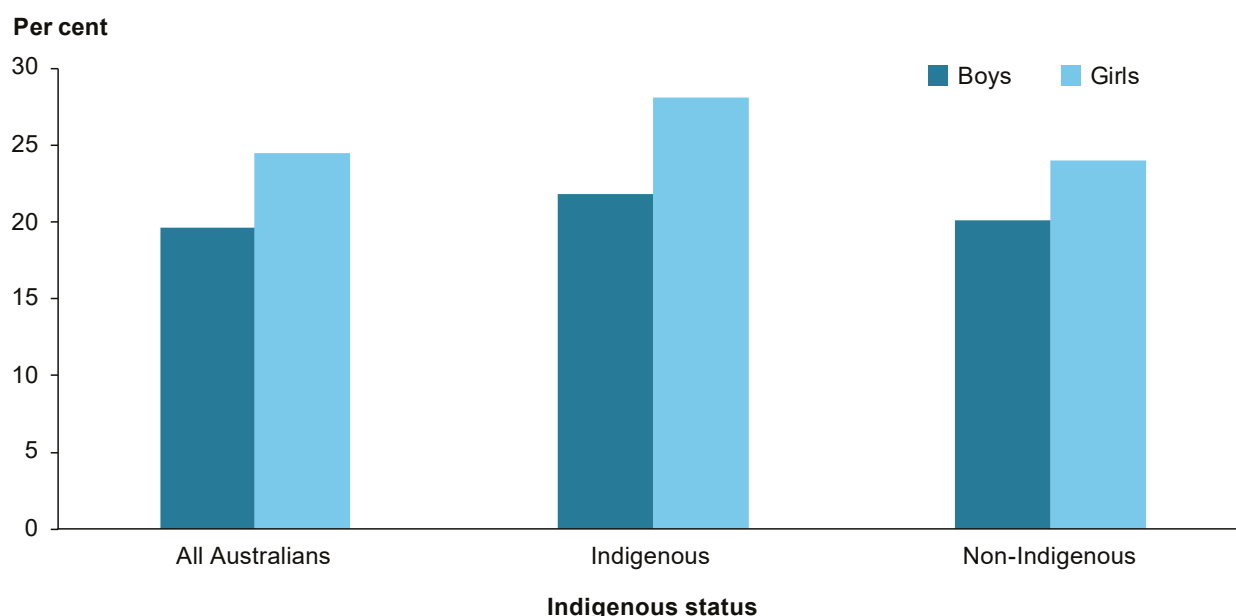
Physical activity

About 2 in 5 (43%) children aged 4-8 do the recommended amount of physical activity, with this level being similar for boys (46%) and girls (40%). The data available indicate that Indigenous children have a higher level of sufficient physical activity than non-Indigenous children, but when looking at boys and girls individually, despite levels appearing higher in Indigenous children, this difference is not statistically significant. This could simply be due to the smaller sample for boys and girls individually, which results in a high margin of error (tables S29 and S30).

Overweight and obesity

About 1 in 5 (22%) children aged 4-8 are overweight or obese, with this level being similar for boys (20%) and girls (25%). One-quarter (25%) of Indigenous children are overweight or obese, which is similar to non-Indigenous children (22%) (Figure 5.18).

Figure 5.18: Prevalence of overweight or obesity, by sex and Indigenous status, aged 4-8, 2012-13 (Indigenous), 2014-15 (all Australians and non-Indigenous)



Sources: AIHW analysis of ABS 2015d, ABS 2016e; ABS 2016f; tables S31 and S32.



Children aged 9–13

Overall, children aged 9–13:

- come close to meeting the recommended daily serves of fruit (based on average intake), but less than half meet the recommended serves
- fall well short of the recommended daily serves of vegetables, meat and alternatives and dairy products and alternatives
- get 40% of their energy from discretionary foods
- get 12% of their energy from added sugars and 14% from saturated and trans fats
- have an intake of sodium well above the level of adequate intake
- have a low prevalence of dietary folate equivalents and iodine intakes.

About 1 in 10 (11%) girls have inadequate iron intakes, while more than half have inadequate calcium intakes.

Less than 1 in 5 (17%) children aged 9–13 do the recommended amount of physical activity each day and almost one-third (29%) are overweight or obese.

Indigenous children, on average, consume similar amounts of food group serves as non-Indigenous children.



Five food groups

The 9–13 age group is split into those aged 9–11 and 12–13 for the 5 food group analysis. This is because they are discrete groups in the ADGs with different serve recommendations, to accommodate the increased requirements during adolescence.

The information presented in this section for the 5 food groups is based on average/mean daily serves (figures 5.19 and 5.21) and the proportion of the population with intakes below the recommended serves (figures 5.20 and 5.22).

For children aged 9–11 the average daily intake of grain foods slightly exceeds the recommended number of serves. Boys consume 5.1 serves of grain foods a day, while girls consume 4.2 serves. However, less than half of both boys (49.3%) and girls (49.6%) meet the recommended serves of grain foods.

For children aged 9–11, intakes of the remaining food groups are below the recommendations:

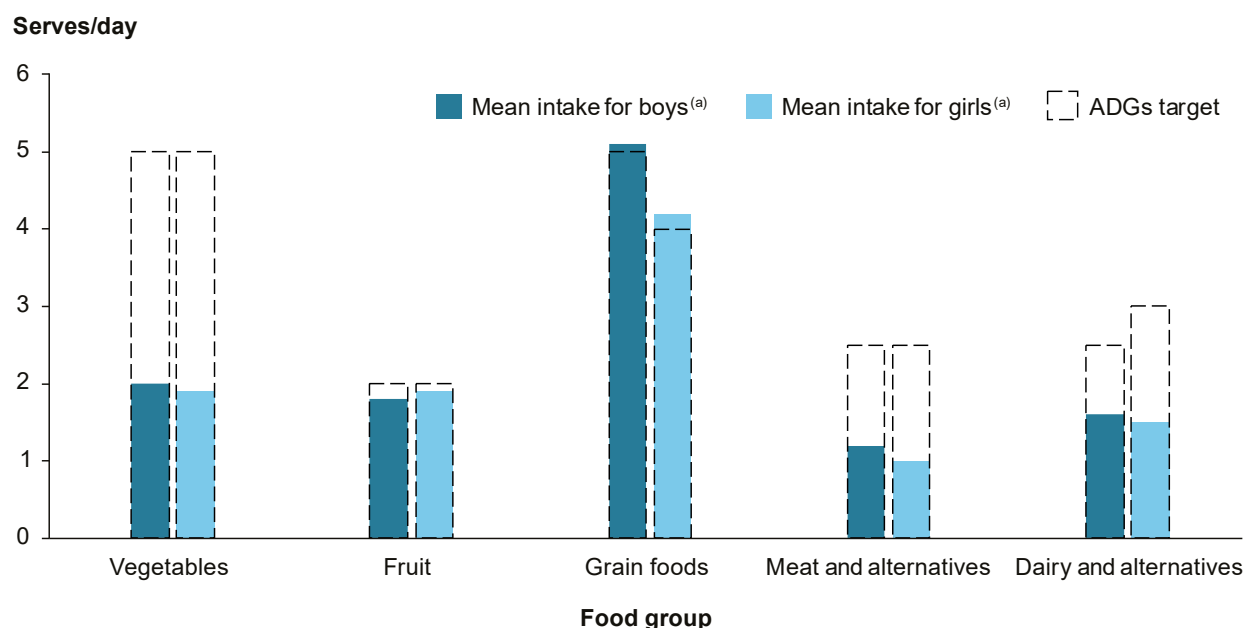
- While the average daily intake of fruit is just below the recommended 2.0 serves (at 1.8 serves for boys, and 1.9 for girls), less than half of both boys (41.0%) and girls (45.0%) meet the recommended serves.
- The average intake of vegetables, meat and alternatives and dairy products and alternatives falls well below the recommended serves.
- In addition, almost all boys and girls do not meet the recommended number of serves of vegetables (99.3% and 99.5%, respectively) and meat and alternatives (96.5% and 99.8%, respectively), and almost all girls (96.1%) do not meet the recommended serves of dairy products and alternatives.

For children aged 12–13, the average daily intakes of the 5 food groups are below the recommendations:

- Boys consume 1.7 serves of fruit per day (just below recommended 2.0 serves a day), while girls consume 1.5 serves (half a serve below the recommendation).
- The average intake of vegetables, meat and alternatives and dairy products and alternatives fall well below the recommended serves.
- While about 1 in 3 children in this age group meet the recommended serves of fruit and grain foods, almost all do not meet the recommended serves of vegetables (99.6% for both boys and girls) and almost all girls do not meet the recommended serves of meat and alternatives (99.3%).



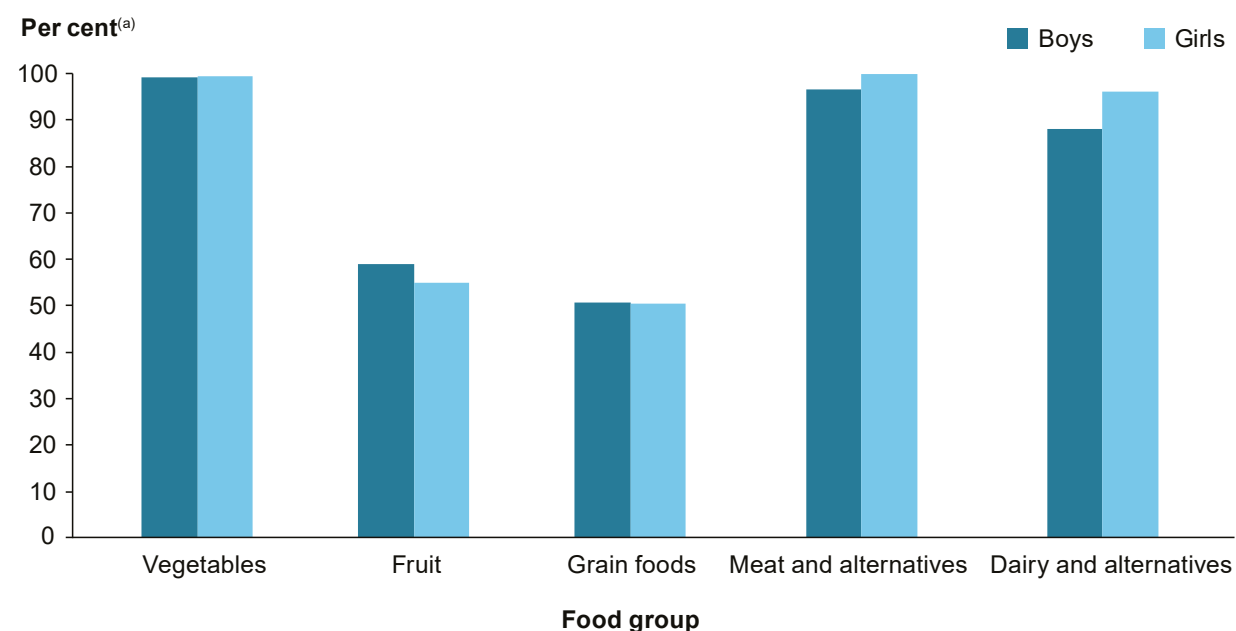
Figure 5.19: Mean intake of food groups compared with the ADGs target, by sex, aged 9–11, 2011–12



(a) Based on intake from Day 1 (see Appendix A), and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S3.

Figure 5.20: Proportion of the population with food group intakes below the recommended serves, by sex, aged 9–11, 2011–12

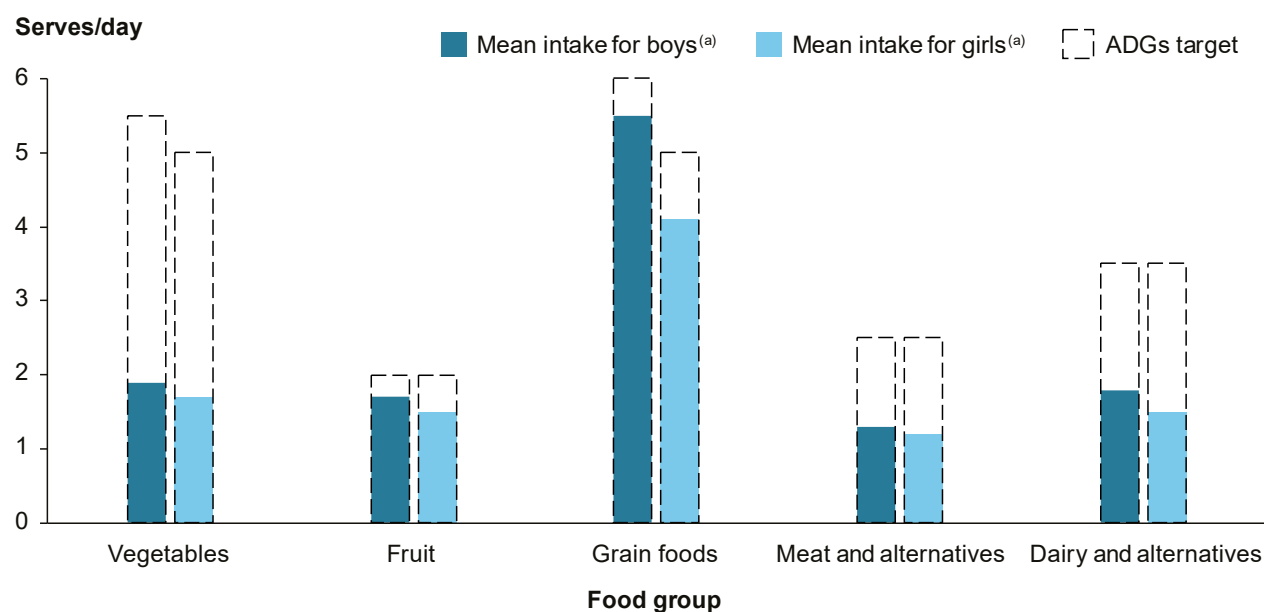


(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016d; Table S3.



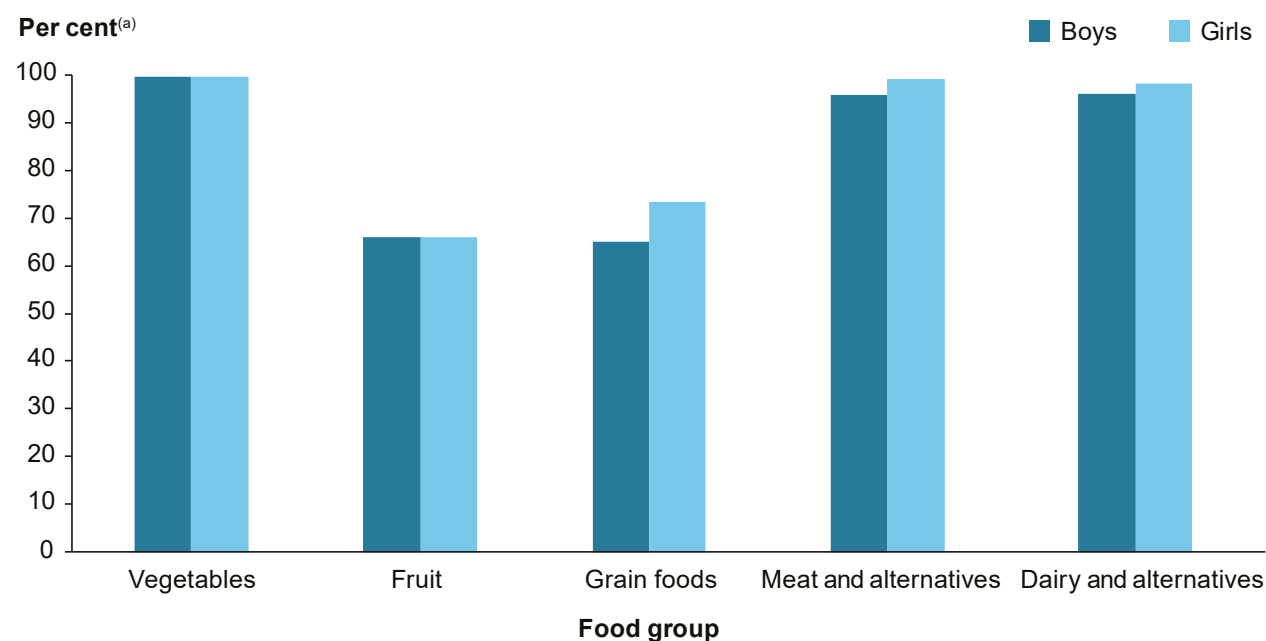
Figure 5.21: Mean intake of food groups compared with the ADGs target, by sex, aged 12–13, 2011–12



(a) Based on intake from Day 1 (see Appendix A), and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S4.

Figure 5.22: Proportion of the population with food group intakes below the recommended serves, by sex, aged 12–13, 2011–12



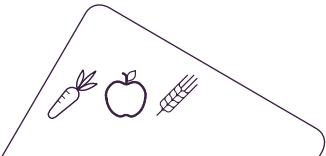
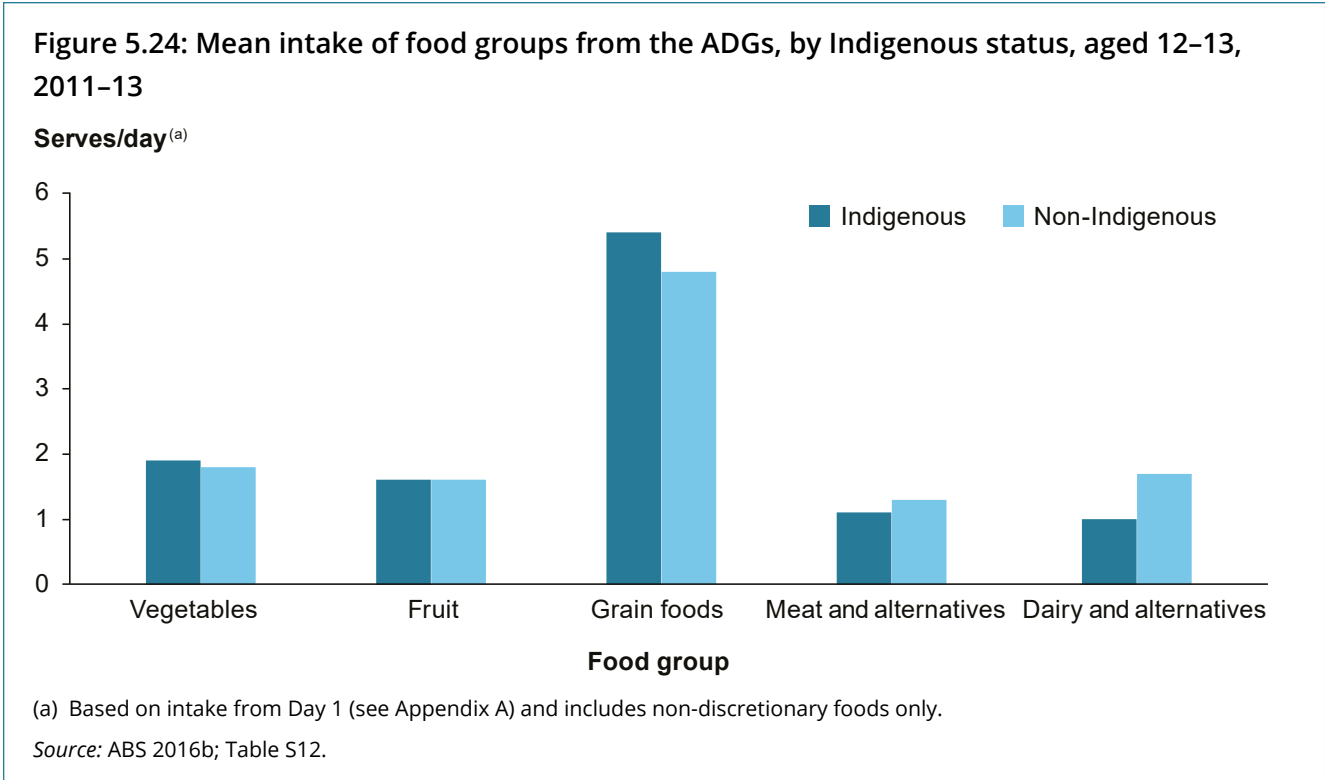
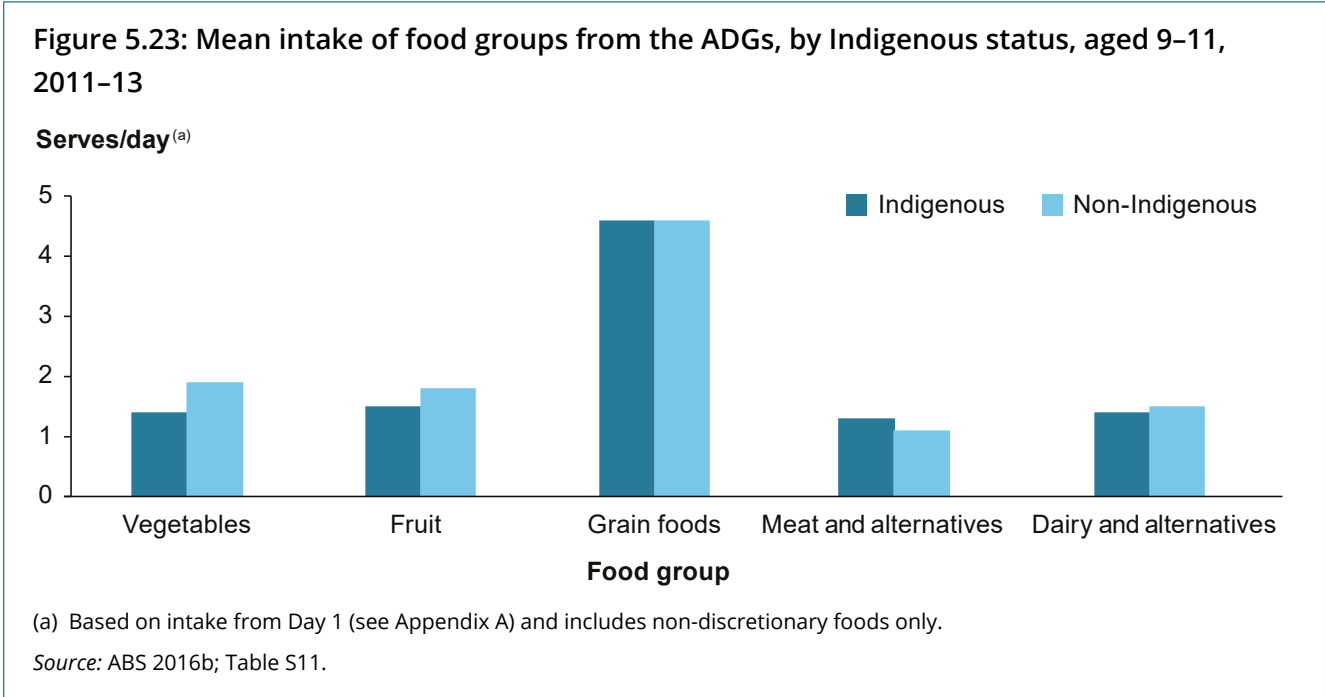
(a) Based on usual intakes, and includes non-discretionary foods only.

Source: ABS 2016d; Table S4.



The average intake of the 5 food groups between Indigenous and non-Indigenous children aged 9–11 is similar. While intake of vegetables and fruit appears higher for non-Indigenous children (1.9 and 1.4 serves, respectively) than for Indigenous children (1.8 and 1.5 serves, respectively), these differences are not statistically significant (Figure 5.23).

Indigenous children aged 12–13 consume an average of 1.0 serves of dairy products and alternatives a day, which is 41% fewer serves than non-Indigenous children (1.7 serves). Average intake for the remaining food groups is similar. While intake of grain foods appears higher for Indigenous children (5.4 serves) than non-Indigenous children (4.8 serves), this difference is not statistically significant (Figure 5.24).

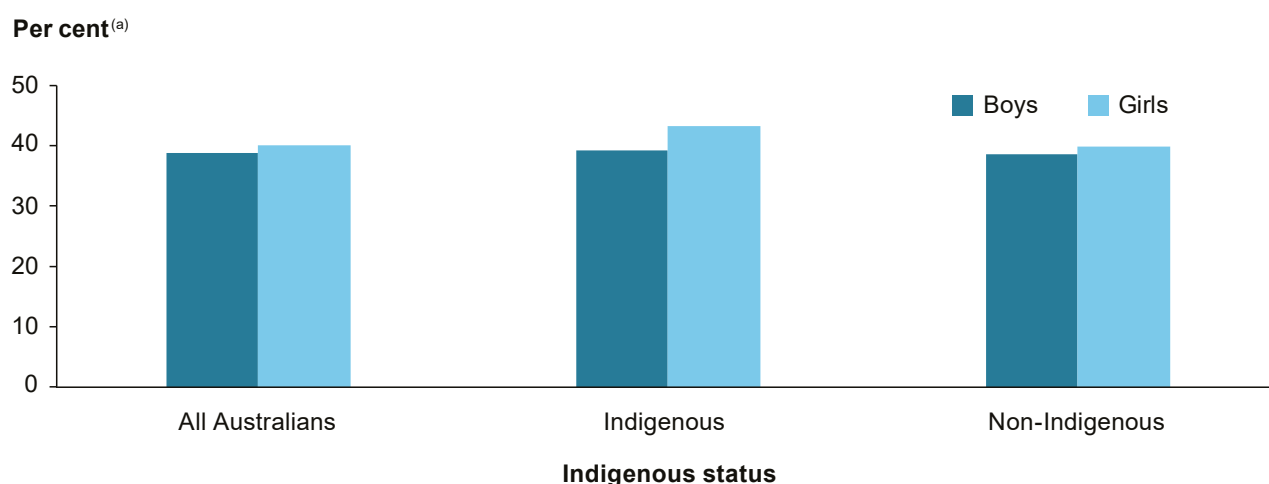


Discretionary food

Children aged 9–13 consume an average of 6.2 serves of discretionary food a day (Table S16), which contributes more than one-third (39%) to their total energy intake. The contribution of discretionary food to energy intake is similar for boys (39%) and girls (40%). Discretionary food contributes 41% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (39%). For Indigenous children, the contribution is also similar between boys (39%) and girls (43%) (Figure 5.25).

The main contributors to discretionary food intake include cakes and muffins (12%), snack foods (such as potato and corn chips) (7.9%), ice cream (7.1%), sweet biscuits (7.4%), pastries (6.9%), fried potato products (6.1%), soft drinks (5.6%) and chocolate and chocolate-based confectionery (5.6%) (Table S18).

Figure 5.25: Proportion of energy intake from discretionary food, by sex and Indigenous status, aged 9–13, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Note: Discretionary foods include cakes, biscuits, confectionery, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Sources: ABS 2014a; ABS 2015a; tables S16 and S17.

Added and free sugars

Children aged 9–13 consume an average of 64 g of added sugars a day (67 g for boys and 61 g for girls), which makes up 12% of their energy intake. Added sugars contribute 13% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (12%) (Figure 5.26; tables S19 and S20).

The main contributors to added sugars intake include soft drinks (18%), cakes and muffins (12%), fruit and vegetable juices and drinks (7.8%), cordials (6.5%) and chocolate and chocolate based confectionery (6.2%) (Table S21).

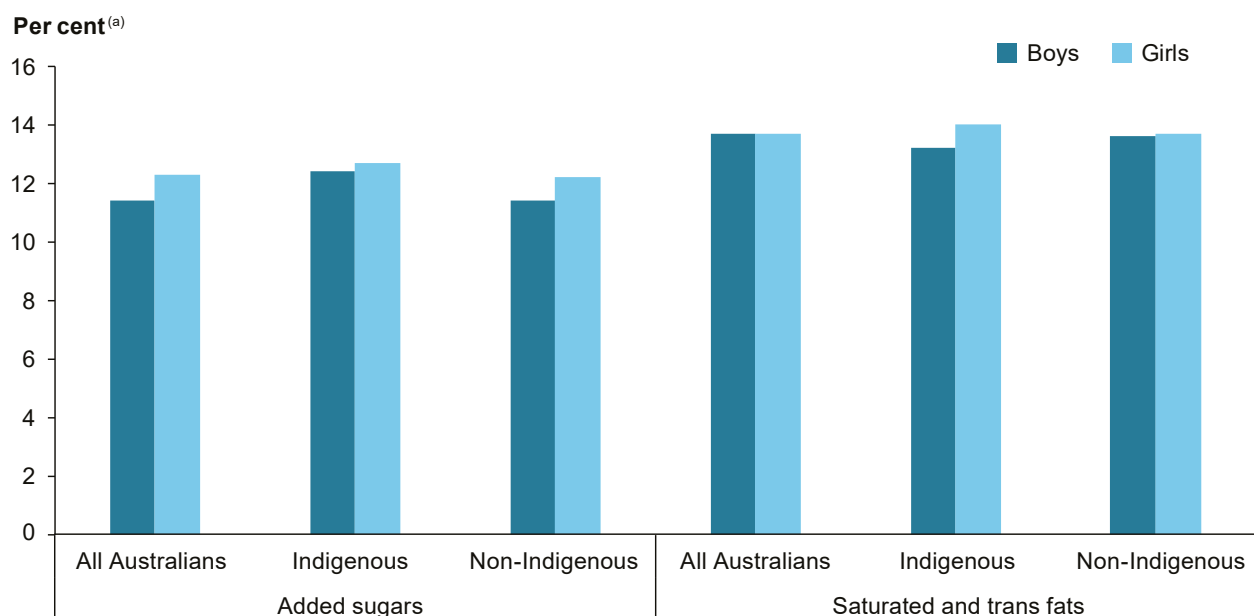
More than 7 in 10 (74%) children aged 9–13 (70% for boys and 77% for girls) have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).



Saturated and trans fats

Saturated and trans fats contribute 14% towards the energy intake of boys and girls aged 9–13. This level of intake is a substantial deviation from the ADGs, which specifies to limit intake of foods containing saturated fat. The contribution of saturated and trans fats to energy intake for Indigenous children (14%) is the same as for non-Indigenous children (Figure 5.26).

Figure 5.26: Proportion of energy intake from added sugars saturated and trans fats, by sex and Indigenous status, aged 9–13, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

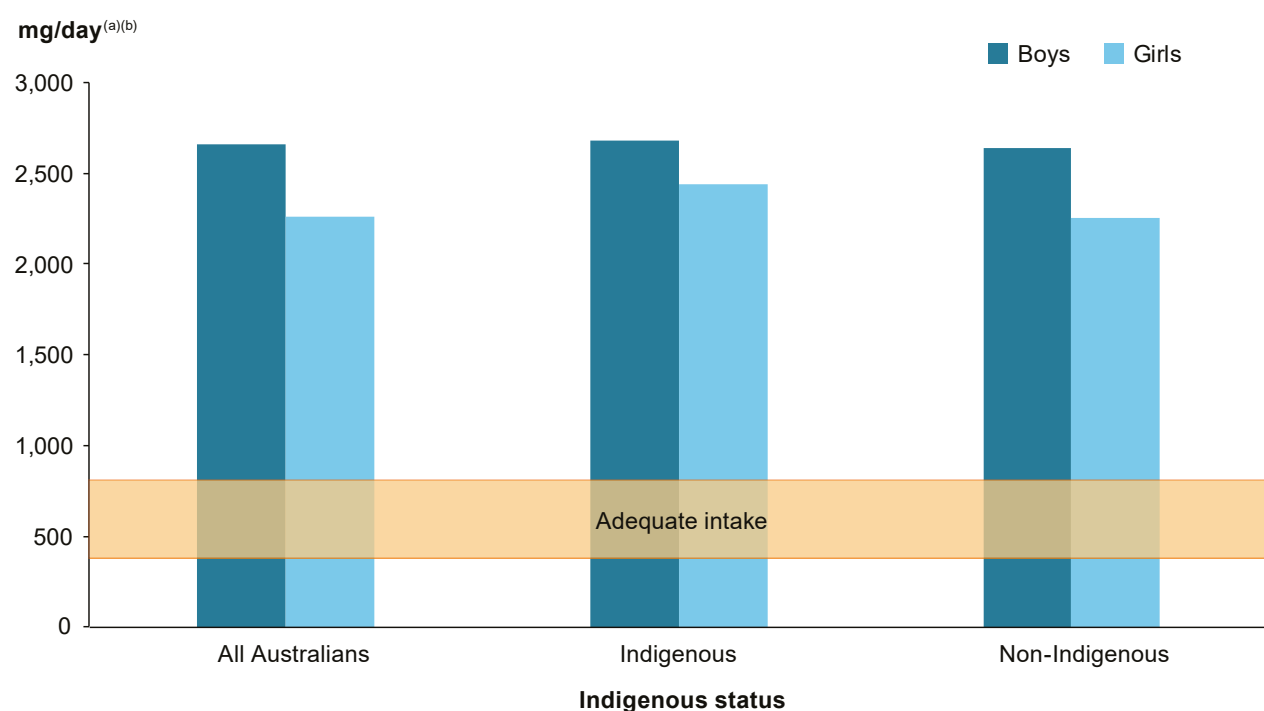
Sources: AIHW analysis of ABS 2013d; ABS 2015a; ABS 2016a; ABS 2016c; tables S19, S20, S22 and S23.

Sodium

Children aged 9–13 consume an average of 2,462 mg of sodium a day, which is well above the adequate intake level of 400–800 mg/day. Intake is higher for boys (2,657 mg) than girls (2,263 mg). Indigenous children consume an average of 2,566 mg of sodium a day, which is similar to the intake of non-Indigenous children (2,450 mg/day) (Figure 5.27).



Figure 5.27: Mean intake of sodium, by sex and Indigenous status, aged 9–13, 2011–13



(a) Includes sodium naturally present in foods and sodium added during processing, but excludes the discretionary salt added by consumers in food prepared at home, or at the table. Excludes sodium from supplements.

(b) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S24 and S25.

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

Only 1.2% or less of boys and girls aged 9–13 have inadequate dietary folate equivalents and iodine intakes. About 1 in 10 (11%) girls and 3.3% of boys have inadequate iron intakes (Figure 5.28). Iron requirements are the same for girls and boys in this age group.

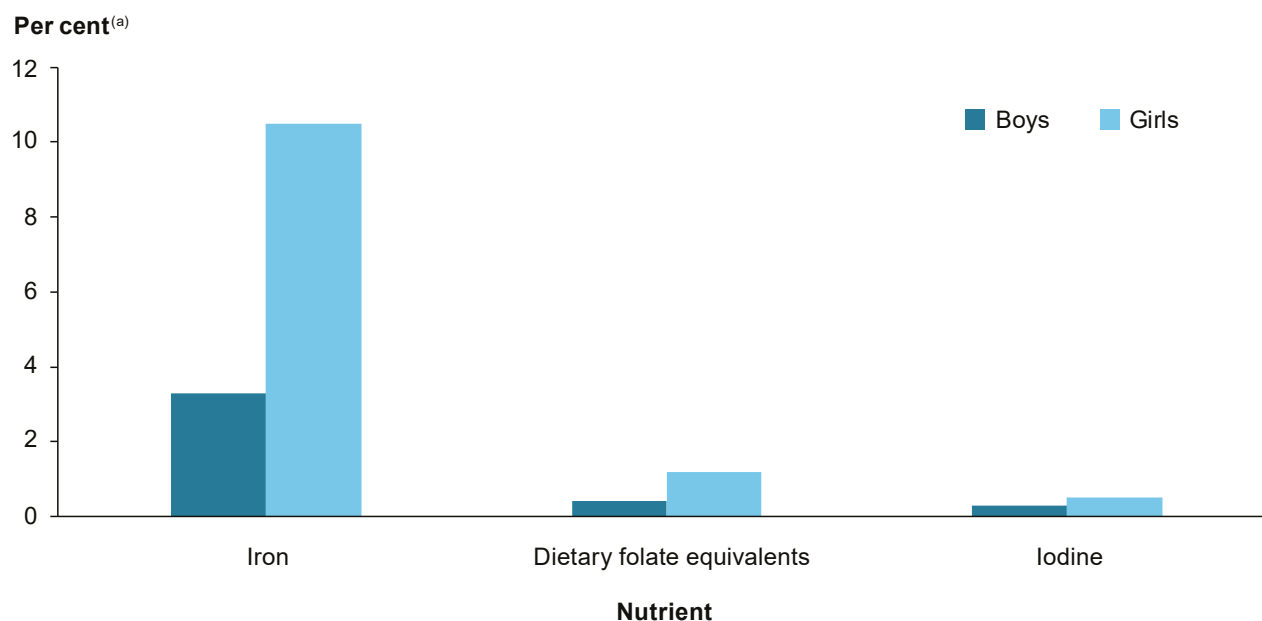
Calcium requirements are different for children aged 9–11 and 12–13; however, boys and girls have the same requirements within these age groups. More than 5 in 10 (54%) girls aged 9–11 have inadequate calcium intakes, rising to more than 8 in 10 (84%) girls aged 12–13. For boys, the prevalence of inadequate calcium intake is 46% for those aged 9–11, rising to 67% for those aged 12–13 (Table S26).

Fibre

The average daily intake of fibre for boys aged 9–13 (23 g) is slightly below the adequate intake level of 24 g/day. Intake for girls (19 g) is also below their adequate intake level of 20 g per day. Indigenous children consume an average of 20 g of fibre a day, which is similar to the intake of non-Indigenous children (21 g/day) (Figure 5.29).



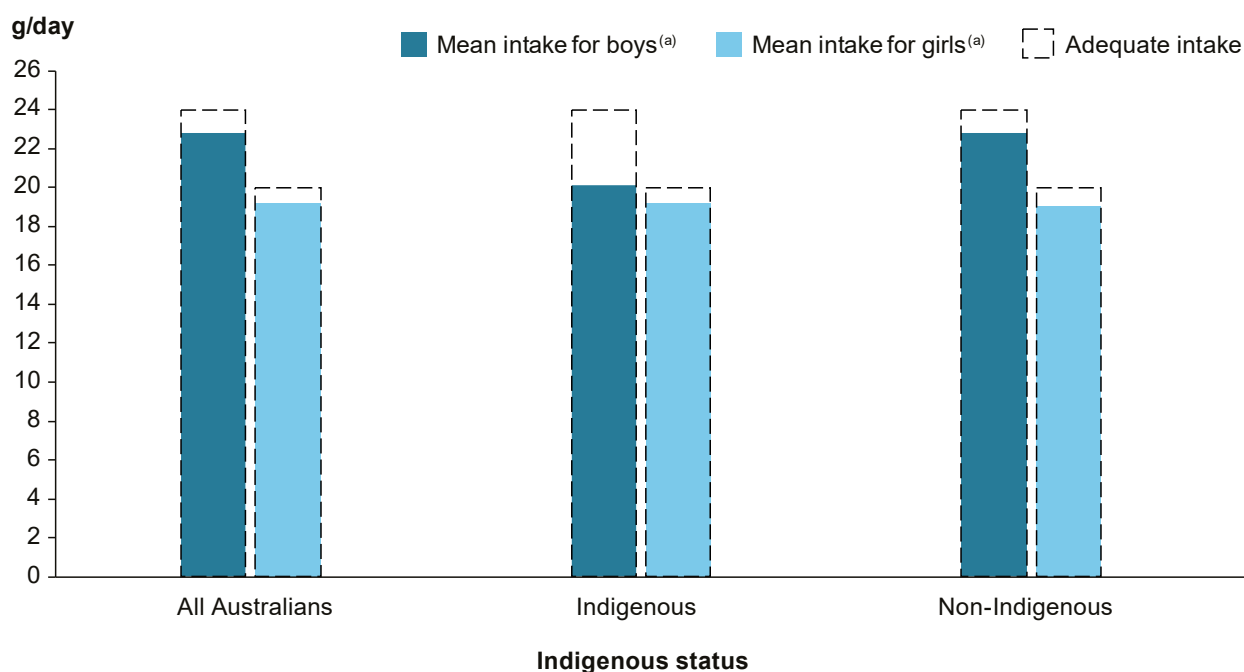
Figure 5.28: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 9–13, 2011–12



(a) Based on usual intakes (see Appendix A). Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 5.29: Mean intake of fibre compared with the level of adequate intake, by sex and Indigenous status, aged 9–13, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S27 and S28.



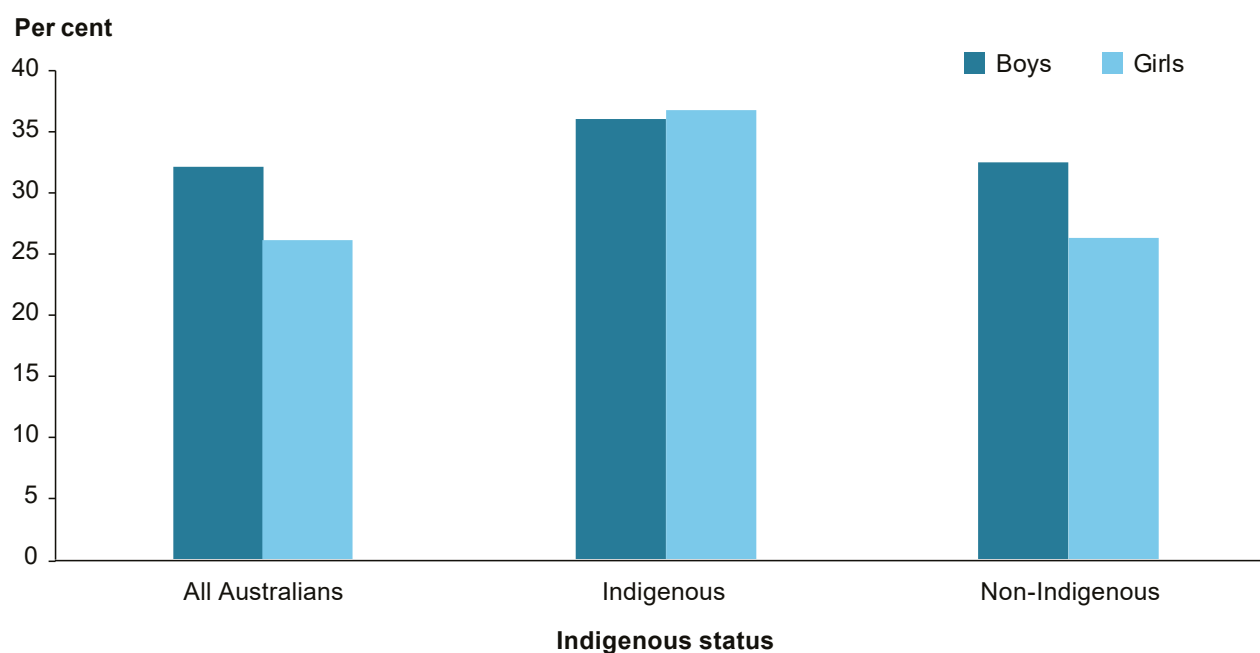
Physical activity

Less than 1 in 5 (17%) children aged 9–13 do the recommended amount of physical activity, with this level being similar for boys (19%) and girls (15%). The small sample for Indigenous children aged 9–13 makes comparisons difficult, as there is a high margin of error, so results should be interpreted with caution. The data available indicate that Indigenous boys have a higher level of sufficient physical activity than non-Indigenous boys, but there is no difference among girls (tables S29 and S30).

Overweight and obesity

Almost one-third (29%) of children aged 9–13 are overweight or obese, with a similar prevalence for boys (32%) and girls (26%). More than one-third (36%) of Indigenous children are overweight or obese, which while appearing higher than non-Indigenous children (30%), is not a statistically significant difference (Figure 5.30).

Figure 5.30: Prevalence of overweight or obesity, by sex and Indigenous status, aged 9–13, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.

Nutrient biomarkers

The median urinary iodine concentration for children aged 9–13 is within the range for iodine adequacy (at 169 µg/L), and the level is similar for boys (170 µg/L) and girls (166 µg/L). In addition, less than 1 in 10 (7.5%) children in this age group have a median urinary iodine concentration below 50 µg/L, which meets the WHO recommendation (Table S34).



Children aged 14–18

Overall, children aged 14–18:

- fall short of meeting the recommended daily serves for all 5 food groups (based on average intake), and almost everyone does not meet the recommended serves of vegetables and dairy products and alternatives
- get 41% of their energy from discretionary foods
- get 13% of their energy from added sugars and 13% from saturated and trans fats (with the latter exceeding the 10% recommended limit)
- have an intake of sodium well above the level of adequate intake
- have a low prevalence of inadequate dietary folate equivalents and iodine intakes.

Of girls aged 14–18, 2 in 5 (40%) have inadequate iron intakes and 9 in 10 (90%) have inadequate calcium intakes.

Less than 1 in 5 (16%) children aged 14–18 do the recommended amount of physical activity each day and almost one-third (30%) are overweight or obese.

Indigenous children, on average, consume fewer serves of dairy products and alternatives than non-Indigenous children, but average intake for the remaining food groups is similar.



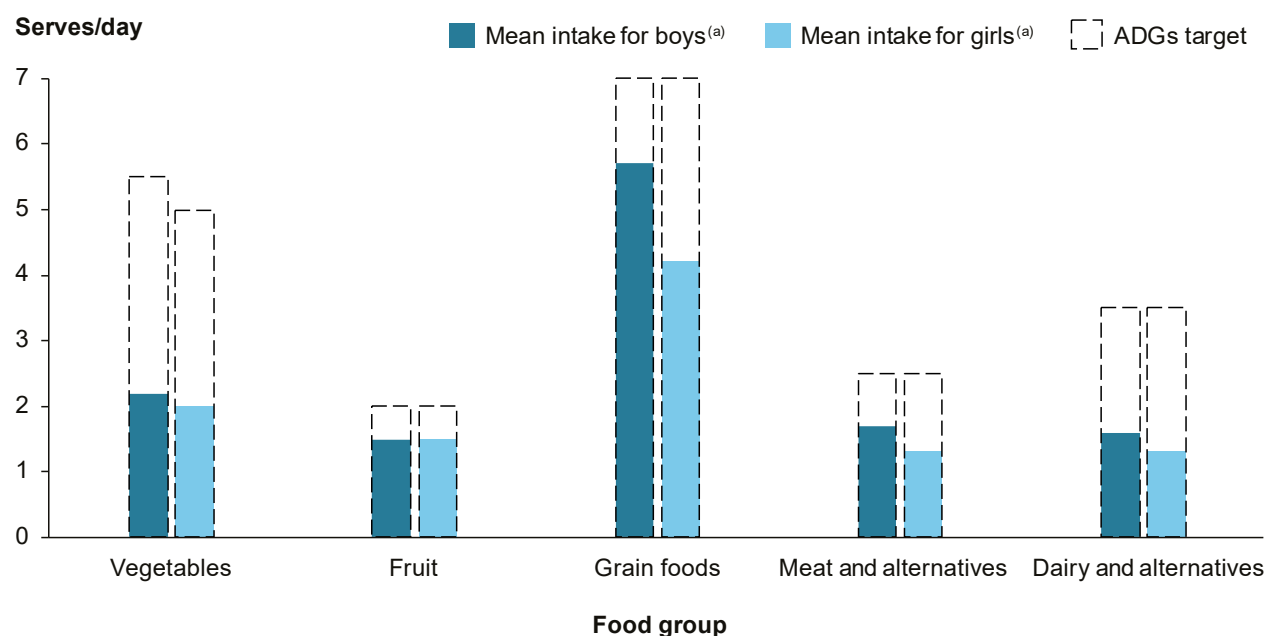
Five food groups

The information presented in this section for the 5 food groups is based on average/mean daily serves (Figure 5.31) and the proportion of the population with intakes below the recommended serves (Figure 5.32).

The average daily intake of all the 5 food groups for children aged 14–18 is below the recommendations:

- Intake of fruit is closest to the recommendation, with boys and girls consuming an average of 1.5 serves per day (half a serve below the 2.0 serve recommendation); however, about 7 in 10 still do not meet the recommended serves.
- Intake of vegetables and dairy products and alternatives is furthest from the recommendations, with boys and girls consuming less than half the recommended serves, and almost no one meeting the recommended serves.

Figure 5.31: Mean intake of food groups compared with the ADGs target, by sex, aged 14–18, 2011–12

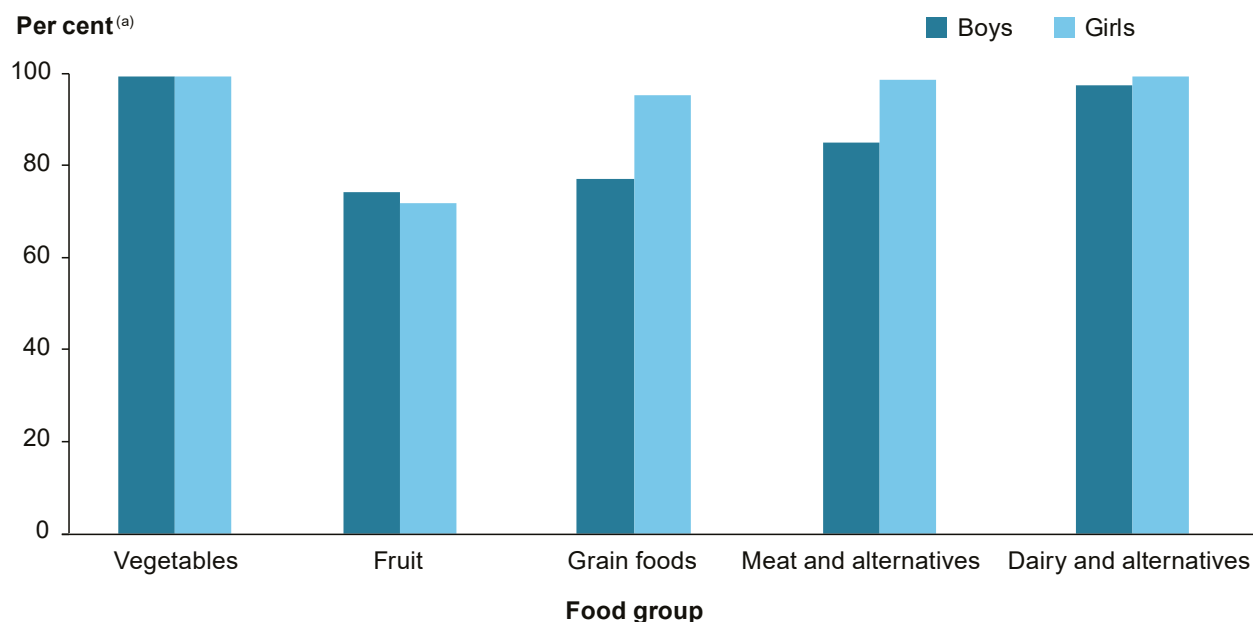


(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S5.



Figure 5.32: Proportion of the population with food group intakes below the recommended serves, by sex, aged 14–18, 2011–12

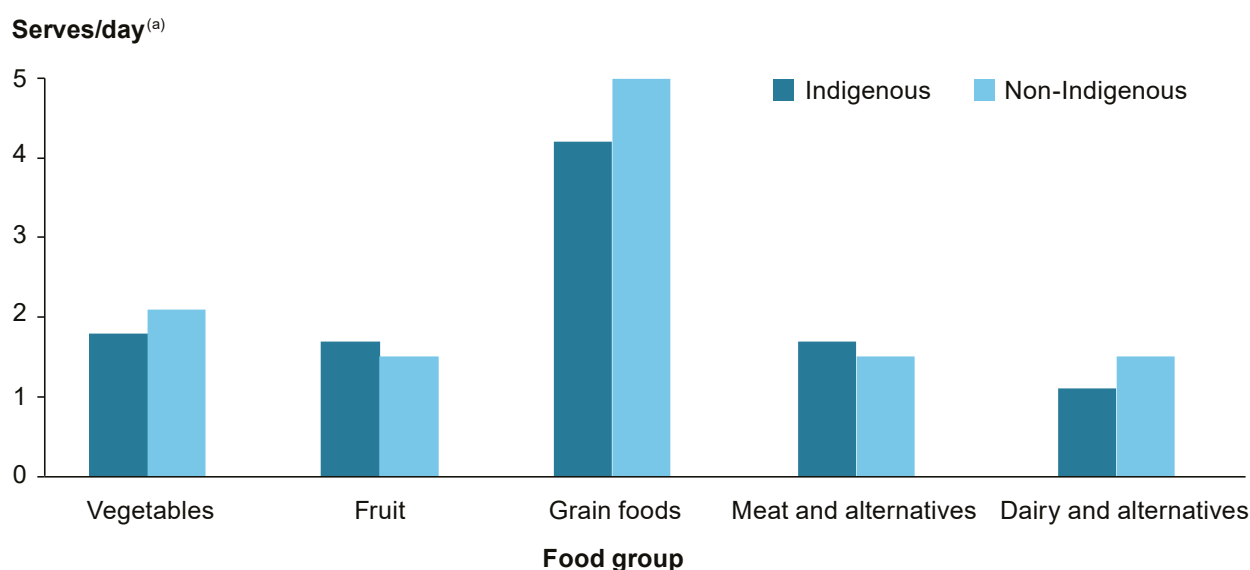


(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016d; Table S5.

Indigenous children aged 14–18 consume an average of 1.1 serves of dairy products and alternatives a day, which is 27% fewer serves than non-Indigenous children (1.5 serves). Average intake for the remaining food groups is similar (Figure 5.33).

Figure 5.33: Mean intake of food groups from the ADGs, by Indigenous status, aged 14–18, 2011–13



(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016b; Table S13.



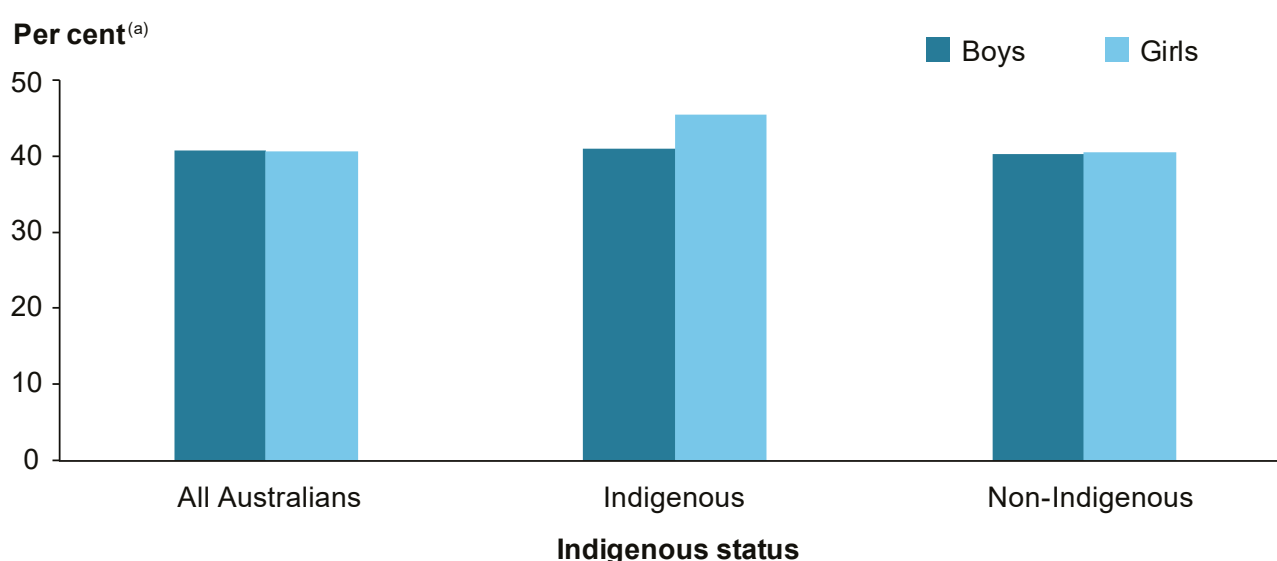
Discretionary food

Children aged 14–18 consume an average of 6.8 serves of discretionary food a day (Table S16), which contributes 41% to their total energy intake. The contribution of discretionary food to energy intake is the same for boys and girls (41%). Discretionary food contributes 43% towards the energy intake of Indigenous children, which is similar to that for non-Indigenous children (40%).

For Indigenous children, the contribution is similar for boys (41%) and girls (45%) (Figure 5.34).

The main contributors to discretionary food intake include soft drinks (8.8%), cakes and muffins (8.4%), fried potato products (8.4%), pastries (7.4%), snack foods (such as potato and corn chips) (5.7%), chocolate and chocolate-based confectionary (5.4%) and sweet biscuits (5.2%) (Table S18).

Figure 5.34: Proportion of energy intake from discretionary food, by sex and Indigenous status, aged 14–18, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Note: Discretionary foods include cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Sources: ABS 2014a; ABS 2015a; tables S16 and S17.

Added and free sugars

Children aged 14–18 consume an average of 73 g of added sugars a day, and this is higher for boys (82 g) than girls (63 g). Added sugars contribute a similar amount to the total energy intake of boys (13%) and girls (12%). Added sugars contribute 16% towards the energy intake of Indigenous boys, which while appearing higher than that for non-Indigenous boys (13%), is not a statistically significant difference. The contribution of added sugars to energy intake is similar for Indigenous and non-Indigenous girls (12%) (Figure 5.35; tables S19 and S20).

The main contributors to added sugar intake include soft drinks (28%), cakes and muffins (7.7%), sugar, honey and syrups (6.3%), fruit and vegetable juices and drinks (5.9%) and chocolate and chocolate-based confectionary (5.7%) (Table S21).

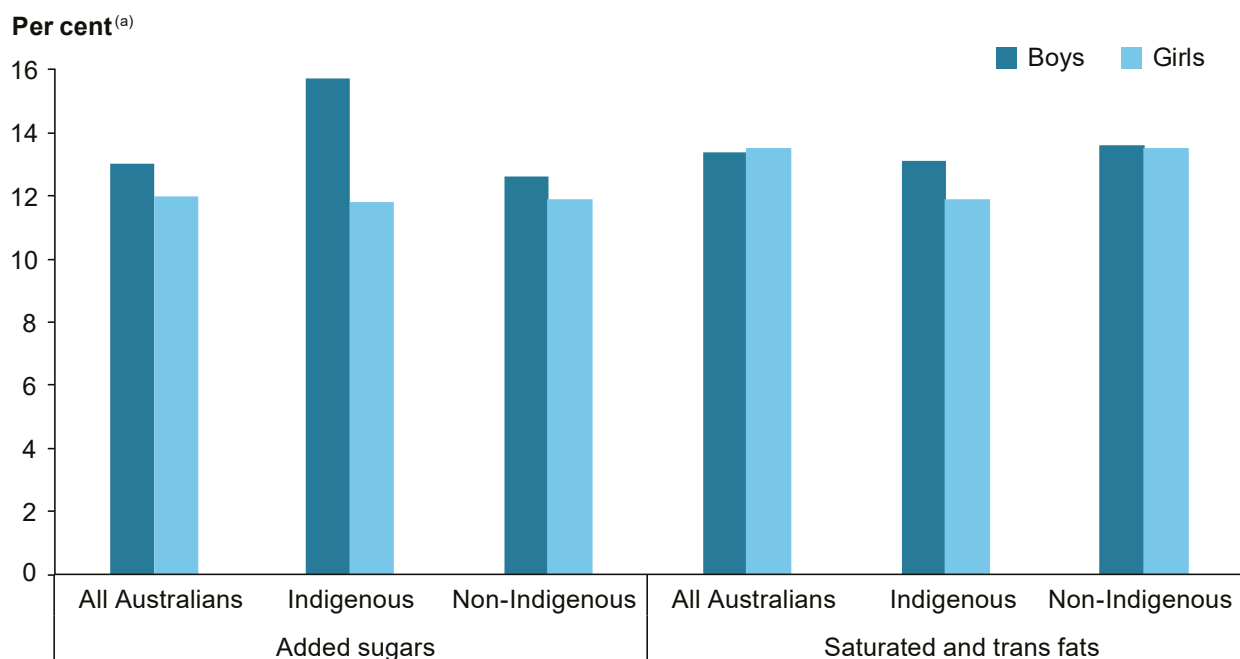
More than 7 in 10 boys (73%) and girls (74%) aged 14–18 have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).



Saturated and trans fats

Saturated and trans fats contribute 13% towards the energy intake of children aged 14–18, with the contribution being similar for boys (13%) and girls (14%). This exceeds the NRV recommendation to limit intake to no more than 10% of energy. The contribution of saturated and trans fats to energy intake for Indigenous boys (13%) and girls (12%) is similar to that for non-Indigenous boys and girls (both 14%) (Figure 5.35).

Figure 5.35: Proportion of energy intake from added sugars and saturated and trans fats, by sex and Indigenous status, aged 14–18, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

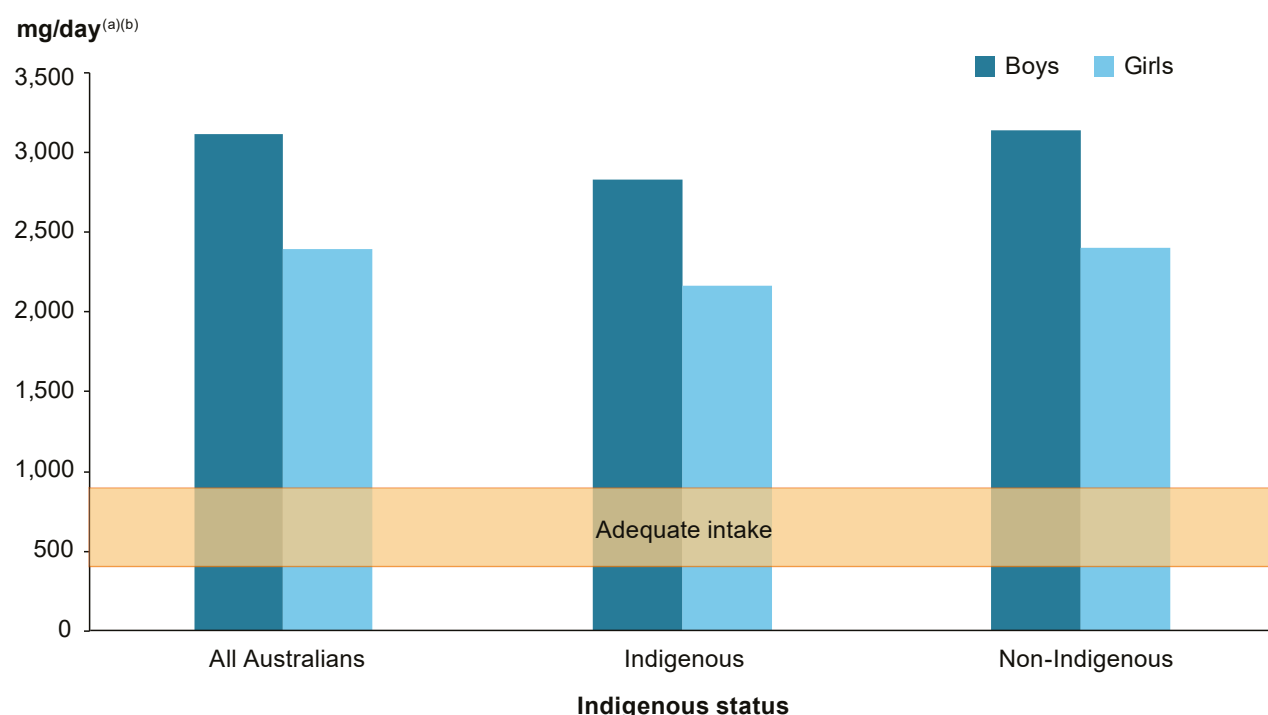
Sources: AIHW analysis of ABS 2013d; ABS 2015a; ABS 2016a; ABS 2016c; tables S19, S20, S22 and S23.

Sodium

Children aged 14–18 consume an average of 2,761 mg of sodium a day, which is well above the adequate intake level of 460–920 mg/day. Intake is higher for boys (3,117 mg) than girls (2,399 mg). Indigenous children consume an average of 2,493 mg of sodium a day, which is similar to the intake of non-Indigenous children (2,774 mg/day) (Figure 5.36).



Figure 5.36: Mean intake of sodium, by sex and Indigenous status, aged 14–18, 2011–13



(a) Includes sodium naturally present in foods and sodium added during processing, but excludes the discretionary salt added by consumers in food prepared at home, or at the table. Excludes sodium from supplements.

(b) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S24 and S25.

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

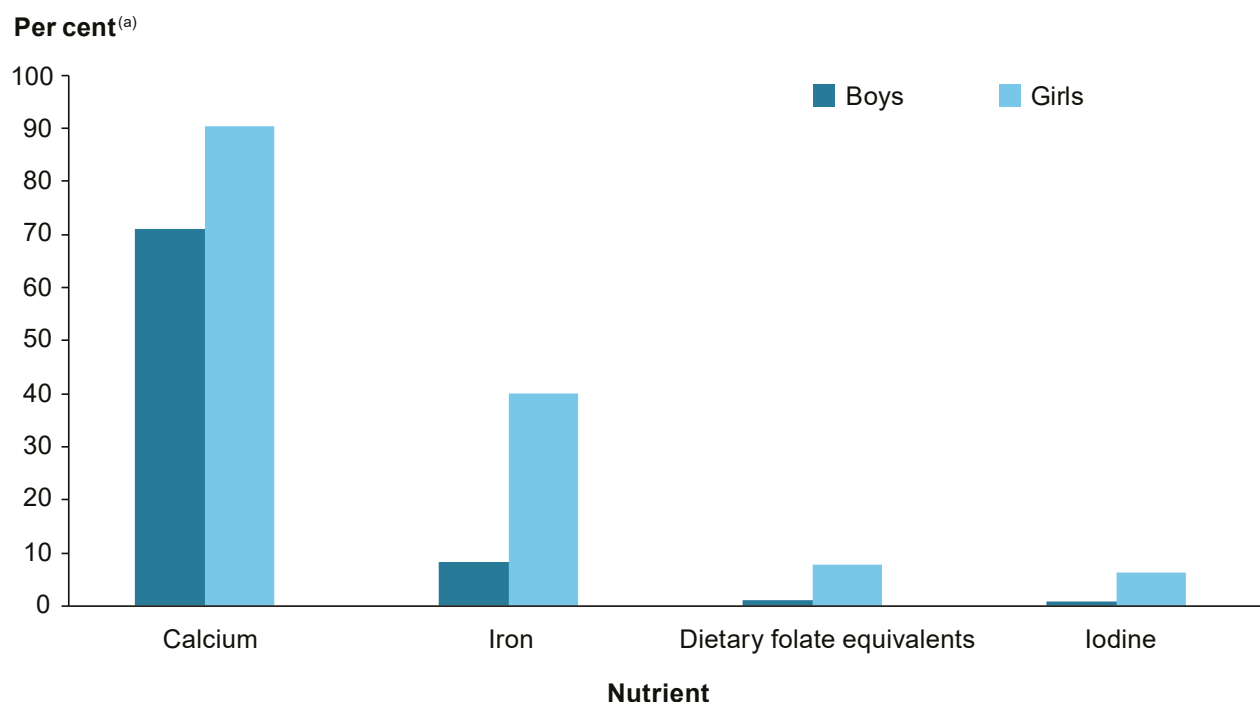
Of children aged 14–18, 1.2% of boys and 7.9% of girls have inadequate dietary folate equivalents intakes and 0.8% of boys and 6.4% of girls have inadequate iodine intakes. Less than 1 in 10 (8.3%) boys have inadequate iron intakes, compared with a much higher prevalence of 2 in 5 girls (40%). For calcium, more than 7 in 10 boys (71%) and 9 in 10 girls (90%) have inadequate intakes (Figure 5.37). Requirements for these 4 nutrients are the same for boys and girls.

Fibre

The average daily intake of fibre for boys and girls aged 14–18 is below the adequate intake level, with intake for boys at 80% of their adequate intake of 28 g/day, and intake for girls at 88% of their adequate intake of 22 g/day. Indigenous children consume an average of 19 g of fibre a day, which is similar to the intake of non-Indigenous children (21 g/day) (Figure 5.38).



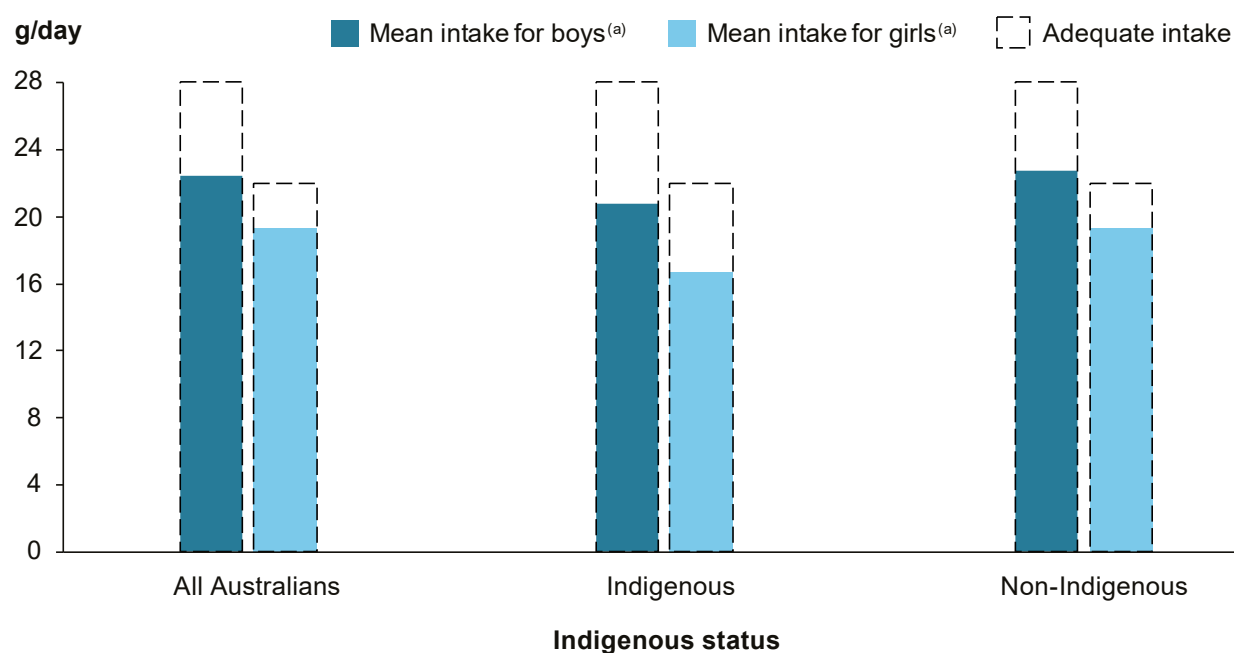
Figure 5.37: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 14–18, 2011–12



(a) Based on usual intakes (see Appendix A). Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 5.38: Mean intake of fibre compared with the level of adequate intake, by sex and Indigenous status, aged 14–18, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S27 and S28.



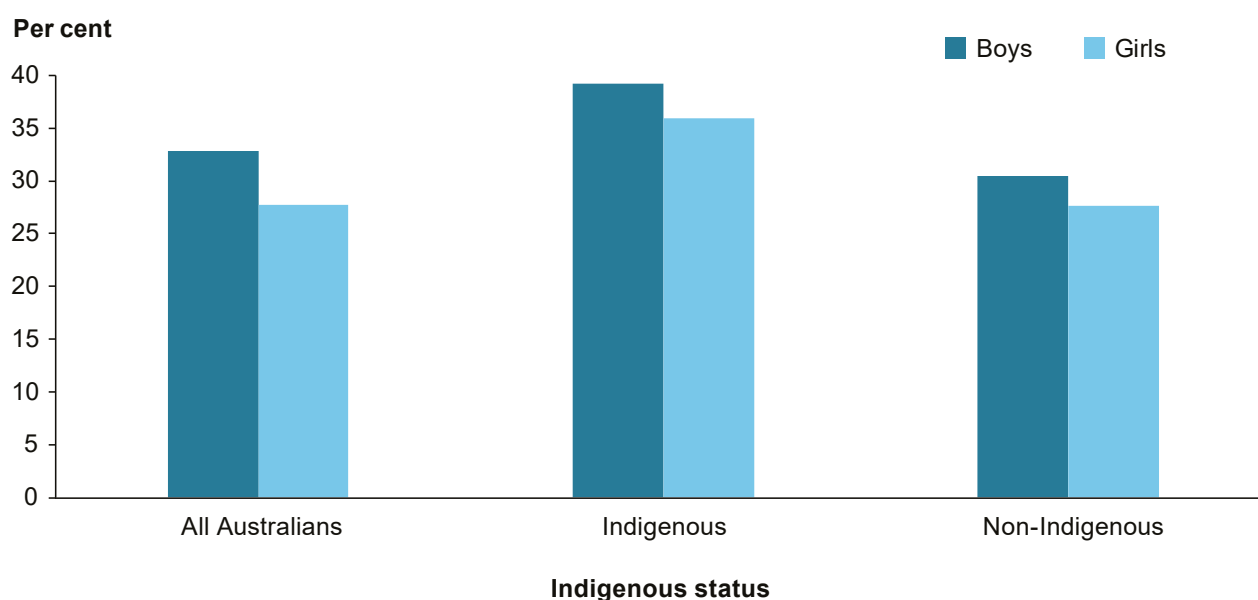
Physical activity

Less than 1 in 5 (16%) children aged 14–18 do the recommended amount of physical activity, with this level being similar for boys (17%) and girls (15%). The small sample for Indigenous children aged 14–18 makes comparisons difficult, as there is a high margin of error, so results should be interpreted with caution. The data available indicate there is no difference in the sufficiency of physical activity between Indigenous and non-Indigenous children aged 14–18 (tables S29 and S30).

Overweight and obesity

Almost one-third (30%) of children aged 14–18 are overweight or obese, with this level being similar for boys (33%) and girls (28%). Almost 4 in 10 (38%) Indigenous children are overweight or obese, which, while appearing higher than non-Indigenous children (30%), is not a statistically significant difference (Figure 5.39).

Figure 5.39: Prevalence of overweight or obesity, by sex and Indigenous status, aged 14–18, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.

Nutrient biomarkers

Mean levels of red blood cell folate, vitamin B12 and iron for children aged 14–18 are above the cut-offs for deficiency. Levels of folate and vitamin B12 are similar for boys and girls; however, girls (35 µg/L) have a lower level of iron than boys (70 µg/L).

The median urinary iodine concentration for children aged 14–18 is within the range for iodine adequacy (at 147 µg/L) and the level is similar for boys (141 µg/L) and girls (148 µg/L). In addition, less than 1 in 10 (7.9%) children in this age group have a median urinary iodine concentration below 50 µg/L, which meets the WHO recommendation. About three-quarters (76%) of children aged 14–18 have adequate levels of vitamin D and the level is the same for boys and girls (Table S34).

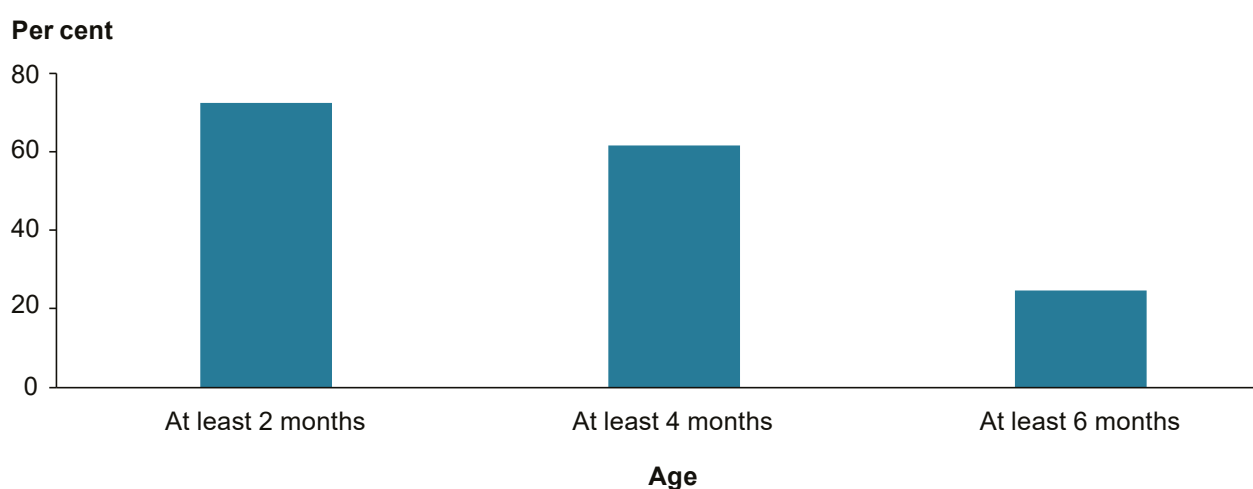


Breastfeeding

In 2014–15, almost all children aged 0–3 (92%) had ever received breastmilk (ABS 2017). Almost three-quarters (73%) of children aged 2–24 months were exclusively breastfed to at least 2 months of age. However this gradually decreased to 62% by at least 4 months and to 25% by at least 6 months of age (Figure 5.40).

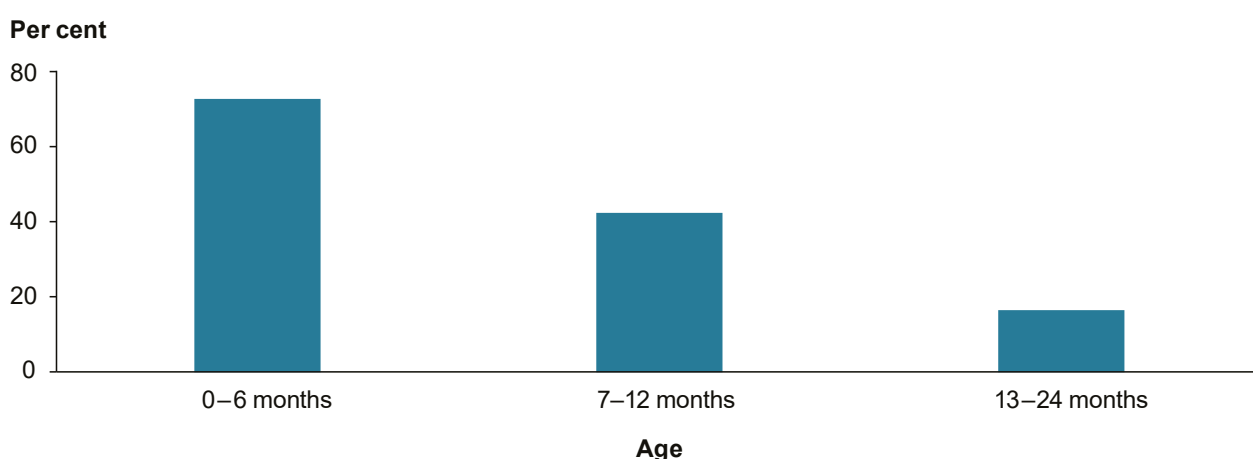
About three-quarters (73%) of children aged 0–6 months at the time of the survey were still receiving any breastmilk, which decreased to 42% at 7–12 months and to 17% at 13–24 months (Figure 5.41).

Figure 5.40: Proportion of children exclusively breastfed to at least 2, 4 and 6 months, aged 2–24 months, 2014–15



Source: ABS 2017; Table S35.

Figure 5.41: Proportion of children currently receiving any breastmilk, by age at the time of interview, aged 0–24 months, 2014–15



Source: ABS 2017; Table S36.



Main findings: adults

6

Adults aged 19–30

Overall, adults aged 19–30 (and 19–50 for the food group analysis):

- fall short of meeting the recommended daily serves for all 5 food groups (based on average intake), and almost everyone does not meet the recommended serves of vegetables
- get more than one-third (36%) of their energy from discretionary foods
- get 11% of their energy from added sugars and 12% from saturated and trans fats (with the latter exceeding the 10% recommended limit)
- have an intake of sodium well above the level of adequate intake.

More than 2 in 5 (44%) men and 7 in 10 (71%) women have inadequate calcium intakes.

Nearly 2 in 5 (38%) women have inadequate iron intakes.

More than half (55%) of adults aged 19–30 do the recommended amount of physical activity each day, and just under half (47%) are overweight or obese.

Indigenous adults, on average, consume fewer serves of fruit, vegetables, and dairy products and alternatives than non-Indigenous adults.



Five food groups

The 19–30 and 31–50 age groups are combined for the 5 food group analysis. This is because the population aged 19–50 is a discrete group in the ADGs.

The information presented in this section for the 5 food groups is based on average/mean daily serves (Figure 6.1) and the proportion of the population with intakes below the recommended serves (Figure 6.2).

The average daily intake of all the 5 food groups for adults aged 19–50 is below the recommendations.

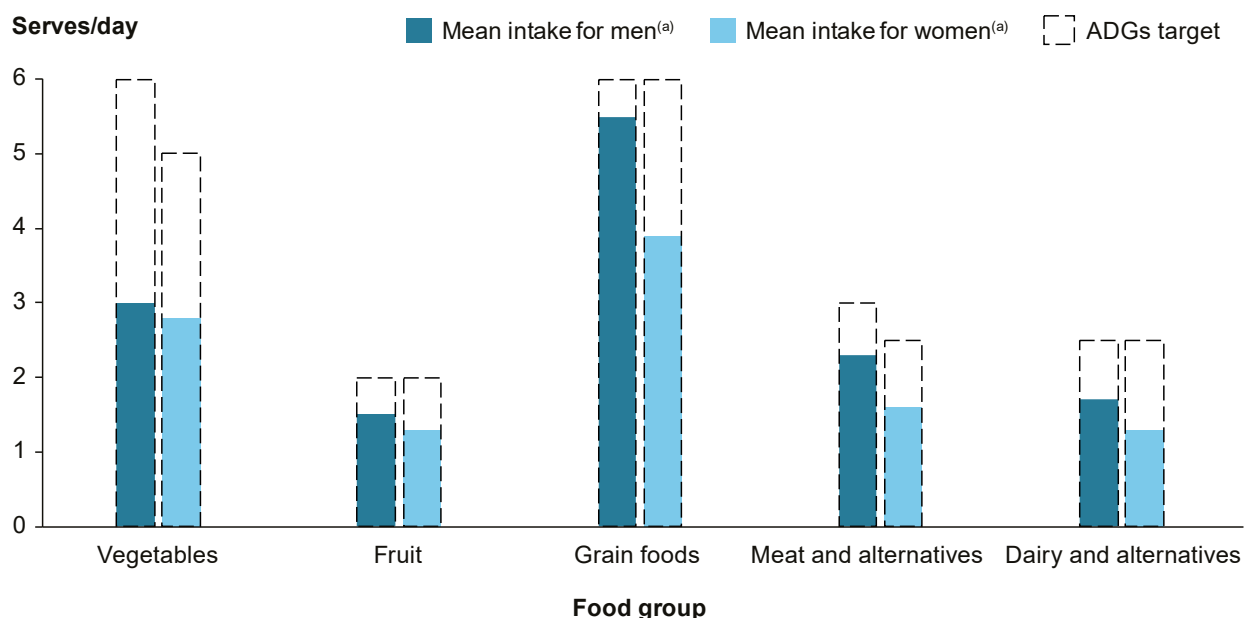
For men:

- intake of fruit (1.5 serves) and grain foods (5.5 serves) is closest to the recommendations, at half a serve below; however, almost 3 in 4 (74.1%) do not meet the recommended fruit serves and almost two-thirds (65.3%) do not meet the recommended grain foods serves
- intake of vegetables is at half the recommended 6 serves and almost everyone does not meet the recommended serves (98.3%).

For women:

- intake of fruit (1.3 serves) is closest to the recommendation; however, still is 0.7 serves below the recommendation and 4 in 5 (80.0%) do not meet the recommended serves
- intake of vegetables (2.8 serves) and dairy products and alternatives (1.3 serves) is just over half of the recommended serves, and a large proportion of the population do not meet the recommended serves (95.8% and 94.0%, respectively).

Figure 6.1: Mean intake of food groups compared with the ADGs target, by sex, aged 19–50, 2011–12

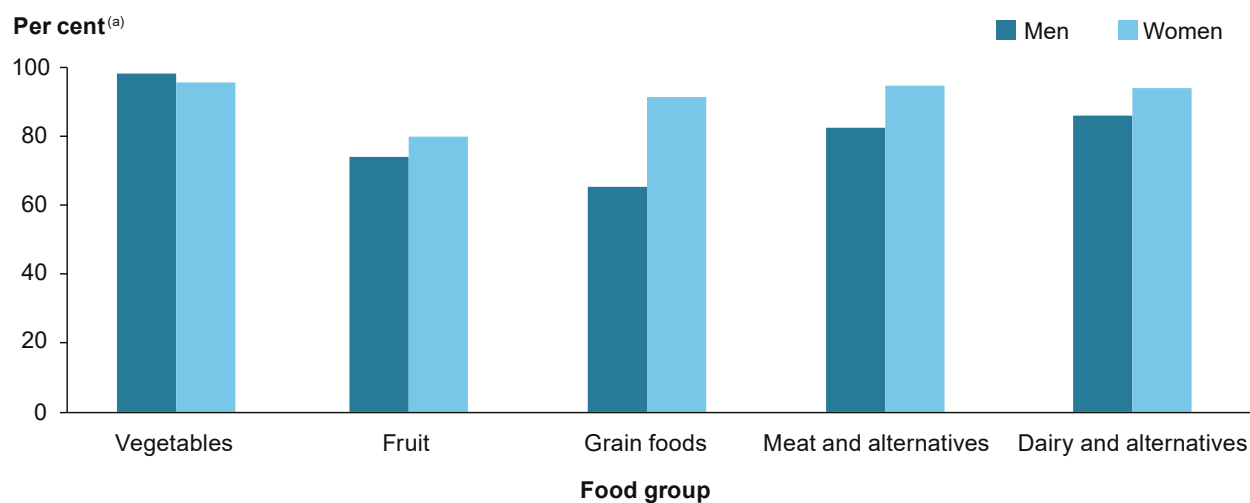


(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S6.



Figure 6.2: Proportion of the population with food group intakes below the recommended serves, by sex, aged 19–50, 2011–12



(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

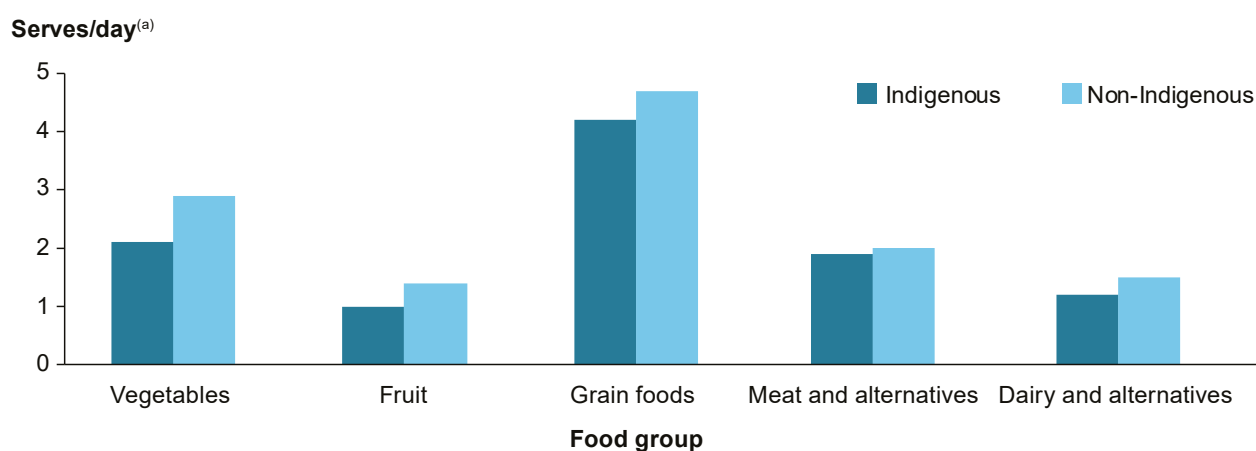
Source: ABS 2016d; Table S6.

Indigenous adults aged 19–50 consume an average of:

- 2.1 serves of vegetables a day, which is 28% fewer than non-Indigenous adults (2.9 serves)
- 1.0 serves of fruit a day, which is 29% fewer than non-Indigenous adults (1.4 serves)
- 4.2 serves of grain foods a day, which is 11% fewer than non-Indigenous adults (4.7 serves)
- 1.2 serves of dairy products and alternatives a day, which is 20% fewer than non-Indigenous adults (1.5 serves) (Figure 6.3).

The differences in intake are more pronounced in women than men.

Figure 6.3: Mean intake of food groups from the ADGs, by Indigenous status, aged 19–50, 2011–13



(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016b; Table S14.

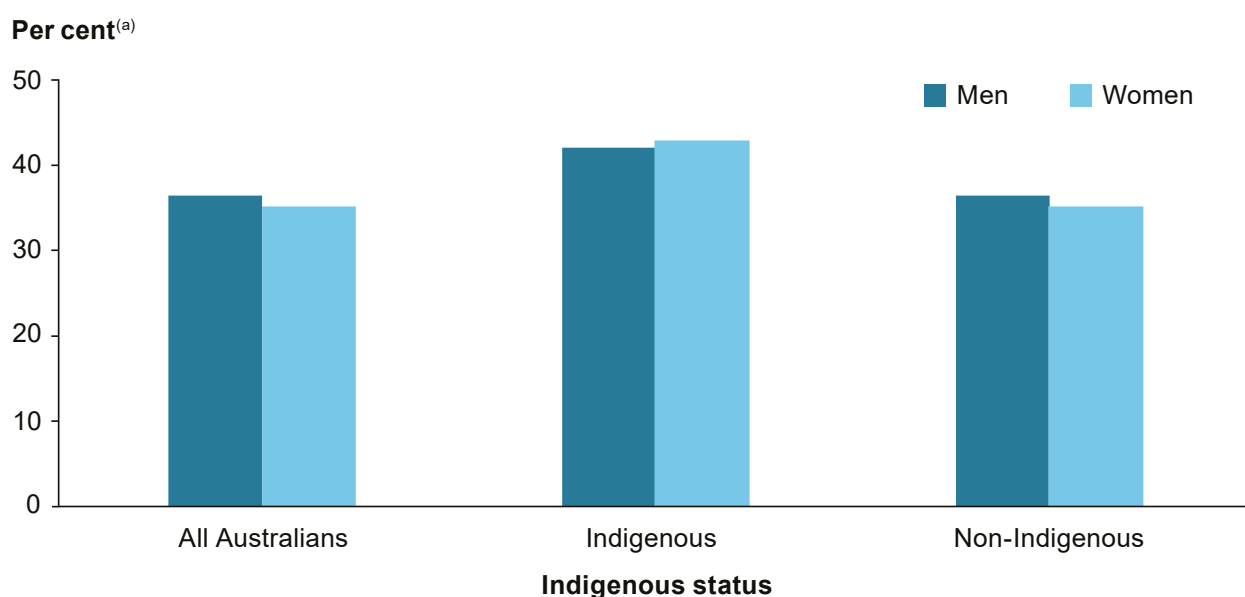


Discretionary food

Discretionary food contributes more than one-third (36%) to total energy intake for adults aged 19–30, which is similar for men (36%) and women (35%). Discretionary food contributes 43% towards the energy intake of Indigenous women, which is higher than for non-Indigenous women (35%). The contribution for Indigenous men (42%) and non-Indigenous men (37%) is similar. For Indigenous adults the contribution is similar for men (42%) and women (43%) (Figure 6.4).

The main contributors to discretionary food intake include alcoholic drinks (13%), soft drinks (7.8%), cakes and muffins (7.2%), fried potato products (7.0%) and pastries (6.7%) (Table S18).

Figure 6.4: Proportion of energy intake from discretionary food, by sex and Indigenous status, aged 19–30, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Note: Discretionary foods include cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Sources: ABS 2014a; ABS 2015a; tables S16 and S17.

Added and free sugars

Adults aged 19–30 consume an average of 65 g of added sugars a day, which is higher for men (76 g) than women (53 g). For men and women, added sugars contribute 11% to total energy intake. Added sugars contribute 13% towards the energy intake of Indigenous men and 16% for women, which is higher than for non-Indigenous men and women (11% for both) (Figure 6.5; tables S19 and S20).

The main contributors to added sugars intake include soft drinks (26%), fruit and vegetable juices and drinks (8.2%), cakes and muffins (7.0%), sugar, honey and syrups (7.2%) and alcoholic drinks (5.1%) (Table S21).

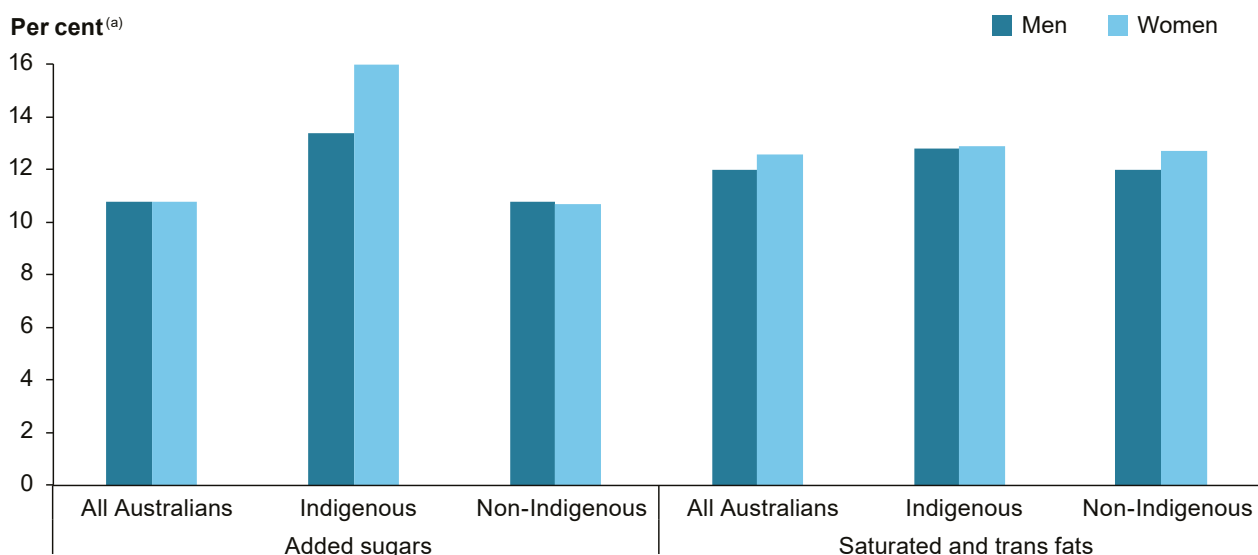
About 3 in 5 men (58%) and women (61%) aged 19–30 have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).



Saturated and trans fats

Saturated and trans fats contribute 12% towards the energy intake of adults aged 19–30, with the contribution being similar for men (12%) and women (13%). This exceeds the NRV recommendation to limit intake to no more than 10% of energy. The contribution of saturated and trans fats to energy intake for Indigenous adults (13%) is similar to that for non-Indigenous adults (12%) (Figure 6.5).

Figure 6.5: Proportion of energy intake from added sugars and saturated and trans fats, by sex and Indigenous status, aged 19–30, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

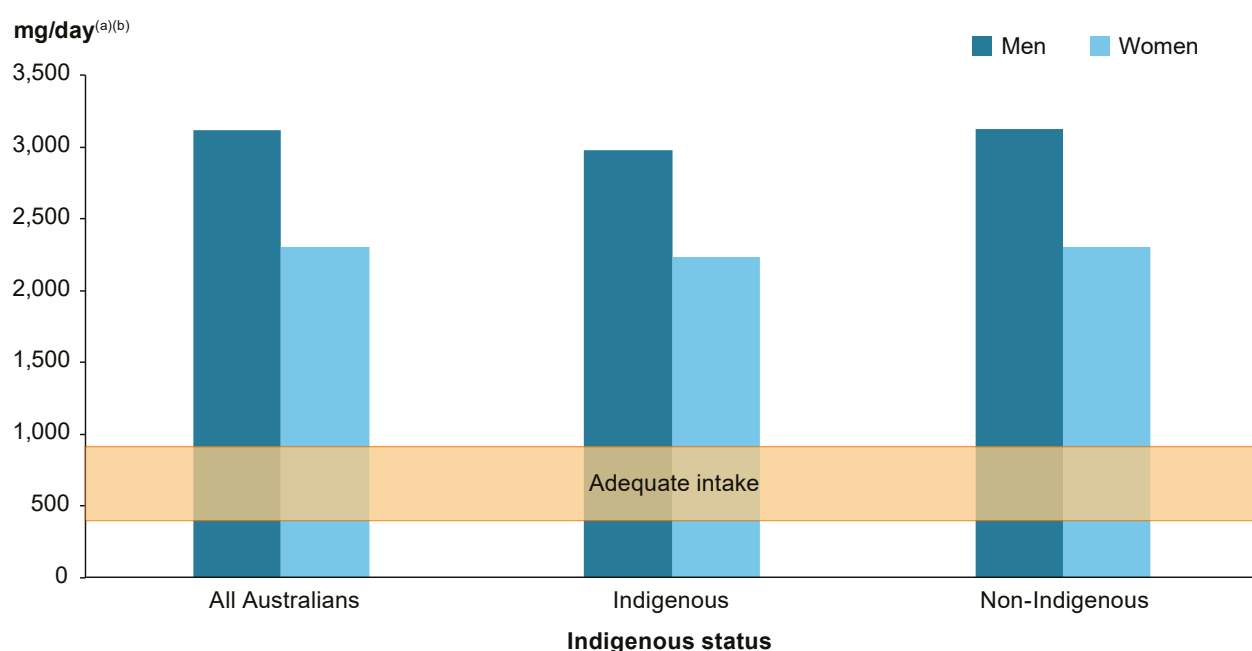
Sources: AIHW analysis of ABS 2013d; ABS 2015a; ABS 2016a; ABS 2016c; tables S19, S20, S22 and S23.

Sodium

Adults aged 19–30 consume an average of 2,720 mg of sodium a day, which is well above the adequate intake level of 460–920 mg/day. Intake is higher for men (3,120 mg) than women (2,303 mg). Indigenous adults consume an average of 2,615 mg of sodium a day, which is similar to the intake of non-Indigenous adults (2,725 mg/day) (Figure 6.6).



Figure 6.6: Mean intake of sodium, by sex and Indigenous status, aged 19–30, 2011–13



(a) Includes sodium naturally present in foods and sodium added during processing, but excludes the discretionary salt added by consumers in food prepared at home, or at the table. Excludes sodium from supplements.

(b) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S24 and S25.

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

Of men aged 19–30, 2.8% or less have inadequate iron, dietary folate equivalents and iodine intakes but, more than 2 in 5 (44%) have inadequate calcium intakes. For women, about 1 in 10 have inadequate intakes of dietary folate equivalents (11%) and iodine (12%), nearly 2 in 5 (38%) have inadequate intakes of iron and more than 7 in 10 (71%) have inadequate intakes of calcium (Figure 6.7).

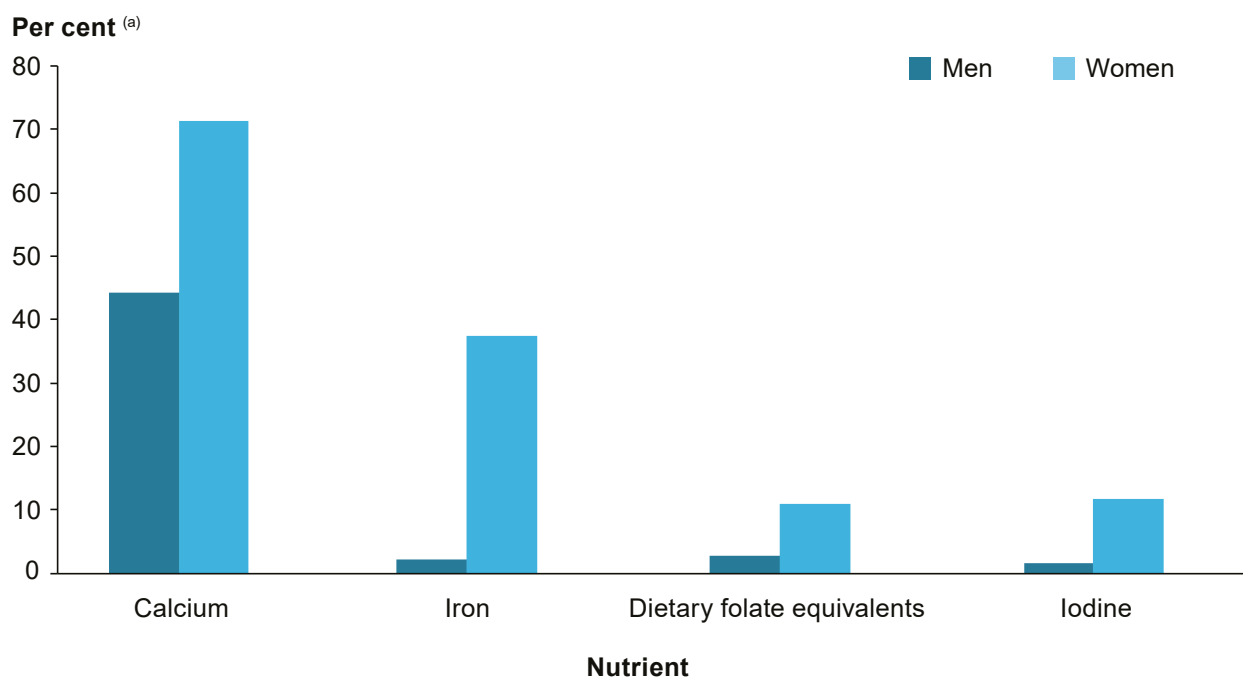
Requirements are the same for men and women of this age for calcium, dietary folate equivalents and iodine; however, women have a higher requirement for iron (8 mg/day) than men (6 mg/day).

Fibre

The average daily intake of fibre for men and women aged 19–30 is below the adequate intake level (at 81% of this amount). Intake for Indigenous men (20 g) and women (16 g) is lower than for non-Indigenous men (25 g) and women (20 g) (Figure 6.8). The adequate intake level for fibre is lower for women (25 g/day) than men (30 g/day).



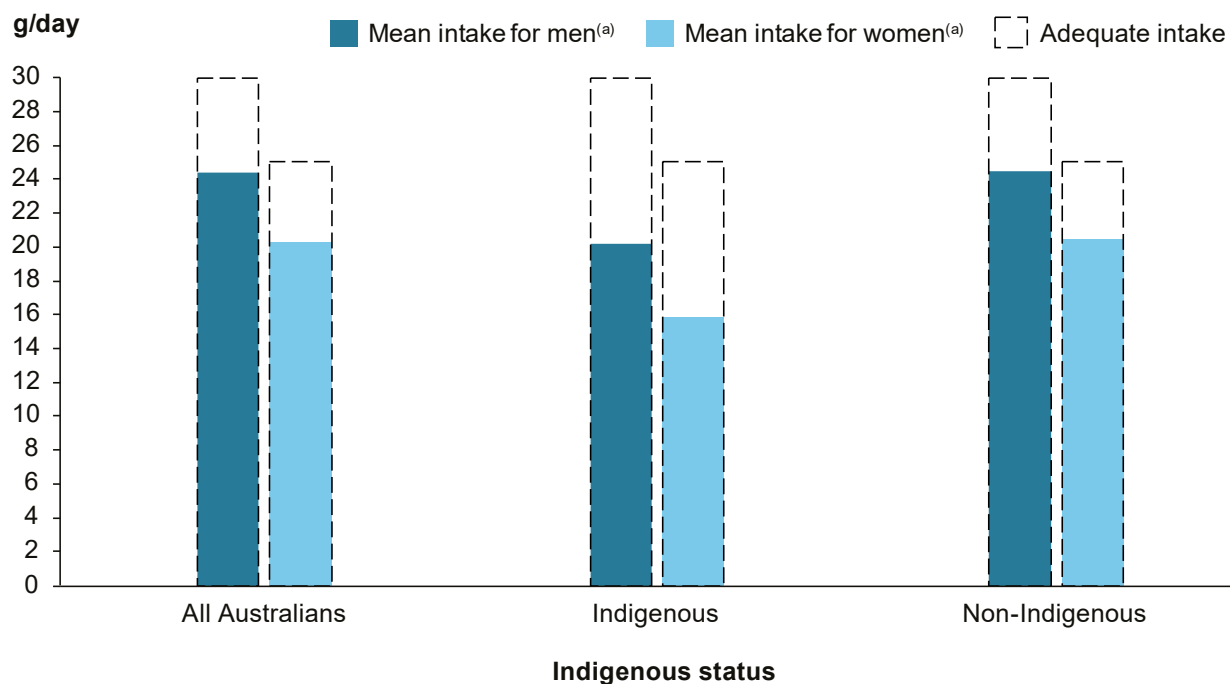
Figure 6.7: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 19–30, 2011–12



(a) Based on usual intakes (see Appendix A). Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 6.8: Mean intake of fibre compared with the level of adequate intake, by sex and Indigenous status, aged 19–30, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S27 and S28.



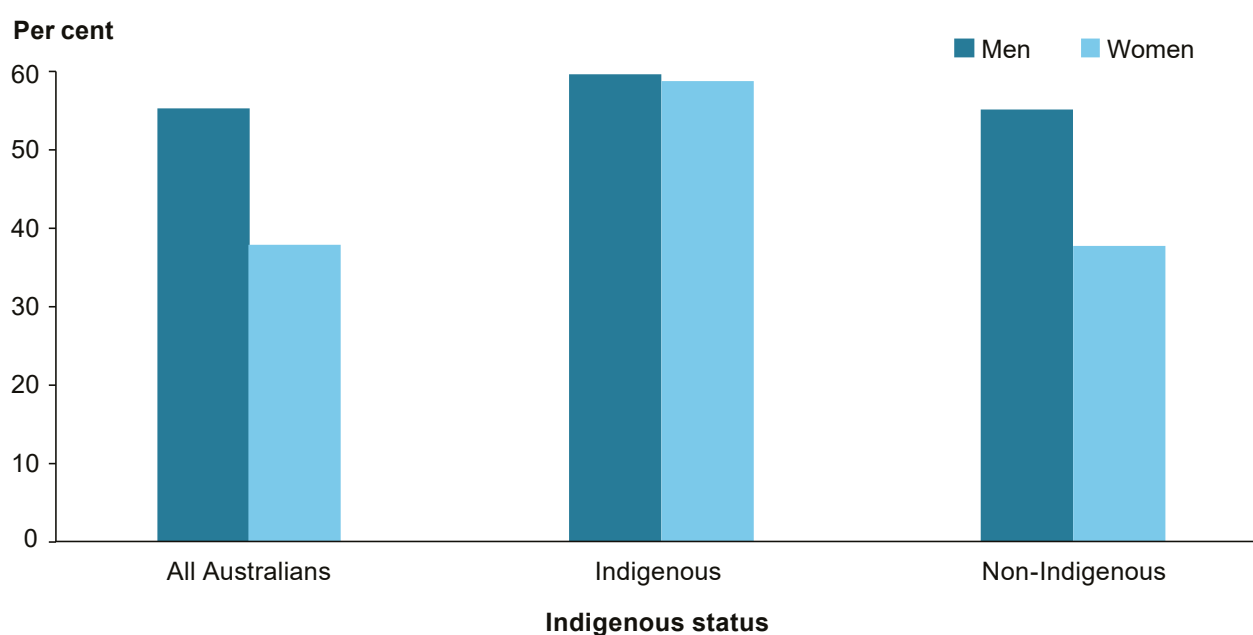
Physical activity

More than half (55%) of adults aged 19–30 do the recommended amount of physical activity, with this level being similar for men (57%) and women (52%). Indigenous adults (45%) have a lower level of sufficient physical activity than non-Indigenous adults (55%), which is driven by the difference in women (40% for Indigenous women compared with 53% for non-Indigenous women) (tables S29 and S30).

Overweight and obesity

Almost half (47%) of adults aged 19–30 are overweight or obese, with this level being higher in men (55%) than women (38%). Almost 3 in 5 (59%) Indigenous women are overweight or obese, which is higher than non-Indigenous women (38%). The level of overweight and obesity is similar for Indigenous men (60%) and non-Indigenous men (55%). There is no difference in the prevalence among Indigenous men and women, unlike for all Australians (Figure 6.9).

Figure 6.9: Prevalence of overweight or obesity, by sex and Indigenous status, aged 19–30, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



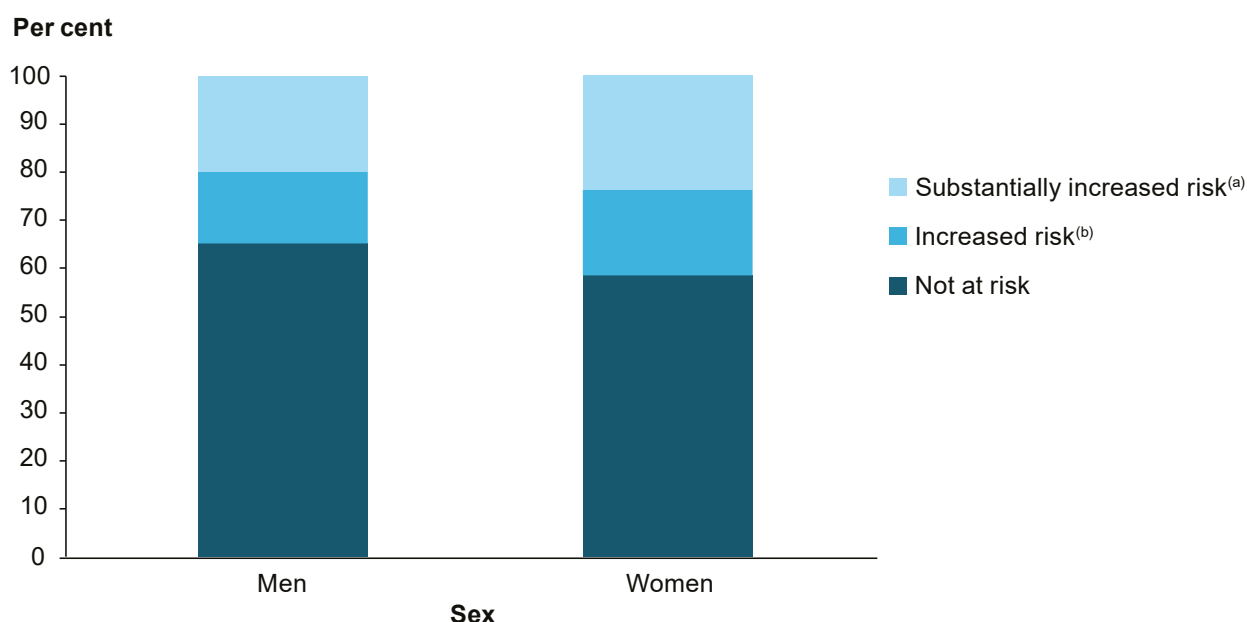
Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.

Waist circumference

About 1 in 5 (20%) men and 1 in 4 (24%) women aged 19–30 have a waist circumference that puts them at substantially increased risk of developing chronic conditions, such as heart disease and type 2 diabetes (Figure 6.10).



Figure 6.10: Proportion of men and women with waist circumference above recommended risk guidelines, aged 19–30, 2014–15



(a) A waist circumference of 102 cm or more for men or 88 cm or more for women.

(b) A waist circumference of 94 cm or more for men or 80 cm or more for women.

Source: AIHW analysis of ABS 2016e; Table S33.

Nutrient biomarkers

Mean levels of red blood cell folate, vitamin B12 and iron for adults aged 19–30 are above the cut-offs for deficiency. Levels of folate are similar for men (33 nmol/L) and women (32 nmol/L). However, women have a lower level of vitamin B12 (347 µg/L compared with 401 µg/L for men) and iron (47 µg/L compared with 150 µg/L for men).

The median urinary iodine concentration is within the range for iodine adequacy (at 125 µg/L), with the level being similar for men (135 µg/L) and women (116 µg/L). In addition, 14% of adults aged 19–30 have a median urinary iodine concentration below 50 µg/L, which meets the WHO recommendation.

Almost two-thirds (64%) of adults aged 19–30 have adequate levels of vitamin D, with the level being similar for men (61%) and women (68%) (Table S34).





Adults aged 31–50

Overall, adults aged 31–50:

- get more than one-third (35%) of their energy from discretionary foods
- get 9% of their energy from added sugars and 12% from saturated and trans fats (with the latter exceeding the 10% recommended limit)
- have an intake of sodium well above the level of adequate intake.

More than 2 in 5 (43%) men and more than 2 in 3 (67%) women have inadequate calcium intakes.

Nearly 2 in 5 (38%) women have inadequate iron intakes.

Less than half (47%) of adults do the recommended amount of physical activity each day, and just under two-thirds (64%) are overweight or obese.

Indigenous adults have a higher intake of added sugars than non-Indigenous adults.



Five food groups

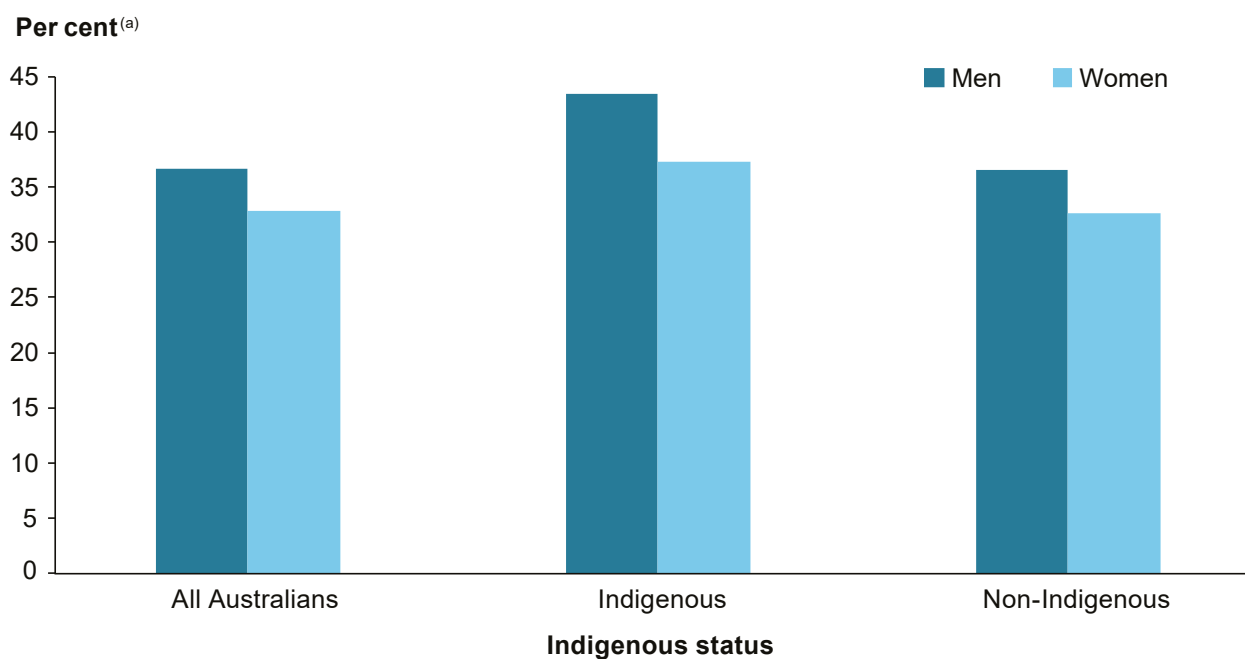
Reporting on the 5 food groups for this population is covered in the previous section on adults aged 19–30.

Discretionary food

Discretionary food contributes more than one-third (35%) to total energy intake for adults aged 31–50, which is higher for men (37%) than women (33%). Discretionary food makes a higher contribution to energy intake for Indigenous adults aged 19–30 (41%) than for non-Indigenous adults (35%). For Indigenous adults, the contribution for men (43%) and women (37%) does not vary greatly (Figure 6.11).

The main contributors to discretionary food intake include alcoholic drinks (17%), cakes and muffins (9.1%), pastries (8.0%) and soft drinks (5.7%) (Table S18).

Figure 6.11: Proportion of energy intake from discretionary food, by sex and Indigenous status, aged 31–50, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Note: Discretionary foods include cakes, biscuits, confectionary, chocolate, pastries, ice confections, butter, cream, potato chips, crisps and other fatty or salty snack foods, sugar sweetened soft drinks and cordials, sports and energy drinks and alcoholic drinks.

Sources: ABS 2014a; ABS 2015a; tables S16 and S17.



Added and free sugars

Adults aged 31–50 consume an average of 52 g of added sugars a day, which is higher for men (62 g) than women (43 g). Added sugars contribute a similar amount towards the total energy intake of men (9.4%) and women (8.9%). The contribution of added sugars to energy intake for Indigenous adults aged 31–50 (12% for men, and 13% for women) is higher than for non-Indigenous adults (9.4% for men, and 8.8% for women) (Figure 6.12; tables S19 and S20).

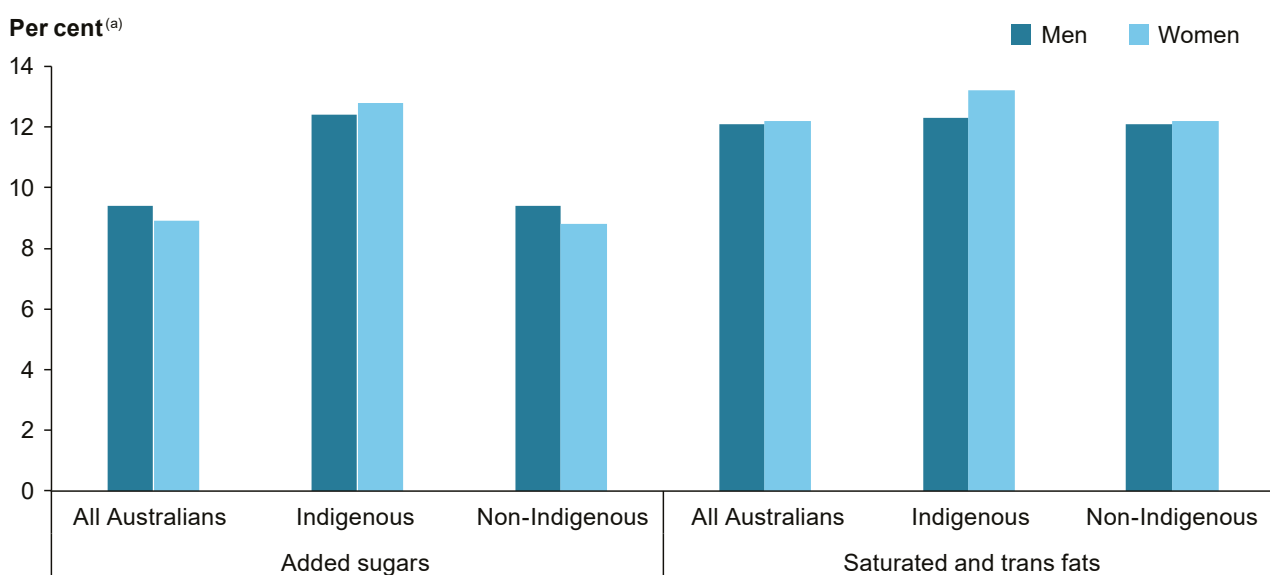
The main contributors to added sugars intake include soft drinks (21%), sugar, honey and syrups (14%), cakes and muffins (9.7%), chocolate and chocolate-based confectionary (5.9%) and cordials (5.6%) (Table S21).

About half of men (50%) and women (46%) have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).

Saturated and trans fats

Saturated and trans fats contribute 12% towards the energy intake of men and women aged 31–50, which exceeds the NRV recommendation to limit intake to no more than 10% of energy. The contribution of saturated and trans fats to energy intake for Indigenous adults (13%) is similar to that for non-Indigenous adults (12%) (Figure 6.12).

Figure 6.12: Proportion of energy intake from added sugars and saturated and trans fats, aged 31–50, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

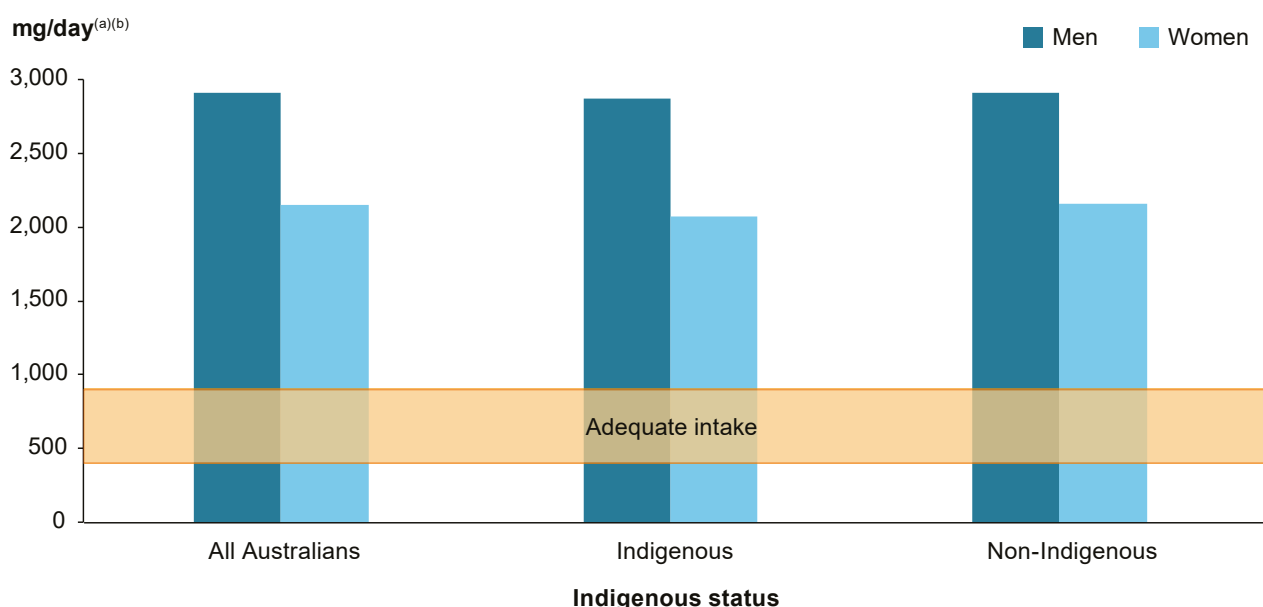
Sources: AIHW analysis of ABS 2013d; ABS 2015a; ABS 2016a; ABS 2016c; tables S19, S20, S22 and S23.



Sodium

Adults aged 31–50 consume an average of 2,533 mg of sodium a day, which is well above the adequate intake level of 460–920 mg/day. Intake is higher for men (2,915 mg) than women (2,154 mg). Indigenous adults consume an average of 2,452 mg of sodium a day, which is similar to the intake of non-Indigenous adults (2,536 mg/day) (Figure 6.13).

Figure 6.13: Mean intake of sodium, by sex and Indigenous status, aged 31–50, 2011–13



(a) Includes sodium naturally present in foods and sodium added during processing, but excludes the discretionary salt added by consumers in food prepared at home, or at the table. Excludes sodium from supplements.

(b) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S24 and S25.

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

Of men aged 31–50, 2.3% or less have inadequate iron, dietary folate equivalents and iodine intakes but, more than 2 in 5 (43%) have inadequate calcium intakes. For women, about 1 in 10 have inadequate intakes of dietary folate equivalents (11%) and iodine (9%), almost 2 in 5 (38%) have inadequate intakes of iron and more than 2 in 3 (67%) have inadequate intakes of calcium (Figure 6.14).

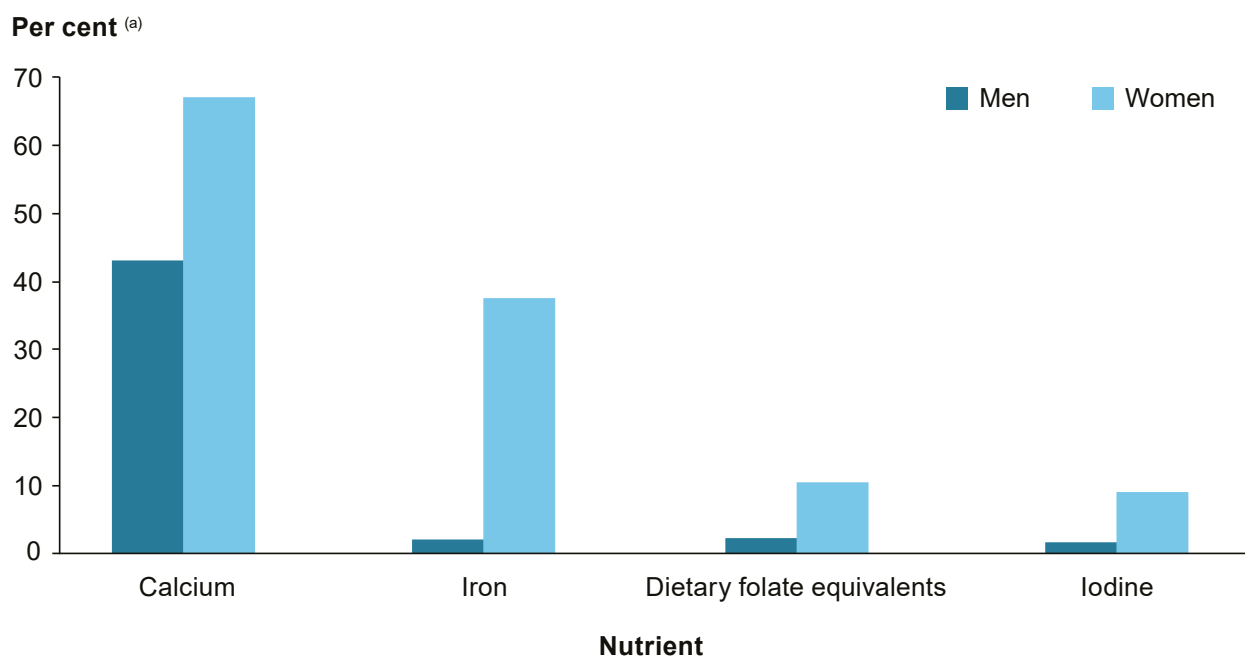
Requirements are the same for men and women of this age for calcium, dietary folate equivalents and iodine but women have a higher requirement for iron (at 8 mg/day) than men (6 mg/day).

Fibre

The average daily intake of fibre for men and women aged 31–50 is below the adequate intake level (at 83% of this amount). Intake for Indigenous men (20 g) and women (15 g) is lower than for non-Indigenous men (25 g) and women (21 g) (Figure 6.15). The adequate intake level for fibre is lower for women (25 g/day) than men (30 g/day).



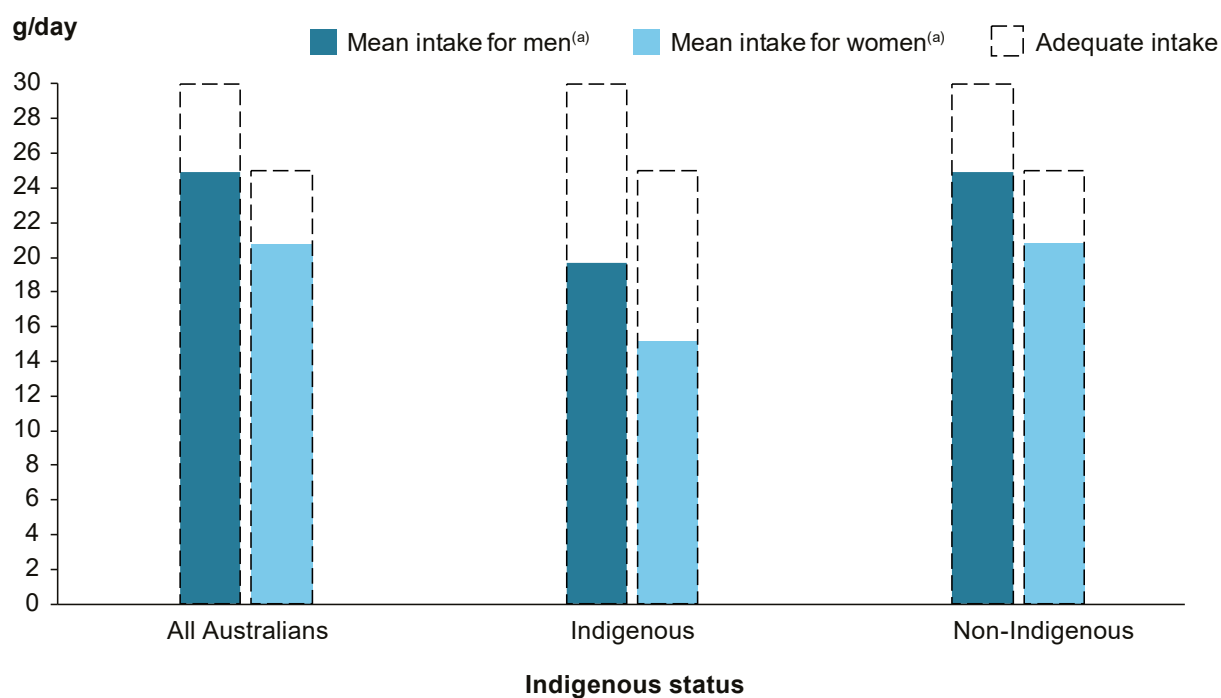
Figure 6.14: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 31–50, 2011–12



(a) Based on usual intakes. Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 6.15: Mean intake of fibre compared with the level of adequate intake, by sex and Indigenous status, aged 31–50, 2011–13



(a) Based on intake from Day 1 (see Appendix A).

Sources: AIHW analysis of ABS 2013d; ABS 2015a; tables S27 and S28.



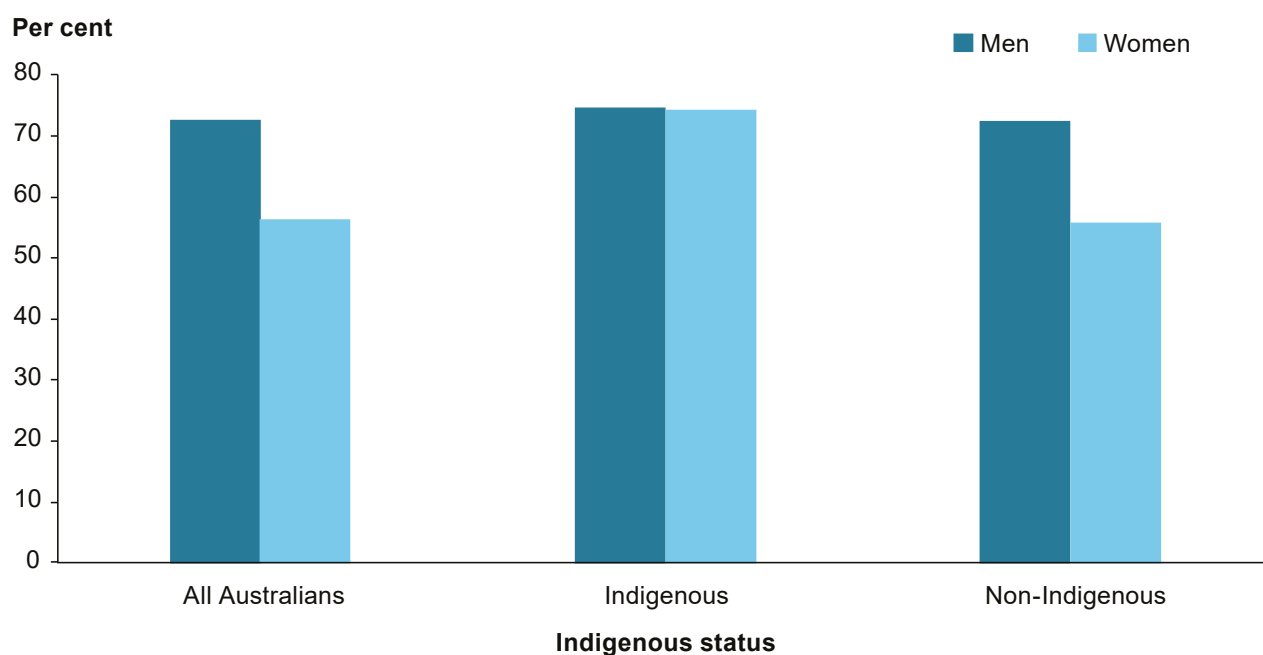
Physical activity

Less than half (47%) of adults aged 31–50 do the recommended amount of physical activity, with this level being the same for men and women. Indigenous adults (36%) have a lower level of sufficient physical activity than non-Indigenous adults (47%), which is driven by the difference in women (30% for Indigenous women, and 46% for non-Indigenous women) (tables S29 and S30).

Overweight and obesity

Almost 2 in 3 (64%) adults aged 31–50 are overweight or obese, with this level being higher in men (73%) than women (56%). Almost three-quarters (74%) of Indigenous women are overweight or obese, which is higher than non-Indigenous women (56%). The level of overweight and obesity is similar for Indigenous men (75%) and non-Indigenous men (73%). There is no difference in the prevalence among Indigenous men and women, unlike for all Australians (Figure 6.16).

Figure 6.16: Prevalence of overweight or obesity, by sex and Indigenous status, aged 31–50, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



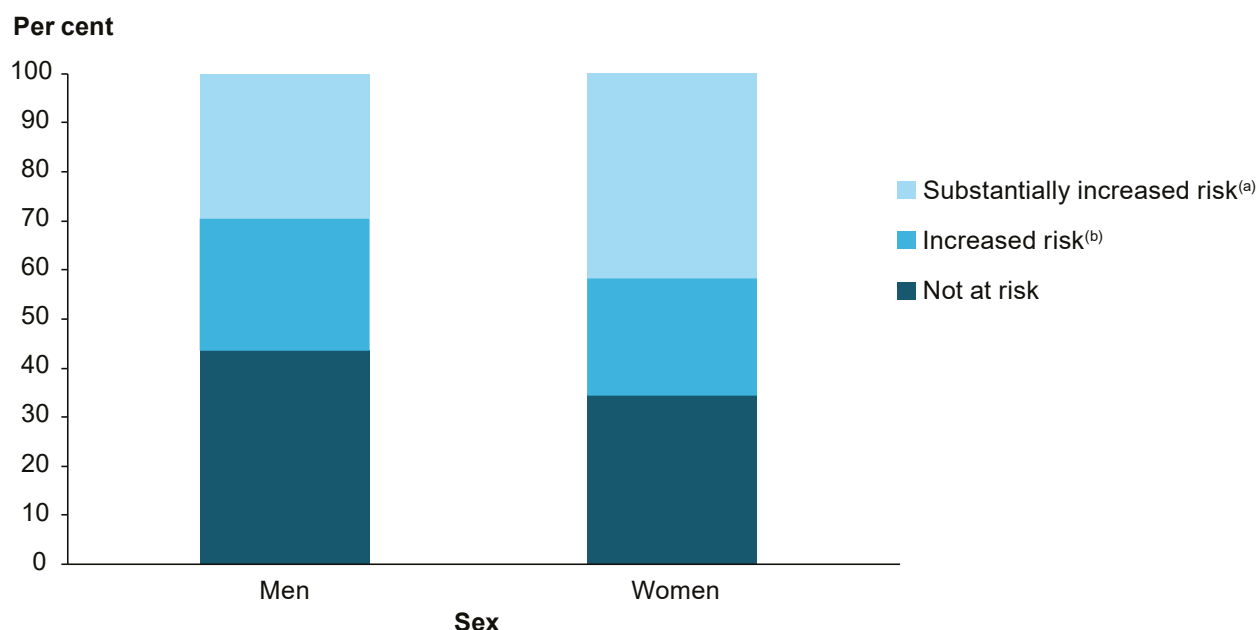
Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.

Waist circumference

About 1 in 3 (29%) men and 2 in 5 (42%) women aged 31–50 have a waist circumference that puts them at substantially increased risk of developing chronic conditions, such as heart disease and type 2 diabetes (Figure 6.17).



Figure 6.17: Proportion of men and women with waist circumference above recommended risk guidelines, aged 31–50, 2014–15



(a) A waist circumference of 102 cm or more for men or 88 cm or more for women.

(b) A waist circumference of 94 cm or more for men or 80 cm or more for women.

Source: AIHW analysis of ABS 2016e; Table S33.

Nutrient biomarkers

Mean levels of red blood cell folate, vitamin B12 and iron for adults aged 31–50 are above the cut-offs for deficiency. Levels of folate and vitamin B12 are similar for men and women; however, women (68 µg/L) have a lower level of iron than men (216 µg/L).

The median urinary iodine concentration is within the range for iodine adequacy (at 124 µg/L), with the level being similar for men (130 µg/L) and women (119 µg/L). In addition, 15% of adults aged 31–50 have a median urinary iodine concentration below 50 µg/L, which meets the WHO recommendation.

Three-quarters (75%) of adults aged 31–50 have adequate levels of vitamin D, with the level being similar for men (75%) and women (76%) (Table S34).





Adults aged 51–70

Overall, adults aged 51–70:

- fall short of meeting the recommended daily serves all 5 food groups (based on average intake), and a large proportion do not meet the recommended serves of vegetables and dairy products and alternatives
- get one-third (33%) of their energy from discretionary foods
- get 7.7% of their energy from added sugars and 12% from saturated and trans fats (with the latter exceeding the 10% recommended limit)
- have an intake of sodium well above the level of adequate intake.

More than 6 in 10 (63%) men and more than 9 in 10 (91%) women have inadequate calcium intakes.

Nearly 2 in 5 (39%) adults do the recommended amount of physical activity each day and almost 3 in 4 (74%) are overweight or obese.

Indigenous adults, on average, consume fewer serves of fruit, vegetables and dairy products and alternatives than non-Indigenous adults.



Five food groups

The information presented in this section for the 5 food groups is based on average/mean daily serves (Figure 6.18) and the proportion of the population with intakes below the recommended serves (Figure 6.19).

The average daily intake of all the 5 food group for adults aged 51–70 is below the recommendations.

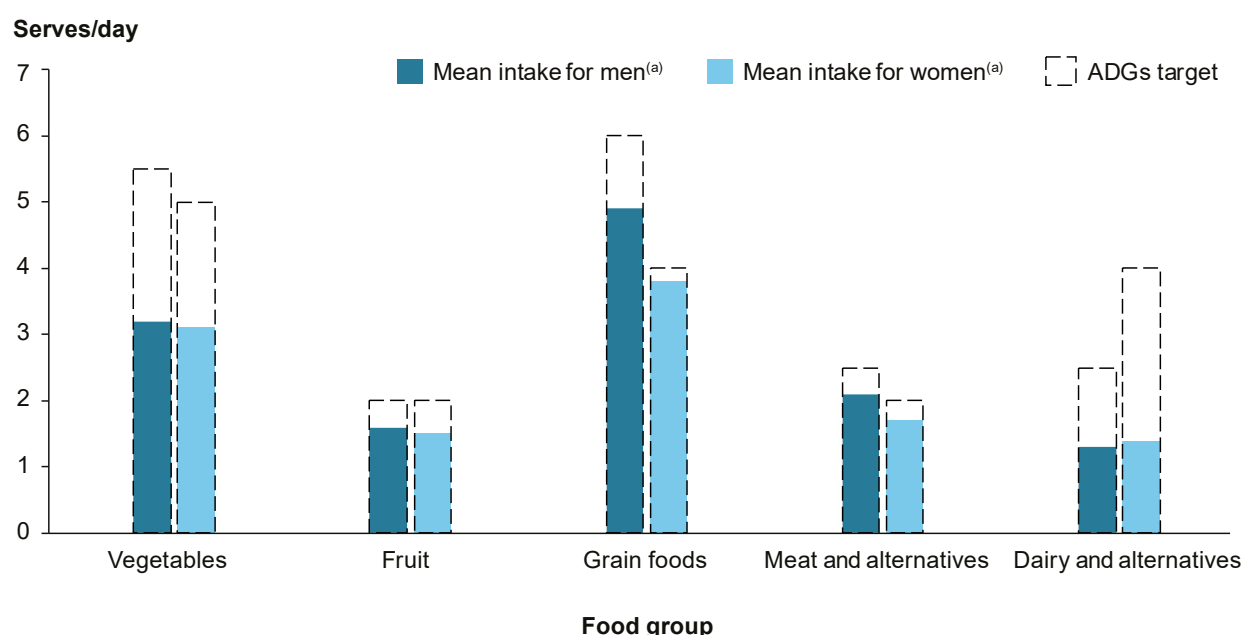
For men:

- intake of fruit (1.6 serves) and meat and alternatives (2.1 serves) is closest to the recommendations, at 0.4 serves below; however, more than 2 in 3 (67.1%) do not meet the recommended fruit serves and 7 in 10 (70.5%) do not meet the recommended meat and alternatives serves
- intake of vegetables is at 3.2 serves, which is well below the recommended 5.5 serves, and a large proportion of the population (94.5%) do not meet the recommended serves.

For women:

- the average daily intake of grain foods (3.8 serves) is 0.2 serves below the recommendation; however, under 2 in 5 (38.9%) meet the recommended serves
- intake of fruit (1.5 serves) is half a serve below the recommendation, while just over 1 in 4 (27.2%) meet the recommended serves
- intake of dairy products and alternatives is the lowest for this population group, at 2.6 serves below the recommendation, and almost all of the population (99.9%) not meeting the recommendation.

Figure 6.18: Mean intake of food groups compared with the ADGs target, by sex, aged 51–70, 2011–12

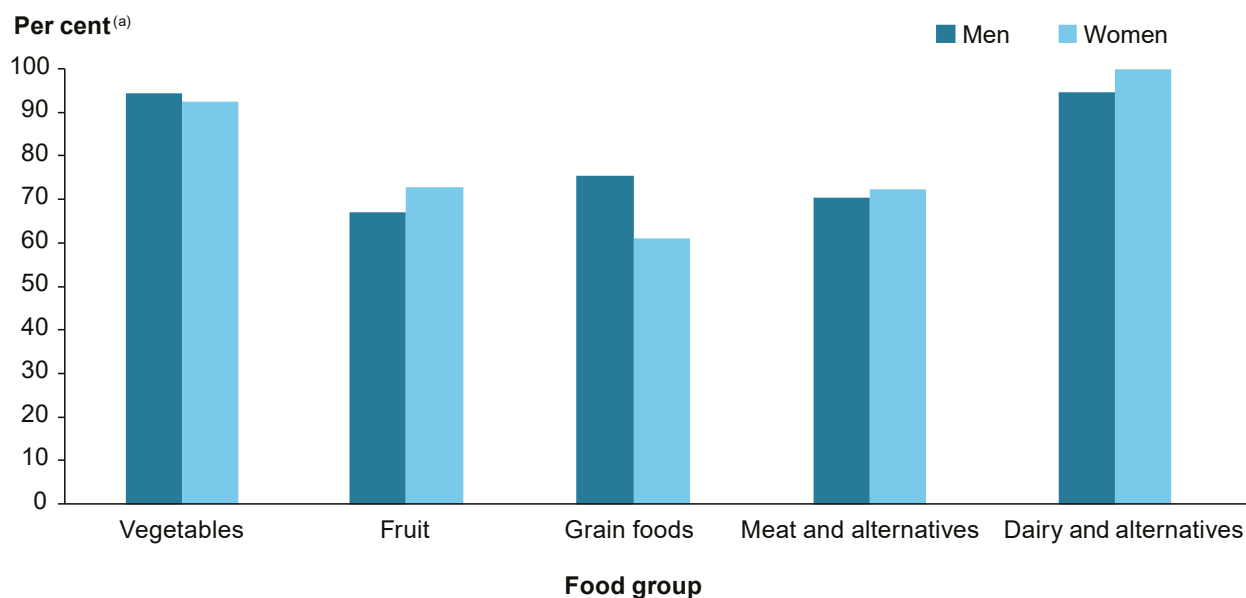


(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S7.



Figure 6.19: Proportion of the population with food group intakes below the recommended serves, by sex, aged 51–70, 2011–12

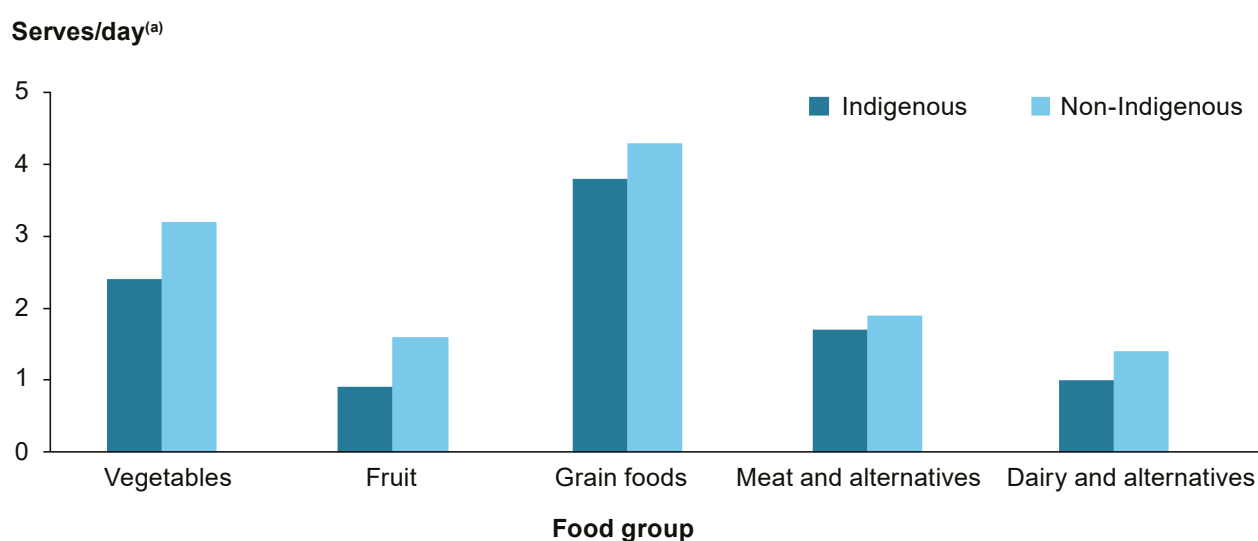


(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

Sources: ABS 2016d; Table S7.

Indigenous adults aged 51–70 consume fewer serves of fruit, dairy products and alternatives and vegetables than non-Indigenous adults (44%, 29% and 25% fewer serves, respectively). The differences in average intakes of grain foods and meat and alternatives between Indigenous and non-Indigenous populations is not significant (Figure 6.20).

Figure 6.20: Mean intake of food groups from the ADGs, by Indigenous status, aged 51–70, 2011–13



(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016b; Table S15.



Discretionary food

Adults aged 51–70 consume an average of 5.0 serves of discretionary food a day, which contributes one-third (33%) to their total energy intake. The contribution of discretionary food is higher for men (35%) than women (31%) (Table S16).

The main contributors to discretionary food intake include alcoholic drinks (22%), cakes and muffins (9.6%), pastries (8.1%), chocolate and chocolate-based confectionery (5.1%) and sweet biscuits (5.1%) (Table S18).

Added and free sugars

Adults aged 51–70 consume an average of 42 g of added sugars a day, which is higher for men (47 g) than women (37 g). Added sugars contribute a similar amount towards the total energy intake of men (7.8%) and women (7.7%) (Table S19).

The main contributors to added sugars intake include sugar, honey and syrups (15%), soft drinks (14%), cakes and muffins (11%), and chocolate and chocolate-based confectionery (7.1%) (Table S21).

More than one-third of men (38%) and women (35%) have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).

Saturated and trans fats

Saturated and trans fats contribute 12% towards the energy intake of men and women aged 51–70, which exceeds the NRV recommendation to limit intake to no more than 10% of energy (Table S22).

Sodium

Adults aged 51–70 consume an average of 2,237 mg of sodium a day, which is well above the adequate intake level of 460–920 mg/day. Intake is higher for men (2,510 mg) than women (1,972 mg) (Table S24).

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

The prevalence of inadequate iron intake for men (2.8%) and women (5.0%) is low. Men have a low prevalence of inadequate intake of dietary folate equivalents (2.5%) and iodine (3.5%). For women, it is higher (at 7.6% for dietary folate equivalents and 11% for iodine). More than 6 in 10 men (63%) and 9 in 10 women (91%) have inadequate calcium intakes (Figure 6.21).

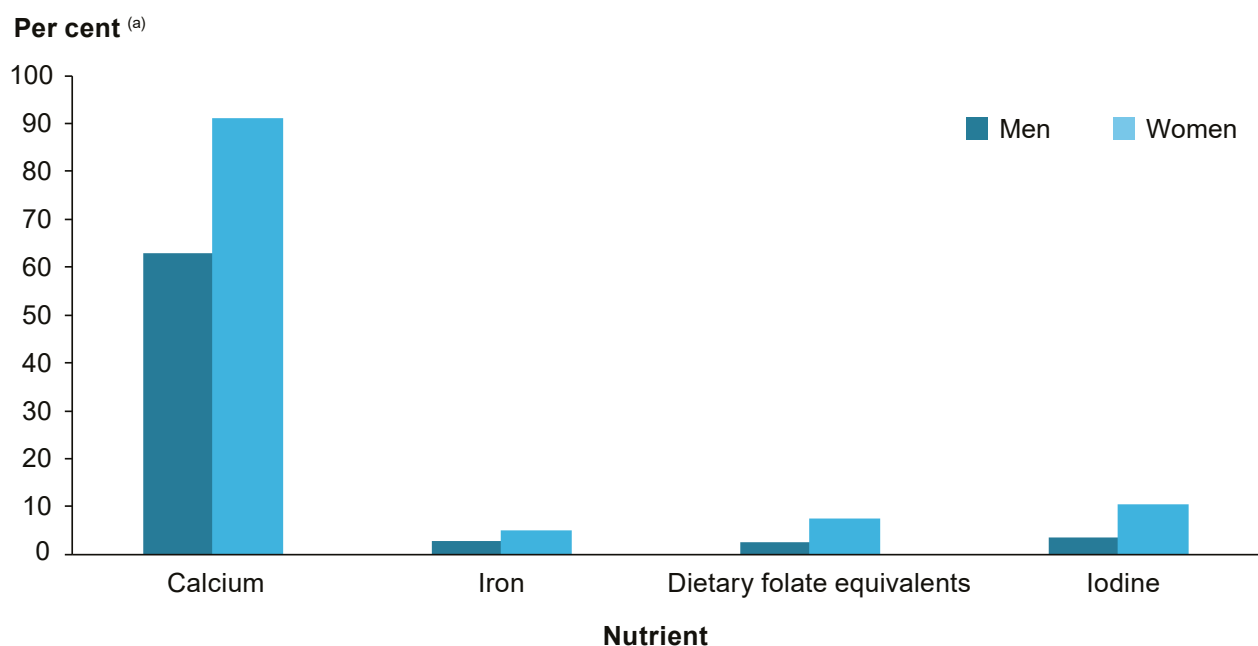
Requirements are the same for men and women of this age for dietary folate equivalents and iodine, but women (5 mg/day) have a lower requirement for iron than men (6 mg/day), and a higher requirement for calcium (at 1,100 mg/day compared with 840 mg/day for men).

Fibre

The average daily intake of fibre for men and women aged 51–70 is below the adequate intake level, with intakes at 83% of the adequate intake level for men and 89% for women (Figure 6.22). The adequate intake level for fibre is lower for women (25 g/day) than men (30 g/day).



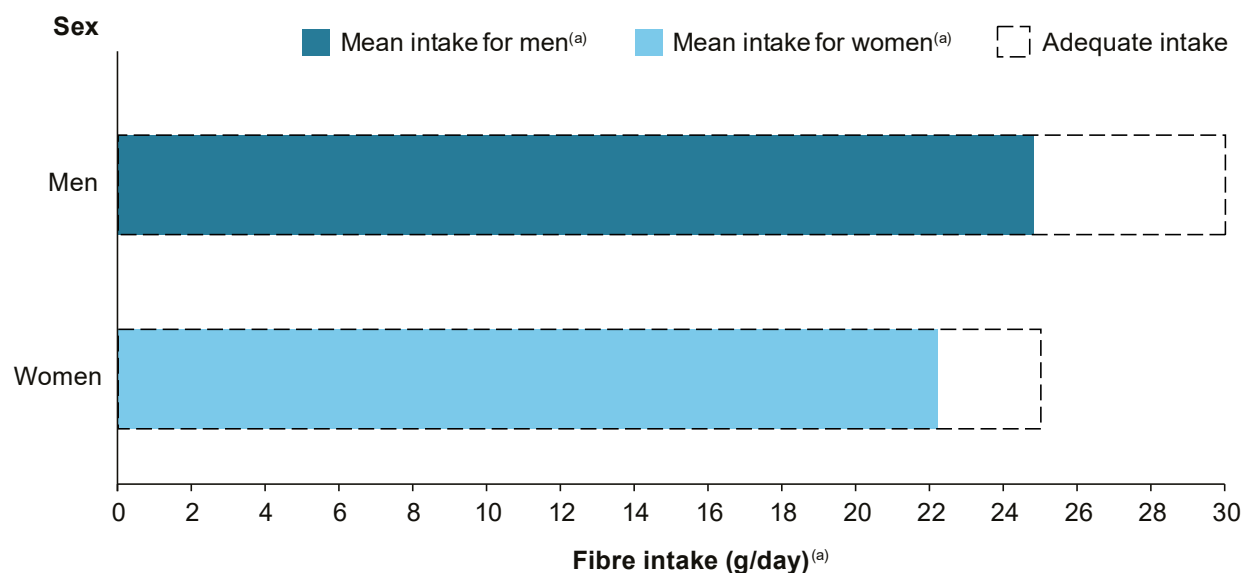
Figure 6.21: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 51–70, 2011–12



(a) Based on usual intakes. Excludes intake from supplements.

Source: ABS 2015b; Table S26.

Figure 6.22: Mean intake of fibre compared with the level of adequate intake, by sex, aged 51–70, 2011–12



(a) Based on intake from Day 1 (see Appendix A).

Source: AIHW analysis of ABS 2013d; Table S27.



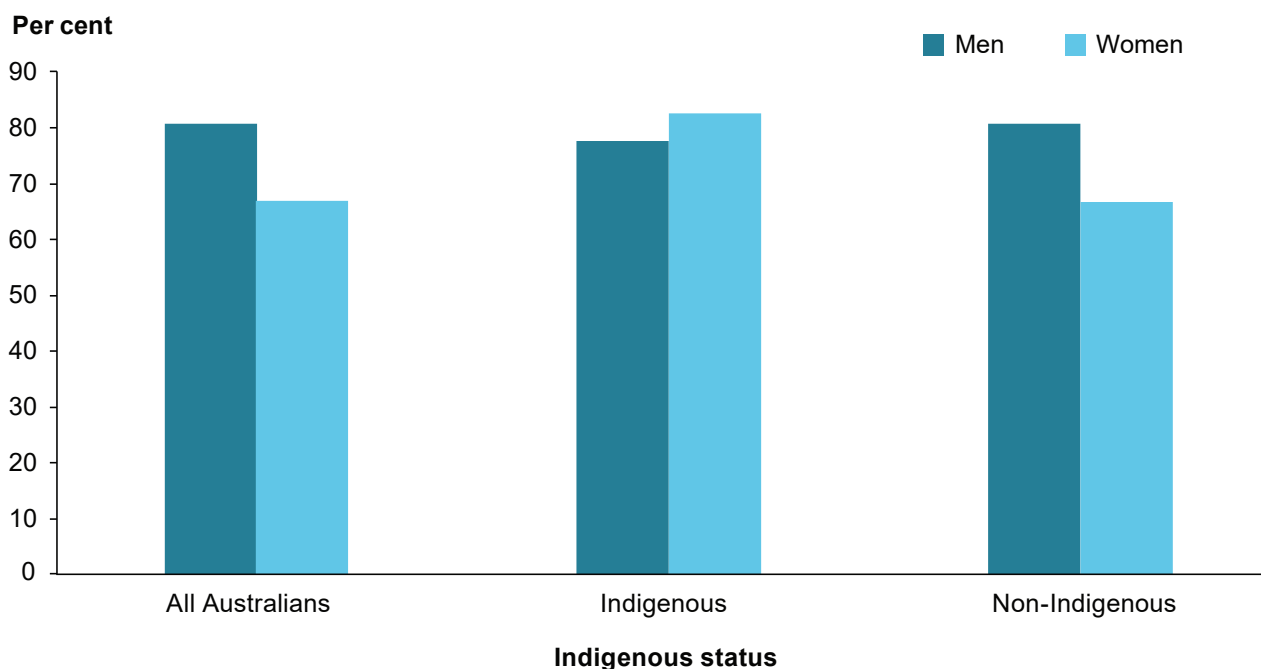
Physical activity

About 2 in 5 (39%) adults aged 51–70 do the recommended amount of physical activity, with this level being similar for men (41%) and women (38%) (Table S29).

Overweight and obesity

Almost 3 in 4 (74%) adults aged 51–70 are overweight or obese, with this level being higher in men (81%) than women (67%). The prevalence of overweight and obesity is higher among Indigenous women (83%) than non-Indigenous women (67%); however, it is similar for men. There is no difference in the prevalence among Indigenous men and women, unlike for all Australians (Figure 6.23).

Figure 6.23: Prevalence of overweight or obesity, by sex and Indigenous status, aged 51–70, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



Note: For Indigenous Australians, the population is those aged 51–69.

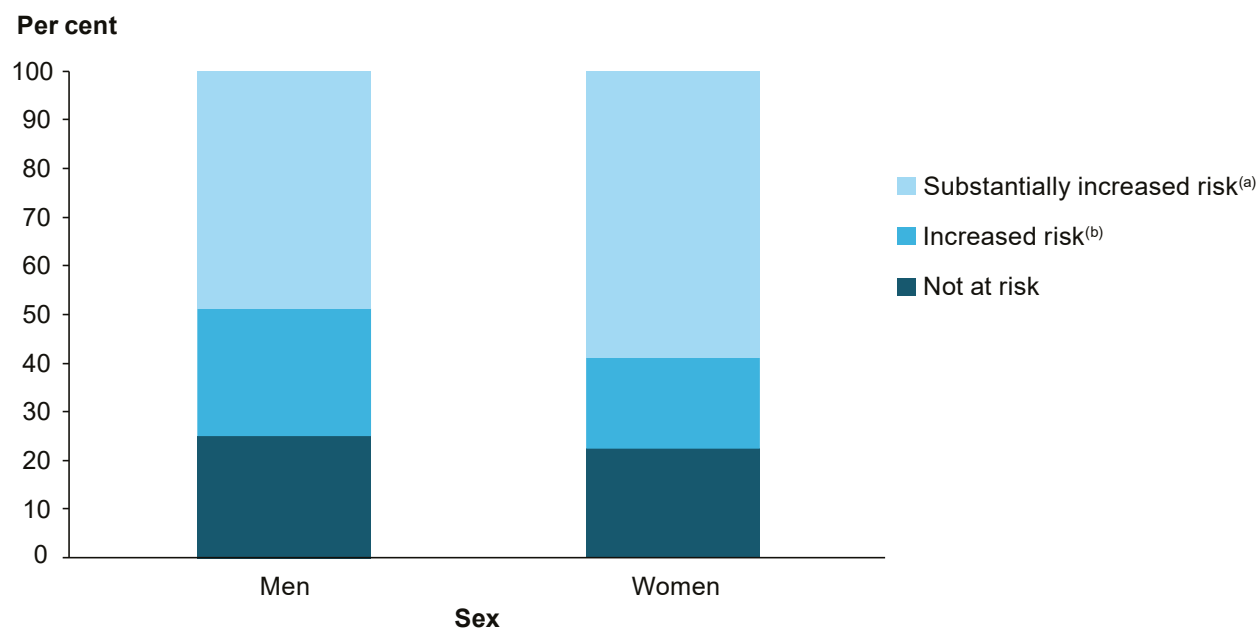
Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.

Waist circumference

About half (49%) of men and 3 in 5 (59%) women aged 51–70 have a waist circumference that puts them at substantially increased risk of developing chronic conditions, such as heart disease and type 2 diabetes (Figure 6.24).



Figure 6.24: Proportion of men and women with waist circumference above recommended risk guidelines, aged 51–70, 2014–15



(a) A waist circumference of 102 cm or more for men or 88 cm or more for women.

(b) A waist circumference of 94 cm or more for men or 80 cm or more for women.

Sources: AIHW analysis of ABS 2016e; Table S33.

Nutrient biomarkers

Mean levels of red blood cell folate, vitamin B12 and iron for adults aged 51–70 are above the cut-offs for deficiency. Levels of folate are similar for men and women; however, women have a higher level of vitamin B12 (388 nmol/L for women compared with 339 nmol/L for men), and a lower level of iron (124 µg/L for women compared with 233 µg/L for men).

The median urinary iodine concentration is within the range for iodine adequacy (at 117 µg/L) and the level is similar for men (125 µg/L) and women (108 µg/L). In addition, 13% of adults aged 51–70 have a median urinary iodine concentration below 50 µg/L, which meets the WHO recommendation.

About 4 in 5 (81%) adults aged 51–70 have adequate levels of vitamin D, with the level being the same for men and women (Table S34).





Adults aged 71 and over

The data presented for the population aged 71 and over are for individuals in the general population and excludes those who live in residential aged care (about 220,000 Australians aged 70 and over) (Productivity Commission 2017).

Overall, adults aged 71 and over:

- fall short of meeting the recommended daily serves for 4 of the 5 food groups (based on average intake), excluding grain foods for women, and almost everyone does not meet the recommended serves of dairy products and alternatives
- get about one-third (34%) of their energy from discretionary foods
- get 8.2% of their energy from added sugars and 12% from saturated and trans fats (with the latter exceeding the 10% recommended limit)
- have an intake of sodium well above the level of adequate intake.

Nine in 10 men (90%) and over 9 in 10 women (94%) have inadequate calcium intakes.

About 1 in 5 (22%) adults do the recommended amount of physical activity each day and about 7 in 10 (71%) are overweight or obese.



Five food groups

The information presented in this section for the 5 food groups is based on average/mean daily serves (Figure 6.25) and the proportion of the population with intakes below the recommended serves (Figure 6.26).

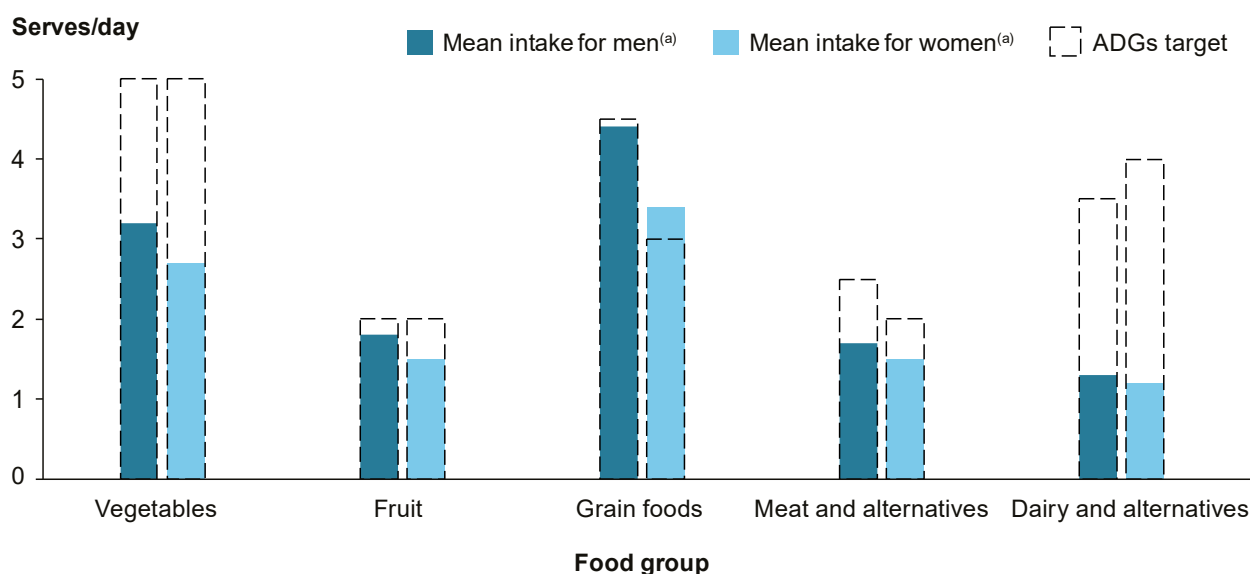
The average daily intake of all the 5 food groups for men aged 71 and over is below the recommendations:

- While intake of fruit and grain foods is just below the recommendations (0.2 serves and 0.1 serves below, respectively), less than 2 in 5 (39.6%) meet the recommended fruit serves and just over half (51.8%) meet the recommended grain food serves.
- While vegetable intake is low (1.8 serves below the recommendation), intake of dairy products and alternatives is the lowest for this population group, at 2.2 serves below the recommendation, and almost all of the population (99.5%) not meeting the recommendation.

For women:

- the average daily intake of grain foods is 0.4 serves higher than the recommended 3 serves and just over 3 in 5 (62.7%) meet the recommended serves
- intake of the remaining food groups is below the recommendations
- intake of fruit, and meat and alternatives (1.5 serves) is half a serve below the recommendation; however, just over 1 in 4 (26.5%) meet the recommended serves for fruit and just over 1 in 10 (12.2%) meet the recommended serves for meat and alternatives
- while vegetable intake is low (2.3 serves below the recommendation), intake of dairy products and alternatives is the lowest for this population group, at 2.8 serves below the recommendation, and almost all of the population (99.9%) not meeting the recommended serves.

Figure 6.25: Mean intake of food groups compared with the ADGs target, by sex, aged 71 and over, 2011–12

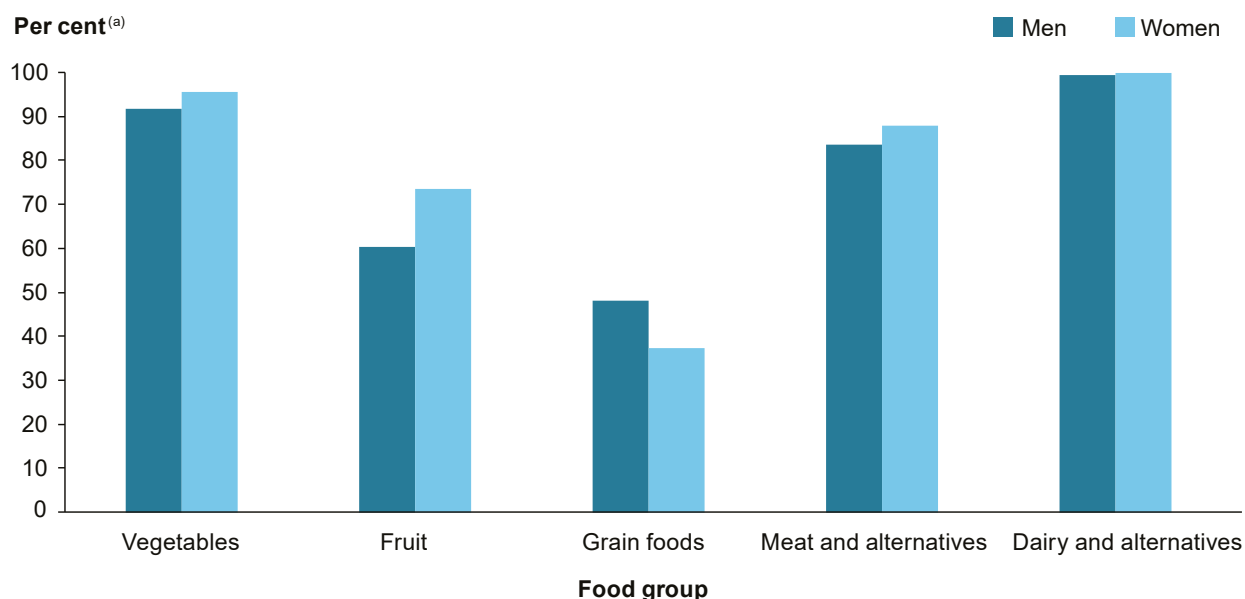


(a) Based on intake from Day 1 (see Appendix A) and includes non-discretionary foods only.

Source: AIHW analysis of ABS 2013d; Table S8.



Figure 6.26: Proportion of the population with food group intakes below the recommended serves, by sex, aged 71 and over, 2011–12



(a) Based on usual intakes (see Appendix A) and includes non-discretionary foods only.

Source: ABS 2016d; Table S8.

Discretionary food

Adults aged 71 and over consume an average of 4.5 serves of discretionary food a day, which contributes one-third (34%) to their total energy intake. The contribution of discretionary food is similar for men (36%) and women (32%) (Table S16).

The main contributors to discretionary food intake include alcoholic drinks (15%), cakes and muffins (14%), sweet biscuits (8.6%) and pastries (7.7%) (Table S18).

Added and free sugars

Adults aged 71 and over consume an average of 39 g of added sugars a day, which is higher for men (45 g) than women (34 g). Added sugars contribute a similar amount to total energy for men (8.5%) and women (8.0%) (Table S19).

The main contributors to added sugars intake include sugar, honey and syrups (17%), cakes and muffins (14%), soft drinks (8.4%), sweet biscuits (7.5%), and fruit and vegetable juices and drinks (5.5%) (Table S21).

Just under half of men (47%) and women (43%) have intakes of free sugars that exceed the WHO recommendation that free sugars should make up less than 10% of energy intake (Table S19).

Saturated and trans fats

Saturated and trans fats contribute 12% towards the energy intake of men and women aged 71 and over, which exceeds the NRV recommendation to limit intake to no more than 10% of energy (Table S22).



Sodium

Adults aged 71 and over consume an average of 1,973 mg of sodium a day, which is well above the adequate intake level of 460–920 mg/day. Intake is higher for men (2,217 mg) than women (1,773 mg) (Table S24).

Key nutrients

Calcium, dietary folate equivalents, iron and iodine

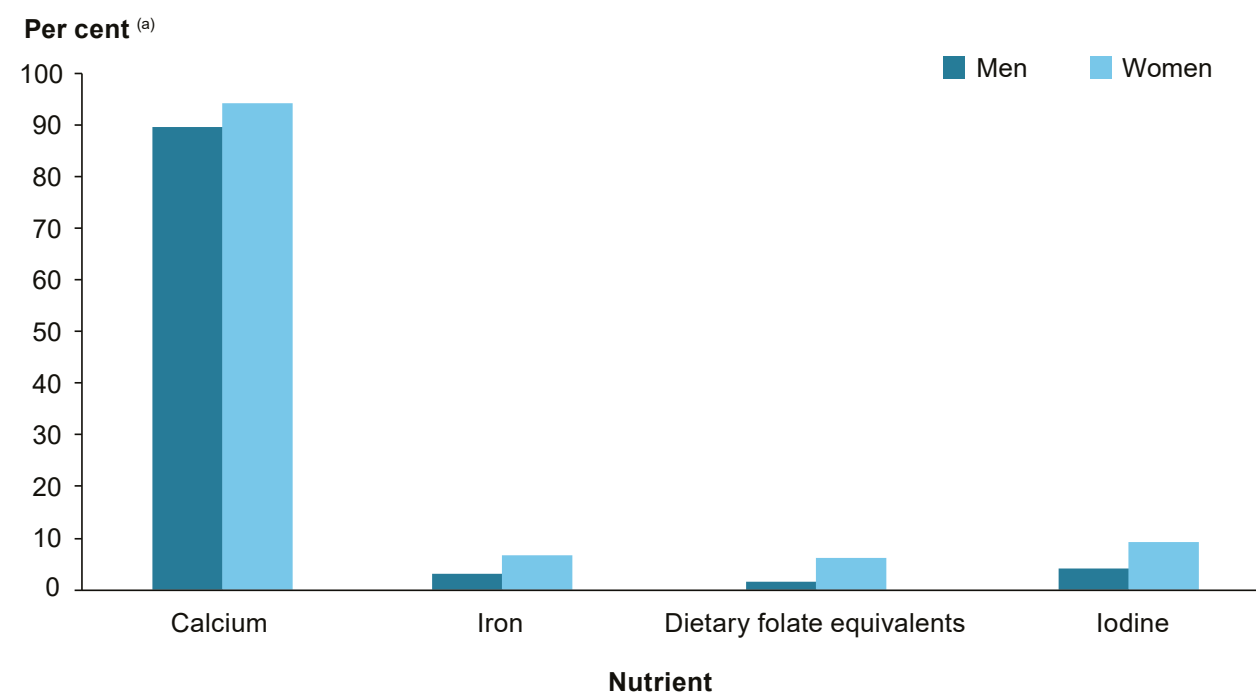
Men aged 71 and over have a low prevalence of inadequate intakes of iron (3.1%), dietary folate equivalents (1.6%) and iodine (4.2%). For women, it is higher (at 6.7% for iron, 6.1% for dietary folate equivalents and 9.2% for iodine). For calcium, 9 in 10 (90%) men and over 9 in 10 women (94%) have inadequate calcium intakes (Figure 6.27).

Requirements are the same for men and women of this age for calcium, dietary folate equivalents and iodine but, women have a lower requirement for iron (at 5 mg/day compared with 6 mg/day for men).

Fibre

The average daily intake of fibre for men and women aged 71 and over is at 84% of the adequate intake level (Figure 6.28). The adequate intake level for fibre is lower for women (25 g/day) than men (30 g/day).

Figure 6.27: Proportion of the population with intakes less than the estimated average requirement for key nutrients, by sex, aged 71 and over, 2011–12

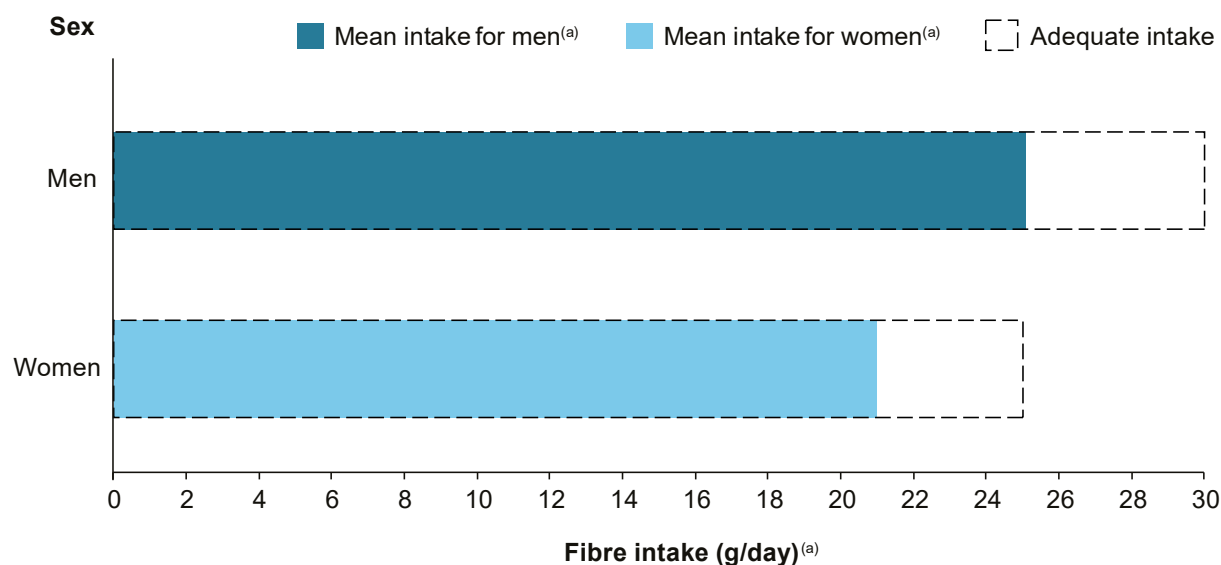


(a) Based on usual intakes. Excludes intake from supplements.

Source: ABS 2015b; Table S26.



Figure 6.28: Mean intake of fibre compared with the level of adequate intake, by sex, aged 71 and over, 2011–12



(a) Based on intake from Day 1 (see Appendix).

Source: AIHW analysis of ABS 2013d; Table S27.

Physical activity

About 1 in 5 (22%) adults aged 71 and over do the recommended amount of physical activity, with this level being similar for men (25%) and women (20%) (Table S29).

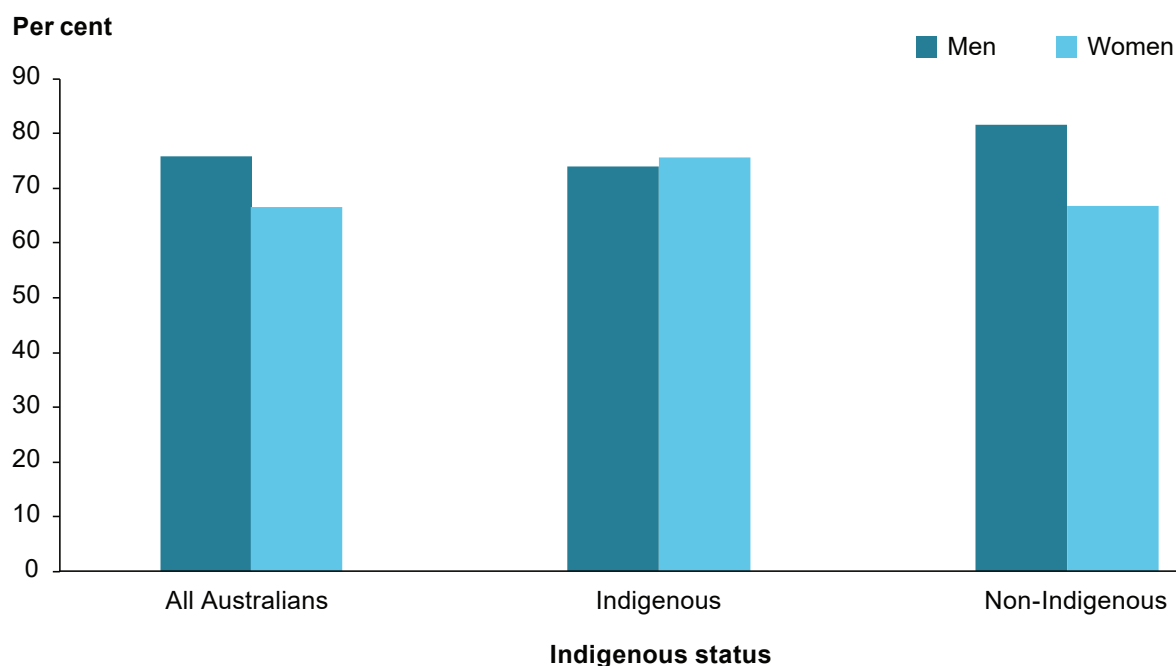
Overweight and obesity

It has been acknowledged that higher BMI cut-offs may be more suitable for older people than the standard BMI cut-offs. However for this report, the standard population cut-offs have been used to provide a general guide.

About 7 in 10 (71%) adults aged 71 and over are overweight or obese, with this level being higher in men (76%) than women (67%). The prevalence of overweight and obesity is higher among Indigenous women (82%) than non-Indigenous women (67%); however, it is similar for men. There is no difference in the prevalence among Indigenous men and women, unlike for all Australians (Figure 6.29).



Figure 6.29: Prevalence of overweight or obesity, by sex and Indigenous status, aged 71 and over, 2012–13 (Indigenous), 2014–15 (all Australians and non-Indigenous)



Note: For Indigenous Australians, the population is those aged 70 and over.

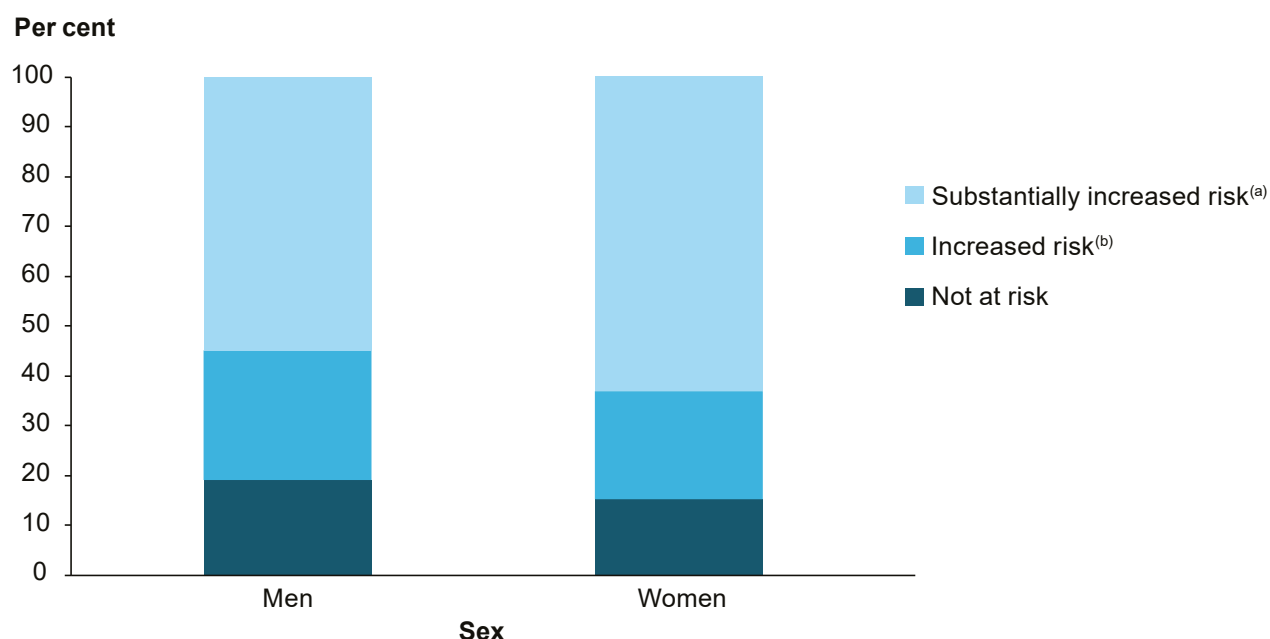
Sources: AIHW analysis of ABS 2015d; ABS 2016e; ABS 2016f; tables S31 and S32.

Waist circumference

About 1 in 2 (55%) men and 3 in 5 (63%) women aged 71 and over have a waist circumference that puts them at substantially increased risk of developing chronic conditions, such as heart disease and type 2 diabetes (Figure 6.30).



Figure 6.30: Proportion of men and women with waist circumference above recommended risk guidelines, aged 71 and over, 2014–15



(a) A waist circumference of 102 cm or more for men or 88 cm or more for women.

(b) A waist circumference of 94 cm or more for men or 80 cm or more for women.

Sources: AIHW analysis of ABS 2016e; Table S33.

Nutrient biomarkers

Mean levels of red blood cell folate, vitamin B12 and iron for adults aged 71 and over are above the cut-offs for deficiency. Levels of folate are similar for men and women; however, women have a higher level of vitamin B12 (370 nmol/L for women compared with 309 nmol/L for men) and a lower level of iron (128 µg/L for women compared with 207 nmol/L for men).

The median urinary iodine concentration is within the range for iodine adequacy (at 131 µg/L) and the level is similar for men (132 µg/L) and women (130 µg/L). In addition, less than 1 in 10 (6.3%) adults aged 71 and over have a median urinary iodine concentration below 50 µg/L, which meets the WHO recommendation.

About 4 in 5 (79%) adults aged 71 and over have adequate levels of vitamin D and the level is similar for men (84%) and women (75%) (Table S34).



Sociodemographic differences

7

Data for a selection of the food and nutrition measures have been assessed based on the geographical area in which people live (remoteness area) and the ABS Index of Relative Socio Economic Disadvantage (socioeconomic group). This was to determine whether where people live and their socioeconomic circumstances are associated with differing food and nutrient intakes.

The Australian Statistical Geography Standard Remoteness Structure (ABS 2014b) is a hierarchical classification system of geographical areas. The 3 remoteness areas used in this report are *Major cities*, *Inner regional*, and *Outer regional/Remote* (which have been combined due to small population sizes).

The Index of Relative Socio Economic Disadvantage scores summarise attributes of populations, such as low income, low educational attainment, high unemployment, and jobs in relatively unskilled occupations. Areas are then ranked by their score, and classified into groups based on this rank. The first fifth contains the bottom 20% (the lowest socioeconomic group), the second fifth contains the second 20%, up to the top 20% (the highest socioeconomic group).

Age-standardised data are presented for the population aged 2 and over (18–64 for physical activity). Due to the small sample size it was not possible to present the data by NRV age groups.

Remoteness area

The quality of food and nutrient intake is generally higher in the less remote areas.

Of the 5 food groups, people living in *Major cities* consume:

- more grain foods (4.6 serves per day) than those living in *Inner regional* areas (4.2 serves) and *Outer regional/Remote* areas (4.3 serves)
- more meat and alternatives (1.8 serves per day) than those living in *Inner regional* areas (1.6 serves).

Intake of added sugars is higher outside of *Major cities*, with the difference more pronounced in *Inner regional* areas (50 g/day in *Major cities* and 61 g/day in *Inner regional*).

The contribution of saturated and trans fats to energy intake is higher outside of *Major cities* (12% in *Major cities* and 13% in *Inner regional* and *Outer regional/Remote* areas).

For the remaining food and nutrition components, while intake appears more favourable in the less remote areas, the differences are not significant.

People in less remote areas are also more likely to follow the physical activity recommendations. Those living in *Major cities* have higher levels of sufficient physical activity (50%) than those living in *Inner regional* areas (43%) and *Outer regional/Remote* areas (40%). This difference is driven by the differing levels among males, as there is no difference among females.

Overweight and obesity levels rise as remoteness increases, at 53% in *Major cities*, 57% in *Inner regional* areas and 61% in *Outer regional/Remote* areas.



		Major cities	Inner regional	Outer regional/ Remote
	Vegetables (serves/day)	2.7	2.7	2.6
	Fruit (serves/day)	1.6	1.5	1.4
	Grain foods (serves/day)	4.6	4.2*	4.3*
	Meat and alternatives (serves/day)	1.8	1.6*	1.7
	Dairy products and alternatives (serves/day)	1.5	1.5	1.6
	Added sugars (g/day)	50	61*	56*
	Saturated and trans fats (% of energy)	12	13*	13*
	Sodium (mg/day)	2,381	2,475	2,468
	Fibre (g/day)	22	22	21
	Physical activity^(a) (%)	50	43*	40*
	Overweight and obesity (%)	53	57	61*

* Significantly different compared with *Major cities*.

(a) Sufficient levels of physical activity for the population aged 18–64, which is classified as meeting at least 150 minutes a week over 5 sessions.

Sources: AIHW analysis of ABS 2013d; ABS 2016e; Table S37.



Socioeconomic groups

The quality of food and nutrient intake varies across socioeconomic groups and is generally higher among those living in the highest socioeconomic areas, compared with the lowest.

Of the 5 food groups, people living in the highest socioeconomic areas consume more fruit, grain foods, meat and alternatives and dairy products and alternatives, than those living in the lowest socioeconomic areas.

In addition, people living in the highest socioeconomic areas have a lower intake of added sugars and a higher intake of fibre.

People living in the highest socioeconomic areas are also more likely to follow the physical activity recommendations (60%) than those in the lowest socioeconomic areas (37%), which is seen in both males and females.

These more favourable food and nutrient intakes and higher levels of physical activity among those living in the highest socioeconomic areas compared with the lowest, is reflected in the lower prevalence of overweight and obesity (50% and 59%, respectively). Again, this is seen in both males and females.



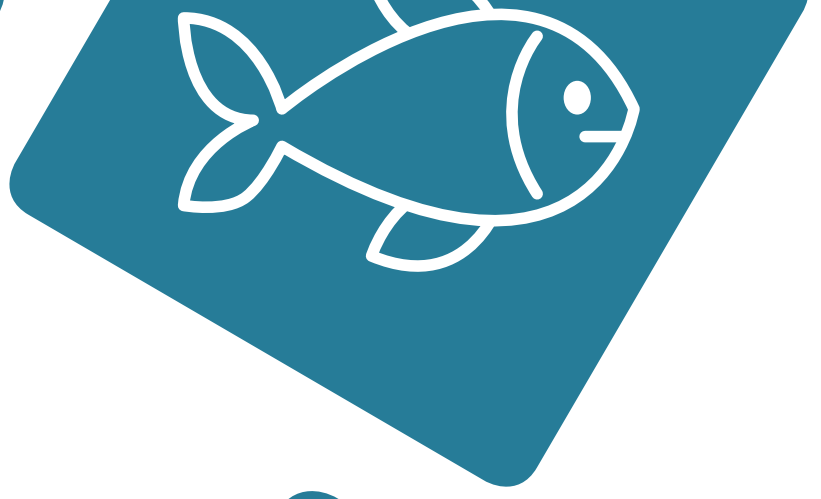
	Lowest 1	2	3	4	Highest 5
 Vegetables (serves/day)	2.6	2.7	2.7	2.7	2.8
 Fruit (serves/day)	1.3	1.4	1.5	1.7*	1.8*
 Grain foods (serves/day)	4.4	4.4	4.4	4.5	4.8*
 Meat and alternatives (serves/day)	1.6	1.7	1.6	1.8*	1.8*
 Dairy products and alternatives (serves/day)	1.4	1.4	1.5	1.5	1.6*
 Added sugars (g/day)	56	55	55	52	47*
 Saturated and trans fats (% of energy)	13	12	13	12	12
 Sodium (mg/day)	2,441	2,334	2,424	2,411	2,448
 Fibre (g/day)	21	22	22	23*	24*
 Physical activity^(a) (%)	37	43	44*	52*	60*
 Overweight and obesity (%)	59	56	56	53*	50*

* Significantly different to the lowest socioeconomic group.

(a) Sufficient levels of physical activity for the population aged 18–64, which is classified as meeting at least 150 minutes a week over 5 sessions.

Sources: AIHW analysis of ABS 2013d; ABS 2016e; Table S37.





Comparison between 1995, 2007 and 2011–12 nutrition surveys

8

Before 2011–13, the last National Nutrition Survey of the majority of the Australian population was conducted in 1995, covering children and adults (aged 2 and over). About 14,000 people participated in the survey, which included a 24-hour dietary recall, then a second 24-hour recall on a proportion of respondents.

For children aged 2–16, the Australian National Children’s Nutrition and Physical Activity Survey (2007 Children’s Nutrition Survey) was conducted in 2007. Almost 4,500 children aged 2–16 participated in the survey, which included two 24-hour dietary recalls on 100% of respondents (CSIRO & University of South Australia 2008).

One of the objectives of the 2011–12 National Nutrition and Physical Activity Survey was to enable comparison of food and nutrition intakes to those reported in these previous national surveys. While the characteristics of both surveys are similar, slight differences may affect results, the extent of which is unknown. This includes differences in:

- period of collection
- professional training of interviewers
- food composition database underpinning the nutrient intake estimates
- how the food consumption data were collected, disaggregated and coded
- response rate.

Also, it is estimated that in the 2011–12 National Nutrition and Physical Activity Survey, males underestimated their energy intake by 17% and females by 21%. This is higher than estimates for 1995, which was 1% for males and 16% for females. This was determined by comparing each person’s basal metabolic rate (BMR) (based on their age, sex and weight) with their reported energy intake and applying the Goldberg cut-off values, to assess whether the energy intake reported was plausible (ABS 2013b).

This section looks at the change in contribution of macronutrients to total energy intake (that is, the proportion of energy from macronutrients), as well as change in intake of serves from the 5 food groups and discretionary food (as serves per 10,000 kJ of energy). These are relative assessments to accommodate any issues with under-reporting. Also, underpinning these analyses is the same food database, which aids the comparability of the data.



Change in contribution of macronutrients to total energy intake

Between 1995 and 2011–12, as a proportion of energy intake, the contribution of:

- protein has increased across all age groups
- total fat, saturated fat, total sugars and added sugars has generally decreased
- starch has increased for children aged up to 13 but, decreased for adults aged 31 and over
- alcohol has increased for adults aged 51 and over.

Change in contribution of macronutrients to energy intake, 1995 to 2011–12

Macronutrient	Age group (years)							
	2–3	4–8	9–13	14–18	19–30	31–50	51–70	71+
Protein	↑	↑	↑	↑	↑	↑	↑	↑
Total fat	↓	↓	↓	↔	↓	↓	↔	↔
Saturated fat	↓	↓	↓	↔	↓	↓	↓	↔
Starch	↑	↑	↑	↔	↔	↓	↓	↓
Total sugars	↓	↓	↓	↓	↔	↔	↓	↔
Added sugars	↓	↓	↓	↓	↓	↔	↔	↔
Alcohol	—	—	—	↔	↔	↔	↑	↑

↔ no change.

— not applicable.

Source: ABS 2016c; tables S38, S39, S40, S41, S42, S43, S44 and S45, which includes data for children aged 2–16 for 2007.



Change in food group intake

Between 1995 and 2011–12, serves of:

- vegetables have decreased for people aged 19 and over
- grain foods have increased for children aged 2–3, 4–8 and 12–13
- meat and alternatives have increased for most age groups
- fruit, and dairy products and alternatives have not changed
- discretionary food has generally decreased.

Change in food group intake (as serves per 10,000 kJ of energy), 1995 to 2011–12

Food group	Age group (years)							
	2–3	4–8	9–11	12–13	14–18	19–50	51–70	71+
Vegetables	↔	↔	↔	↔	↔	↓	↓	↓
Fruit	↔	↔	↔	↔	↔	↔	↔	↔
Grain foods	↑	↑	↔	↑	↔	↔	↔	↔
Meat and alternatives	↑	↑	↔	↔	↑	↑	↑	↑
Dairy products and alternatives	↔	↔	↔	↔	↔	↔	↔	↔
Discretionary food	↓	↓	↔	↓	↔	↓	↔	↑

↔ no change.

Source: ABS 2016d; tables S46, S47, S48, S49, S50, S51, S52 and S53.



Discussion

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Five food groups

Adherence to the 5 food group serve recommendations is low for all age groups. While some age groups fare better than others for certain food groups, particularly children, the overall finding is few population groups have an ideal intake.

Younger age groups generally consume the recommended serves of fruit and dairy products and alternatives; however, this decreases with age. While the recommended serves increase with age, so too should food intake (as reflected in the ADGs); therefore, there is the potential to meet these serves.

For children aged 2–3, the average daily intakes of fruit and dairy serves exceeds the recommendations, and the proportion of children not meeting the recommended serves is low. The recommended number of fruit serves for children this age is lower than for other age groups, at 1.0 serve per day. Given the serve recommendations are minimum amounts, this higher intake of fruit for young children is not a concern, particularly as intake drops off with age.

For all age groups, out of the 5 food groups, the average daily intake of fruit serves is closest to the recommendations. Nevertheless, the proportion of the population not meeting the recommended serves of fruit increases markedly with age, with 77% of adults aged 19–50 not meeting recommendations (up from 22% of children aged 2–3).

Low vegetable intake occurs in all age groups, with the average daily intake well below the recommended number of serves. Between the ages of 2–18, more than 99% of the population does not meet the recommended number of serves. From the age of 19, this reduces slightly but, is still more than 90%.

For dairy products and alternatives, the average daily serves consumed by women aged 51 and over is well below the recommended number of serves, and almost all do not meet the recommendation. From the age of 51, the recommended serve rises from 2.5 to 4.0, to assist in maintaining bone density following menopause. For males aged 71 and over, the requirement increases from 2.5 serves to 3.5 serves, which increases the proportion who are not meeting the recommendation to close to 100%.

Adherence to the recommended serves of meat and alternatives decreases from ages 2–3 to 12–13, before increasing slightly with age but, insufficient intake remains high.

The 2011–12 Australian Health Survey did not collect data for children aged under 2; however, a recent study showed that while most babies aged 9 months met the required intake of vegetables (96%), this declined to just 3% in those aged 18 months. Fruit intake was better, with almost all babies aged 9 months meeting the required intake (98%), then falling to 89% by 18 months (Spence et al. 2018). Unlike the Australian Health Survey, this study did not include fruit juice; therefore, adherence to the fruit recommendation is likely be higher.



Discretionary food

Discretionary food contributes a substantial amount towards total energy intake—about one-third for all age groups, though slightly higher for boys and girls aged 14–18 (41%), and girls aged 9–13 (40%). In their study on food intake in children aged under 2, Spence et al. (2018) found that discretionary food contributed 14% to the energy intake of children aged 18 months, which shows that discretionary food plays a major role in the diet of Australians, even from a young age. These findings are consistent with the discretionary food intake of populations in other countries, including the United Kingdom and United States (An & Maurer 2016; Rivera et al. 2016; Sichieri et al. 2015; Whitton et al. 2011).

The ADGs (NHMRC 2013) recognise that while discretionary foods are not needed to meet nutrient requirements, they can contribute to the overall enjoyment of eating. There is limited capacity for including discretionary foods within the recommended diet and servings should be small. The findings presented in this report show a large deviation from this advice, with discretionary foods displacing the more nutrient-dense core foods from the food intake of Australians. This finding is supported by research by the Commonwealth Scientific and Industrial Research Organisation (CSIRO), with results from their Healthy Diet Score survey (with more than 145,000 completed surveys) showing that the diets of Australians are not consistent with the ADGs, with discretionary food being the most problematic area (Hendrie et al. 2017).

The main contributors to discretionary food intake differ across the age groups. For children, sweet biscuits, cakes and muffins, ice cream, pastries and fried potato products are the main contributors. For adults, alcoholic drinks are a main contributor, reaching 22% for those aged 51–70. Other foods include cakes and muffins and pastries. The contribution of soft drinks (sugar-sweetened drinks) to discretionary food intake is lower down the list for most age groups than other discretionary foods, reaching a maximum of 8.8% for children aged 14–18. However, soft drinks are a leading contributor to added sugars intake for most age groups (see further details below).

Risk nutrients

The Australian population is exceeding the recommendations for intakes of added sugars, saturated and trans fats and sodium. This is likely to be an effect of discretionary food making a substantial contribution to energy intake, and the insufficiencies in the intake of foods from the 5 food groups. Sodium intakes are also likely to be higher than reported, as they do not capture any sodium from discretionary salt use, such as that added during cooking or at the table.

Intake of added sugars peaks in children aged 14–18. In this group, the average intake of added sugars is 73 g/day (higher for boys than girls), added sugars contribute 13% to energy intake, and 74% of people have intakes of free sugars greater than or equal to 10% of energy intake. While added sugars intake decreases after the age of 14–18, it remains high. More than half of the population in each age group up to 19–30 have intakes of free sugars that are greater than the WHO cut-off (of less than 10% of energy intake). This decreases slightly for the older age groups but remains high (with between 35% and 50% of the population with intakes greater than or equal to 10% of energy intake).



The main contributors to added sugars intake is similar across the age groups but, the proportions vary. These include fruit and vegetable juices and drinks, soft drinks, cakes and muffins, cordials and sweet biscuits. For children aged 14–18, the contribution of soft drinks to added sugar intake reaches 28%. For adults aged 71 and over, the leading contributor is cakes and muffins (14%), with soft drinks at 8.4%.

The contribution of saturated and trans fats to energy intake is greater than the recommended maximum 10% of energy intake for all age groups 14 and over (ranging from 12%–14%). Trans fats make up a very small proportion of this intake (less than 1% of energy intake for all ages). The main contributors to saturated fat intake across all age groups include sweet biscuits, muffins and cakes, processed meat, butter and other dairy products and chocolate confectionary (ABS 2014a).

The average daily intake of sodium increases with age up to 19–30, then decreases slightly, but remains high. With the exception of children aged 2–3, the intake of sodium for males is higher than females. For all age groups, the average daily intake of sodium is well above the level of adequate intake. It is estimated that 80% of Australians' sodium intake comes from processed foods, with the remaining 20% from salt used at the table or in-home cooking. The leading contributors to sodium intake include: bread; meat, poultry and game products and dishes; cereal products and dishes; savoury sauces and condiments; and cheese (FSANZ 2015).

Until recently, an upper level of intake was available to assess the proportion of the population at risk of adverse health effects associated with high sodium intake. However, this was removed in 2017, as the data available found that sodium intake was associated with increased blood pressure at all measured levels of intake (1,200–3,300 mg) (NHMRC & NZMoH 2006). The 2011–12 Australian Health Survey found that usual intakes of sodium for adults in the 5th percentile of intakes are already more than 1,200 mg/day, except for women aged 71 and over, where the 10th percentile intake is above this level. In addition, the suggested dietary target for the population aged 14 and over is 2,000 mg per day and at least 90% of this population exceed this level (ABS 2015b).

A study on strategies to reduce discretionary food intake in the Australian population looked at 3 options—moderation, substitution and reformulation. It found the substitution strategy (replacing half of discretionary choices with core choices) has the best potential to reduce intake of energy and 'risk' nutrients (sodium and added sugar), while maintaining or improving micronutrient, protein and fibre intake (Grieger et al. 2017). While reformulating products may play a role in reducing the intake of risk nutrient where energy moderation is not a priority, the study found it is unlikely to help prevent obesity. Substitution was also a strategy that balanced maximising nutritional impact and ease of adoption.

Fayet-Moore & Pearson (2015) suggest that an area for development is the provision of practical advice to the general population on how to translate terminology on discretionary food intake, such as limit, avoid, reduce, sometimes or occasionally. Additionally, providing more advice on how to incorporate discretionary and non-discretionary dietary choices in a healthy way based on gender, age, height and physical activity levels could be an easier way to develop dietary consistency, while also recognising the role that discretionary foods often play in the social connectedness of people's lives.



Key nutrients

This report has established that intake of foods from the 5 food groups is low and intake of discretionary food is high across the life stages, which is likely to be resulting in the high intakes of added sugars, saturated fat and sodium. Despite this, intake and biomedical levels of the assessed nutrients are not adversely affected across all age groups. These findings do not include intake from supplements, so intakes are likely to be higher in some instances.

The proportion of the population with intakes of iodine and dietary folate equivalents that are below requirements (the estimated average requirement) are low for all age groups (reaching about 11% for women aged 19–30 and 31–50) and assessment of nutrient biomarkers show adequate levels for all age groups. This is likely to be a reflection of mandatory fortification of bread and bread products with folic acid and iodine, introduced in 2009 (AIHW 2016b). In addition, the biomedical assessment shows adequate levels of Vitamin B12.

About one-third of women aged 19–50 have iron intakes below requirements, compared with 2.2% of men in the same age group. This is likely to reflect the higher iron requirement for women (8 mg/day) compared with men (6 mg/day), as well as the lower number of serves women consume from the meat and alternatives food group compared with men. The biomedical assessment, however, shows that all population groups have adequate iron status, although with levels higher for men than women. The differing finding in iron intake and status may reflect the under-reporting that is evident in food intake surveys, and the fact that the biomedical assessment measures iron stores and supplement use, rather than short-term iron intake through food.

Apart from children aged 2–3, a high proportion of people in each age group have intakes of calcium below the estimated average requirement. For females aged 14–18, 51–70 and 71 and over, this reaches more than 90%, which likely reflects the higher requirements for these age groups and almost everyone not meeting the required serves of dairy products (a rich source of calcium).

Children aged 2–3 are much more likely to meet their calcium requirements than other age groups (0.7% of boys and 2.4% of girls have usual intakes below their requirements). This is likely to be a result of lower requirements for calcium and higher consumption of dairy products and alternatives, as a proportion of their total diet. The benefits of adequate dairy foods intake in children extend beyond those related to the calcium content, with research showing that children who consume the recommended serves of dairy each day are more likely to have higher quality nutritional intake and consume fewer sugar-sweetened drinks (Rangan et al. 2012).

The low intake of calcium for most age groups is of concern—particularly for older men and women, as low dairy intake has been associated with lower bone mineral density and a higher risk of osteoporosis and fractures, as well as a higher likelihood of being overweight. In addition, calcium plays a vital role in aiding growth and development in children and adolescents (Muehlhoff et al. 2013), so the low intakes past the age of 3 is of concern.

For fibre, average daily intakes increase with age. Children aged 2–3 and boys aged 4–8 exceed the level of adequate intake. For the other groups, average intakes are between 80% and 96% of the adequate intake. The adequate intake level is the average daily nutrient intake based on observed or estimated intakes by a group of apparently healthy people that are assumed to be adequate. Therefore, mean intakes around the adequate intake reflect expected intakes, suggesting current intakes would maintain the functions associated with fibre intakes.

The majority of the population has adequate levels of vitamin D.



Physical activity, overweight and obesity, waist circumference

Three-quarters (75%) of children aged 2–3 are meeting the recommendation for sufficient exercise, which decreases to about 1 in 5 (16%) children aged 14–18. Sufficiency then increases to between 40% and 55% of the population aged 19–50, before falling to 1 in 5 (22%) adults aged 71 and over.

The prevalence of overweight and obesity increases from 20%–30% of children (aged up to 18), to 55% of men aged 19–30, and 70%–80% of adults aged 51 and over. Waist circumference measurements that put the population at substantially increased risk of developing chronic conditions such as heart disease and type 2 diabetes also rise with age, reaching more than half of the population aged 51 and over.

Sociodemographic differences

This report shows that remoteness area and socioeconomic status play a role in the quality of Australians' diet. On average, diets are more favourable as remoteness decreases (that is, closer to *Major cities*) and as socioeconomic status increases.

These findings are consistent with other research, which shows inequalities for both children and adults in overall diet quality, as well as individual foods and nutrients across socioeconomic variables (Chapman et al. 2016; Livingstone et al. 2017; Spence et al. 2018). While there is a notable difference across socioeconomic variables, this gap has not widened since 1995 (Olstad et al. 2018), which is positive from a public health perspective.

Studies looking at the cost and availability of foods across remoteness areas consistently show that there are more choices for fruits and vegetables in highly accessible areas and their average cost is lower, than in more remote areas (Chapman et al. 2014; Queensland Health and Queensland Treasury 2012). These costs only account for the actual purchase price of food and do not include the additional transportation costs to access the food. People living in remote areas generally have to travel further to buy food, so use more fuel (Chapman et al. 2014).

Sociodemographic variables also have an influence on levels of physical activity and overweight and obesity. As remoteness decreases (that is, closer to *Major cities*) and socioeconomic status increases, physical activity increases and overweight and obesity decreases.

Indigenous Australians

This report looked at whether food and nutrient intakes and health outcomes differ between Indigenous and non-Indigenous Australians, and found that overall, there is little difference.

Intake of serves from the 5 food groups for Indigenous children is similar to the intake for non-Indigenous children. However, differences are seen in the adult populations, particularly for fruit, vegetables, dairy products and alternatives (for those aged 19–50 and 71 and over) and grain foods (for those aged 19–50), where intake is lower for Indigenous Australians.

Comparing the contribution of discretionary food to energy intake for Indigenous and non-Indigenous Australians, the main differences are seen in women aged 19–30 and men and women aged 31–50, with the contribution being higher in Indigenous Australians.



While the intake of added sugars appears higher among Indigenous Australians than non-Indigenous Australians, this is only significant in those aged 19–30 and 31–50. Intake of saturated and trans fats and sodium are similar for Indigenous and non-Indigenous Australians. Fibre intake for Indigenous Australians aged 19–30 and 31–50 is lower than for non-Indigenous Australians.

The small survey sample for Indigenous Australians makes comparisons difficult when looking at levels of physical activity as there is a high margin of error, so results should be interpreted with caution. Levels of sufficient physical activity appear higher in Indigenous Australians; however, in most cases, the differences are not statistically significant. The only exceptions are children aged 4–8 and boys aged 9–13, where the levels are higher in Indigenous Australians. For adults aged 19–30 and 31–50, non-Indigenous Australians have higher levels of physical activity.

For males, the prevalence of overweight and obesity does not differ by Indigenous status. However, for women, from the age of 19, the prevalence is higher among Indigenous women than non-Indigenous women. Among Indigenous Australians, there is no difference in the prevalence of overweight and obesity between males and females, unlike non-Indigenous Australians, where from the age of 19, the prevalence is higher in men than women.

Diet quality among Indigenous Australians may be affected by the remoteness of the area in which they live, as a higher proportion of Indigenous Australians live outside of *Major cities* than non-Indigenous Australians (AIHW 2018a). Hudson (2010) suggests that many Indigenous Australians know what foods they need to maintain health; however, supply and affordability of fresh produce appear to be limiting factors in dietary quality. Limited stock of fruit and vegetables have been found in remote shops near Indigenous communities, with some areas going without a delivery of fresh produce for weeks. And what is available is expensive. When deliveries are received, stock can be up to 2 weeks old, so of poor quality. Additionally, lack of competition in these areas appears to be a factor with price.

Fibre-modified and fortified white bread appears to provide a large proportion of energy and required key nutrients for Indigenous Australians living in remote areas (in particular protein, folate, iron and calcium) (Brimblecombe et al. 2013a; Brimblecombe et al. 2013b; Gwynn et al. 2012). The diet of Indigenous Australians have for some time, been shifting from traditional Indigenous diets that were previously high protein, fibre, polyunsaturated fat and complex carbohydrates to a more highly refined carbohydrate diet, with added sugars, saturated fat, sodium and low levels of fibre (Ferguson et al. 2017). This may be due to lack of access to traditional food and general food affordability (Brimblecombe et al. 2014).

Lack of facilities to prepare and store food such as refrigerators and stovetops, have also caused an increased reliance of ready-made meals or takeaway foods for Indigenous Australians living in remote areas (Hudson 2010).



Change over time

Much of the data presented in this report present a bleak view of the quality of Australians' diets. Some positive changes that have been estimated over time include a decrease in the contribution of total sugars, added sugars, total fat and saturated fat to energy intake, with a subsequent increase in the proportion of energy from starch and protein. However, for those aged 51 and over, the contribution to their energy intake from alcohol has increased.

Discretionary food intake has largely decreased for the population aged up to 50, while remaining similar for those aged 51–70 and increasing for those aged 71 and over. For these older age groups, however, current intake of discretionary food is still lower than that for the younger age groups.

Intake of serves from the 5 food groups have changed since 1995. For children, intake of grain food and meat and alternatives serves has increased, with similar levels for the other food groups. For adults, intake of vegetable serves has decreased, while intake of meat and alternatives serves has increased.

Bringing about change

This report has found that Australians are not meeting the national dietary and physical activity guidelines and levels of overweight and obesity are high. Suboptimal food and nutrient intake begins from an early age (as young as 2), which indicates that good eating practices are not being established in early childhood to take forward into adulthood.

The Australian food supply is diverse and abundant with a variety of foods, including those needed for a healthy diet. Despite this, the distribution of this food is not equal and consumption of food types at the population level is at odds with the ADGs, with a clear preference for energy-dense, nutrient-poor foods. It is clear that changes are needed to improve the nutritional quality of Australians' diets and that multiple areas require improvement, rather than a single food group, food type or nutrient.

Limitations

The available data are adequate to allow a robust assessment of food and nutrition intakes in Australia. There are, however, notable gaps in some areas:

- Food intake data from the Indigenous population are insufficient to calculate usual food and nutrient intakes, which could be an area to address in future surveys.
- Participants of nutrition surveys are prone to under-reporting food intake, and not necessarily equally for all foods. This can reduce the confidence that the resulting data on food and nutrient intakes adequately reflect the situation. It is difficult to improve on this, as the 24-hour recall is the most cost-effective method of obtaining food intake data on a population level. The fact that under-reporting is present must be acknowledged and considered when interpreting the data. For the trend analysis, the data were assessed on a relative basis to accommodate any issues with under-reporting between surveys.
- The nutrient intake data exclude any contribution from supplements; therefore, intakes for some nutrients are likely to be higher. Data on supplement use are available, but were not considered in the calculation of nutrient intakes.



Appendix A: Data sources



2011–12 Australian Health Survey

The ABS 2011–12 Australian Health Survey (AHS) is the largest, most comprehensive health survey of the Australian population ever conducted. It combined the existing National Health Survey (NHS) with 2 new components:

- the National Nutrition and Physical Activity Survey (NNPAS)
- the National Health Measures Survey (NHMS).

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 were excluded. These exclusions are unlikely to affect national estimates, but will have an impact on prevalence estimates broken down by remoteness area.

Non-private dwellings such as institutional care facilities (including hospitals and aged care facilities), hotels, motels and short-stay caravan parks were excluded from the survey. The following groups were also excluded: certain diplomatic personnel of overseas governments, people whose usual place of residence was outside Australia, members of non-Australian Defence forces (and their dependants) stationed in Australia, and visitors to private dwellings.

People who took part in the AHS participated in either the NHS or the NNPAS. A core set of data items was common to both surveys, and information from these data items is available for all people in the AHS (about 32,000). This core set of data items included household and demographic information, self-assessed health status and self-assessed body mass. Respondents were aged 2 and over.

About 20,500 people participated in the NHS, where data were collected on long-term health conditions, health services and medicine use, social and emotional wellbeing, breastfeeding and disability status.

About 12,000 people participated in the NNPAS, where data were collected on physical activity, foods and nutrients consumed, and selected dietary behaviours.

All people aged 5 and over were then invited to participate in the voluntary NHMS, and more than 11,000 people did so.

Australian Health Survey data used in this report

The NNPAS and NHMS components of the AHS provide much of the data for this report.

For the NNPAS, trained ABS interviewers held personal interviews with selected residents. One person aged 18 and over in each dwelling was selected and interviewed about their own health, including a 24-hour dietary recall and a physical activity module. An adult was then interviewed about 1 child (aged 2 and over) living in the household. Some children aged 15–17 were personally interviewed with parental consent. All selected people were required to have a follow-up phone interview at least 8 days after the face-to-face interview to collect a second 24-hour dietary recall.



The 24-hour dietary recall component collected detailed information on all foods and drinks consumed on the day before the interview (midnight to midnight). This included the time of consumption, the name of the eating occasion (for example, breakfast), detailed food descriptions, and the amount eaten. Data were collected through the Automated Multiple Pass Method questionnaire developed by the Agricultural Research Service of the United States Department of Agriculture and adapted for the NNPAS to include foods consumed in Australia.

The questionnaire contains more than 10,000 individual and combined foods to reflect the Australian food supply. Once a food or drink was reported, further questions were asked to capture detailed information about the food, cooking methods and amount consumed.

Population nutrition guidelines, such as the estimated average requirement and upper level of intake from the NRVs are based on long-term or 'usual' nutrient intakes. Intakes derived from single 24-hour recall data do not represent a person's usual intake, because of variation in day-to-day intakes. The 2-days of food consumption data from the NNPAS were used to estimate 'usual' food and nutrient intake distributions at the population level, which enables the calculation of the proportion of the population with intakes above or below reference values. For mean intakes, it is suitable to use 1 day of data (that is, Day 1).

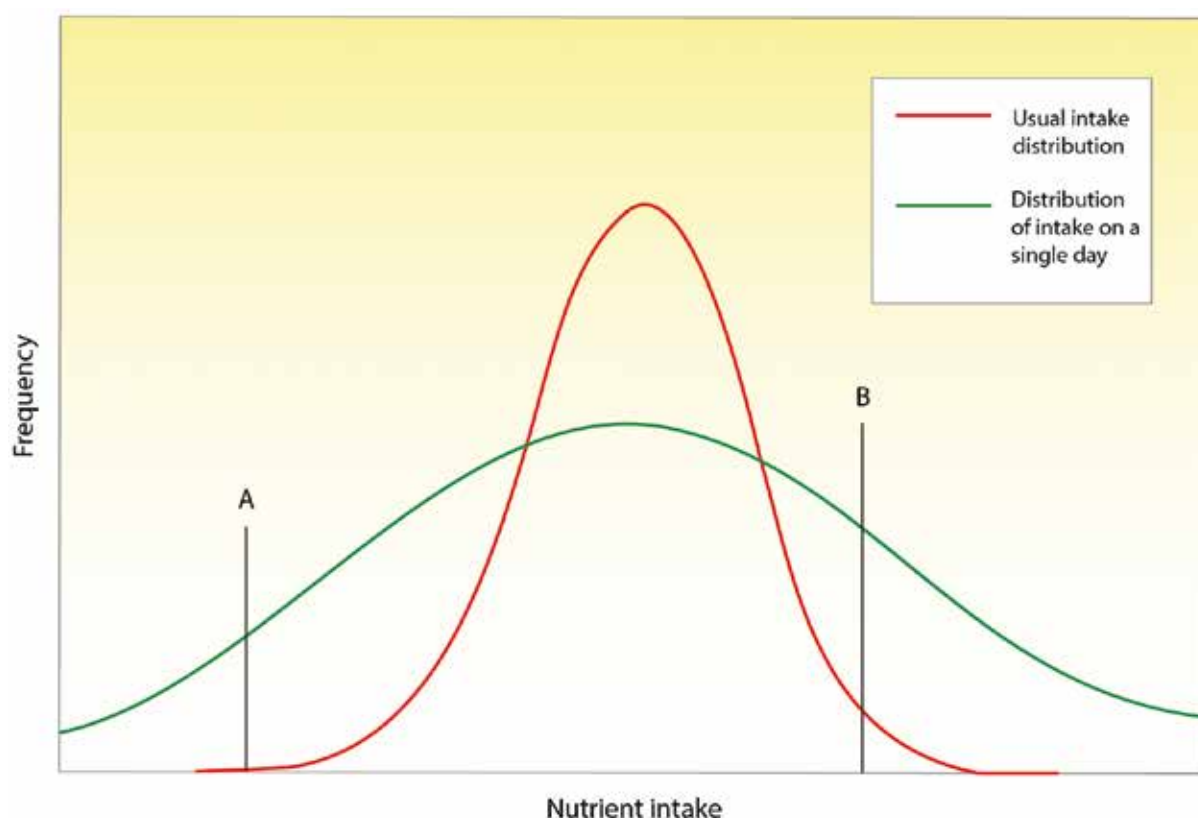
This concept is demonstrated in Figure A1, which shows, in general terms, nutrient intake distribution from a single day versus usual intake and a comparison with NRVs. With cut point A representing the requirement for nutritional adequacy, the prevalence of inadequacy is much greater for the distribution based on intake from a single day (to the left of point A under the green line) than usual intake (to the left of point A under the red line). With cut point B, which represents the upper safe level, the proportion of the population with an increased risk of adverse effects is much greater for the distribution based on intake from a single day (to the right of point B under the green line) than usual intake (to the right of point B under the red line). While the means of the 2 distributions are similar, usual intake data provide a more accurate picture of inadequacies or the risk of adverse effects.

A single 24-hour recall was collected from all respondents. Those who reported they were pregnant or breastfeeding at the time of the survey (n = 228) were excluded from the usual intake analysis (because the general NRVs do not apply to pregnant and breastfeeding women), leaving a day 1 sample of 11,925. The second 24-hour dietary recall (Day 2) had 7,585 participants (about 64% of the total).

For the NNPAS, the ABS used the National Cancer Institute (NCI) method, developed by the National Cancer Institute, to estimate usual food and nutrient intakes. This method uses the available 2-day records for the group to remove within person (or day-to-day) variation from the group's day 1 intakes, which narrows the tails of the group intake distribution (that is, the values are less extreme at the upper and lower ends of the distribution). As the calculation is done on the pooled group data, usual intakes for individuals within the group are not produced. The output is percentiles of intake for the population and proportions above or below cut points.



Figure A1: Population nutrient intakes based on a single day compared with usual intake and nutrient reference values



Source: FSANZ 2009; ABS 2013b.

In the NHMS, urine samples were collected from respondents aged 5 and over, and blood samples from respondents aged 12 and over. The survey tested the samples for chronic disease biomarkers and nutrition biomarkers, such as folate and iodine.

2012–13 Australian Aboriginal and Torres Strait Islander Health Survey

The ABS 2012–13 Australian Aboriginal and Torres Strait Islander Health Survey (AATSIHS) is the largest, most comprehensive health survey of the Australian Indigenous population ever conducted. It combined the existing ABS National Aboriginal and Torres Strait Islander Health Survey (NATSIHS), with 2 new components:

- the National Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey (NATSINPAS)
- the National Aboriginal and Torres Strait Islander Health Measures Survey (NATSIHMS).

Non-remote and *Remote* areas in all states and territories were included, including discrete Aboriginal and Torres Strait Islander communities.



Non-private dwellings such as institutional care facilities (including hospitals and aged care facilities), hotels, motels and short-stay caravan parks were excluded from the survey. The following groups were also excluded: non-Indigenous Australians, certain diplomatic personnel of overseas governments, people whose usual place of residence was outside Australia, members of non-Australian Defence forces (and their dependants) stationed in Australia, and visitors to private dwellings.

People who took part in the AATSIHS participated in either the NATSIHS or the NATSINPAS. A core set of data items was common to both surveys, and information from these data items is available for all people in the AATSIHS (about 12,900). This core set of data items included household and demographic information, self-assessed health status and self-assessed body mass. Respondents were aged 2 and over.

About 9,300 people participated in the NATSIHS, where data were collected on long term health conditions, health services and medicine use, social and emotional wellbeing, breastfeeding and disability status.

About 4,100 people participated in the NATSINPAS, where data were collected on physical activity, foods and nutrients consumed, and selected dietary behaviours.

All people aged 18 and over were then invited to participate in the voluntary NATSIHMS, and about 3,300 people did so.

Australian Aboriginal and Torres Strait Islander Health Survey data used in this report

The NATSINPAS and NATSIHMS components of the AATSIHS provide much of the data for this report.

In the NATSINPAS, trained ABS interviewers held personal interviews with selected residents. One person aged 18 and over in each dwelling was selected and interviewed about their own health, including a 24-hour dietary recall and a physical activity module. An adult was then interviewed about 1 child (aged 2 and over) living in the household. Some children aged 15–17 were personally interviewed with parental consent. People from non-remote areas only were required to have a follow-up phone interview at least 8 days after the face-to-face interview to collect a second 24-hour dietary recall.

For the collection of 24-hour dietary recall data, the same collection method as the NNPAS was used, but with a different food model booklet, and an additional a bush tucker prompt card for respondents living in *Remote* areas.

'Usual' food and nutrient intakes were not estimated for the Indigenous population, as there were not enough data from Day 2 for the calculation. As such, it is not possible to determine the proportion of the population with intakes higher or lower than nutrient reference values.



2014–15 National Health Survey

In the 2014–15 National Health Survey, about 14,700 private dwellings across Australia were surveyed, with a total of 19,259 people. All urban and rural areas in all states and territories were included but, non-private dwellings, *Very remote* areas and discrete Aboriginal and Torres Strait Islander communities were excluded. Within each randomly selected dwelling 1 adult (18 or over) and 1 child (0–17) were personally interviewed by an ABS interviewer.

The survey collected a wide variety of data on areas such as body mass index, physical measurements (for example, measured waist circumference, weight, height), blood pressure, breastfeeding, smoking, fruit and vegetable intakes, dietary behaviours, alcohol consumption, exercise and sedentary behaviour. The key results provide information on the prevalence of long-term health conditions, health risk factors, use of health services and demographic and socioeconomic characteristics.

2007 Australian National Children's Nutrition and Physical Activity Survey

The 2007 Australian National Children's Nutrition and Physical Activity survey was the first survey to address both dietary intake and exercise in the same sample group. The Department of Health, Department of Agriculture, Fisheries and Forestry and the Australian Food and Grocery Council commissioned the survey. A total of 4,487 participants were randomly selected by postcode, using random digit dialling from metropolitan, rural and remote areas of Australia.

This survey was not designed to collect information on representative samples of children living in *Remote* areas or those of Indigenous origin. As a result, these postcodes were excluded from the sampling frame. Additionally, the number of children included from each state was proportional to the population of children in that state or territory.

The survey recognised the need for national data on children's weight status, physical activity and activity levels for monitoring purposes. As a result, the survey aimed to assess food and nutrient intakes, assess physical activity participation and measure weight, height and waist circumference in a sample of children aged 2–16.

The data for the survey were collected based on the 24-hour dietary recall method using computer assisted personal interview (CAPI) in the child's home. Computer assisted telephone interviews (CATI) were conducted 7–21 days later. All respondents completed the second 24-hour recall. The data collection occurred from February 2007 to August 2007, and attempted to collect information on school and non-school days.

During the data collection period dietary intakes of food and drinks, use of supplements, selected food habits, height, weight, BMI, waist circumference, time spent in physical/sedentary activity (screen time), number of daily steps taken and demographic characteristics were measured.



The method used in the survey is broadly comparable to that used in the 1995 National Nutrition Survey (see next section), with differences including the sampling frame, use of the CATI in this survey versus a personal interview in the NNS, and differing food composition databases.

The resultant data categorised the children into 4 age groups (2–3, 4–8, 9–13 and 14–16) to align with the relevant NRV age groups.

1995 National Nutrition Survey

The 1995 National Nutrition Survey (NNS) was a comprehensive survey of the diet of Australians. Detailed information for the survey was collected from 13,835 participants aged 2 and over, based on food and drink intake, usual frequency of intake, habits and attitudes towards food and physical measurements.

The sample for the NNS was selected from participants who had been involved in the 1995 NHS. A maximum of 2 people per household in urban areas and a maximum of 3 people per household in rural areas were invited to take part (to increase the sample size from Queensland, 3 people from either urban or rural were invited to participate). In addition, all those 65 or over who lived in households were invited to participate.

A 24-hour dietary recall based on detailed foods and drinks consumed the day before (from midnight to midnight) was undertaken, as well as physical measurements. Factors considered for adult participants included state/territory, geographic region, region of birth, Index of Relative Socio-Economic Disadvantage for areas, weekday/weekend, season and BMI.

A second 24-hour recall was collected from a subsample of respondents (1,490 people), on a different day of the week, within about 10 days of the first interview. This enabled appropriate adjustment of data to better estimate longer-term nutrient intakes in the population.

Under-reporting in nutrition surveys

Participants in nutrition surveys tend to underestimate their food intake, which can be the result of:

- changing what they eat because they know they will be participating in the survey
- misrepresenting what they eat, such as making their intake appear healthier or quicker to report.

Under-reporting occurs to some extent in all dietary surveys. It is estimated that males under reported their energy intake in the NNPAS by 17% and females by 21%, and the level of under-reporting was higher for overweight and obese people than for those of normal weight. It is unknown what effect this has on resultant food and nutrient intake data, as under-reporting is unlikely to affect all foods equally (ABS 2013b).

In the NATSINPAS, it is estimated that males under-reported their energy intake by 24% and females by 31%. Again, the level of under-reporting was higher for overweight and obese people than for those of normal weight (ABS 2013a).



Glossary

abnormal blood lipids: Blood lipids are fats in the blood and include cholesterol and triglycerides. Usually high levels can contribute to the development of atherosclerosis—a build up of fatty deposits in the blood vessels that can lead to the development of cardiovascular diseases. Also known as dyslipidaemia.

Aboriginal or Torres Strait Islander: A person of Aboriginal and/or Torres Strait Islander descent who identifies as an Aboriginal and/or Torres Strait Islander.

biomarker: A measured characteristic that can be used to indicate a health risk factor or condition—for example, vitamin D and iodine.

cardiovascular disease: Any disease of the circulatory system—namely the heart (cardio) or blood vessels (vascular). Includes heart attack, angina, stroke, coronary heart disease and peripheral vascular disease. Also known as circulatory disease.

chronic condition: A condition with symptoms ranging from mild to severe that persist or develop and can deteriorate over a long period of time (for example, diabetes mellitus and arthritis).

colorectal cancer: Occurs when abnormal cells in the wall of the large bowel grow in an uncontrolled way. Also known as bowel cancer.

diabetes mellitus: A chronic condition, characterised by high blood levels of glucose. It is caused by deficient production of insulin (the hormone that helps to metabolise glucose) or resistance to its action. There are 2 main types of diabetes—**type 1 diabetes**, where there is a complete deficiency of insulin, and **type 2 diabetes**, which is marked by a relative insufficiency of insulin or resistance to its action.

discretionary food: Foods and drinks that are not necessary to provide the nutrients the body needs but, may add variety. 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.

high blood pressure/hypertension: A systolic blood pressure of 140 mmHg or more, or a diastolic blood pressure of 90 mmHg or more, or where the person is receiving medication for high blood pressure

musculoskeletal condition: A condition that affects the bones, muscles, connective tissues and joints. Common musculoskeletal conditions include various forms of arthritis, back pain and problems, osteoporosis and gout.

Nutrient Reference Value (NRV): A suite of reference values for Australians that represent the levels of nutrients needed to meet the known nutritional needs of the healthy population. It can be used to assess the likelihood of inadequate or excess intake in individuals or groups of people.

osteoporosis: A condition in which bones become brittle and weak if minerals (such as calcium) are lost more rapidly than can be replaced by the body. This decreases the bone density and increases the risk of bone breaks.

physical inactivity: Not completing enough physical activity as suggested by the Physical Activity and Sedentary Behaviour Guidelines.



References

- ABS (Australian Bureau of Statistics) 2013a. Australian Aboriginal and Torres Strait Islander Health Survey: users' guide, 2012–13. ABS cat. no. 4727.0.55.002. Canberra: ABS.
- ABS 2013b. Australian Health Survey: users' guide, 2011–13. ABS cat. no. 4363.0.55.001. Canberra: ABS.
- ABS 2013c. Microdata: Australian Health Survey 2011–12: core content—risk factors and selected health conditions, expanded confidentialised unit record file, DataLab. ABS cat. no. 4324.0.55.003. Canberra: ABS.
- ABS 2013d. Microdata: Australian Health Survey 2011–12: nutrition and physical activity, expanded confidentialised unit record file, DataLab. ABS cat. no. 4324.0.55.002. Canberra: ABS.
- ABS 2014a. Australian Health Survey: nutrition first results—foods and nutrients, 2011–12. ABS cat. no. 4364.0.55.007. Canberra: ABS.
- ABS 2014b. Remoteness structure. Canberra: ABS. Viewed 24 April 2018, <<http://www.abs.gov.au/websitedbs/D3310114.nsf/home/remoteness+structure>>.
- ABS 2015a. Australian Aboriginal and Torres Strait Islander Health Survey: nutrition results—food and nutrients, 2012–13. ABS cat no. 4727.0.55.005. Canberra: ABS.
- ABS 2015b. Australian Health Survey: usual nutrient intakes, 2011–12. ABS cat no. 4364.0.55.008. Canberra: ABS.
- ABS 2015c. Microdata: Australian Aboriginal and Torres Strait Islander Health Survey 2012–13: nutrition and physical activity, expanded confidentialised unit record file, DataLab. ABS cat. no. 4715.0.30.002. Canberra: ABS.
- ABS 2015d. Microdata: Australian Aboriginal and Torres Strait Islander Health Survey, 2012–13: risk factors and selected health conditions, expanded confidentialised unit record file, DataLab. ABS cat. no. 4715.0.30.003. Canberra: ABS.
- ABS 2016a. Australian Aboriginal and Torres Strait Islander Health Survey: consumption of added sugars, 2012–13. ABS cat no. 4727.0.55.009. Canberra: ABS.
- ABS 2016b. Australian Aboriginal and Torres Strait Islander Health Survey: consumption of food groups from the Australian Dietary Guidelines, 2012–13. ABS cat no. 4727.0.55.008. Canberra: ABS.
- ABS 2016c. Australian Health Survey: consumption of added sugars, 2011–12. ABS cat no. 4364.0.55.011. Canberra: ABS.
- ABS 2016d. Australian Health Survey: consumption of food groups from the Australian Dietary Guidelines, 2011–12. ABS cat no. 4364.0.55.012. Canberra: ABS.
- ABS 2016e. Microdata: National Health Survey, 2014–15: expanded confidentialised unit record file, DataLab. ABS cat no. 4324.0.55.001. Canberra: ABS.
- ABS 2016f. Microdata: National Health Survey, 2014–15. ABS cat. no. 4324.0.55.001. Canberra: ABS.
- ABS 2017. Health service usage and health related actions, Australia, 2014–15. ABS cat. no. 4364.0.55.002. Canberra: ABS.
- AIHW (Australian Institute of Health and Welfare) 2012. Australia's food and nutrition. Cat. no. PHE 163. Canberra: AIHW.
- AIHW 2016a. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Australian Burden of Disease Study series no. 3. Cat. no. BOD 4. Canberra: AIHW.



AIHW 2016b. Monitoring the health impacts of mandatory folic acid and iodine fortification 2016. Cat. no. PHE 208. Canberra: AIHW.

AIHW 2017a. Impact of overweight and obesity as a risk factor for chronic conditions. Australian Burden of Disease Study. Australian Burden of Disease Study series no. 11. Cat. no. BOD 12. Canberra: AIHW.

AIHW 2017b. Impact of physical inactivity as a risk factor for chronic conditions: Australian Burden of Disease Study. Australian Burden of Disease Study series no. 15. Cat. no. BOD 16. Canberra: AIHW.

AIHW 2018a. Australia's health 2018. Cat. no. AUS 221. Canberra: AIHW.

AIHW 2018b. Impact of alcohol and illicit drug use on the burden of disease and injury in Australia: Australian Burden of Disease Study 2011. Australian Burden of Disease Study series no. 17. Cat. no. BOD 19. Canberra: AIHW.

An R & Maurer G 2016. Consumption of sugar-sweetened beverages and discretionary foods among US adults by purchase location. *European Journal of Clinical Nutrition* 70:1396–400.

ANZSGM (Australian and New Zealand Society for Geriatric Medicine) 2011. Position statement no. 19: Obesity and the older person. Canberra: ANZSGM.

Brimblecombe J, Ferguson M, Liberato S & O'Dea K 2013a. Characteristics of the community-level diet of Aboriginal people in remote northern Australia. *Medical Journal of Australia* 198:380–4.

Brimblecombe J, Liddle R & O'Dea K 2013b. Use of point-of-sale data to assess food and nutrient quality in remote stores. *Public Health Nutrition* 16:1159–67.

Brimblecombe J, Maypilama E, Colles S, Scarlett M, Dhurrkay JG, Ritchie J et al. 2014. Factors influencing food choice in an Australian Aboriginal community. *Qualitative Health Research* 24:387–400.

Chapman K, Havill M, Watson WL, Wellard L, Hughes C, Bauman A et al. 2016. Time to address continued poor vegetable intake in Australia for prevention of chronic disease. *Appetite* 107:295–302.

Chapman K, Kelly B, Bauman A, Innes-Hughes C & Allman-Farinelli M 2014. Trends in the cost of a healthy food basket and fruit and vegetable availability in New South Wales, Australia, between 2006 and 2009. *Nutrition and Dietetics* 71:117–26.

CSIRO (Commonwealth Scientific and Industrial Research Organisation) & University of South Australia 2008. Australian national children's nutrition and physical activity survey: main findings. Canberra: Commonwealth of Australia.

Department of Health 2014a. Australia's physical activity and sedentary behaviour guidelines for adults (18–64 years). Canberra: Department of Health.

Department of Health 2014b. Australia's physical activity and sedentary behaviour guidelines for children (5–12 years). Canberra: Department of Health.

Department of Health 2017. Australian 24-hour movement guidelines. Canberra: Department of Health.

Department of Veterans Affairs & Department of Health 2005. Choose health: be active—a physical activity guide for older Australians. Canberra: Commonwealth of Australia and the Repatriation Commission.

Ebeling P, Daly R, Kerr D & Kimlin M 2013. Building healthy bones throughout life: an evidence-informed strategy to prevent osteoporosis in Australia. *Medical Journal of Australia Open Supplement*:1–46.



Fayet-Moore F & Pearson S 2015. Interpreting the Australian Dietary Guideline to 'limit' into practical and personalised advice. *Nutrients* 7:2026–43.

Ferguson M, Brown C, Georga C, Miles E, Wilson A & Brimblecombe J 2017. Traditional food availability and consumption in remote Aboriginal communities in the Northern Territory, Australia. *Australian and New Zealand Journal of Public Health* 41:294–8.

FSANZ (Food Standards Australia and New Zealand) 2009. Principles and practices of dietary exposure assessment for food regulatory purposes. Canberra: FSANZ, <<http://www.foodstandards.gov.au/science/exposure/pages/protectinghighconsum4441.aspx>>.

FSANZ 2015. How much sodium do Australians eat? Canberra: FSANZ.

Grieger J, Johnson B, Wycherley T & Golley R 2017. Comparing the nutritional impact of dietary strategies to reduce discretionary choice intake in the Australian adult population: a simulation modelling study. *Nutrients* 9:442.

Gunderson EP, Lewis CE, Lin Y, Sorel M, Gross M, Sidney S et al. 2018. Lactation duration and progression to diabetes in women across the childbearing years: the 30-year CARDIA study. *JAMA Internal Medicine* 178:328–337.

Gwynn JD, Flood VM, D'Este CA, Attia JR, Turner N, Cochrane J et al. 2012. Poor food and nutrient intake among Indigenous and non-Indigenous rural Australian children. *BMC Pediatrics* 12:12.

Hendrickx G, Boudin E & Van Hul W 2015. A look behind the scenes: the risk and pathogenesis of primary osteoporosis. *Nature Reviews Rheumatology* 11:462–74.

Hendrie GA, Baird D, Golley RK & Noakes M 2017. The CSIRO Healthy Diet Score: an online survey to estimate compliance with the Australian Dietary Guidelines. *Nutrients* 9:47.

Hudson S 2010. Healthy stores, healthy communities: the impact of outback stores on remote Indigenous Australians. New South Wales: Centre for Independent Studies.

Livingstone KM, Olstad DL, Leech RM, Ball K, Meertens B, Potter J et al. 2017. Socioeconomic inequities in diet quality and nutrient intakes among Australian adults: findings from a nationally representative cross-sectional study. *Nutrients* 9:1092.

Masters G, Coles-Rutishauser I, Webb K, Marks G & Pearse J 2006. National food and nutrition monitoring and surveillance system: a framework and a business case. Sydney: Nexus Management Consulting.

Muehlhoff EB, Bennett A, McMahon D 2013. Milk and dairy products in human nutrition. Rome: Food and Agriculture Organisation of the United Nations.

NHMRC (National Health and Medical Research Council) 2012. Infant feeding guidelines information for health workers. Canberra: NHMRC.

NHMRC 2013. Australian Dietary Guidelines. Canberra: NHMRC.

NHMRC & NZMoH (New Zealand Ministry of Health) 2006. Nutrient Reference Values for Australia and New Zealand. Version 1.2. Updated September 2017. Canberra: NHMRC.

Nowson C, McGrath J, Ebeling P, Haikerwal A, Daly R, Sanders K et al. 2012. Vitamin D and health in adults in Australia and New Zealand: a position statement. *Medical Journal of Australia* 196:686–7.

Olstad DL, Leech RM, Livingstone KM, Ball K, Thomas B, Potter J et al. 2018. Are dietary inequalities among Australian adults changing? A nationally representative analysis of dietary change according to socioeconomic position between 1995 and 2011–13. *International Journal of Behavioral Nutrition and Physical Activity* 15:30.



Productivity Commission 2017. Report on Government Services 2017: Volume f, chapter 14, aged care services attachment tables. Canberra: Productivity Commission.

Rangan AM, Flood VM, Denyer G, Webb K, Marks GB & Gill TP 2012. Dairy consumption and diet quality in a sample of Australian children. *Journal of the American College of Nutrition* 31:185-93.

Rivera J, Pedraza L, Aburto T, Batis C, Sanchez-Pimienta T, Gonzalez de Cosio T et al. 2016. Overview of the dietary intakes of the Mexican population: results from the National Health and Nutrition Survey 2012. *The Journal of Nutrition* 146:1851S-5S.

Sichieri R, Bezerra I, Araujo M, de Moura Souza A, Yokoo E & Pereira R 2015. Major food sources contributing to energy intake: a nationwide survey of Brazilians aged 10 years and older. *British Journal of Nutrition* 113:1638-42.

Spence A, Campbell K, Lioret S & McNaughton S 2018. Early childhood vegetable, fruit, and discretionary food intakes do not meet dietary guidelines, but do show socioeconomic differences and tracking over time. *Journal of the Academy of Nutrition and Dietetics* 118:1634-1643. doi 10.1016/j.jand.2017.12.009.

Queensland Health and Queensland Treasury 2012. The 2010 Healthy Food Access Basket (HFAB) survey. Brisbane: Queensland Government.

WCRF (World Cancer Research Fund International) & AICR (American Institute for Cancer Research) 2010. Continuous update project report: Food, nutrition, physical activity, and the prevention of colorectal cancer. Washington DC: WCRF & AICR.

Whitton C, Nicholson S, Roberts C, Prynne C, Pot G, Olson A et al. 2011. National Diet and Nutrition Survey: UK food consumption and nutrient intakes from the first year of the rolling programme and comparisons with previous surveys. *British Journal of Nutrition* 106:1899-914.

WHO (World Health Organization) 2003. Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation. Geneva: WHO.

WHO 2007a. Assessing the iron status of populations. Geneva: WHO.

WHO 2007b. Assessment of iodine deficiency disorders and monitoring their elimination: a guide for programme managers. Third edition. Geneva: WHO.

WHO 2008. Conclusions of a WHO technical consultation on folate and vitamin B12 deficiencies. *Food and Nutrition Bulletin* 29:S238-S44.

WHO 2011. Waist circumference and waist-hip ratio. Report of a WHO expert consultation. Geneva: WHO.

WHO 2015. Guideline: sugars intake for adults and children. Geneva: WHO.

WHO 2016. Obesity and overweight. Geneva: WHO. Viewed 18 September 2017, <<http://www.who.int/mediacentre/factsheets/fs311/en/>>.

Winter JE, MacInnis RJ, Wattanapenpaiboon N, Nowson CA 2014. BMI and all-cause mortality in older adults: a meta-analysis. *American Journal of Clinical Nutrition* 99(4):875-90.



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Australians of all ages generally do not eat enough of the 5 food groups, eat too much discretionary food, and eat too much sugar, saturated fat, and sodium. This suboptimal intake begins from an early age and good eating practices are not established early to take forward into adulthood. Despite this, nutrient intake and nutrient status is generally adequate, but physical activity levels are low, and overweight and obesity is high.

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