

2 Existing measures for food and nutrition monitoring in Australia

In this section, the dietary guidelines are presented with existing measures for nutrition monitoring relevant to the dietary guidelines, together with published data. Relevant published international measures are also presented for comparison, with data presented for reference in Appendix 2. Gaps in available Australian data are highlighted and comparisons are made with the international data collection to help inform the development of endorsed Australian indicators. Details of all data sources are outlined in Appendix 1.

Detailed information about requirements for specific nutrients, including for population subgroups, are provided through the Recommended Dietary Intakes (RDIs) (NHMRC 1991) which reflect an upper recommendation for intakes. However, it should be noted that new Nutrient Reference Values (NRVs) are currently being finalised, which will supersede the 1991 RDIs (Baghurst 2005). The most recent reference for recommended intakes within food groups is *The Australian Guide to Healthy Eating* (DHFS 1998a). As this report focuses on the dietary guidelines for adults, which are aimed at healthy, independent adults (NHMRC 2003:vii), it does not examine the particular nutrition needs of other population subgroups, such as children.

2.1 Eat plenty of vegetables, legumes and fruits

Diets high in vegetables, fruit and legumes (also called 'pulses') are associated with substantially reduced risk of coronary heart disease, stroke and some cancers (including mouth, stomach, colon and lung). They may also reduce the risk of hypertension, Type 2 diabetes mellitus, cataracts and macular degeneration of the eye (NHMRC 2003:20–21). In 1996 it was estimated that inadequate fruit and vegetable consumption (less than five serves per day) was responsible for 3% of the total burden of disease and 11% of the total cancer burden in Australia (AIHW: Mathers et al. 1999).

The Australian Guide to Healthy Eating (DHFS 1998a) recommends consumption of four to eight servings of vegetables and legumes, and two to four servings of fruit, per day. One serve of fruit is 150 g and one serve of vegetables or legumes is 75 g.

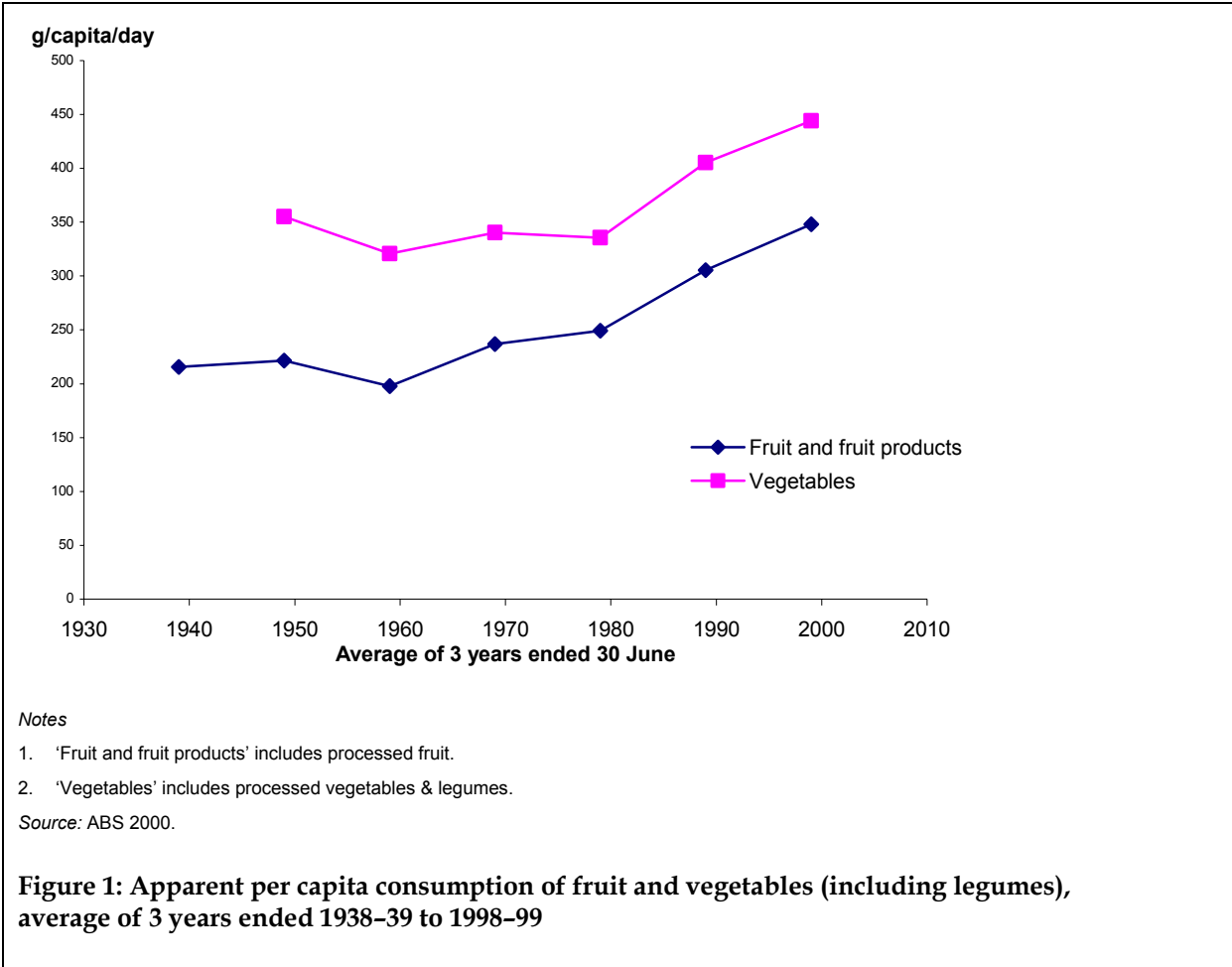
Existing measures for this guideline relate to the availability of these products in the Australian food supply (apparent consumption data) and population intake of these products, including average daily intakes and usual intakes. Intake of legumes is also included with intake of meat and meat alternatives, as they are a good source of protein and are included in both guidelines.

Apparent consumption of fruit and vegetables

Existing measures:

- *Apparent per capita consumption of fruit*
- *Apparent per capita consumption of vegetables (including legumes)*

The apparent consumption data in Figure 1 show the quantity of fruit and vegetables (including legumes) available for consumption in the Australian food supply. Although this does not represent actual consumption by the population (see Appendix 1 for details), recommended daily intakes cannot be met without sufficient fruit and vegetables available for consumption.



According to 1998-99 per capita apparent consumption data, there were the equivalent of 2.32 serves of fruit (150 g per serve) and 5.92 serves of vegetables (75 g per serve) per capita available in the Australian food supply. Apparent consumption data show that per capita consumption of fruit has increased consistently over the last few decades, whereas apparent consumption of vegetables has increased more recently, mainly during the 1980s (ABS 2000).

Fruit and vegetable intake

Existing measures:

- *Average daily intake of fruit among adults*
- *Average daily intake of vegetables among adults*
- *Average daily intake of legumes among adults*
- *Proportion of adults usually consuming four serves or more of vegetables per day*
- *Proportion of adults usually consuming two serves or more of fruit per day*

The most recent data for average daily intakes are from the 1995 NNS, and for usual intake are from the 2001 NHS (Tables 2 and 3). In 1995, the average daily intakes of fruit and vegetables for both men and women were below recommended levels.

In 2001, just one in three adults reported that they usually consume the recommended level of vegetables per day, and one in two the recommended level of fruit (Table 3). The proportion usually consuming two serves of fruit or more per day has remained similar to that reported in 1995 (Rutishauser et al. 2001:45). However, there has been an increase in the proportion of people usually consuming at least four serves of vegetables per day, from 15% of men and 22% of women in 1995 (Rutishauser et al. 2001:40) to 27% and 34%, respectively, in 2001 (Table 3). In interpreting this change, it should be noted that the question was self-completed in 1995 as part of a food frequency questionnaire but was interviewer-administered in 2001 with more extensive visual prompts.

Table 2: Average daily fruit, vegetable and legume intakes, 1995

Measure	Males	Females
	(g/person/day)	
Average intake of fruit products and dishes ^(a)	141.3	145.7
Average intake of vegetable products and dishes ^(b)	295.6	242.4
Average intake of fruit and vegetable juices and drinks	139.5	109.4

(a) Excludes fruit juice.

(b) Includes potatoes, and legumes and pulse products and dishes.

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.
3. One serve of fruit equals 150 g and one serve of vegetables equals 75 g.

Source: ABS & DHAC 1999.

Table 3: Usual daily fruit and vegetable intake, 2001

Measure	Males	Females
	Per cent	
Proportion usually consuming at least 4 serves or more of vegetables per day	27	34
Proportion usually consuming at least 2 serves or more of fruit per day	47	58

Notes

1. Adults aged 19 years and over.
2. Age standardised to the 2001 Australian population.

Source: AIHW analysis of the 2001 National Health Survey questions 'How many serves of vegetables do you usually eat each day?' and 'How many serves of fruit do you usually eat each day?'.

Overview of international measures

Published measures relating to this guideline, for the selected countries, are outlined in Table 4 (see Appendix 2, Tables A2.1–A2.3, for data). Measures used internationally for intake and supply are generally consistent with Australian measures. The majority of these countries report both average intakes of fruit and vegetables and the proportion meeting a set number of serves, although the number of serves and the age ranges reported vary among countries.

Much of the international data relevant to fruit and vegetable consumption are available on the WHO Global Infobase website, in the country profiles (WHO 2005). Apparent consumption data are published by Japan, the USA and Canada, and the UK publishes data on apparent food intakes from the Expenditure and Food Survey. Apparent consumption data, including fruit and vegetable supply, are also published by the FAO as food balance sheets for all these countries, by country (FAO 2005a).

Table 4: Published international measures relating to fruit and vegetable consumption

Country	National data sources	Most recent	Existing measures
Australia	National Health Survey	2001	Proportion of adults usually consuming 4 or more serves of vegetables per day Proportion of adults usually consuming 2 or more serves of fruit per day
	National Nutrition Survey	1995	Average daily intake of fruit among adults Average daily intake of vegetables (including legumes) among adults
	Apparent consumption data	1998–99	Weight of fruit available for consumption Weight of vegetables available for consumption
New Zealand	New Zealand National Health Survey	2002–04	Proportion of people usually consuming 2 or more servings of fruit per day Proportion of people usually consuming 3 or more servings of vegetables per day

(continued)

Table 4 (continued): Published international data relating to fruit and vegetable consumption

Country	National data sources	Most recent	Existing measures
Canada	Canadian Community Health Survey	2003	Proportion of people consuming fruit and vegetables less than 5 times per day
	Apparent consumption data	2001 ^(a)	Fresh equivalent and retail equivalent weight of fruit available for consumption Fresh equivalent and retail equivalent weight of vegetables available for consumption
France	French national food and nutrient intake data	1993–94	Average intake of fruit Average intake of vegetables
Japan	National Nutrition Survey	2002	Average intake of fruit Average intake of vegetables Average intake of pulses
	Supply and demand of food (apparent consumption)	2002	Supplies of net sweet potato, irish potato and vegetables Supplies of net fruit
UK	The National Diet and Nutrition Survey	2000–01	Average intake of fruit (specific types) Average intake of vegetables (specific types, including pulses) Proportion of adults consuming 5 serves or more of fruit and vegetables per day Average number of portions of fruit consumed per day Average number of portions of vegetables consumed per day
	Expenditure and Food Survey	2002–03	Household apparent consumption of fruit Household apparent consumption of vegetables (excluding potatoes)
	National Health Survey for England	2003	Proportion of adults consuming 5 serves or more of fruit and vegetables per day
USA	National Health and Nutrition Examination Survey	2001–02	Average intakes (dietary recall)
	Behavioural Risk Factor Surveillance System	2003	Proportion of adults consuming less than 5 serves of fruit and vegetables per day
	Food Availability Data (apparent consumption)	2003	Weight of fruit (fresh, canned, dried, frozen) available for consumption Weight of vegetables (fresh, canned, frozen) available for consumption

(a) Data for fruit and vegetables not published for 2004.

2.2 Eat plenty of cereals (including breads, rice, pasta and noodles), preferably wholegrain

Cereals are an important source of carbohydrate, dietary fibre and protein, and for this reason eating plenty of cereals is a key component of the dietary guidelines. They are also mostly low in fat and are a good source of vitamins (particularly B vitamins and vitamin E) and minerals (including iron, zinc, magnesium and phosphorus) (NHMRC 2003:32). It is recommended that breads, cereals, rice, pasta and noodles form the basis of a healthy diet. *The Australian Guide to Healthy Eating* suggests a minimum of seven serves per day for adults, where one serving is equivalent to two slices of bread; one cup of cooked rice, pasta or noodles; one cup of prepared porridge; one-and-one-third cups of breakfast cereal; or half a cup of muesli (DHFS 1998a). However, cereal-based foods with high levels of added fat and sugar (e.g. cakes, biscuits, pastries, are not included in this recommendation.

Cereals, particularly wholegrains, are also an important source of fibre and were seen to provide more than 30% of daily fibre intake in the 1995 NNS. There is evidence linking cereal fibre with improvement in risk markers for colorectal cancer, reduced risk of coronary heart disease, breast cancer and diverticular disease, and lowering of cholesterol (NHMRC 2003:42). The 1991 RDIs do not include a recommendation for dietary fibre for Australians (NHMRC 1991). However, the WHO suggests that wholegrain cereals, fruit and vegetables are the preferred sources of dietary fibre, and that consumption of wholegrain foods and more than 400 g of fruit and vegetables per day (which would be included in the Australian recommended intake of 600 g) would likely provide more than 25 g of total dietary fibre per day (WHO 2003).

Existing measures relating to this guideline are apparent consumption of grain (cereal) products, and cereal and fibre intake.

Apparent consumption of cereals

Existing measures:

- *Apparent per capita consumption of grain products (cereals)*

Apparent consumption data for grain products (cereals) reflects the mix of products available in the Australian food supply, with the primary cereals consumed being wheat flour and bread (Table 5). Data from previous years show that this has changed significantly since the 1930s, with consumption of rice and breakfast foods increasing significantly (from 4.9 g and 13.2 g per capita per day respectively) and consumption of flour falling (from 232.6 g to 187.5 g per capita per day). Bread consumption fell to a low average of 122 g per capita per day in the 3 years ending 1988–89 and has since risen to 146 g per capita per day (ABS 2000).

Table 5: Apparent per capita consumption of grain products (cereals), average of 3 years ended 1938–39 to 1998–99

Measure	1938–39	1948–49	1958–59	1968–69	1978–79	1988–89	1998–99
	g/capita/day						
Apparent consumption of:							
Wheaten flour ^{(a)(b)}	232.6	250.7	225.5	211.9	190.7	198.7	187.5
Breakfast foods	13.2	16.7	17.0	18.6	21.4	26.6	20.4
Table rice	4.9	1.1	n.a.	5.2	6.6	11.5	19.8
Bread	135.9	175.2	189.3	162.9	130.7	121.5	146.0

(a) 'Wheaten flour' includes flour used for breadmaking.

(b) From 1994–95 data exclude flour used in the production of starch and gluten.

Note: Data converted from per capita/year to per capita/day.

Source: ABS 2000.

Cereal consumption

Existing measures:

- *Average daily intake of cereals among adults*
- *Proportion of adults meeting core food group target for cereals*

As expected, men reported a higher average intake of cereals than women (Table 6). However, on the day of the NNS recall only 34% of men and 21% of women reported meeting the recommended core food group cereal targets of seven servings a day (NHMRC 2003:33). A comparison of cereal intakes from comparable samples of the 1983 and 1995 nutrition surveys shows an increase in the average and median intakes of cereals and cereal products, as well as cereal-based products and dishes, for men and women. However, between these years there was a decrease in the proportion who reported consuming cereal products on the survey day (Cook et al. 2001a:54–57).

Table 6: Average daily cereal intakes, 1995

Measure	Males	Females
	g/person/day	
Average intake of cereals and cereal products	250.2	181.2
Average intake of cereal-based products and dishes	154.1	100.1

Notes

1. Adults aged 19 years and over.

2. 'Cereals and cereal products' refers to basic cereals, such as rice, and cereal products, such as pasta or bread. 'Cereal-based products and dishes' refers to foods for which a cereal or product is the major component, such as cakes, fruit tarts or pizza (Cook et al. 2001b).

3. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS & DHAC 1999.

Dietary fibre intake

Existing measures:

- *Average daily intake of fibre among adults*

According to the WHO estimate of an appropriate intake of 25 g per day, men were, on average, consuming sufficient fibre, whereas women did not appear to be (Table 7). A comparison of fibre intakes from comparable samples of the 1983 and 1995 national nutrition surveys shows a significant rise in both the average intakes of fibre for men (from 24 g to 27 g per day) and women (from 19 g to 21 g per day), as well as in median intakes (Cook et al. 2001a:32).

Table 7: Average daily intake of fibre among adults, 1995

Measure	Males	Females
	g/person/day	
Average intake of dietary fibre among adults	25.9	20.3

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 8 (see Appendix 2, Tables A2.4–A2.7, for data). Japan and the UK, like Australia, have published data on average intakes of cereals. The UK has also presented data on daily intakes of dietary fibre, as has New Zealand. Intakes of cereals and fibre can be calculated from the USA NHANES intake data. Apparent consumption data for cereals have been published regularly by Japan, the USA and Canada, and for cereals and fibre by the UK, from the Expenditure and Food Survey. New Zealand and Australia have also reported the proportion meeting the recommended number of serves of cereals.

Table 8: Published international measures relating to cereal and fibre consumption

Country	National data sources	Most recent	Existing measures
Australia	National Nutrition Survey	1995	Average intake of cereals and cereal products Average intake of cereal-based products and dishes Proportion meeting the core food group guidelines (7 servings/day) Average intake of dietary fibre among adults
	Apparent consumption data	1998–99	Apparent consumption of grain products
New Zealand	National Nutrition Survey	1997	Proportion who met the breads and cereals guideline (6+ servings/day) Proportion consuming bread <1/day, 3–4/day and >5/day; proportion consuming cereal <4/week, >10/week Usual daily average dietary fibre intake
	Apparent consumption data	2004	Equivalent weight of cereal products available for consumption
Japan	National Nutrition Survey	2002	Average intake of cereals among adults
	Supply and demand of food (apparent consumption)	2002	Supplies of net rice, wheat, barley and miscellaneous cereals
UK	The National Diet and Nutrition Survey	2000–01	Average intake of cereal foods (specific) Average daily intake of non-starch polysaccharides (fibre)
	Expenditure and Food Survey	2002–03	Household apparent consumption of bread, cereals and cereal products Average apparent intake of fibre
USA	National Health and Nutrition Examination Survey	2001–02	Average intakes (dietary recall)
	Food availability data (apparent consumption)	2003	Apparent consumption of flour and cereal products (including grains)

2.3 Include lean meat, fish, poultry and/or alternatives

Lean meat, fish, poultry and alternatives are important sources of protein and minerals. In particular, meat, fish and poultry are generally good sources of bioavailable iron, zinc, vitamin B12, and n-3 (omega-3) fats (in fish). Iron deficiency appears to be a particular problem among young women in Australia (NHMRC 2003:52). It refers to a condition of low body iron and can cause fatigue and pallor, as well as affecting behaviour. Iron deficiency can progress to iron deficiency anaemia.

The Australian Guide to Healthy Eating recommends one and a half serves per day for men, and one to one and a half serves per day for women (aged 19–60), where one serve equates to 65–100 g of cooked meat or chicken; half a cup (cooked) of dried beans, lentils, chick peas, split peas or canned beans; 80–120 g cooked fish fillet; two small eggs; one-third of a cup of almonds or peanuts; or a quarter cup of sunflower or sesame seeds (DHFS 1998a). The RDIs for iron are 7 mg per day for adult males, 12–16 mg per day for females aged 19–54 and 5–7 mg per day for females over 54 years (NHMRC 1991).

Existing measures for this guideline relate to the apparent consumption and intake of these foods and intakes of iron. Another pertinent indicator is the prevalence of iron deficiency anaemia among adults.

Apparent consumption of meat, fish, poultry and alternatives

Existing measures:

- *Apparent per capita consumption of meat and meat products, poultry, seafood, nuts and eggs*

Apparent consumption data for meat and meat products mainly reflects changes in the products available in the Australian food supply (Table 9). These data show that apparent per capita consumption of carcass meat and peanuts has steadily declined. Conversely, apparent consumption of bacon and ham, poultry, seafood and tree nuts has risen over the past several decades (ABS 2000).

Table 9: Apparent per capita consumption of meat, poultry, fish and alternatives, average of 3 years ended 1938–39 to 1998–99

Measure	1938–39	1948–49	1958–59	1968–69	1978–79	1988–89	1998–99
	g/capita/day						
Carcass meat	278.1	231.6	266.3	235.1	263.3	218.4	200.1
Bacon and ham	12.6	14.5	8.8	9.9	16.4	18.9	23.7
Poultry	n.a.	n.a.	n.a.	22.7	46.8	66.0	80.5
Total seafood ^(a)	13.4	11.2	12.3	15.3	17.5	22.7	29.6
Nuts in shell							
Peanuts	n.a.	11.5	8.5	7.7	5.8	6.3	6.0
Tree nuts	n.a.	4.9	9.3	15.9	7.9	10.4	13.5
Egg and egg products (equivalent number of eggs) ^(b)	0.7	0.7	0.6	0.6	0.6	0.4	0.4

(a) Comprises fresh, frozen and otherwise prepared seafood.

(b) Data from 1988–89 onwards includes an estimate for home production of eggs.

Note: Data converted from per capita/year to per capita/day.

Source: ABS 2000.

Intake of meat, fish, poultry and alternatives

Existing measures:

- *Average intakes of meat and meat dishes, fish, poultry and alternatives among adults*

Both men and women reported highest intake in the ‘muscle meat and dishes’ category (Table 10). Data from comparable samples from the 1983 National Dietary Survey of Adults (NDSA) and the 1995 NNS show a significant increase in the mean intake of fish and seafood products and dishes (of 8 g per day) for both men and women, and significant decreases in intakes of meat, poultry and game products (of 3 g per day) and seed and nut products and dishes (of 1–2 g per day) among women (Cook et al. 2001a:60–79).

Table 10: Average intakes of meat, fish, poultry and alternatives products and dishes among adults, 1995

Measure	Males	Females
Average daily intakes of:	g/person/day	
Muscle meat and dishes	124.9	69.9
Poultry and other feathered game, and dishes	51.5	35.4
Organ meats and offal, products and dishes	1.2	1.1
Sausages, frankfurts, and saveloys	14.5	6.3
Processed meats	7.6	3.3
Fish and seafood products and dishes	28.9	22.6
Legumes and pulse products and dishes	12.2	7.5
Seed and nut products and dishes	5.1	3.6
Egg products and dishes	16.3	11.2

Notes

1. Adults 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

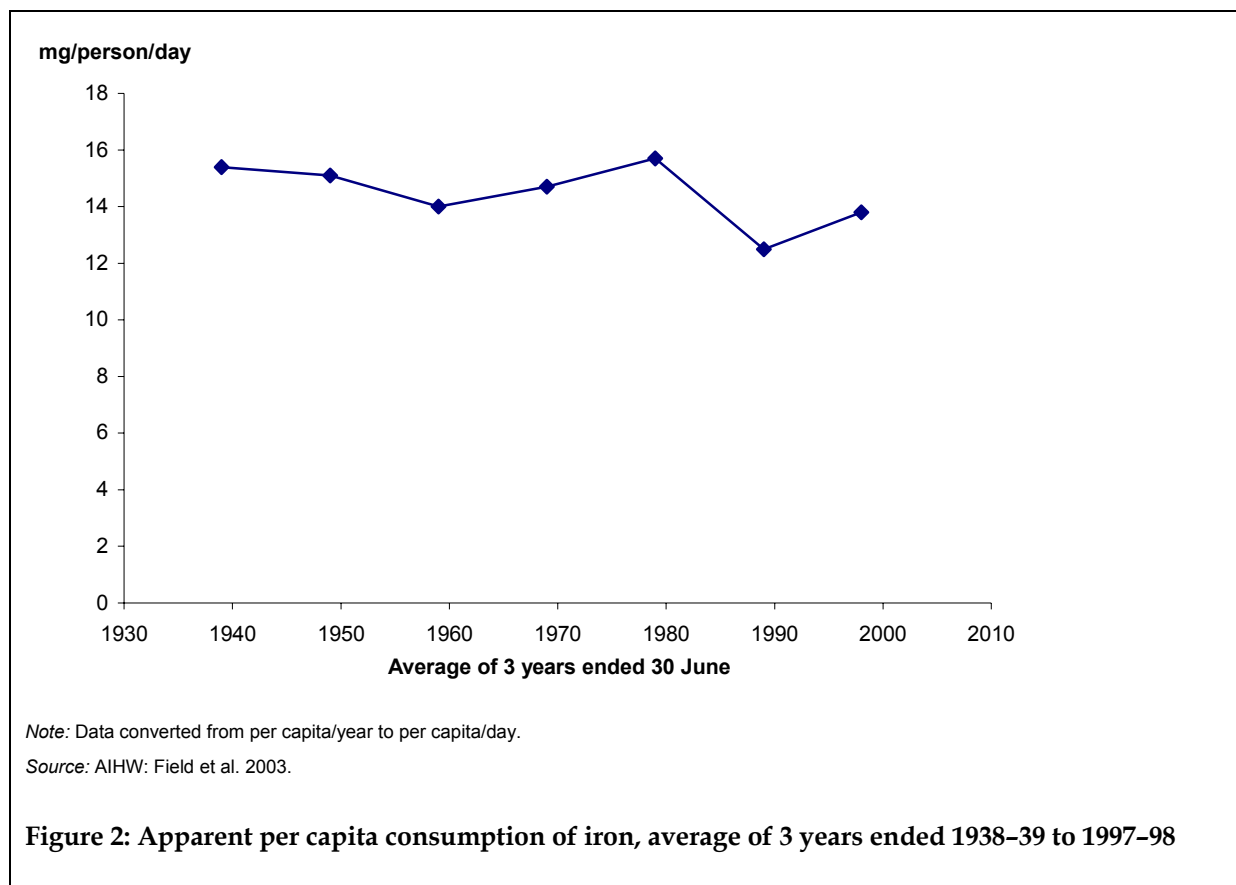
Source: ABS & DHAC 1999.

Apparent consumption of iron

Existing measures:

- *Apparent per capita consumption of iron*

Apparent consumption data (Figure 2) indicate that the supply of iron has consistently been sufficient to meet recommended dietary intakes, based on the 1997–98 population adjusted RDI of 9.2 mg (AIHW: Field et al. 2003). Apparent consumption data for iron show an overall decrease in the iron available in the food supply over the past six decades, but a recent increase from an average of 12.4 mg per capita per day in the three years ending 1988–89 to 14.1 mg per capita per day in 1998–99.



Iron intake

Existing measures:

- *Average iron intake among adults*

Due to their higher consumption, men, on average, had a considerably higher intake of iron than women and consumed more than enough to meet the RDI (Table 11). In contrast, women did not tend to meet the recommended intakes – in fact, 33% of females aged 19-54 years consumed less than 70% of the RDI on the day of the 1995 NNS recall, which means they may be at risk of low iron intakes (Baghurst et al. 2000). However, compared to the 1983 NDSA, iron intakes reported in the 1995 NNS were significantly higher for both men and women (Cook et al. 2001a:44).

Table 11: Average iron intake among adults, 1995

Measure	Males	Females
	mg/person/day	
Estimated average intake of iron for adults	16.4	11.9

Notes

1. Adults 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998.

Iron status

Existing measures:

- *Proportion of adults with iron deficiency*

The 1989 National Heart Foundation Risk Factor Prevalence Survey (RFPS) revealed a significantly higher prevalence of iron deficiency in women compared to men (Table 12). Iron deficiency was defined using two plasma iron status indicators (ferritin <12 µg/L and transferrin saturation <16%) (Lester 1994:201). The survey also showed that iron deficiency was greatest in women during the reproductive years (20–49). However, no national trend data are available, as iron status was not measured in the 1980 or 1983 RFPS or been measured nationally since.

Table 12: Proportion of adults with iron deficiency, 1989

Measure	Males	Females
	Per cent	
Proportion of adults with iron deficiency (aged 20–69 years)	0.4	7.5

Source: 1989 Risk Factor Prevalence Survey (Lester et al. 1994:201).

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 13 (see Appendix 2, Tables A2.8–A2.10, for data). Japan, the USA and the UK, like Australia, have collected data on average intakes of meat, poultry, fish and alternatives, and Canada, Japan, and the USA have apparent consumption data for meat and meat products. The USA also publishes apparent consumption of iron. The UK collects household apparent intake data for meat, fish, eggs and iron through the Household Expenditure Survey. Australia, New Zealand, Japan, the USA and the UK have collected data on mean daily intakes of iron. In addition to this, New Zealand, the UK and USA have recent data on blood measures of iron deficiency.

An additional measure which could be useful in informing indicator development for Australia is:

- the proportion of adults with inadequate iron intakes (New Zealand NNS and the UK NDNS).

Table 13: Published international measures relating to intakes of meat, fish, poultry and alternatives, iron intakes and iron status

Country	National data sources	Most recent	Existing measures
Australia	Risk Factor Prevalence Survey	1989	Proportion of adults with iron deficiency
	National Nutrition Survey	1995	Average estimated daily intakes of meat, fish, poultry, legume & pulse, seed & nut and egg products and dishes Average iron intake
	Apparent consumption data	1998–99 1997–98	Apparent consumption of meat, poultry, seafood, nuts and eggs Apparent consumption of iron
New Zealand	National Nutrition Survey	1997	Average daily iron intake Proportion with inadequate iron intake Proportion of people with low iron stores, iron deficiency, or iron deficiency anaemia
Canada	Apparent consumption data	2004	Retail equivalent weight of red meat, poultry, fish, pulses and nuts, and number of eggs available for consumption
Japan	National Nutrition Survey	2002	Average intake of fishes and shellfishes, meats, eggs, seeds and nuts, and pulses Average intake of iron
	Supply and demand of food (apparent consumption)	2002	Supplies of net meat, beef, pork, chicken, hen eggs, and fish and shellfish

(continued)

Table 13 (continued): Published international measures relating to intakes of meat, fish, poultry and alternatives, iron intakes and iron status

Country	National data sources	Most recent	Existing measures
UK	The National Diet and Nutrition Survey	2000–01	Average intake of meat and meat dishes and products, fish and fish dishes, eggs and egg dishes, and nuts Average daily intake of iron Proportion of respondents with average daily intakes of iron below the Lower Reference Nutrient Intake Average plasma iron % saturation Average plasma iron
	Expenditure and Food Survey	2002–03	Household apparent consumption of meat, fish and eggs Average daily intake of iron
USA	National Health and Nutrition Examination Survey	2001–02	Average daily intake of iron (mg) (published for 1999–2000) Prevalence of iron deficiency (published for 1999–2000) Average intakes (dietary recall)
	Food availability data (apparent consumption)	2003	Weight of red meat, poultry, fish and shellfish and nuts, and number of eggs available for consumption
	Nutrient availability data (apparent consumption)	2000	Availability of iron in the food supply

2.4 Include milks, yoghurts, cheeses and/or alternatives

Milk and milk products or alternatives are good sources of nutrients – particularly calcium, but also protein, riboflavin and vitamin B12. The key rationale for the emphasis on consuming dairy foods in the dietary guidelines is their ‘role as a rich source of calcium’, as dairy foods are the main source of calcium in the Australian diet (NHMRC 2003:76, 79). It should also be noted that many types of milk and milk products are fortified with calcium. In this guideline, the ‘alternative’ category includes milk-based custards, ice-creams and evaporated milks, as well as fortified soy milk and derivatives. Other foods that supply moderate to good amounts of calcium and protein include fish with bones that can be eaten, and some nuts (e.g. almonds) (NHMRC 2003:75).

The Australian Guide to Healthy Eating (DHFS 1998a) recommends two to three serves of milk and milk products or alternatives each day for women, and two to four serves for men. A serve is equivalent to a cup of milk, half a cup of evaporated milk, 40 g of cheese, or 200 g of yoghurt. For alternatives, a serve equals a cup of calcium- and vitamin B12-fortified soy beverage, a cup of almonds, five sardines or half a cup of pink salmon (with bones) or a cup of calcium-fortified breakfast cereal.

The RDIs for calcium are 800 mg per day for men aged 19–64 years and women aged 19–54 years. For women aged 55 years and over and girls aged 12–15 years, the recommended intake is 1,000 mg per day. In pregnancy, the recommendation is 1,100 mg per day and in lactation it is 1,200 mg per day. (NHMRC 1991).

Existing measures for this guideline relate to apparent consumption and intakes of milk, milk products and alternatives, and to calcium supply and intake.

Apparent consumption of milk and milk products

Existing measures:

- *Apparent per capita consumption of milk and milk products*

Apparent consumption data for milk and milk products reflect the mix of products available in the Australian food supply and changes in these products (Table 14). Apparent consumption of total dairy products has increased steadily since the late 1930s, peaking at 69.5 g per capita per day in the late 1960s (Figure 3), due to increases in skim condensed, concentrated and evaporated milk. Apparent consumption of liquid milk has declined markedly since the late 1940s (from a high of 379.7 ml per capita per day to 282.7 ml per capita per day in 1998–99), with cheese consumption rising from 6.8 g per capita per day to 29.3 g per capita per day over the same period (ABS 2000).

Table 14: Apparent per capita consumption of milk and milk products, average of 3 years ended 1938–39 to 1998–99

Measure	1938–39	1948–49	1958–59	1968–69	1978–79	1988–89	1998–99
Apparent consumption of:							
	ml/capita/day						
Market milk (fluid) ^(a)	291.5	379.7	352.6	350.9	275.3	278.4	282.7
Condensed, concentrated and evaporated milk							
	g/capita/day						
Full cream ^(b)	5.5	9.3	11.2	12.6	9.0	6.0	1.2
Skim	n.a.	n.a.	1.6	1.9	4.4	3.3	1.9
Powdered milk							
Full cream	3.3	4.1	3.0	2.2	3.6	2.5	2.8
Skim	0.0	0.8	3.0	11.8	7.4	7.7	5.4
Cheese (natural equivalent weight) ^(c)	5.5	6.8	7.1	9.6	14.5	24.1	29.2

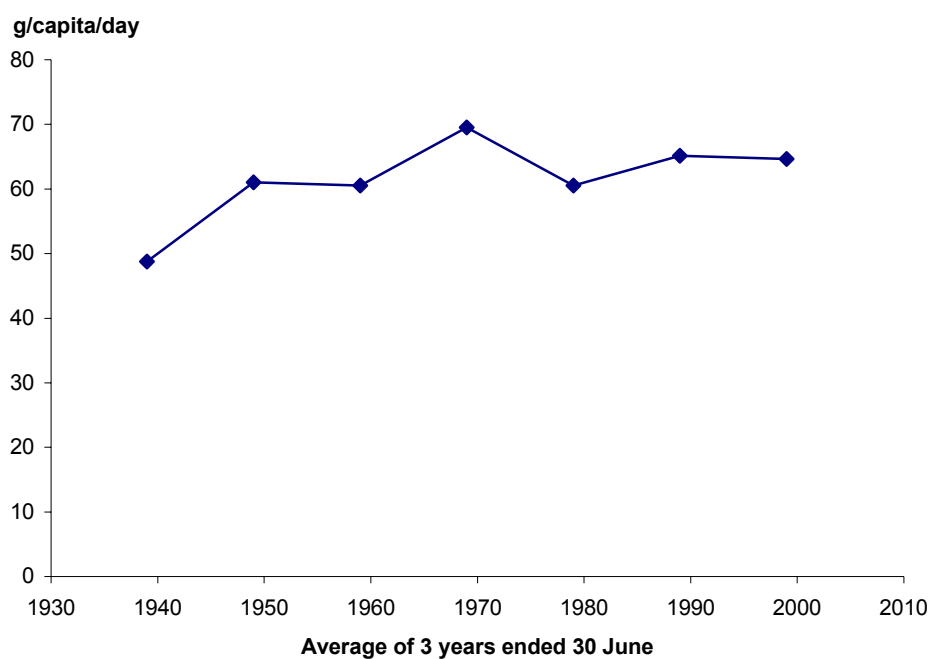
(a) Prior to 1978–79 known as fluid whole milk.

(b) Included in 'ice-cream mix' prior to 1972–73.

(c) Combined product and natural equivalent weights prior to 1971–72.

Note: Data converted from per capita/year to per capita/day.

Source: ABS 2000.



Note: Data converted from per capita/year to per capita/day.

Source: ABS 2000.

Figure 3: Apparent per capita consumption of total milk and milk products, converted to solids, average of 3 years ended 1938–39 to 1998–99

Intakes of milk and milk products and alternatives

Existing measures:

- *Average intakes of milk products and dishes among adults*

As would be expected, men consumed, on average, more milk products and dishes than women on the day of the NNS recall (Table 15). However, 38% of men and 45% of women consumed less than one serving of milk products and dishes on the survey day, and only 16% of men and 10% of women consumed three or more servings (NHMRC 2003:77). It should also be noted that milk products and dishes (this category does not include butter) contributed 17% of total fat and 27% of saturated fat to the diet (see Section 2.6, 'Limit saturated fat and moderate total fat intake') (NHMRC 2003:79).

Table 15: Average daily intakes of milk products and dishes, 1995

Measure	Males	Females
Average intake of:	g/person/day	
Dairy milk	223.3	184.4
Yoghurt	11.0	16.5
Cream	3.2	2.6
Cheese	16.2	13.0
Frozen milk products	22.5	12.9
Other dishes where milk or a milk product is the major component	12.6	11.6
Milk substitutes	4.7	5.4
Flavoured milks	28.3	11.3

Notes

1. Adults aged 19 years and over.
2. Data from 1995 NNS.

Source: ABS & DHAC 1999.

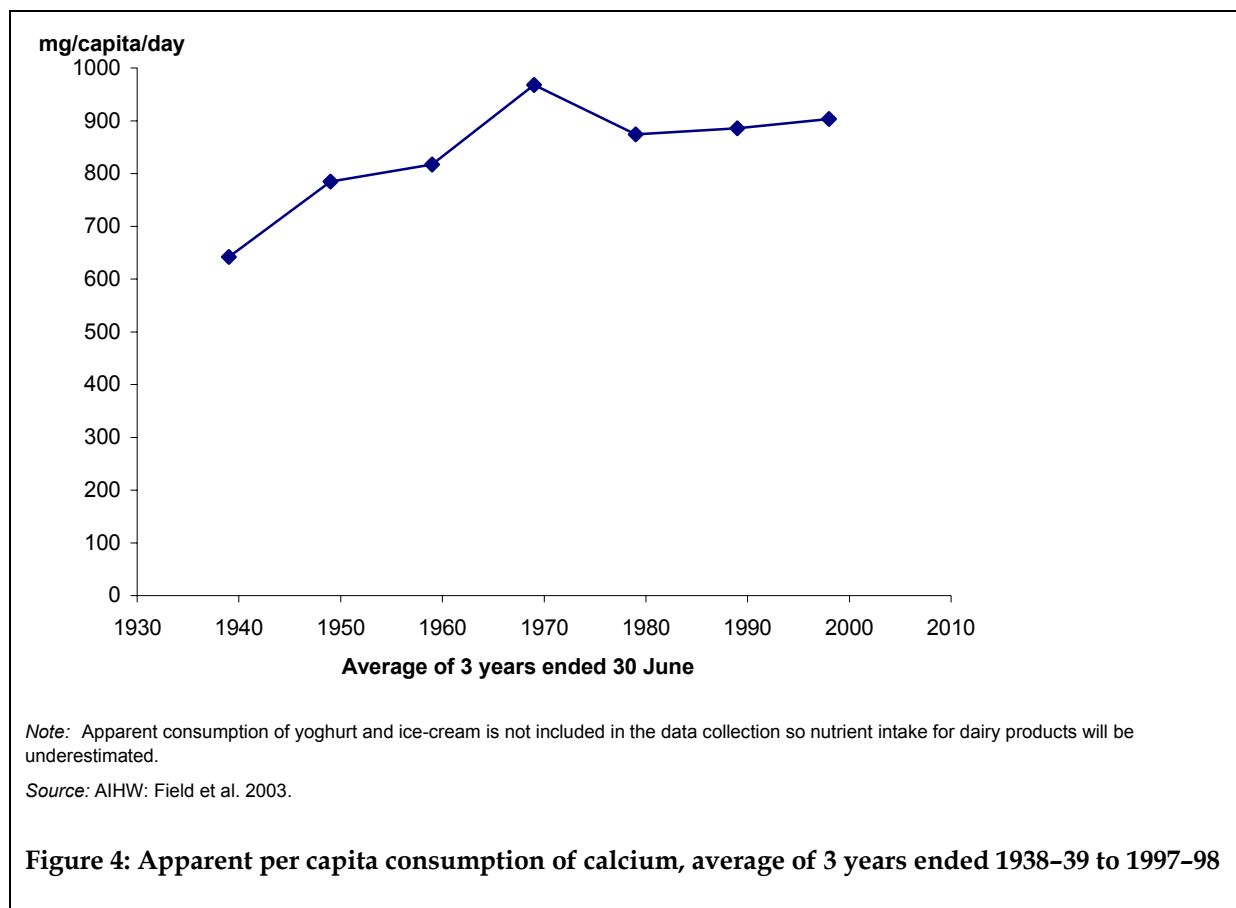
Compared to 1983 NNS, intakes of milk products and dishes appear to have remained the same for men, but declined for women from 260 g to 245 g per day (Cook et al. 2001a:72)

Apparent consumption of calcium

Existing measures:

- *Apparent per capita consumption of calcium*

Apparent consumption data (Figure 4) suggest that supply of calcium (892 mg per capita per day in 1997–98) may be only barely adequate to meet the recommended requirements, based on the population-adjusted RDI of 840 mg. However, available calcium in the food supply has increased slightly from 1993–94 to 1998–99, peaking in 1996–97 at 915 mg per capita per day (AIHW: Field et al. 2003).



Calcium intake

Existing measures:

- *Average calcium intake among adults*

Intake data suggest that men, on average, appeared to be meeting the recommended daily intake for calcium but that women were consuming less than the RDI (Table 16). Compared to the 1983 nutrition survey, calcium intakes appear to have increased significantly for both men and women (Cook et al. 2001a:46).

Table 16: Average calcium intakes among adults, 1995

Measure	Males	Females
	mg/person/day	
Estimated average intake of calcium for adults (19 years and over)	945.5	748.6

Note: Data from 1995 NNS.

Source: ABS 1998.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 17 (see Appendix 2, Tables A2.11–A2.13, for data). Japan, the USA and the UK, like Australia, have collected data on average intakes of dairy products and alternatives, as well as calcium. Apparent consumption data are collected by Japan, the USA and Canada for milk, cream, cheese and other dairy products (with the USA also including calcium), and the UK collects household apparent intake data for milk, cream and cheese, and calcium through the Expenditure and Food Survey.

Additional indicators which could be useful in informing indicator development for Australia include:

- the proportion consuming inadequate amounts of calcium (New Zealand NNS)
- the proportion not consuming milk as a drink (UK NDNS)
- measures of bone density (USA NHANES).

Table 17: Published international measures relating to consumption of milk, milk products and dishes, and calcium

Country	National data sources	Most recent	Existing measures
Australia	National Nutrition Survey	1995	Average daily intakes of milk products and dishes Average calcium intakes among adults
	Apparent consumption data	1998–99	Apparent consumption of milk and milk products Apparent consumption of calcium
New Zealand	National Nutrition Survey	1997	Average daily calcium intake among adults Proportion with inadequate daily calcium intake
	Apparent consumption data	2004	Retail equivalent volume of fluid milk and cream available for consumption Retail equivalent weight of cheese and 'other dairy products' available for consumption
Japan	National Nutrition Survey	2002	Average intake of milk among adults Average intake of calcium among adults
	Supply and demand of food (apparent consumption)	2002	Supplies of net cow milk and dairy products

(continued)

Table 17 (continued): Published international measures relating to consumption of milk, milk products and dishes, and calcium

Country	National data sources	Most recent	Existing measures
UK	The National Diet and Nutrition Survey	2000–01	Average intake of milk and milk products (specific foods) Proportion reporting 'did not have milk as a drink' Proportion reporting 'did not have any milk' Average daily intake of calcium Proportion of respondents with average daily intakes of calcium below the Lower Reference Nutrient Intake
	Expenditure and Food Survey	2002–03	Household apparent consumption of 'milk and cream' and cheese Household apparent consumption of calcium
USA	National Health and Nutrition Examination Survey	2001–02	Average intakes (dietary recall) Average daily intake of calcium (published for 1999–2000) Prevalence of low and very low bone density (dual energy x-ray absorptiometry)
	Food availability data (apparent consumption)	2003	Weight of fluid milk and cream available for consumption Weight of other varieties of dairy products (including cheeses, dry milk products and frozen products) available for consumption
	Nutrient availability data (apparent consumption)	2000	Availability of calcium in the food supply

2.5 Drink plenty of water

Water is an essential nutrient – approximately 50% to 80% of body weight is water, and all biochemical reactions in the body occur in water (NHMRC 2003:95–96). Inadequate fluid consumption results in dehydration, which has been linked to impaired physiological responses and performance and may also be related to disease, including urinary stone disease and cancers of the colon.

Adults require approximately 2,500–3,000 ml of fluid per day. Approximately 1000 ml of water is obtained from the diet (from solid food) and 250 ml from water produced by the body’s metabolism, leaving about 1,250–1,750 ml to be obtained from fluid intake (NHMRC 2003:95).

The existing measures for this guideline are intake of fluids (including plain water and other non-alcoholic beverages) and total moisture intake.

Water intake

Existing measures:

- *Total moisture intake for adults*
- *Average daily intakes of non-alcoholic fluids (water, tea, coffee, soft drinks) for adults*

Australian adults, on average, appear to be meeting recommendations for fluid intake (Table 18). However, on the day of the 1995 NNS, 30% to 40% of the population did not meet their fluid requirements (NHMRC 2003:95). Men and women reported consuming similar amounts of fluids (2,052 ml and 1,916 ml respectively), and intake of water decreased with age.

Table 18: Average daily intakes of non-alcoholic fluids, 1995

Measure	Males	Females
	g/person/day	
Average total moisture intake	3,426.3	2,817.0
Average total intake of non-alcoholic beverages among adults:	2,052.3	1,916.7
Mineral waters and water ^(a)	854.9	849.0
Tea	344.8	451.5
Coffee and substitutes	474.6	378.9
Soft drinks, flavoured mineral waters and electrolyte drinks	236.3	126.0

(a) Includes plain drinking water.

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998; ABS & DHAC 1999.

Data from the comparable samples assessed by Cook et al. (2001a) suggest that the average intake of plain drinking water increased significantly from 1983 and 1995 (from 227 g to 657 g per day for men and from 242 g to 745 g for women). In addition, the proportion of the population who reported consuming any plain drinking water increased from around 50% to around 70%. However, these trends should be interpreted with caution as there may have been systematic biases in data collection because the procedure for collecting information on plain drinking water was different in the two surveys (collected as part of a 24-hr recall in 1983 and via a separate question in 1995) (Cook et al. 2001b:27).

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 19 (see Appendix 2, Table A2.14, for data). Japan, the UK and the USA, like Australia, have collected data on intakes of water and other fluids. New Zealand has reported the proportion consuming various fluids ‘regularly’ (at least three times per week), which is more a measure of the types of fluids preferred for consumption than of actual intake.

Table 19: Published international measures relating to fluid intakes

Country	National data sources	Most recent	Existing measures
Australia	National Nutrition Survey	1995	Average daily total moisture intakes Average daily intakes of non-alcoholic fluids
New Zealand	National Nutrition Survey	1997	Per cent consuming ‘regularly’ (water, coffee, tea, herbal tea, carbonated drinks, diet carbonated drinks, sports drinks, powdered drinks, cordial)
Japan	National Nutrition Survey	2002	Average intake of beverages
UK	The National Diet and Nutrition Survey	2000–01	Average intake of fluids (including water, teas, coffee, juice, soft drink)
USA	National Health and Nutrition Examination Survey	2001–02	Average intakes (dietary recall)

2.6 Limit saturated fat and moderate total fat intake

Fats are essential in the diet, as fatty acids are an important component of body cells, and fats supply fat soluble vitamins in the diet. In addition, fats are the most concentrated form of all the energy sources (NHMRC 2003). The three main types of fats are saturated, mono-unsaturated and polyunsaturated. Saturated fat intake is associated with increased plasma low-density lipoprotein (LDL) cholesterol levels—the ‘bad’ cholesterol linked to heart and vascular disease (AIHW 2004b). The National Heart Foundation of Australia has recommended that saturated fats and trans-fatty acids together should contribute no more than 8% of total energy, and the NHMRC recommendation is no more than 10% (NHMRC 2003). In addition, a diet high in total fat may contribute to an increased risk of being overweight (AIHW 2004). The NHMRC (2003) recommends that total fat intake should contribute no more than 30% of total energy intake.

The main existing measure for this guideline is fat intake, both in grams and as a percentage of energy intake. As noted previously, dairy products contribute significantly to, and thus provide a good proxy indicator for, saturated fat intake (Marks et al. 2001a). As a result, the proportion of adults consuming whole cow’s milk is also a useful measure.

Fat intake

Existing measures:

- *Proportion of people consuming whole cow’s milk*
- *Average daily intake of fat*
- *Average contribution of total fat as a proportion of energy intake*
- *Average contribution of saturated fat as a proportion of energy intake*

More males than females reported that they usually consume whole cow’s milk (Table 20); males also reported a higher average fat intake (Table 21). However, the contribution of total fat and saturated fat to energy intake was similar for both men and women in 1995 (Table 22), which may reflect the generally lower energy intake (and requirements) of women. The proportion of both men and women reporting that they usually consume whole milk declined from 1995 to 2001, from 61% and 46.5% (Rutishauser et al. 2001:35) to 56% and 42% (Table 20) respectively. In addition, average intakes of fat declined significantly between 1983 and 1995, based on a comparable sample of survey respondents, by 6 g per day for men and 3 g for women (Cook et al. 2001a:26).

Table 20: Consumption of whole cow's milk, 2001

Measure	Males	Females
	Per cent	
Proportion usually consuming whole cow's milk (aged 12 and over)	55.9	41.7

Note: Data from the 2001 NHS, response to the question 'What type of milk do you usually consume?'.
Source: ABS 2003a.

Table 21: Average daily fat intakes for adults, 1995

Measure	Males	Females
	g/person/day	
Average daily intake of fat for adults	98.5	67.6

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998.

Among Australian men and women, the proportion of energy derived from total fat intake (i.e. saturated, mono-unsaturated and polyunsaturated) declined from 1983 (37%) (NHMRC 2003) to 1995 (33%) (Table 22). However, the 1995 level was still above the NHMRC's (2003) recommended level of 30%. The contribution of saturated fat as a proportion of total energy intake has also declined over the past decade. However, saturated fat still accounts for around 13% of total energy intake, higher than the maximum levels of 10% and 8% recommended by the NHMRC and Heart Foundation respectively. Consumption of saturated fat was slightly higher among younger Australians than older Australians.

Table 22: Fat as a proportion of energy intake, 1995

Measure	Males	Females
	Per cent	
Average contribution of total fatty acids as a proportion of energy intake	32.4	32.5
Average contribution of saturated fatty acids as a proportion of energy intake	12.7	12.7

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 23 (see Appendix 2, Table A2.15, for data). Similar to Australia, most of the countries have collected data on fat intakes, type of milk usually consumed and/or the contribution of fat to energy intake.

An additional measure which could be useful in informing indicator development for Australia is:

- the proportion of the population always or often removing chicken skin or trimming the excess fat off other meats (New Zealand NNS) – this is relevant to this guideline as a measure of ‘choosing’ to limit (saturated) fat intake.

Table 23: Published international measures relating to fat intakes

Country	National data sources	Most recent	Existing measures
Australia	National Health Survey	2001	Proportion consuming whole cow's milk
	National Nutrition Survey	1995	Average daily intake of fat among adults Average contribution of total fatty acids as a proportion of energy intake Average contribution of saturated fatty acids as a proportion of energy intake
New Zealand	National Nutrition Survey	1997	Average daily intake of fat Proportion of population who usually choose standard milk Average contribution of fat to energy Average contribution of saturated fat to energy Proportion who always or often remove chicken skin Proportion who always or often trim excess fat from pork, beef, mutton, hogget, or lamb
France	French national food and nutrient intake data	1993–94	Average contribution of fat to energy intake Average contribution of saturated fat to energy intake
Japan	National Nutrition Survey	2002	Average intake of fats and oils among adults
UK	The National Diet and Nutrition Survey	2000–01	Average daily intake of fat Average contribution of fat to energy Average contribution of saturated fat to energy Proportion usually consuming whole milk (1) as a drink, (2) on breakfast cereals and in puddings
USA	National Health and Nutrition Examination Survey	2001–02	Average contribution of fat to energy (published for 1999–2000) Average contribution of saturated fat to energy (published for 1999–2000) Type of milk usually consumed Average intakes (dietary recall)

2.7 Choose foods low in salt

Existing evidence suggests that a high dietary intake of salt may contribute to the rise in blood pressure that occurs with increasing age in western countries (AIHW 2004b).

The source of most dietary sodium (salt) in Australia, as in other western countries, is not discretionary salt use (i.e. salt added to cooking and at the table) but widely consumed processed foods such as bread, cheese, processed meats and snack foods. Because of this, the dietary guidelines recommend that the entire population reduce its salt consumption as a primary preventive measure against high blood pressure (NHMRC 2003:144–5). The Dietary Guidelines for Older Australians emphasise the preventive effect that reducing salt intake has on high blood pressure, as well as its impact on reducing blood pressure in those who already have hypertension (NHMRC 1999:107).

However, no national data exist to assess levels of salt consumption among Australians. In one study conducted in Hobart in the mid-1990s, men were seen to have an average urinary sodium excretion rate of 170 mmol per day, and women of 118 mmol per day – both above the maximum intake for sodium of 100 mmol per day recommended by the NHMRC (100 mmol is approximately equivalent to 6 g of common salt or one and a half teaspoons) (NHMRC 2003:135). The recommended range for consumption of sodium for Australian adults is 40–100 mmol per day (NHMRC 1991).

The only existing measure for Australia is discretionary salt use, which is easily measured through self-reporting. A more accurate way of measuring sodium intake would be to measure sodium output in the urine over a 24-hour period (NHMRC 2003:135). Apparent consumption data for sodium show the amount of salt contained in whole foods, but do not include discretionary salt intake or salt added to processed foods (AIHW: Field et al. 2003:4) and so do not add value as an indicator.

Salt use

Existing measures:

- *Proportion of people who regularly add salt to food after it is cooked*

Males were more likely than females to report that they usually or sometimes add salt after cooking and less likely to report 'never or rarely' (Table 24). Compared to the 1995 NNS, a higher proportion of both men and women in 2001 reported that they usually added salt to their food after cooking, with fewer reporting that they never added salt to food after cooking (ABS 2003a). The dietary guidelines suggest that to achieve the recommended dietary intake of sodium, adults should not only avoid adding salt to food, but should also consume fresh food, foods normally processed without salt, and low-salt or no-added-salt groceries.

Table 24: Proportion of people who add salt to food after cooking, 2001

Measure	Never/rarely	Sometimes	Usually
Proportion adding salt to food after cooking (frequency)			
	Per cent		
Males	49.3	20.7	30.0
Females	60.4	18.4	21.2
Persons	54.9	19.5	25.5

Notes

1. Aged 12 years and over.
2. Data from the 2001 NHS.

Source: ABS 2003a.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 25 (see Appendix 2, Table A2.16, for data). Many of the countries do not measure salt (sodium) intake.

Additional measures which could be useful in informing indicator development for Australia include:

- measuring urinary sodium excretion over 24 hours (as noted previously, an 'ideal' indicator), which has been used to estimate intakes of sodium and salt (UK NDNS)
- estimation of sodium intake from 24-hour dietary recall (USA NHANES).

Table 25: Published international measures relating to sodium intake and use

Country	National data sources	Most recent	Existing measures
Australia	National Health Survey	2001	Proportion of people who add salt to food after cooking
UK	The National Diet and Nutrition Survey	2000–01	Average intakes of sodium and salt, estimated from urinary sodium excretion per 24 hours
USA	National Health and Nutrition Examination Survey	2001–02	Sodium intake (dietary recall) (published for 1999–2000)

2.8 Limit your alcohol intake if you choose to drink

Alcohol is included in the dietary guidelines both because it is the fourth macronutrient that provides dietary energy (along with carbohydrate, fat and protein) and because of its documented negative effects on health (NHMRC 2003:151). Excessive alcohol consumption is a major risk factor for morbidity and mortality, and high doses of alcohol severely impair brain function and can result in coma or even death (AIHW 2004a). It can also impair liver function and have toxic effects on the cardiovascular system and foetal development and increase the risk of cancer (NHMRC 2003:152). Net harm associated with alcohol consumption is around 2.2% of the total burden of disease (AIHW 2004a).

The Australian Alcohol Guidelines (DoHA 2003) recommend that, to minimise risks to health, both in the short and long term, and to gain any longer-term benefits to health, men consume no more than four standard drinks a day on average and no more than six standard drinks on any one day and that women consume no more than two standard drinks a day on average and no more than four standard drinks on any one day. Both men and women should have one or two alcohol-free days per week.² One standard drink is any drink that contains 10 g (or 12.5 ml) of alcohol. Alcohol consumption associated with harm is outlined in Table 26.

Existing measures for this guideline are those relating to alcohol supply, average population intake and alcohol use.

Table 26: Alcohol consumption associated with harm

Alcohol consumption associated with harm	Short-term harm		Long-term harm	
	Risky	High risk	Risky	High risk
Males	7 or more standard drinks on any one day	11 or more standard drinks on any one day	29 to 42 standard drinks per week	43 or more standard drinks per week
Females	5 or more standard drinks on any one day	7 or more standard drinks on any one day	15 to 28 standard drinks per week	29 or more standard drinks per week

Source: AIHW 2005a; DoHA 2003.

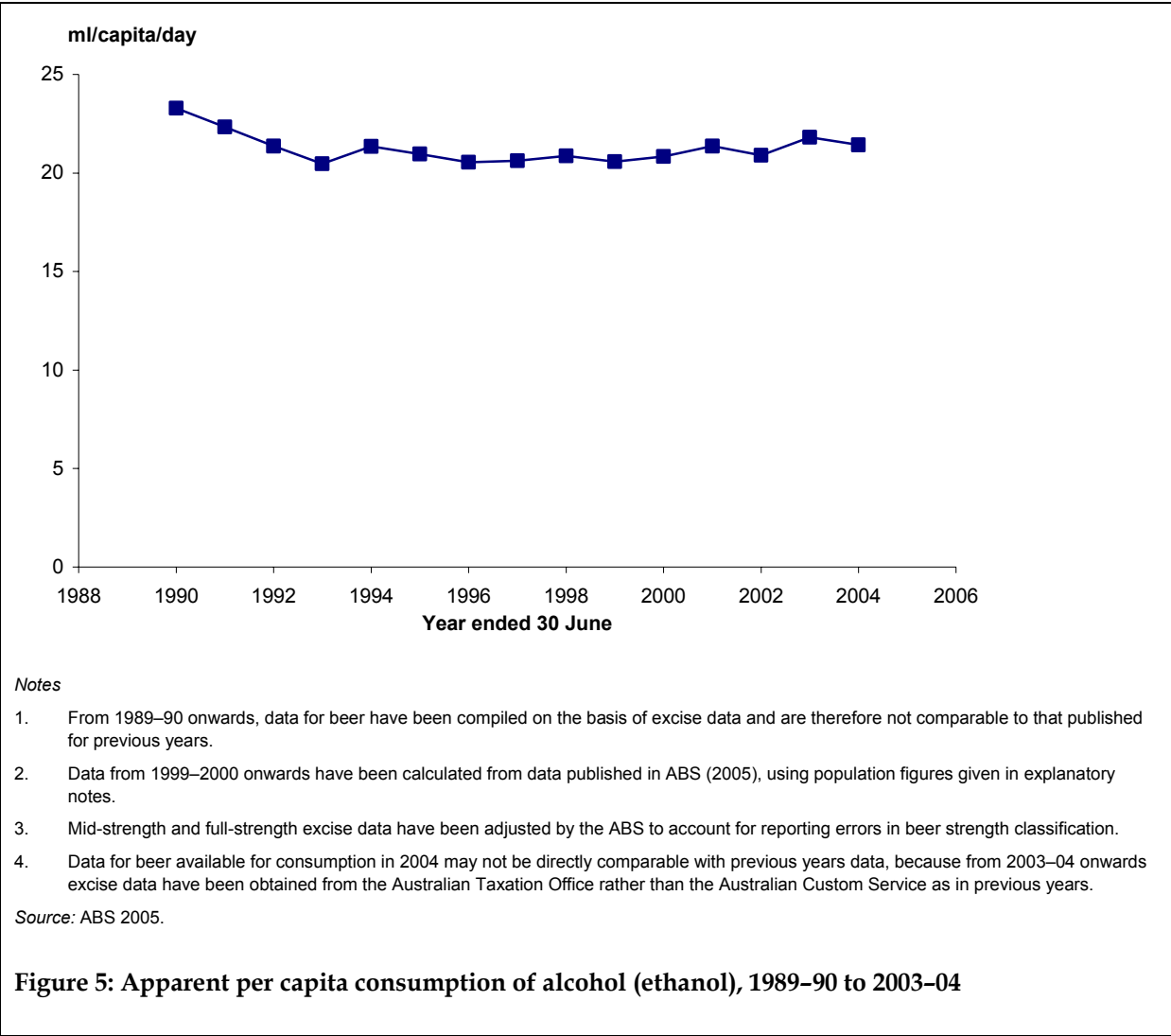
² This guideline is for people who do not undertake activities that involve risk or a degree of skill.

Alcohol supply

Existing measures:

- *Apparent per capita consumption of alcohol*

Apparent consumption data show that more than the equivalent of two standard drinks (per person, per day) is available in the Australian food supply (Figure 5). Per capita apparent consumption of pure alcohol fell during the early 1990s but has since remained relatively stable at around 21 ml per day. Long-term apparent consumption data for alcohol are available but are not comparable to more recent data because of changes to the method of data compilation (ABS 2000).



Alcohol intake

Existing measures:

- *Average daily alcohol intake among adults*

Men reported consuming more alcohol than women, both on average and among those who reported consuming alcohol on the day of the 24-hour recall (Table 27), despite the fact that the average intake of alcohol decreased significantly for men but not for women between 1983 and 1995 (Cook et al. 2001a:30). For those who reported drinking alcohol on the day of the recall, the average dietary energy derived from alcohol was 11.4% for men and 10.6% for women, which implies that there were some people obtaining more dietary energy from alcohol than from protein. (NHMRC 2003:153).

Table 27: Average daily alcohol intake among adults, 1995

Measure	g/person/day	Equivalent standard drinks
Average alcohol intake		
Males	18.5	<2
Females	7.3	<1
Average alcohol intake among adults who consumed alcohol on the recall day		
Males	44.2	>4
Females	30.0	3

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: NHMRC 2003:153.

Alcohol use

Existing measures:

- *Proportion of adults who consume alcohol at risky or high-risk levels*

Males were consistently more likely than females to engage in 'risky and high-risk' alcohol use leading to both short-term and long-term harm (Table 28). Persons in the 20–29 years age group were most likely to consume alcohol in a way that put them at risk for long-term (chronic) alcohol-related harm. This age group was also the least likely to abstain from consuming alcohol. However, at all ages, greater proportions of the population drink at risky or high-risk levels for short-term harm compared with risk for long-term harm (AIHW 2005a).

Changes to the way in which data are reported in the NDSHS mean that trend data are not available for alcohol consumption patterns leading to short- and long-term harm (AIHW 2005a)

Table 28: Proportion of adults consuming alcohol at risky and high-risk levels, 2004

Measure	Males	Females
Proportion consuming alcohol at risky or high-risk levels (short-term harm)		
	Per cent	
At least weekly	9.8	5.7
At least monthly	14.4	11.5
At least yearly	16.1	13.5
Proportion of adults consuming alcohol at risky or high-risk levels (long-term harm)		
	10.1	9.6

Notes

1. Aged 14 years and over.
2. Data from the 2004 National Drug Strategy Household Survey.

Source: AIHW 2005a.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 29 (see Appendix 2, Tables A2.17–A2.18, for data). New Zealand, the USA and the UK, like Australia, have collected data on alcohol intakes as part of nutrition surveys, and New Zealand, Canada, the UK and the USA have reported on alcohol use. Apparent consumption of alcohol is reported by Australia, New Zealand, France, the USA and the UK. However, apparent consumption data are reported by Canada only for alcoholic beverages (rather than pure alcohol).

An additional measure which could be useful in informing indicator development for Australia is:

- proportion of adults consuming alcohol in excess of guidelines (based on dietary recall) (UK NDNS).

Table 29: Published international measures relating to consumption of alcohol

Country	National data sources	Most recent	Existing measures
Australia	National Drug Strategy Household Survey	2004	Proportion of adults consuming alcohol at risky and high-risk levels
	National Nutrition Survey	1995	Average daily alcohol intake among adults
	Apparent consumption data	2003–04	Apparent consumption of alcohol

(continued)

Table 29 (continued): Published international measures relating to consumption of alcohol

Country	National data sources	Most recent	Existing measures
New Zealand	New Zealand National Health Survey	2002–04	Proportion of adult drinkers with a potentially hazardous drinking pattern
	National Nutrition Survey	1997	Average daily alcohol intake
	Apparent consumption data	2004	Apparent consumption of alcohol
Canada	Canadian Community Health Survey	2003	Proportion of heavy episodic/binge drinkers
	Canadian Addiction Survey	2004	Prevalence of heavy drinking among past-year drinkers Percentage exceeding low-risk drinking guidelines among past-year drinkers
France	Apparent consumption data	2003	Annual average consumption of alcohol
Japan	National Nutrition Survey	2002	Proportion of heavy episodic/binge drinkers
UK	The National Diet and Nutrition Survey	2000–01	Average daily alcohol intake Proportion of adults consuming alcohol in excess of the weekly guidelines during the 7-day reporting period Proportion of adults consuming alcohol in excess of the daily guidelines during the 7-day reporting period
	Expenditure and Food Survey	2002–03	Average daily household apparent consumption of alcohol
USA	National Health and Nutrition Examination Survey	2001–02	Average intakes (dietary recall)
	Behavioural Risk Factor Surveillance System	2003	Median proportion at risk for binge drinking (5 or more drinks on one occasion) Median proportion at risk for heavy drinking
	Apparent consumption data	2002	Apparent consumption of alcohol

2.9 Consume only moderate amounts of sugars and foods containing added sugars

Foods with high added sugar content are often energy dense but have a low nutrient content in relation to the amount of energy they provide. This low nutrient density is of concern, because if sugar is providing a high proportion of total energy, the remainder of the diet may not be sufficient to provide all necessary nutrients. Some studies from the US suggest that high intakes of sugar are linked to diet quality (higher energy, lower fruit and vegetable consumption) and there is concern about the nutrient density of the diet if added sugars comprise 10–15% of energy (NHMRC 2003:176). A diet high in sugar has also been linked to an increased risk of dental caries. Dental caries are one of the most expensive diet-related health problems in Australia (NHMRC 2003:181), and levels of dental decay among children have been increasing since 1996 (AIHW 2004a). Sucrose (cane sugar) is the dietary sugar most likely to cause caries; however, other sugars also contribute to caries formation. There is no RDI for Australians for sugar (NHMRC 1991).

Sugars in the diet can be divided into ‘natural sugars’ and ‘added sugars’. Natural sugars are those which occur naturally in foods, whereas added sugars (often cane sugar) are those which have been added during processing, cooking or preparation. There is no difference between the energy contributions of these sugars to the diet (NHMRC 2003:172).

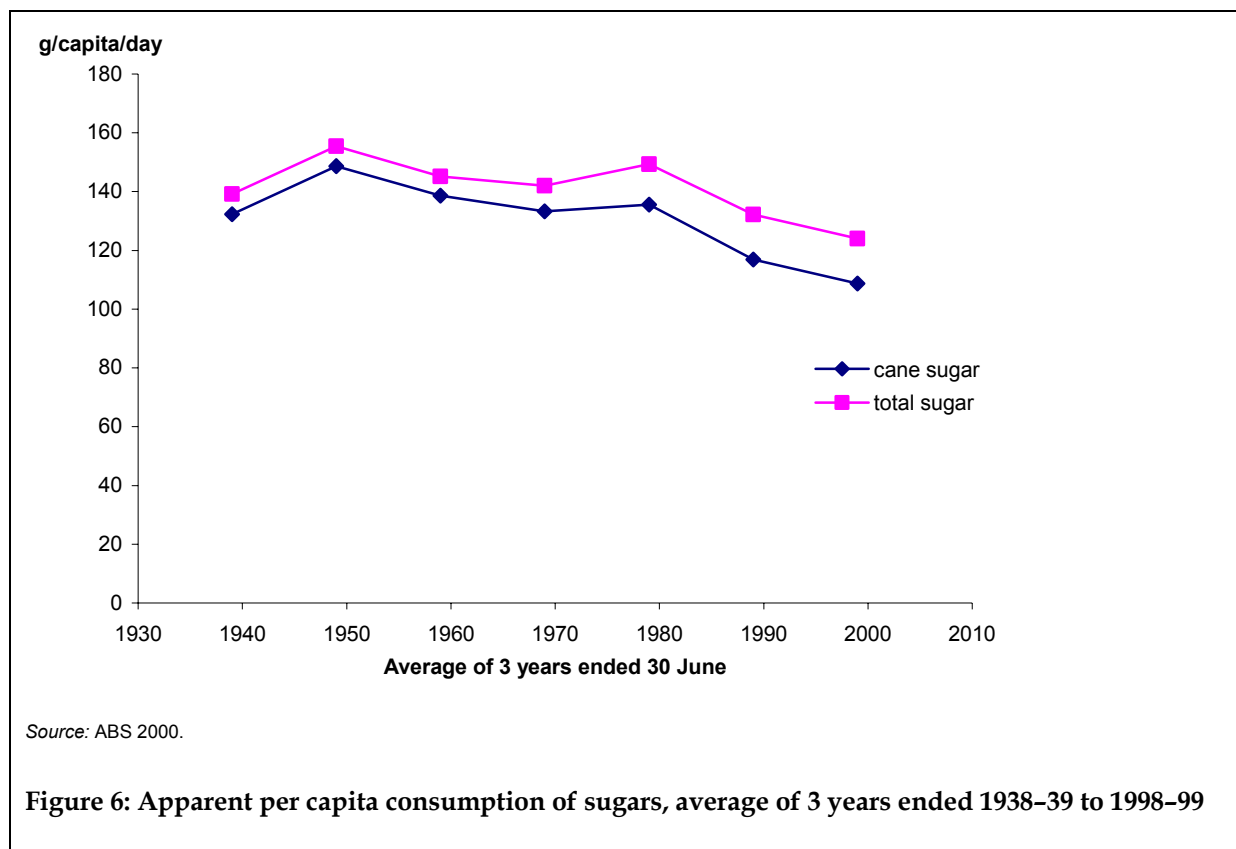
Key indicators for this guideline, for which there are available data, relate to sugar supply (apparent consumption) and sugar intake (including the proportion of energy intake from sugars).

Sugar supply

Existing measures:

- *Apparent per capita consumption of sugars*

Apparent consumption data for sugar (Figure 6) do not represent actual consumption by the population, because some sugar is wasted and some is used for brewing and other purposes. Therefore, less sugar is available for consumption than indicated by apparent consumption data. However, these data are useful for identifying trends in sugar use and consumption. There has been a 23% decrease in apparent consumption of total sugar since it peaked in 1948–49 at 155.6 g per capita per day, as well as a decrease in the consumption of honey (ABS 2000). More recently, apparent consumption of sugars has remained relatively stable.



Sugar intake

Indicators:

- *Average daily sugar intake among adults*
- *Proportion of total energy intake from sugars*

The NNS results show that men consumed, on average, more sugar in the form of sugar, honey and syrups than women, as well as more total sugar (Table 30). The average intake of total sugar in 1995 represents a significant increase in intake for both men (14 g per day) and women (5 g) from 1983 levels (Cook et al. 2001a:22). Although added sugar and natural sugar appear to have approximately the same contribution to total energy intake (Table 31), sugar contributed more than 20% of total energy intake, which is higher than the 10%–15% suggested by the dietary guidelines in relation to nutrient density of the diet.

Table 30: Average daily sugar intakes, 1995

Measure	Males	Females
	g/person/day	
Average daily intake of sugar, honey and syrups	16.8	9.1
Average intake of total sugar	133.5	97.0

Notes

1. Adults aged 19 years and over.
2. Data from 1995 NNS.

Source: ABS & DHAC 1999; ABS 1998.

Table 31: Sugar as a proportion of energy intake, 1995

Measure	Males	Females
	Per cent	
Sugar as a proportion of energy intake: ^(a)	19.3	20.8
Added sugars	10.4	9.4
Natural sugars	8.9	11.4

(a) Since separate day-2-adjustment factors are applied to sugars and to energy, the resulting calculated percentage of energy can vary slightly from unadjusted mean per cent energy values.

Notes

1. Adults aged 19 years and over.
2. Data from 1995 NNS.
3. Uses day-2-adjusted nutrient data and the population-weighted sample.

Source: Cobiac et al. 2003.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 32 (see Appendix 2, Tables A2.19–A2.20, for data). New Zealand, the UK and the USA, like Australia, have collected data on sugar intakes, and apparent consumption data for sugar are collected by Japan, the USA and Canada. The UK collects apparent household intake data for sugar and preserves through the Expenditure and Food Survey.

Table 32: Published international measures relating to consumption of sugar

Country	National data sources	Most recent	Existing measures
Australia	National Nutrition Survey	1995	Average daily sugar intake Proportion of total energy intake from sugars
	Apparent consumption data	1998–99	Apparent consumption of cane sugar and total sugar
New Zealand	National Nutrition Survey	1997	Average daily intake of 'total sugars', 'glucose', 'lactose', 'fructose', 'maltose', 'sucrose'
Canada	Apparent consumption data	2004	Retail equivalent weight of sugars and syrups available for consumption
Japan	National Nutrition Survey	2002	Average daily intakes of sugars and preserves
	Supply and demand of food (apparent consumption)	2003	Supply of net sugar
UK	The National Diet and Nutrition Survey	2000–01	Average daily intake of non-milk extrinsic sugars Average daily intake of intrinsic and milk sugars
	Expenditure and Food Survey	2002–03	Household consumption of sugar
USA	National Health and Nutrition Examination Survey	2001–02	Average intakes (dietary recall)
	Food availability data (apparent consumption)	2003	Weight of caloric sweeteners available for consumption

2.10 Prevent weight gain: be physically active and eat according to your energy needs

This dietary guideline emphasises that Australians should combine healthy eating with an active lifestyle to minimise weight gain during adult life (NHMRC 2003:195). At a basic level, energy intake and output are the two controllable factors governing weight status; as a result, both diet and physical activity are important factors in maintaining a healthy weight (AIHW 2004a:126). The negative health consequences associated with overweight, and in particular obesity, include coronary heart disease, Type 2 diabetes, hypertension, dislipidaemia, stroke, sleep apnoea, pulmonary dysfunction, gall bladder disease, liver disease, osteoarthritis, gout, and some cancers (colon, endometrial and post-menopausal breast cancer) (WHO 2000).

Health benefits of physical activity include primary prevention of many of the consequences of obesity, as well as improving musculoskeletal health, reducing the risk of injury, and promoting psychological well-being (DoHA 1999, DHFS 1998b).

Existing measures for this guideline are energy intake, physical activity status and measures of overweight and obesity in the population. In relation to energy intake, the recommended daily intake for women aged 19–60 years is 7,200–11,300 kJ per day and 9,000–13,700 kJ per day for men, depending on energy expenditure. The NHMRC (1991) emphasises that recommendations for energy intake for groups need to take into account all the factors contributing to the balance between intake and expenditure, and provides details on recommended daily intakes for energy by age, sex, height and weight. The minimum recommendation for physical activity (to provide a health benefit) is 30 minutes of accumulated moderate-intensity physical activity per day on most, preferably all, days of the week (DoHA 1999).

The key measures used to indicate body fatness for population monitoring are the body mass index (BMI) and waist circumference. In assessing body fatness, measured data have been seen to be more reliable than self-reported data (Flood et al. 1999).

Energy intake

Existing measures:

- *Average energy intake among adults*
- *Average ratio of energy intake to basal metabolic rate for adults*

The energy intakes reported by men and women fell into the ranges recommended (Table 33). The average ratio of energy intake to basal metabolic rate was similar for men and women, although slightly higher for men. A ratio of 1.3–1.5 suggests sedentary levels of activity, under-reporting of food consumption or low consumption (ABS 1998). It has been suggested that energy intake may be under-reported by up to 25% by up to one-third of the population (Schoeller 2002). Data

indicate that average daily energy intake increased significantly – by around 350 kJ – between 1983 and 1995, based on comparable survey samples (Cook et al. 2001a:16).

Table 33: Average daily energy intake and ratio of energy intake to basal metabolic rate, for adults, 1995

Measures	Males	Females
Average daily energy intake of adults (kJ/person/day)	11,050	7,481
Average ratio of energy intake to basal metabolic rate	1.5	1.3

Notes

1. Aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998.

Level of physical activity

Existing measures:

- *Proportion of adults who are insufficiently active*

More than half of the population reported levels of physical activity that were insufficient to provide a health benefit. Men and women reported similar overall rates of physical activity (Table 34); however, more men than women reported being insufficiently active in their leisure time. In addition, people aged 30 and over were more likely to report insufficient physical activity than those aged 18–29 years. The National Physical Activity Surveys (1997–2000) suggest that there may be a trend towards higher proportions of people being insufficiently active (NHMRC 2003:196).

Table 34: Proportion of adults undertaking insufficient physical activity, 2000

Measure	Males	Females
Proportion of adults reporting insufficient physical activity	53.7	54.8

Notes

1. Based on self-reported data.
2. Adults aged 18–75 years.
3. 'Sufficient' physical activity is at least 150 minutes of moderate-intensity activity accrued over at least five separate sessions in the previous week. For further detail, refer to AIHW (2004a:144–8).
4. Aged standardised to the 2001 Australian standard population.

Source: AIHW analysis of the 2000 National Physical Activity Survey.

Weight status

Existing measures:

- *Proportion of adults who are overweight or obese (BMI)*
- *Proportion of adults who are abdominally obese (waist circumference)*

The Australian Diabetes, Obesity and Lifestyle (AusDiab) study showed that women were more likely to be obese than men but that men were more likely to be overweight but not obese (Table 35). It also showed that women were more likely to have a waist circumference that put them at a substantially increased health risk.

Table 35: Proportion of adults overweight and obese, and abdominally obese, 1999–2000

Measures	Males	Females	Persons
Proportion of adults who are overweight or obese (BMI)^(a)			
	Per cent		
Overweight	67.3	52.0	59.6
Overweight but not obese	48.2	29.8	38.9
Obese	19.1	22.2	20.7
Proportion of adults who are abdominally obese (waist circumference)			
Increased risk total	55.5	56.3	55.8
Increased risk ^(b)	28.4	22.4	25.3
Substantially increased risk	27.1	33.9	30.5

(a) Results are based on BMI calculated from measured height and weight.

(b) But not substantially increased risk.

Notes

1. Data are for people aged 25 years and over.
2. Results are age-standardised to the 2001 Australian population.
3. The National Health Data Dictionary (NHDD) defines overweight as a BMI of 25 or more and obesity as a BMI of 30 or more. Also according to the NHDD, a waist circumference of 94 cm or more in men and 80 cm or more in women indicates increased risk of negative health consequences, and a waist circumference of 102 cm or more in men and 88 cm or more in women indicates substantially increased risk.

Source: AIHW analysis of the 1999–2000 Australian Diabetes, Obesity and Lifestyle (AusDiab) Study.

In the 20-year period between 1980 and 2000, there appears to have been a dramatic increase in rates of overweight and obesity. Measured data suggest that the proportion of men aged 25–64 years who were obese rose from 9% in 1980 to 17% in 1999–2000, and that for women the proportion increased from 8% to 20%. The total prevalence of overweight rose from 47% to 68.3% for men and 27% to 47% for women during the same period. In addition, between 1989 and 1999–2000 the prevalence of abdominal obesity increased from 14% to 21% in men and from 16% to 28% in women (AIHW: Dixon & Waters 2003).

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 36 (see Appendix 2, Tables A2.21–A2.23, for data). All of these countries have published data on energy intakes. New Zealand, Canada, the UK and the USA, like Australia, have collected data on self-reported physical activity. The UK has also collected data on physical activity using seven-day physical activity records. These four countries, and Australia, have also collected data on measured BMI. Australia and the UK have also published data on measured waist circumference.

Additional measures that could inform Australian indicator development include:

- the proportion of adults participating in at least 30 minutes of activity of at least moderate intensity per day (UK NDNS)
- the proportion of adults meeting guidelines for moderate/vigorous physical activity (USA BRFSS)
- the proportion of obese respondents based on body composition (using dual-energy X-ray absorptiometry) (USA NHANES)
- the proportion of people gaining 10 kg or more since turning 18 (New Zealand NHS).

Table 36: Published international measures relating to energy intakes, physical activity, and overweight and obesity

Country	National data sources	Most recent	Existing measures
Australia	National Physical Activity Survey	2000	Proportion of adults undertaking insufficient physical activity
	National Nutrition Survey	1995	Average daily energy intake among adults Average ratio of energy intake to basal metabolic rate
	AusDiab Study	1999–00	Proportion of adults who are overweight and/or obese (BMI, measured) Proportion of adults who are abdominally obese (waist circumference, measured)
New Zealand	New Zealand National Health Survey	2002–04	Proportion sedentary Proportion overweight or obese (BMI, measured) Proportion gaining 10 kg or more since turning 18
	National Nutrition Survey	1997	Average daily energy intake among adults Proportion with excess waist–hip ratio (measured)
Canada	Canadian Community Health Survey	2003	Proportion of people ‘physically inactive’ in leisure time
	Canadian Community Health Survey: Nutrition	2004	Proportion overweight or obese (BMI, measured)

(continued)

Table 36 (continued): Published international measures relating to energy intakes, physical activity, and overweight and obesity

Country	National data sources	Most recent	Existing measures
France	French national food and nutrient intake data	1993–94	Average daily energy intake
	EU nationally representative physical activity and overweight study	1997	Proportion undertaking no exercise Proportion overweight or obese (BMI, self-reported)
Japan	National Nutrition Survey	2002	Average daily energy intake Proportion undertaking physical activity (more than twice per week, 30 minutes or more per occasion, continued for more than 1 year) Proportion overweight and obese (BMI, measured)
UK	The National Diet and Nutrition Survey	2000–01	Average daily energy intake (kcal) Proportion with self-reported level of physical activity 'not at all' Proportion participating in at least 30 minutes of activity of at least moderate intensity per day Proportion with waist circumference indicating a substantially increased risk of metabolic complications of obesity (measured) Proportion overweight or obese (BMI, measured)
USA	National Health and Nutrition Examination Survey	2001–02	Average daily energy intake (published for 1999–2000) Proportion walking or bicycling as part of getting to and from work, or school, or to do errands over the past 30 days (how often, how long) Proportion undertaking vigorous activities for at least 10 minutes, during leisure time or at school over the past 30 days (what, how often, how long) Proportion undertaking moderate activities for at least 10 minutes, during leisure time or at school over the past 30 days (what, how often, how long) Proportion obese (BMI, measured) (published for 1999–2002) Proportion obese (body composition—dual-energy X-ray absorptiometry)
	National Health Interview Survey	2003	Proportion overweight or obese (BMI, self-reported)
	Behavioural Risk Factor Surveillance System	2003	Proportion not meeting guidelines for moderate physical activity Proportion not meeting guidelines for vigorous physical activity

2.11 Care for your food: prepare and store it safely

Foodborne illness can have very serious health consequences, especially for vulnerable groups (e.g. the immuno-compromised), and the focus of this guideline is on microbiological aspects of food safety and practical matters (NHMRC 2003:211).

The key indicator relating to food safety, for which there is available data, is notifications of foodborne illness, which is reported against in the dietary guidelines for adults (NHMRC 2003:212).

Foodborne illness

Indicators:

- *Notification of foodborne illness received by Australian health authorities for selected foods*
- *Notification of foodborne illness received by Australian health authorities, by setting where the outbreak occurred*

Foodborne illness may cost Australia as much as \$1.2 billion annually, and national surveillance of foodborne diseases is important to provide data for evaluating and informing food safety policy and interventions (OzFoodNet Working Group 2005). The occurrence of repeated outbreaks with similar food vehicles or settings of preparation indicates the need for enforcement of controls (OzFoodNet Working Group 2004). Although reported data on foodborne illness underestimates the true incidence (NHMRC 2003:211), it can still provide a useful indication of trends and sources of illness.

Existing measures for this guideline include the number of outbreaks reported, by food vehicle or setting of preparation. The OzFoodNet Annual Report for 2004 (OzFoodNet Working Group 2005) reported that outbreaks associated with fish, poultry, bakery products, seafood and mixed meat dishes were common (Table 37) and that outbreak data indicated a need to monitor food safety in aged-care settings, restaurants and catered events (Table 38). In relation to the microbial cause of foodborne illness, the highest impact seemed to be from salmonella (typhimurium) and campylobacter (OzFoodNet Working Group 2005). There has also been a trend towards gradual increases in notifications of foodborne illness associated with campylobacter, salmonella and listeria (NHMRC 2003:212).

Table 37: Notifications of foodborne illness for selected foods, 2004

Food category	Number of outbreaks	Per cent	Number affected	Number hospitalised
Cakes	4	3.4	82	10
Custard	1	0.9	43	17
Dessert	1	0.9	4	0
Dips	1	0.9	14	0
Eggs	1	0.9	4	0
Fish	10	8.6	52	8
Mixed dish	5	4.3	63	1
Mixed meat dish	6	5.2	191	2
Oysters	4	3.4	35	1
Pizza	4	3.4	108	8
Pork	1	0.9	27	1
Poultry	6	5.1	188	3
Salad	1	0.9	28	3
Sandwiches	3	2.6	270	0
Seafood	6	5.2	45	10
Suspected eggs	2	1.7	19	6
Suspected poultry	2	1.7	24	2
Suspected red meat	1	0.9	5	5
Suspected water	1	0.9	7	0
Vegetable dish	1	0.9	6	0
Unknown	57	49.1	861	39
Total	118	100.0	2,076	116

Source: OzFoodNet Working Group 2005.

Table 38: Notifications of foodborne illness by setting category, 2003

Setting prepared	Number of outbreaks	Number affected	Number hospitalised
Aged care	5	75	4
Bakery	4	82	10
Café	2	17	3
Camp	1	5	0
Commercial caterer	16	683	15
Contaminated primary produce	7	58	9
Grocery store/delicatessen	2	30	0
Hospital	4	42	7
Institution	2	52	17
National franchised fast food	7	83	11
Private residence*	14	157	6
Restaurant	40	558	27
Takeaway	8	30	1
Other	1	27	1
Unknown	5	177	5
Total	118	2,076	116

* Includes one outbreak where food prepared included food prepared by takeaway stores.

Source: OzFoodNet Working Group 2005.

Data show an increase in the number of reported episodes of foodborne illness. In 2004, OzFoodNet sites reported 24,313 notifications of eight potentially foodborne diseases. This was an increase on the 23,250 notifications for the previous year (OzFoodNet Working Group 2005), which was itself a 5% increase on the mean of the previous five years (OzFoodNet Working Group 2004). However, the increase in notification may also be due in part to better reporting and identification of pathogens, and increased awareness among consumers and health professionals.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 39 (see Appendix 2, Table A2.24, for data). New Zealand, the UK and the USA publish data regarding reported incidence of foodborne illness.

Table 39: Published international measures relating to food safety

Country	National data sources	Most recent	Existing measures
Australia	OzFoodNet	2004	Notification of foodborne illness received by Australian health authorities for selected foods Notification of foodborne illness received by Australian health authorities by setting
New Zealand	Public health surveillance annual outbreak summary	2003	Number of reported cases by vehicle (food) Number of reported cases by setting
UK	Foodborne Disease Strategy	2003	Number of laboratory reports for key pathogens
USA	Foodborne Disease Outbreak Surveillance System	2003	Outbreak data by pathogen (etiology), vehicle and location

2.12 Encourage and support breastfeeding

It is well established that there are many health advantages of breastfeeding, and this guideline is included in the dietary guidelines for adults 'in acknowledgment of the nutritional, health, social and economic benefits it provides for the Australian community and of the need for family and community support' (NHMRC 2003:228). The WHO Expert Consultation on the optimal duration of exclusive breastfeeding (held 28 to 30 March 2001) recommended exclusive breastfeeding for 6 months, with introduction of complementary foods and continued breastfeeding from 6 months of age (WHO 2002).

Key indicators for monitoring breastfeeding in Australia, largely consistent with those recommended by the WHO, have been outlined by Webb et al. (2001). These are:

- per cent ever breastfed
- per cent breastfeeding at each completed month of age to 12 months
- median duration of breastfeeding among 'ever breastfed' children
- per cent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months
- per cent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months
- per cent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months
- per cent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months.

Existing measures relevant to this guideline are the proportion of infants ever breastfed, the proportion of infants breastfed at ages 6 and 12 months, and the proportion of infants fully breastfed (at 4 and 6 months of age). This list does not include all indicators, because for some indicators, no national data are available (e.g. national data exists to measure 'fully breastfeeding' but not 'exclusively breastfeeding'), and others do not add substantially to information relevant to the breastfeeding guideline (i.e. 'use of breastmilk substitutes' or 'introduction of solids' are negative measures of supporting breastfeeding).

Breastfeeding prevalence

Existing measures:

- *Per cent ever breastfed*

The term 'ever breastfed' refers to infants who have been put to the breast, if only once, and includes infants who have received expressed breastmilk in a bottle but have never been put to the breast (ABS 2003b). The rate reported in 2001 (Table 40) was similar to that reported in 1995 (86%). The dietary guidelines suggest that Australia could achieve an initiation (i.e. 'ever breastfed') rate above 90% (NHMRC 2003:228).

Table 40: Proportion of children ever breastfed, 2001

Measure	Infants aged 0–3 years
	Per cent
Proportion of infants ever breastfed	87

Note: Data from the 2001 NHS.

Source: ABS 2003b.

Breastfeeding duration

Existing measures:

- *Per cent breastfeeding at age 6 months and 12 months*

Although the indicator recommended by Webb et al. (2001) is 'percent breastfeeding at each completed month of age to 12 months', the recent data reported on for Australia are for 6 and 12 months (Table 41). These data show a steep decline in breastfeeding rates, particularly when compared with 'ever breastfed' – by 6 months the proportion breastfed has dropped from 87% to 48%, and then by 12 months to 23%. These data are similar to those reported in 1995. However, the dietary guidelines suggest that 80% of mothers breastfeeding at 6 months would be an achievable goal in Australia (NHMRC 2003:228).

Table 41: Proportion of children receiving breastmilk at 6 and 12 months of age, 2001

Measure	Infants aged 0–3 years
	Per cent
Proportion of children receiving any breastmilk at age:	
6 months	48
12 months	23

Note: Data from the 2001 NHS, response to the question 'Is...currently being breastfed?'

Source: ABS 2003b.

Full breastfeeding

Existing measures:

- *Per cent of infants fully breastfeeding (in the previous 24 hours) at age 3 months and 6 months.*

'Fully breastfed' refers to infants who receive only breastmilk on a regular basis (ABS 2003b), which the WHO recommends for infants up to 6 months of age (WHO 2002). The proportion of infants fully breastfed decreases with age (Table 42), and there has been little change in the proportion of infants fully breastfed from 1995 data (AIHW 2005b).

Table 42: Proportion of infants fully breastfed at 3 and 6 months of age, 2001

Measure	Infants aged 0–3 years
Proportion of infants fully breastfed at age:	Per cent
3 months	54
6 months	32

Note: Data from the 2001 NHS, response to the question 'Is...currently being breastfed?' taking into account whether they are given breastmilk substitutes or food regularly.

Source: ABS 2003b.

Overview of international measures

Published indicators relating to this guideline, for the selected countries, are outlined in Table 43 (see Appendix 2, Table A2.25, for data). New Zealand, Canada, the UK and the USA, like Australia, have published statistics for the key breastfeeding indicators – ever breastfed, fully breastfed and breastfeeding duration.

Table 43: Published international measures relating to breastfeeding

Country	National data sources	Most recent	Existing measures
Australia	National Health Survey	2001	Proportion of infants ever breastfed Proportion of infants receiving breastmilk at 6 and 12 months of age Proportion of infants fully breastfed at 4 and 6 months of age
New Zealand	Plunket Operational National Database (free data)	2003–04	Breastfeeding practices—infants aged 6 weeks (exclusive, full, partial) Breastfeeding practices—infants aged 3 months (exclusive, full, partial)

(continued)

Table 43 (continued): Published international measures relating to breastfeeding

Country	National data sources	Most recent	Existing measures
Canada	Canadian Community Health Survey	2003	Breastfeeding practices, females aged 15 to 55 who had a baby in the previous 5 years:
			Initiated breastfeeding
			Breastfed at least 4 months
			Breastfed at least 4 months exclusively
			Breastfed at least 6 months
			Breastfed at least 6 months exclusively
UK	Infant Feeding Survey	2000	Initial incidence of breastfeeding
			Proportion still breastfeeding at ages up to 9 months (1 week, 2 weeks, 6 weeks, 4 months, 6 months, 8 months, 9 months)
			Percentage exclusively breastfed at 3–6 weeks, 6–8 weeks, 8 weeks–3 months.
USA	National Survey of Family Growth	1993–94	Per cent of babies breastfed Per cent of breastfed babies who were breastfed 3 months or more
	National Health and Nutrition Examination Survey	2001–02	Proportion ever breastfed Age of child when first fed something other than breastmilk or water (i.e. percentage fully breastfed at each completed month of age to 6 months) Age of child when completely stopped breastfeeding (i.e. percentage breastfed at each completed month of age to 12 months)

2.13 Other nutritional issues: food security

According to the UN Food and Agriculture Organization (FAO), food security means:

...that all people, at all times, have physical and economic access to adequate food that is safe and in keeping with social and cultural preferences, to be able to lead an active and healthy life. FAO identifies four conditions of food security – adequate food supply; stability of food supply without seasonal or yearly fluctuations; physical and economic access to food; food quality and safety (FAO 2005b).

In relation to nutrition, poor food security has been associated with poor diet quality (McComb et al. 2000). Food insecurity data for Australia has been reported by Marks et al. (2001a) and was proposed as an indicator by Gill et al. (2004). In addition, *Eat Well Australia* highlights food security as an important nutritional issue for vulnerable groups and suggests that 'validated food security indicators be developed as part of a national food and nutrition monitoring system' (SIGNAL 2001:43).

The existing measure relating to food security for Australia (based on availability of data) is 'food insufficiency', which refers to an inadequate amount of food intake because of a lack of money or resources (ABS 2003a). However, it should be noted that Marks et al. (2001b:29) suggest that this survey question (and therefore any indicator based on these data) will result in an underestimation of food insecurity because it only covers some aspects of food security.

Food insufficiency

Existing measures:

- *Proportion of people who ran out of food and did not have enough money to buy more in the last 12 months*

Data from the 2001 NHS show that just over 5% of Australians reported running out of food during the past 12 months and being unable to purchase more (Table 44). Women were more likely than men to report running out of food. These results are very similar to those from the 1995 NNS (ABS 2003), although the difference between the responses of men and women was slightly less in 2001 (the responses were closer to the average). In their analysis of responses from the 1995 NNS, Marks et al. (2001a) suggest that socioeconomic indices, such as employment status, are associated with food sufficiency status.

Table 44: Food insufficiency, 2001

Measure	Males	Females
	Per cent	
Proportion who reported running out of food in the last 12 months and did not have money to buy more (adults 18 years and over)	4.9	5.5

Note: Data from the 2001 NHS.

Source: ABS 2003a.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 45 (see Appendix 2, Table A2.26, for data). New Zealand, Canada and the USA have collected data regarding food security in households through health and nutrition surveys, using a variety of measures.

Additional measures that could inform Australian indicator development include:

- the proportion of people eating less or limiting the variety of food because of lack of money, and worrying about lack of money for food (New Zealand NNS)
- the proportion of households not eating the quality or variety of foods desired (Canada NPHS)
- the proportion of households food insecure, with and without hunger (USA Current Population Survey)
- the proportion of people not able to afford balanced meals or feeling hungry or losing weight because of a lack of money for food, and receiving emergency food (USA NHANES).

Table 45: Published international measures relating to food security

Country	National data sources	Most recent	Existing measures
Australia	National Health Survey	2001	Proportion of people who ran out of food and did not have enough money to buy more in the last 12 months
New Zealand	National Nutrition Survey	1997	Proportion of households that: <ul style="list-style-type: none"> • can afford to eat properly (always/sometimes) • because of lack of money: run out of food; eat less; eat a limited variety of foods; rely on others; use food grants/banks (often/sometimes) • are stressed about lack of money for food; are stressed when there is no food for social occasions (often/sometimes)
Canada	National Population Health Survey (food insecurity supplement questionnaire)	1998–99	Proportion of households experiencing an episode of food insecurity in the past year defined as: (1) worry that there would not be enough food to eat, (2) not eating the quality or the variety of foods that they wanted, (3) not having enough food to eat.
USA	Current Population Survey Food Security Supplement	2004	Proportion of households food insecure, with and without hunger
	National Health and Nutrition Examination Survey	2001–02	In the last 12 months, proportion that: <ul style="list-style-type: none"> • ran out of food, worried about food running out, couldn't afford balanced meals, relied on only a few kinds of low-cost foods • cut size of meals, skipped meals, ate less, felt hungry, lost weight, did not eat for a whole day because there wasn't enough money to buy food • [child]: skipped meals, felt hungry, did not eat for a whole day because there wasn't enough money for food • received emergency food from a church or soup kitchen etc., received benefits from the Women, Infants and Children program. • were authorised to receive food stamps (how many months, are you now authorised to receive food stamps)

2.14 Other nutritional issues: folate

Adequate folate intake in the first few weeks of pregnancy is important in preventing neural tube defects (NHMRC 1995). *Eat Well Australia* highlights folate as an important nutritional issue for Australians under their maternal and child health initiatives (SIGNAL 2001:66). The proposed strategy is to 'reduce the incidence of birth defects by increasing average folate intakes and the proportion of pregnant women who meet the RDI of 400 µg per day through promotion of fortified foods, supplement use and intake of natural dietary folate sources'. Data relating to folate use and intake are reported in Marks et al. (2001a). In addition, folate use and intake were identified as a priority for data collection by the ABS for the 2001 NHS (ABS 2003a).

Folate is also mentioned specifically in the dietary guidelines under fruit and vegetable consumption, in relation to assisting pregnant women to meet their increased nutrient requirements. The current recommended daily intake for folate is 200 µg (including natural folate and fortified food sources). For women, this increases to 400 µg for those who are pregnant and 350 µg for those who are breastfeeding (NHMRC 1991).

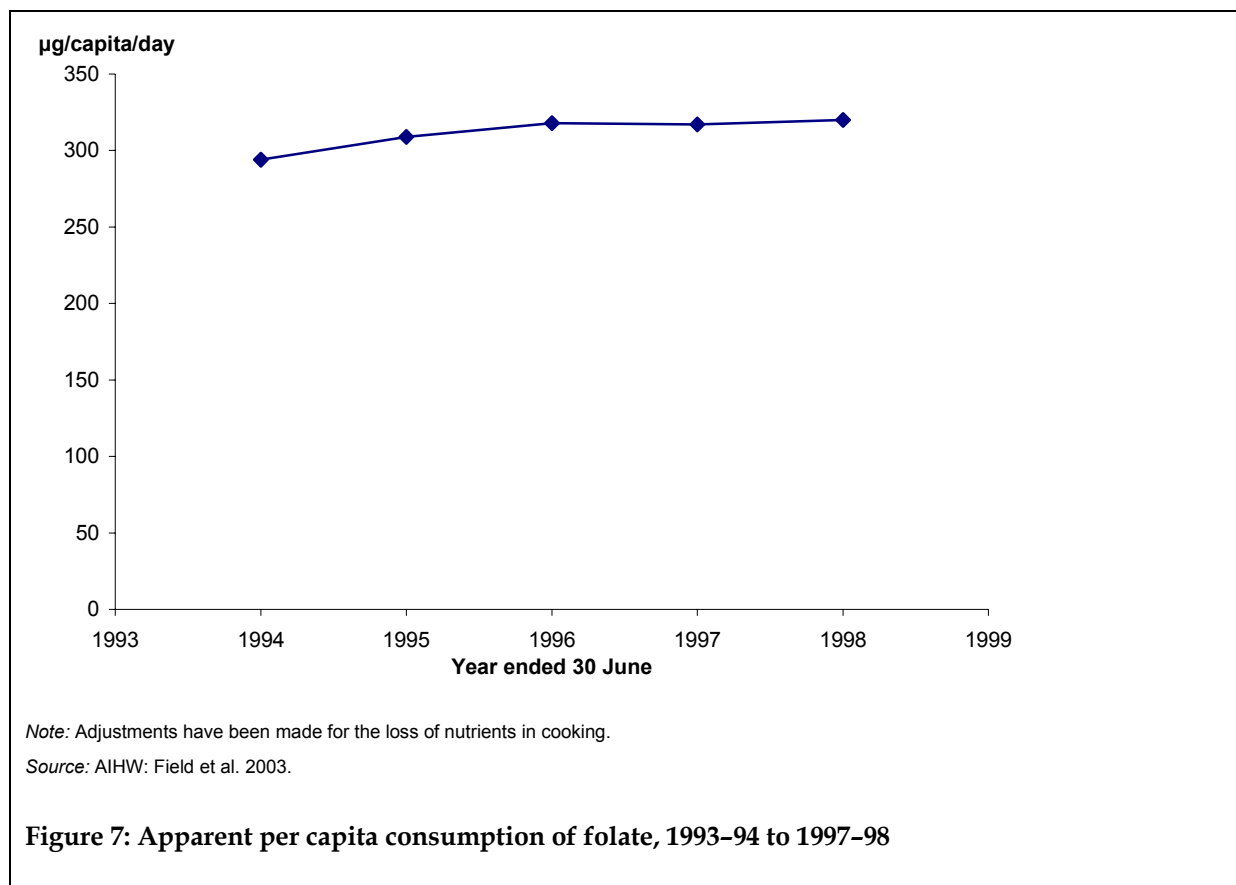
Key indicators, for which there are available data, are folate intake and use of folate supplements and folate-fortified products.

Apparent consumption of folate

Existing measures:

- *Apparent per capita consumption of folate*

Apparent consumption data (Figure 7) suggest that the supply of folate is sufficient to meet the current recommended requirements, based on a per capita adjusted RDI of 186 µg. Trends in apparent consumption data for folate showed an increase in the folate available in the food supply from 294 µg per capita per day in 1993–94 to 320 µg per capita per day in 1998–99. This increase may be attributable to the use of revised nutrient composition data from 1995–96 onwards reflecting fortification of some grain products (AIHW: Field et al. 2003).



Folate use

Existing measures:

- *Proportion of women of child-bearing age (18–49 years of age) who intentionally use folate-fortified foods, drinks or supplements*

Women were more likely to consume supplements or fortified foods rather than fortified drinks to improve their intake of folate (Table 46). There appears to have been a decrease in the proportion of women taking folate supplements. In 1995 more than 10% of women (over 18 years of age) reported consuming a supplement on the day before the survey (Abraham & Webb 2001:70, Marks et al. 2001a:16) whereas only 7% reported supplement use in 2001 (ABS 2003a).

Table 46: Folate use among women of child-bearing age, 2001

Measure	Women aged 18–49 years
	Per cent
Folate fortified foods consumed	6.5
Folate fortified drinks consumed	2.1
Took vitamin/mineral supplements for folate	7.0

Note: Data from the 2001 NHS.

Source: ABS 2003a.

Folate intake

Existing measures:

- *Average folate intake among adults*

Men consumed, on average, more folate than women and both met the RDI (Table 47). Fifty per cent of women aged 19–44 years met or exceeded the RDI for non-pregnant women; however, 25% of all women did not meet the RDI (Marks et al. 2001a).

Table 47: Average folate intake among adults, 1995

Measure	Males	Females
	µg/person/day	
Average daily folate intake	306.8	232.8

Notes

1. Adults aged 19 years and over.
2. Data from the 1995 NNS, from a single 24-hour recall.

Source: ABS 1998.

Overview of international measures

Published international measures relating to this guideline, for the selected countries, are outlined in Table 48 (see Appendix 2, Tables A2.27–28, for data). Australia, New Zealand, the UK and the USA all collect data on folate intakes and use of folate supplements. The UK also calculates apparent intakes of folate from the Expenditure and Food Survey. New Zealand, like Australia, has also reported the proportion of people with inadequate folate intake.

An additional measure that could inform Australian indicator development is

- average blood folate status (UK NDNS and USA NHANES).

Table 48: Published international measures relating to apparent consumption, intakes and use of folate

Country	National data sources	Most recent	Existing measures International indicators
Australia	National Health Survey	2001	Proportion of women of child-bearing age (18-49 years of age) who intentionally use folate-fortified foods, drinks or supplements
	National Nutrition Survey	1995	Average folate intake among adults
	Apparent consumption	1997–98	Apparent consumption of folate
New Zealand	National Nutrition Survey	1997	Proportion that consumed folic acid supplements (excluding multivitamin supplements) in the past year
			Average daily folate intake
			Proportion with inadequate daily folate intake

(continued)

Table 48 (continued): Published international measures relating to apparent consumption, intakes and use of folate

Country	National data sources	Most recent	Existing measures International indicators
UK	The National Diet and Nutrition Survey	2000–01	Proportion of adults using prescribed folic acid supplements Proportion of adults using non-prescribed folic acid supplements only Average daily folate intake Proportion of respondents with average daily intakes of folate below the Lower Reference Nutrient Intake (LRNI) Average red cell and serum folate (nmol/L)
	Expenditure and Food Survey	2002–03	Average daily apparent consumption of folate
USA	National Health and Nutrition Examination Survey	2001–02	Average red cell and serum folate (ng/ml) (published for 1999–2000) Folate intakes (dietary recall) (published for 1999–2000) Proportion taking vitamin/mineral supplement with folate
	Nutrient availability data (apparent consumption)	2000	Availability of folate in the food supply