Towards national indicators for food and nutrition: an AIHW view

Reporting against the Dietary Guidelines for Australian Adults

Australian Institute of Health and Welfare

February 2006

Australian Institute of Health and Welfare
Canberra

AIHW cat. no. PHE 70

A complete list of the Institute's publications is available from the Business Promotion and Media Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's website <http://www.aihw.gov.au>.

ISBN 1 74024 545 8

Suggested citation

AIHW 2005. Towards national indicators for food and nutrition: an AIHW view. Reporting against the Dietary Guidelines for Australian Adults. AIHW Cat. No. PHE 70. Canberra: AIHW.

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

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

Phone: (02) 6244 1000

Published by Australian Institute of Health and Welfare

Printed by

Foreword

Nutrition is a key determinant of health and wellbeing. Current evidence suggests that there are still significant nutritional issues to be addressed in Australia—many of our current health concerns are directly or indirectly related to diet. However, there is limited recent data available for ongoing nutrition monitoring and surveillance.

Towards National Indicators for Food and Nutrition: An AIHW View is a timely publication in the light of the current planning for a national food and nutrition monitoring and surveillance system, and more immediately, a Children's National Nutrition and Physical Activity Survey.

By presenting existing measures relevant to monitoring against the Dietary Guidelines for Australian Adults, this report provides a baseline document for the development of Australian food and nutrition indicators. The AIHW supports the development of comprehensive national indicators to ensure that there is ongoing reporting.

The AIHW joins with many in the nutrition community in calling for the continued development of regular and appropriate data sources and consistent reporting of nutrition-related data. Indicators are an essential component of a comprehensive monitoring system and will be invaluable in ensuring effective development and evaluation of policy and interventions to improve the nutrition of Australians.

I would like to acknowledge Anne Marie Thow for her work in preparing this report, as well as those who gave generously of their time to referee the report.

Dr Ching Choi

Acting Director

Australian Institute of Health and Welfare

Contents

List of tables

List of figures

Acknowledgments

This report was prepared by Anne Marie Thow of the Australian Institute of Health and Welfare (AIHW).

Valuable comments and assistance were received from Karen Cashel, Ingrid Coles-Rutishauser and Bonnie Fields, as referees, and internally at the AIHW from Louise Catanzariti, Mark Cooper-Stanbury, Paul Magnus, Lynelle Moon, and Kathleen O'Brien.

Abbreviations

ABS	Australian Bureau of Statistics
AFNMU	Australian Food and Nutrition Monitoring Unit
AIHW	Australian Institute of Health and Welfare
AusDiab	Australian Diabetes, Obesity and Lifestyle Study
BMI	body mass index
CATI	computer assisted telephone interviewing
DHFS	Department of Health and Family Services
DoHA	Department of Health and Ageing
EU	European Union
FAO	Food and Agriculture Organization
NDNS	National Diet and Nutrition Survey (UK)
NDSA	National Dietary Survey of Adults
NDSHS	National Drug Strategy Household Survey
NHANES	National Health and Nutrition Examination Survey (USA)
NHDD	National Health Data Dictionary
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NNS	National Nutrition Survey
NPAS	National Physical Activity Survey
OECD	Organisation for Economic Cooperation and Development
RDI	recommended daily intake
RFPS	Risk Factor Prevalence Survey
SIGNAL	Strategic Inter-Governmental Nutrition Alliance
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

Symbols

g	grams
kcal	kilocalories
kJ	kilojoules
mg	milligrams
ml	millilitre
mmol	millimole
ng	nanograms
nmol/L	nanomoles per litre
µg	micrograms
µg/L	micrograms per litre
µmol/L	micromoles per litre

Summary

This report provides an overview of the status of food and nutrition data in Australia, based on existing published measures relevant to the Dietary Guidelines for Australian Adults (NHMRC 2003). The purpose of the report is to assist in the development of a national food and nutrition monitoring system in Australia through informing indicator development and identifying gaps in existing data collection. This report also provides a comparison with relevant food and nutrition measures and data from a selected number of other countries.

The report follows on from and expands on the core set of indicators reported in *Key Food and Nutrition Data for Australia 1990–1999* (Marks et al. 2001a), with measures aligned to the revised Dietary Guidelines for Australian Adults. The dietary guidelines are a key statement of Australia's policy goals and directions for supporting better nutritional outcomes for the population.

The food and nutrition data reviewed provide a status report on the nutrition of Australians. It is evident from available data relevant to the dietary guidelines that there are still important nutritional issues to be resolved in Australia. For example, more than 50% of people have reported not meeting the minimum recommendations for fruit and vegetable consumption, and data suggest a trend towards higher proportions of people being insufficiently active, and increased levels of obesity.

Although there is a large body of existing food and nutrition data pertinent to reporting against the Australian dietary guidelines, key components of these data are not collected on an ongoing basis and many are no longer recent—in particular, measures relating to dietary intakes and biomedical risk factors. There are also gaps in data availability relevant to the dietary guidelines. This lack of recent data for some areas, along with the gaps in data collection, makes it difficult to monitor changes in nutrition, and in conjunction with this, to effectively evaluate the dietary guidelines as an important policy document.

The international measures presented in this report suggest that Australian reporting of food and nutrition data has thus far been largely comparable to that in a range of similar countries. However, the measures also serve to highlight gaps in Australian data collection and suggest potential new measures that could be used to inform Australian indicator development. In addition, collating international measures has emphasised the age and non-ongoing status of much of the Australian data, as many of the countries reviewed have in place systems for collecting nutrition-related data on an ongoing basis.

The evident limitations of currently available data, in conjunction with continuing nutrition concerns, highlight the need for nationally endorsed indicators for food and nutrition in Australia to guide data collection and reporting. These indicators would be an important part of a comprehensive framework for ongoing monitoring and surveillance of Australia's food and nutrition situation.

1 Introduction

The purpose of this report is to contribute to the development of a national food and nutrition monitoring system in Australia—in particular, to inform future data collection and the development of indicators. Through collating data relevant to the new Dietary Guidelines for Australian Adults (NHMRC 2003), this report highlights existing statistical measures that have been used to report on food and nutrition (for reference in indicator development) as well as gaps in data collection to date. The report also provides a comparison with existing food and nutrition measures and published data from a selected number of other countries.

1.1 Reporting against the Dietary Guidelines for Australian Adults

The National Health and Medical Research Council's Dietary Guidelines for Australian Adults (the dietary guidelines; see Box 1) are a key statement of Australia's policy goals and directions for supporting better nutritional outcomes for the population. The dietary guidelines focus on food consumption patterns and practices, and population nutritional status, and providing information on these areas has been highlighted as an essential component of a food and nutrition monitoring system (Lester 1994:272).

Box 1: Dietary guidelines for Australian adults

Enjoy a wide variety of nutritious foods

Eat plenty of vegetables, legumes and fruits

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

Include lean meat, fish, poultry and/or alternatives

Include milks, yoghurts, cheeses and/or alternatives: reduced fat varieties should be chosen, where possible

Drink plenty of water

and take care to:

Limit saturated fat and moderate total fat intake

Choose foods low in salt

Limit your alcohol intake if you choose to drink

Consume only moderate amounts of sugars and foods containing added sugars

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

Care for your food: prepare and store it safely

Encourage and support breastfeeding

Source: NHMRC 2003.

Statistical measures previously published as part of nutrition monitoring activities, both in Australia and overseas, are presented in this report (see Table 1). This list of measures is not intended to be a definitive set, but rather to highlight existing data, and gaps in data availability, in order to contribute to other action relating to food and nutrition monitoring. This report follows on from and expands on the set of statistical measures reported in *Key Food and Nutrition Data for Australia 1990–1999* (Marks et al. 2001a), which were aligned to the 1992 dietary guidelines (NHMRC 1992), and includes measures recommended by other reports as appropriate for monitoring nutrition in Australia (e.g. Gill et al. 2004, AIHW 2004a). The measures presented here are aligned to the revised dietary guidelines and incorporate relevant new data.

There are some divergences from the dietary guidelines in this report, which should be noted. First, no measures have been specifically included for the first guideline, 'Enjoy a wide variety of nutritious foods'. It has been presumed that the key measures relevant to food diversity are encompassed within those relating to other guidelines. Second, this report includes two other priority nutrition issues—food security and folate—which have been highlighted in other reports as important aspects to monitor (particularly, Marks et al. 2001a, SIGNAL 2001, Gill et al. 2004) and for which data are available.

1.2 Food and nutrition monitoring in Australia

This report is designed to facilitate the development of Australian indicators for food and nutrition and inform future nutrition-related data collection—processes that will require appropriate consultation as part of the creation of a national food and nutrition monitoring system. Work towards this goal is already underway: in 2005, the Australian Government, in conjunction with the Strategic Inter-Governmental Nutrition Alliance (SIGNAL), funded the development of a framework and business case for an ongoing monitoring system for food and nutrition, within a broader chronic disease monitoring framework (Masters et al. 2005). This report also draws on previous work relating to food and nutrition monitoring conducted by the Australian Food and Nutrition Monitoring Unit (AFNMU) and, prior to this, by the AIHW (e.g. Lester 1994).

This report focuses on the development of indicators for food and nutrition because of their importance in public health as a tool to monitor progress towards goals (Webb et al. 2001:xii). Instituting regular reporting against a consistent set of indicators would help minimise gaps in nutrition-related data collection and provide a framework for publishing and disseminating relevant data. In particular, the development of such indicators would provide data to inform nutrition-related interventions and monitor their impact.

Some countries with established indicators for monitoring food and nutrition include the European Union (EU), the United States of America (USA) and Canada. In particular, the provisional indicators developed for the EU as part of a government-funded project (Sjöström et al. 2003) provide a useful summary of comprehensive

indicators for public health nutrition. However, it should be noted that they cover broader issues than those in this report, which are focused on food supply, food intake and nutritional status (based on the dietary guidelines).

Data presented in the report

By compiling statistical measures that have been previously published, this report provides a summary of existing measures used to report on food and nutrition, as well as a status report for monitoring relevant to the dietary guidelines. As the report is structured around the Dietary Guidelines for Australian Adults, only data sources relating to adults have been included. In addition, while many states and territories are actively collecting data relevant to food and nutrition monitoring, e.g. through computer-assisted telephone interviewing (CATI), this report will focus on nutrition data collection at the national level.

The main national data sources relevant to nutrition monitoring in Australia, in relation to reporting against the dietary guidelines, are the 1995 National Nutrition Survey (NNS), apparent consumption data, and the ongoing National Health Survey (NHS). These data sources are diverse in nature, but the data collected are complementary. Data from the 1995 NNS focus on food intakes of the survey population, apparent consumption on the food available for consumption (i.e. the food supply) and the NHS has a section with short questions regarding usual intakes, food choice and food security. Additional data sources include the 1989 Risk Factor Prevalence Survey (RFPS), the 1999–2000 AusDiab Study, the 2000 National Physical Activity Survey (NPAS), the 2004 National Drug Strategy Household Survey (NDSHS) and the data collected through OzFoodNet. Details of national data sources have been outlined in Appendix 1.

1.3 International data

Relevant statistical measures for selected countries have been presented for each section to provide further information relevant to the development of indicators in Australia. The selected countries are New Zealand, Canada, Japan, France, the USA and the United Kingdom (UK). The measures presented are those relevant to the Australian dietary guidelines.

The countries reviewed were selected based on their general comparability to Australia. They are all countries of the Organisation for Economic Cooperation and Development (OECD), and criteria such as region, state of economic development, food supply and availability of data were considered in their selection. Details on the data sources for these countries are presented in Appendix 1. Published data for the measures outlined in the report are presented in Appendix 2, with the exception of those from the USA National Health and Nutrition Examination Survey (NHANES)[1]. These data are generally not directly comparable because of differences in definitions

[1] Data from the NHANES are available free of charge on the Internet.

and age groups, but have been presented for reference. The data presented were sourced by direct request and through the Internet, including from the World Health Organization website as part of the Global Infobase Surveillance of Risk Factors country profiles (WHO 2005). Every effort has been made to identify and present all relevant and freely available data.

Table 1: Measures included in the report

Dietary guideline	Measures	National data sources
Eat plenty of vegetables, legumes and fruits	Apparent per capita consumption of fruit	Apparent consumption data, annually to 1998–99
	Apparent per capita consumption of vegetables (including legumes)	Apparent consumption data, annually to 1998–99
	Average daily intake of fruit among adults	NNS, 1995
	Average daily intake of vegetables among adults	NNS, 1995
	Average daily intake of legumes among adults	NNS, 1995
	Proportion of adults usually consuming 4 serves or more of vegetables per day	NHS, 2001
	Proportion of adults usually consuming 2 serves or more of fruit per day	NHS, 2001
Eat plenty of cereals (including breads, rice, pasta and noodles), preferably wholegrain	Apparent per capita consumption of grain products (cereals)	Apparent consumption data, annually to 1998–99
	Average daily intake of cereals among adults	NNS, 1995
	Average daily intake of fibre among adults	NNS, 1995
Include lean meat, fish, poultry and/or alternatives	Apparent per capita consumption of meat and meat products, poultry, seafood, nuts and eggs	Apparent consumption data, annually to 1998–99
	Average intakes of meat and meat dishes, fish, poultry and alternatives among adults	NNS, 1995
	Apparent per capita consumption of iron	Apparent consumption data, annually to 1997–98
	Average iron intake among adults	NNS, 1995
	Proportion of adults with iron deficiency	NRFPS, 1989
Include milks, yoghurts, cheeses and/or alternatives	Apparent per capita consumption of milk and milk products	Apparent consumption data, annually to 1998–99
	Average intakes of milk products and dishes among adults	NNS, 1995
	Apparent per capita consumption of calcium	Apparent consumption data, annually to 1997–98
	Average calcium intake among adults	NNS, 1995
Drink plenty of water	Average daily intakes: total moisture and non-alcoholic fluids among adults	NNS, 1995
Limit saturated fat and moderate total fat intake	Proportion of people consuming whole cow's milk	NHS, 2001
	Average daily intake of fat	NNS, 1995
	Average contribution of total fat as a proportion of energy intake	NNS, 1995
	Average contribution of saturated fat as a proportion of energy intake	NNS, 1995

(continued)

Table 1 (continued): Measures included in the report

Dietary guideline	Measures	National data sources
Choose foods low in salt	Proportion of people who regularly add salt to food after it is cooked	NHS, 2001
Limit your alcohol intake if you choose to drink	Apparent per capita consumption of alcohol	Apparent consumption data, annual
	Average daily alcohol intake among adults	NNS, 1995
	Proportion of adults who consume alcohol at risky or high-risk levels	NDSHS, 2004
Consume only moderate amounts of sugars and foods containing added sugars	Apparent per capita consumption of sugars	Apparent consumption data, annually to 1998–99
	Average daily sugar intake among adults	NNS, 1995
	Proportion of total energy intake from sugars	NNS, 1995
Prevent weight gain: be physically active and eat according to your energy needs	Average energy intake among adults	NNS, 1995
	Average ratio of energy intake to basal metabolic rate for adults	NNS, 1995
	Proportion of adults who are insufficiently active	NPAS, 2000
	Proportion of adults who are overweight or obese (BMI)	AusDiab, 1999–2000
	Proportion of adults who are abdominally obese (waist circumference)	AusDiab, 1999–2000
Care for your food: prepare and store it safely	Notification of foodborne illness received by Australian health authorities for selected foods	OzFoodNet, 2003
	Notification of foodborne illness received by Australian health authorities, by setting where the outbreak occurred	OzFoodNet, 2003
Encourage and support breastfeeding	Per cent ever breastfed	NHS, 2001
	Per cent breastfeeding at 6 and 12 months of age	NHS, 2001
	Per cent fully breastfeeding at 3 and 6 months of age	NHS, 2001
Other nutritional issues: food security	Proportion of people who ran out of food and did not have enough money to buy more in the last 12 months	NHS, 2001
Other nutritional issues: folate	Apparent per capita consumption of folate	Apparent consumption data, annually to 1997–98
	Proportion of women of child-bearing age (18–49 years of age) who intentionally use folate-fortified foods, drinks or supplements	NHS, 2001
	Average folate intake among adults	NNS, 1995

AusDiab Australian Diabetes, Obesity and Lifestyle Study
NHS National Health Survey
NNS National Nutrition Survey
NDSHS National Drug Strategy Household Survey
NPAS National Physical Activity Survey
RFPS Risk Factor Prevalence Survey

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.

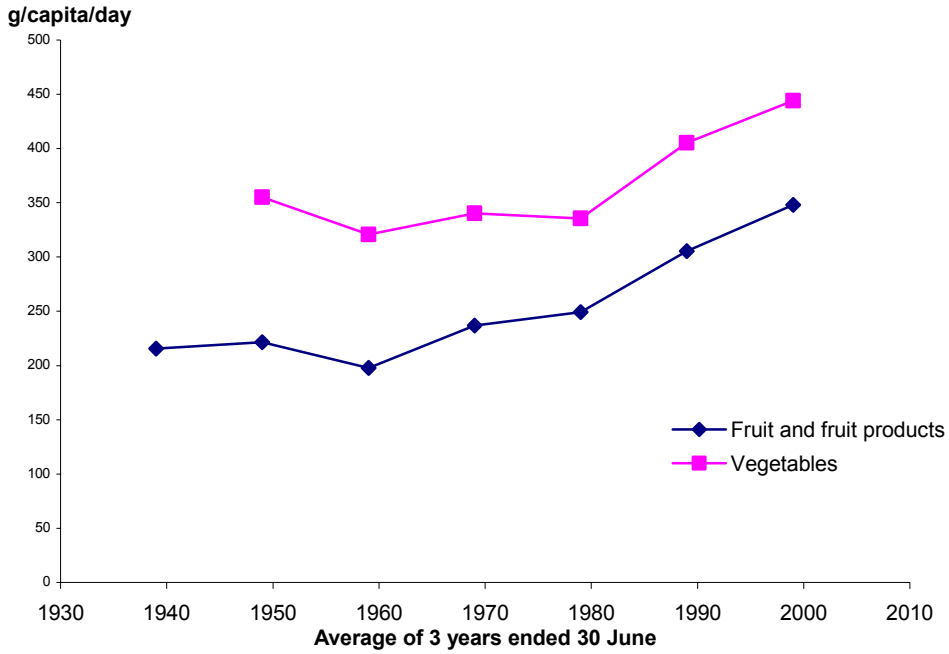
Existing measures for this guideline relate to the availability of these products in the Australian food supply (apparent consumption data) and population intake of these products, including average daily intakes and usual intakes. Intake of legumes is also included with intake of meat and meat alternatives,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



Notes

1. 'Fruit and fruit products' includes processed fruit.
2. 'Vegetables' includes processed vegetables & legumes.

Source: ABS 2000.

Figure 1: Apparent per capita consumption of fruit and vegetables (including legumes), average of 3 years ended 1938–39 to 1998–99

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
Canada	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.

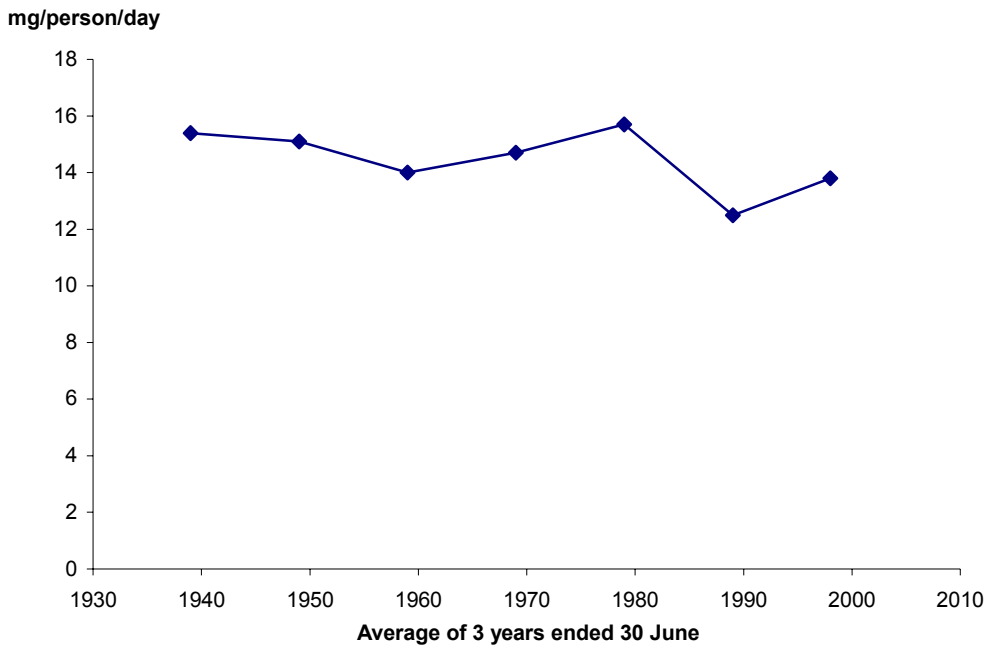
Source: ABS & DHAC 1999.

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.



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

Source: AIHW: Field et al. 2003.

Figure 2: Apparent per capita consumption of iron, average of 3 years ended 1938–39 to 1997–98

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	Apparent consumption of meat, poultry, seafood, nuts and eggs
		1997–98	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, port, 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

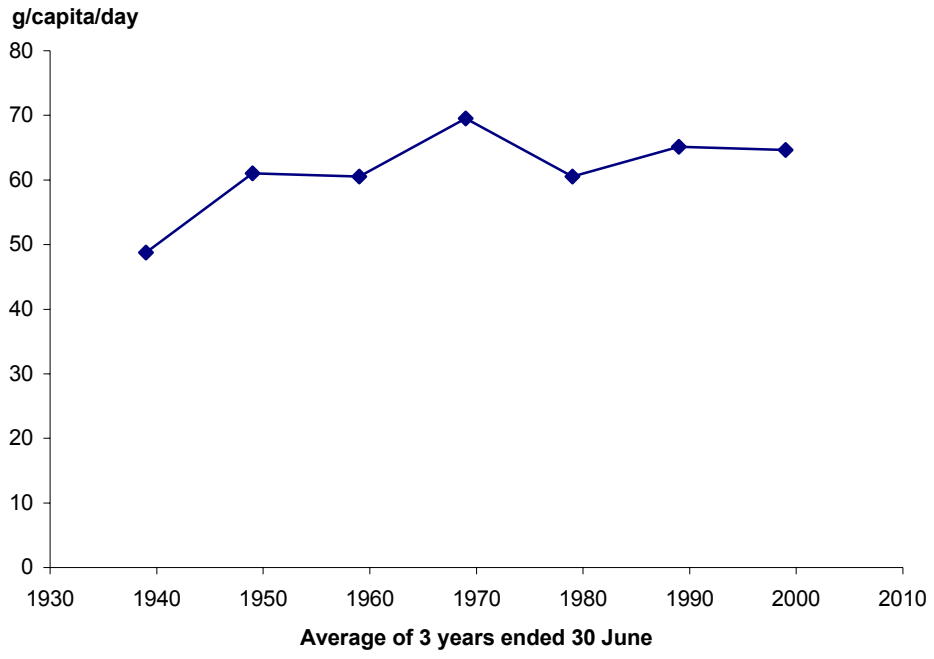
(a) Prior to 1978–79 known as fluid whole milk.

(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.

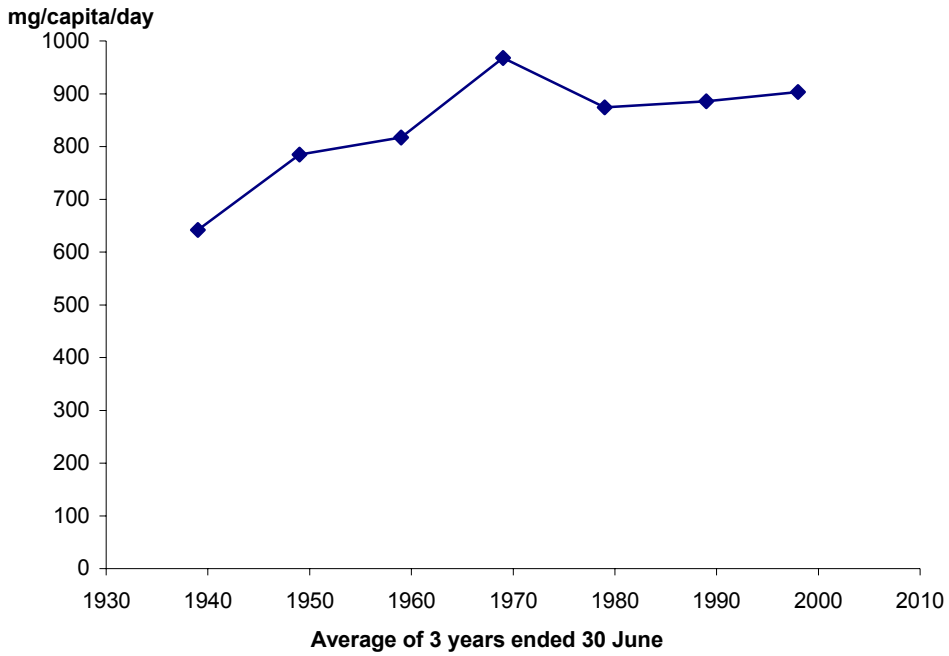
Compared to 1983 NNS, intakes of milk products and dishes appear to have remained the same for men, but declined for women from 260 g to 245 g per day (Cook et al. 2001a:72)

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).



Note: Apparent consumption of yoghurt and ice-cream is not included in the data collection so nutrient intake for dairy products will be underestimated.

Source: AIHW: Field et al. 2003.

Figure 4: Apparent per capita consumption of calcium, average of 3 years ended 1938–39 to 1997–98

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
Canada	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.

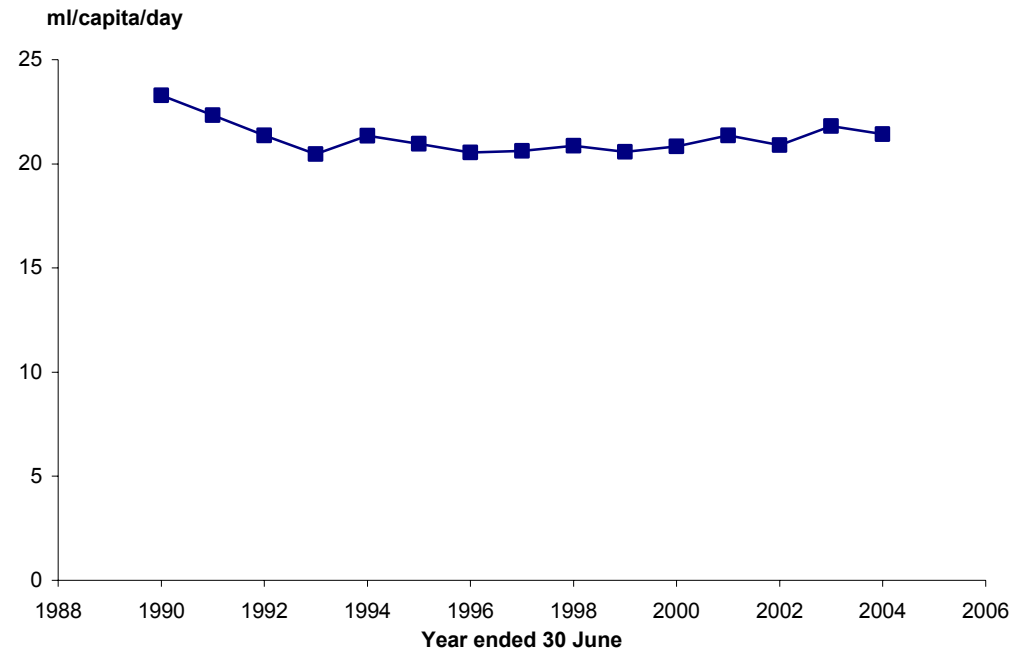
[2] This guideline is for people who do not undertake activities that involve risk or a degree of skill.

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).



Notes

1. From 1989–90 onwards, data for beer have been compiled on the basis of excise data and are therefore not comparable to that published for previous years.
2. Data from 1999–2000 onwards have been calculated from data published in ABS (2005), using population figures given in explanatory notes.
3. Mid-strength and full-strength excise data have been adjusted by the ABS to account for reporting errors in beer strength classification.
4. Data for beer available for consumption in 2004 may not be directly comparable with previous years data, because from 2003–04 onwards excise data have been obtained from the Australian Taxation Office rather than the Australian Custom Service as in previous years.

Source: ABS 2005.

Figure 5: Apparent per capita consumption of alcohol (ethanol), 1989–90 to 2003–04

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).

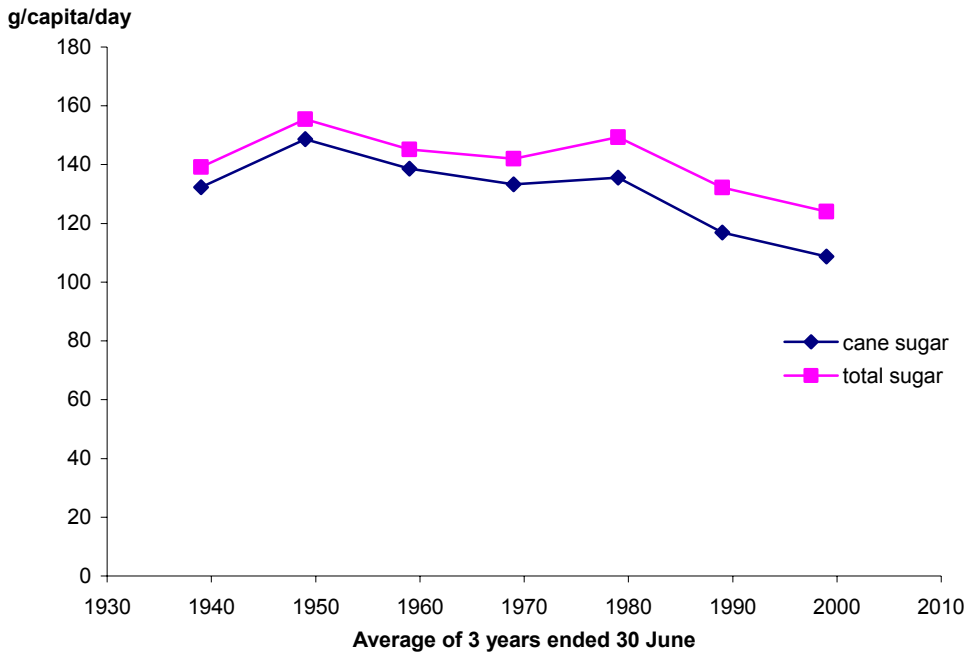
Key indicators for this guideline, for which there are available data, relate to sugar supply (apparent consumption) and sugar intake (including the proportion of energy intake from sugars).

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.



Source: ABS 2000.

Figure 6: Apparent per capita consumption of sugars, average of 3 years ended 1938–39 to 1998–99

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
Proportion of children receiving any breastmilk at age:	Per cent
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: • 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: • 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).

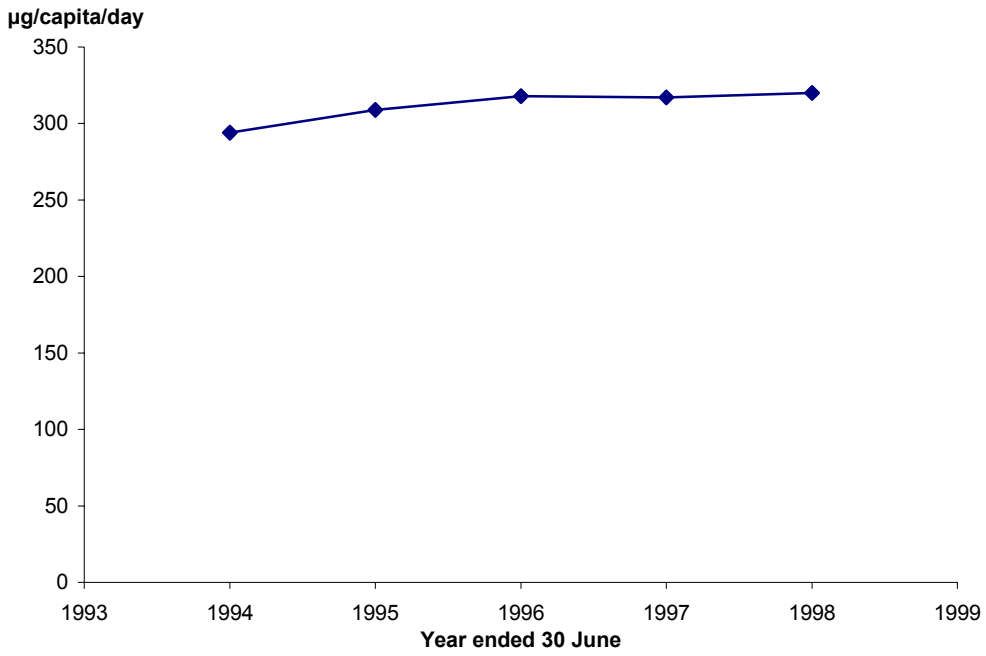
Key indicators, for which there are available data, are folate intake and use of folate supplements and folate-fortified products.

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).



Note: Adjustments have been made for the loss of nutrients in cooking.

Source: AIHW: Field et al. 2003.

Figure 7: Apparent per capita consumption of folate, 1993–94 to 1997–98

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

3 Discussion

There is a large body of data pertinent to food and nutrition available in Australia, and by reporting against the dietary guidelines this publication has highlighted existing measures and data relevant to food intakes, the food supply and food choices. The key data sources are the 1995 NNS, the ongoing NHS, apparent consumption data (last published 1998–99, other than for alcohol), and the 1989 RFPS.

The published data reviewed here provide a status report regarding the nutrition of Australians as a follow-up to the data presented by Marks et al. (2001a), including the more recent data provided by the 2001 NHS, the 2000 National Physical Activity Survey, the 2004 National Drug Strategy Household Survey, the 1999–2000 AusDiab Survey and the OzFoodNet surveillance network. It is evident from these data relevant to the dietary guidelines that there are still important nutritional issues to be addressed in Australia. Although there were a higher proportion of adults in 2001 than in 1995 who reported usually consuming two serves of fruit and four serves of vegetables per day, more than 50% of people did not report meeting these minimum recommendations. In addition, data suggest a trend towards higher proportions of people being insufficiently active and indicate increased levels of obesity. In relation to food, there has been an increase in the number of foodborne illnesses reported during the past 10 years and no reported improvement in levels of food insufficiency between 1995 and 2001. Other areas of concern include fewer women of child-bearing age reporting that they take supplements for folate in 2001 compared to 1995 and the lack of reported improvements in breastfeeding rates between 1995 and 2001.

In addition, it is evident that key components of data relevant to food and nutrition monitoring in Australia are not collected on an ongoing basis and are no longer recent—in particular, the data relating to dietary intakes (1995) and biomedical risk factors (1989). As a result, it is difficult to determine current trends or areas of concern relating to these matters. Some gaps in data availability relevant to the dietary guidelines are also evident. For example, in the context of the guideline, 'choose foods low in salt', there are no data available regarding actual intakes of sodium or food-choice patterns in relation to low-salt foods. In addition, it is apparent that some data collected are not published. For example, the AusDiab survey asked questions on knowledge of consumption requirements for a healthy diet, which have not been published. Analysis of such data would help to assess public knowledge of dietary guidelines and recommendations. This lack of recent data for some key areas, along with the gaps and inconsistencies, make it difficult to monitor changes in nutrition in Australia and to effectively evaluate the dietary guidelines as a key policy document.

The international measures presented suggest that existing Australian measures relating to food and nutrition are largely comparable to those in a range of similar other countries. In some cases, such as for breastfeeding data and consumption of alcohol, Australian reporting is comparatively recent and comprehensive. However,

the international indicators have also served to highlight additional measures that might enhance Australian food and nutrition monitoring relevant to the dietary guidelines, as noted in the previous sections. For example, some countries have collected extensive data for indicators regarding food insecurity, rather than just food insufficiency. Similarly, the biomedical component of the USA NHANES adds substantially to data regarding iron deficiency, bone density (which is related to sufficient calcium intakes) and folate status, all of which are important public health concerns. Measures relating to blood folate levels were also reported from the UK NDNS, along with blood measures of other vitamins, including vitamin C, vitamin B12, thiamin (B1), riboflavin (B2), vitamin D, vitamin E, and retinol and carotenoids (indicative of vitamin A).

In addition, questions about barriers to diet change were published by New Zealand from their 1997 NNS, including difficulties in eating more fruit and vegetables, or decreasing fat intake. New Zealand also reported the proportion of adults who remove fat from their meat. These measures appear to be relevant to the dietary guidelines, as they are concerned with facilitating appropriate changes to diet where necessary. Such additional measures are noted in this report for consideration in the development of food and nutrition indicators for Australia.

Comparison with international measures also highlighted the age and non-ongoing status of much of the Australian data. Many of the countries have in place systems for collecting nutrition-related data on an ongoing basis—notably, Japan and the USA, which conduct yearly food and nutrition surveys—whereas much of the Australian data is now around 10 years old.

The limitations of existing measures for food and nutrition monitoring in Australia discussed above, in conjunction with the evident continuing nutrition concerns, highlight the need for nationally endorsed indicators as part of an ongoing food and nutrition monitoring and surveillance system. Regular reporting against a consistent set of indicators would help to minimise data gaps and ensure that all relevant data collected were published and disseminated.

This report has only presented existing statistical measures relevant to the Dietary Guidelines for Australian Adults. However, it would be beneficial to invest in research into technical specifications for 'ideal' (i.e. not solely based on existing data collection) food and nutrition indicators for Australia, in conjunction with the ongoing work towards the development of a monitoring system. To develop these indicators, it would be essential to look at indicators outside the dietary guidelines, although they are an important place to start. The broad-ranging food and nutrition indicators proposed for the EU may provide a useful guideline. For example, additional indicators proposed include environmental factors (such as policy and nutrition interventions), nutrition-related inequalities, and genetic factors and interactions (Sjöström et al. 2003). More investigation is also needed into the development of indicators and data sources relating to the nutrition of children, older adults and special population groups.

4 Conclusion

This report has collated existing measures and data relevant for reporting against the Dietary Guidelines for Australian Adults. Although there is a large body of data relevant to food and nutrition monitoring available for Australia, there is a lack of both recent and ongoing data for key areas. In particular, data regarding dietary intakes have not been collected since 1995, and there are no recent data for biochemical measures, such as blood iron and folate status.

The international measures reviewed indicate that existing Australian measures for food and nutrition are generally consistent with those elsewhere. However, some additional indicators were highlighted, which could be considered for future data collection, e.g. more comprehensive assessment and monitoring of food security and biochemical factors. The regular collection of nutrition-related data in other countries also emphasised the age and non-ongoing status of much of the Australian data.

In light of ongoing nutrition concerns and gaps in existing data collection, this report highlights the need for the development of Australian indicators for food and nutrition monitoring. These would be an important part of a comprehensive framework for data collection and reporting, within an ongoing system of monitoring and surveillance. They would also provide a useful reference for future survey development by indicating potential survey components and providing a consistent standard for data collection. As such, these indicators would be useful in assessing changes in population nutrition and in the evaluation of nutrition-related interventions and policies.

Appendix 1—data sources

National data sources

Apparent consumption of foodstuffs and nutrients

Apparent consumption data are a measure of the food supply available for human consumption after allowing for other uses and losses. These data are not a direct measure of food intake. Apparent consumption is estimated through calculating total production and imports (including commercial production, estimated home production, imports and opening stocks) and subtracting exports, usage for processed foods, non-food use, wastage and closing stocks. As a result, the data are for 'food available for consumption' which is not the same as food consumed. Because the calculated values are averages of per capita availability of the food supply for the population as a whole, they give no information on the food consumption of individuals or groups of individuals within the population. However, they are useful for highlighting trends and changes in food availability.

The most recent Australian apparent consumption data (other than for alcohol) is for 1998–99 (foodstuffs) and 1997–98 (nutrients). For further details, see *Apparent Consumption of Foodstuffs 1997–98 and 1998–99* (ABS 2000) and *Apparent Consumption of Nutrients* (AIHW: Field et al. 2003). The average of the 3 years ended 1998–99 (1997–98 for nutrients) were calculated using published per capita data— for previous decades, the average of the last 3 years has been published by the ABS.

Data in Australian and international publications are usually shown as kilograms per capita per year; for this report, grams per capita per day were derived by multiplying these data by 1,000 and dividing by 365 (or 366, in the case of a leap year). Conversion factors for pounds and gallons were used as appropriate for data from the USA.

Apparent consumption data are also compiled for Australia by the FAO (as 'food balance sheet' data) using their own methodology and are available on the FAO website (FAO 2005a).

Australian Diabetes, Obesity and Lifestyle (AusDiab) Study, 1999–2000

The AusDiab study, conducted by the International Diabetes Institute, was designed to provide estimates of the prevalence of diagnosed and undiagnosed diabetes and self-reported chronic conditions such as heart disease and high blood pressure. It also provided national measurements of blood pressure, blood lipids, blood glucose, body fat, height and weight, and waist and hip circumference, as well as self-reported information on diet, smoking, alcohol consumption, physical activity, and general health and wellbeing. The study collected information in urban and non-urban areas in all states and the Northern Territory and sampled more than 20,000

people aged 25 years and above, of whom more than 11,000 underwent a physical examination.

In relation to nutrition, the AusDiab study collected information on body mass and knowledge of dietary requirements. A food frequency questionnaire was also administered, but was not analysed for this report.

National Drug Strategy Household Survey (NDSHS), 2004

The NDSHS includes data on Australians aged 12 years and older. The 2004 survey was the eighth survey in a series that began in 1985. Respondents were asked about their knowledge of drugs, attitudes towards drugs, drug consumption histories and related behaviours.

Data on alcohol use (people aged 14 years and over) were used for this report.

National Health Survey (NHS), 2001

The 2001 NHS, one in a series of surveys conducted by the ABS, was designed to obtain national information on the health status of Australians, their use of health services and facilities, and health-related aspects of their lifestyle. The survey collected information from a sample of 26,900 people from February to November 2001.

The 2001 NHS included short questions on usual fruit and vegetable consumption. These data provide a valid estimate of different intakes (e.g. among those who reported two to three serves compared with those who reported four or more serves) but are not indicative of the average daily quantity of fruit and vegetables consumed. For example, it has been seen that the average intake of vegetables was less than 300 g per day (where a serve is equal to 75 g) among those who reported usually consuming four or more serves per day (Marks et al. 2001b). The short questions, however, provide valuable trend data in the interim years between the more detailed dietary surveys.

Data on breastfeeding were also collected in the 2001 NHS. This data collection relates to current (rather than retrospective) breastfeeding practices for children aged 3 years or less, which is recommended by WHO (2002).

National Nutrition Survey (NNS), 1995

The NNS, conducted by the ABS and the Commonwealth Department of Health, was the first nationally representative Australian survey of food and nutrient intake, dietary habits and body measurements. The survey collected information from a subsample of respondents from the 1995 NHS, approximately 13,800 people from urban and rural areas of Australia. The NNS was conducted over a 13-month period from February 1995 to March 1996 (McLennan & Podger 1998).

The NNS included a detailed 24-hour dietary recall (which provided a valid estimate of mean population food and nutrient intakes), questions on food habits and attitudes, and a food frequency questionnaire. In addition, blood pressure (of those

aged 16 years and over), height, weight, and waist and hip circumferences were measured by trained interviewers.

National Physical Activity Survey (NPAS), 2000

The 2000 NPAS was conducted to assess physical activity patterns and knowledge of the benefits of physical activity among adult Australians after the Olympics in Sydney (September 2000). The survey collected information from a national sample of 3,590 people aged 18–75 years during November and December 2000. This survey followed on from the 1997 Active Australia Baseline Survey and 1999 National Physical Activity Survey.

National Heart Foundation Risk Factor Prevalence Survey (RFPS), 1989

The Risk Factor Prevalence surveys (1980, 1983 and 1989), a series of surveys conducted by the National Heart Foundation of Australia, were designed to obtain national information on biomedical and behavioural risk factors in Australia and to monitor trends over time. The 1989 study collected a range of information, including data on iron status, from a sample of around 9,000 adults living in capital cities of Australia between May/June and December of the survey year.

OzFoodNet

The Australian Government Department of Health and Ageing established the OzFoodNet network in 2000 to collaborate nationally in investigating foodborne disease. OzFoodNet conducts studies on the burden of illness and coordinates national investigations into outbreaks of foodborne disease.

OzFoodNet reports quarterly on investigations of gastroenteritis outbreaks and clusters of disease potentially related to food. Annual reports have been produced and published in *Communicable Diseases Intelligence* since 2001—most recently for 2004 (OzFoodNet Working Group 2005). Data are reported from all Australian jurisdictions.

International data sources

All countries

The Surveillance of Risk Factors report (SuRF 2)

Compiled by the World Health Organization, *WHO Global Infobase: SuRF Country Profiles* (WHO 2005) present available prevalence data on non-communicable disease risk factors at the country level for a number of member states of the WHO.

Country profiles are available from:

<http://www.who.int/ncd_surveillance/infobase/web//surf2/country_list.html>

(viewed 13 July 2005).

Food and Agriculture Organization (FAO) food balance sheets

Compiled by the FAO for a wide range of countries and country groups, the FAO food balance sheets (FAO 2005a) present data on food supply and utilisation, by year.

Data are available from:

<http://faostat.fao.org/faostat/form?collection=FBS&Domain=FBS&servlet=1&hasbulk=0&version=ext&language=EN>

(viewed 13 July 2005).

New Zealand

Table A1.1: National data sources—New Zealand

National data sources	Most recent	Details
National Health Survey (Ministry of Health 2004) <http://www.moh.govt.nz/moh.nsf/0/3D15E13BFE803073CC256EEB0073CFE6/$File/aportraitofhealth.pdf> Information on the survey is also available via the WHO NCD Infobase.	2002–04	Cross-sectional, regular national health survey (household); physical measurements People aged 15 years and over
National Nutrition Survey (Ministry of Health 1999) <http://www.moh.govt.nz/moh.nsf/0/8f1dbeb1e0e1c70c4c2567d80009b770/$FILE/nns.pdf> Information on the survey is also available via the WHO NCD Infobase.	1997	Cross-sectional, one-time national survey (household); physical measurements, 24-hour recall People aged 15 years and over

(continued)

Table A1.1 (continued): National data sources—New Zealand

National data sources	Most recent	Details
Annual outbreak summary (Public Health Surveillance 2004) <http://www.surv.esr.cri.nz/surveillance/annual_outbreak.php?we_objectID=297>	2003	These reports summarise the results of outbreak surveillance coordinated by the Institute of Environmental Science and Research Ltd (ESR) under contract with the Ministry of Health (MoH). See also, Microbiological Risk Profiles (NZFSA 2005): summary of severity, incidence, common vehicles for foodborne pathogens. Available at: <http://www.nzfsa.govt.nz/science-technology/risk-profiles/index.htm>
Breastfeeding Data—Plunket Operational National Database (Royal New Zealand Plunket Society 2004) Free data available at: <http://www.plunket.org.nz/Other_Information_Page.htm>	2003–04	Data now purchased by the Ministry of Health from the Plunket Society (Ministry of Health 2003) e.g. statistics from *Breastfeeding: A guide for action* 2002 at: <http://www.moh.govt.nz/moh.nsf/0/b2c10ff5e960e1edcc256dc10077c608?OpenDocument>

Canada

Table A1.2: National data sources—Canada

National data sources	Most recent	Details
Canadian Community Health Survey (Statistics Canada 2005a) <http://www.statcan.ca/english/concepts/health/index.htm> Information on the survey is also available via the WHO NCD Infobase	2003	Regular national health survey (household), self-administered questionnaire People aged 12 years and over
Canadian Community Health Survey Cycle 2.2—Nutrition Focus Survey (Statistics Canada 2005b) Data/publications at: <http://www.statcan.ca/cgi-bin/downpub/listpub.cgi?catno=82-620-MIE>	2004	Regular national health survey (household), physical measurements People aged 12 years and over
Canadian Addiction Survey (Health Canada 2005) Detailed report (2005) available at: <http://www.ccsa.ca/pdf/ccsa-004028-2005.pdf>	2004	National telephone survey (household) People aged 15 years and over
Apparent consumption data (Statistics Canada 2005c) <http://www40.statcan.ca/l01/cst01/famil102a.htm>	2004	Per capita consumption of major food groups These data represent food available for consumption and not actual quantities of food consumed since they do not allow for losses such as waste and/or spoilage in stores, households, private institutions or restaurants.
National Population Health Survey (food insecurity supplement questionnaire) (Rainville & Brink 2001) Questionnaires at: <http://www.statcan.ca/english/concepts/nphs/nphs1.htm> Published findings at: <http://dsp-psd.pwgsc.gc.ca/Collection/MP32-29-01-2E.pdf>	1998–99	Longitudinal survey on current state of health and health care needs (same respondents have been interviewed every two years for the last 10 years) Data for adults (18 years and over) presented in this report

France

Table A1.3: National data sources—France

National data sources	Most recent	Details
French national dietary survey (Volatier & Verger 1999) Information on the survey is also available via the WHO NCD Infobase.	1993–94	Regular national health survey, self-administered questionnaire (household) Adults aged 18 years and over
Physical Activity Levels and Body Weight in a Nationally Representative Sample in the European Union (Vaz de Almeida et al. 1999) Data are also available from WHO (2005).	1997	National, both urban and rural populations, France People aged 15 years and over

Japan

Table A1.4: National data sources—Japan

National data sources	Most recent	Details
National Nutrition Survey (Statistics Bureau 2005) Published in *Japan Statistical Yearbook*, Table 21-1: <http://www.stat.go.jp/english/data/nenkan/1431-21.htm> Data are also available from WHO (2005)	2002	Cross-sectional, annual national health survey (household); physical measurements Adults aged 20 years and over
Supply and demand of food (food balance sheet) (Statistics Bureau 2005) Published in *Japan Statistical Yearbook*, Table 7-60: <http://www.stat.go.jp/english/data/nenkan/1431-07.htm>	2002	Supplies of net food per capita, 1985–2002

United Kingdom

Table A1.5: National data sources—United Kingdom

National data sources	Most recent	Details
The National Diet and Nutrition Survey (National Statistics 2004a) Products available from: <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=9761> Data are also available from WHO (2005)	2000–01	Cross-sectional, regular national health survey (household): physical measurements; 7-day dietary records; 7-day physical activity records; 24-hour urine collection Adults aged 19–64 years
Expenditure and Food Survey (National Statistics 2004b) Report at: <http://statistics.defra.gov.uk/esg/publications/efs/2003/familyfood.pdf>	2002–03	Estimates of average consumption, expenditure and energy and nutrient intakes from food and drink (eaten in household and out). Current estimates do not include free food (may be in future reports). Participants aged 7 years and over complete a diary. For the purposes of this report, this will be considered with apparent consumption data, as data refer to food purchased, rather than that actually consumed by respondents.

(continued)

Table A1.5 (continued): National data sources—United Kingdom

National data sources	Most recent	Details
Infant Feeding Survey (Hamlyn et al. 2002) Report at: <http://www.dh.gov.uk/assetRoot/04/05/97/63/04059763.pdf>	2000	Based on national sample of births, questionnaires sent out when babies aged 4–10 weeks, 4–5 months, and 8–9 months.
Foodborne disease strategy (Advisory Committee on the Microbiological Safety of Food 2004) <http://www.food.gov.uk/multimedia/pdfs/acm719.pdf#page=3>	2003	Information paper ACM/719: *FSA Foodborne Disease Strategy. Trends in Foodborne Disease: Figures*.

United States of America

Table A1.6: National data sources—United States of America

National data sources	Most recent	Details
National Health and Nutrition Examination Survey (NHANES) (National Center for Health Statistics 2005) Data files at: <http://www.cdc.gov/nchs/about/major/nhanes/nhanes01-02.htm> Published data are available from WHO (2005) and other sources cited.	2001–02	Cross-sectional, regular national household survey: physical measurements, biochemical measures Adults aged 20 years and over (Published data presented where possible; otherwise available survey data highlighted—available free on the Internet)
Behavioural Risk Factor Surveillance System (National Center for Chronic Disease Prevention and Health Promotion 2005) <http://apps.nccd.cdc.gov/brfss/> Data are also available from WHO (2005).	2003	Cross-sectional, continuous telephone health survey (household) Adults aged 20 years and over
National Health Interview Survey (Lethbridge-Çejku & Vickerie 2005)	2003	Cross-sectional continuous household survey; personal interview Information collected from people 17 years and over (information also requested regarding children)
Foodborne Disease Outbreak Surveillance System (Foodborne Outbreak Response and Surveillance Unit 2005) Report at: <http://www.cdc.gov/foodborneoutbreaks/us_outb/fbo2003/summary03.htm>	2003	Foodborne disease outbreaks reported to the Center for Disease Control and Prevention (CDC) by state epidemiologists using the Electronic Foodborne Outbreak Reporting System through (EFORS)
Current Population Survey—Food Security Supplement (Nord et al. 2005) Report at: <http://www.ers.usda.gov/Briefing/FoodSecurity/trends/>	2004	Annual household survey Information collected on household as a whole
National Survey of Family Growth (National Center for Health Statistics 2004)	1995	Personal interview survey Women aged 15–44 years
Food and nutrient availability data (Economic Research Service 2005) <http://www.ers.usda.gov/data/foodconsumption/FoodAvailIndex.htm>	2003	ERS annually calculates the amounts of several hundred foods available for human consumption in the United States; also called 'food supply' or 'food disappearance' data.

Appendix 2—international data

In this section, the published measures referred to in the report for Australia, New Zealand, Canada, France, Japan, the UK and the USA are presented with data. Care should be taken in comparing these data, as there may be differences in the way the indicators are structured—for example, in collection methods, age of respondents, combinations or groupings of foods, or portion sizes. It should also be noted that numbers have been rounded to the nearest integer. For information about data sources, see Appendix 1.

Vegetables, legumes and fruits

Table A2.1: Apparent consumption of fruit and vegetables

Existing measures (by country)	Apparent consumption
Australia, 1998–99	**g/capita/day**
Fruit and fruit products[(a)]	370
Vegetables[(b)]	444
Source: ABS (2000).	
Canada, 2001	
Total fruit	365
Total vegetables, including potatoes	489
Source: Statistics Canada (2005c).	
Japan, 2002	
Fruit	115
Vegetables	265
Sweet potatoes	12
Irish potatoes	42
Source: Statistics Bureau (2005), Table 7-60.	
United States, 2003	
Total fruit	342
Total vegetables (including pulses)	518
Source: Economic Research Service (2005a).	
United Kingdom, 2002–03	
Household apparent consumption of fruit	172
Household apparent consumption of vegetables (excluding potatoes)	157
Source: UK Expenditure and Food Survey (National Statistics (2004b), Table 1.2).	

(a) Includes jams, dried fruit and processed fruit.

(b) Includes processed vegetables and legumes.

Note: Converted (where applicable) to g/capita/day from published figures.

Table A2.2: Average intakes of fruit and vegetables

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average intake of fruit products and dishes among adults	141	146
Average intake of vegetable products and dishes among adults (including legumes and potatoes)	296	242
Average intake of fruit and vegetable juices and drinks	139.5	109.4
Source: National Nutrition Survey (ABS & DHAC 1999).		
Japan, 2002		
Average intake of fruit, all ages	110	137
Average intake of vegetables, all ages	277	264
Source: WHO (2005).		
Average intake of pulses among adults aged 20 years or more[#]	59	
Source: National Nutrition Survey (Statistics Bureau 2005), Table 21-1.		
France, 1993–94		
Average intake of fruit among adults aged 18 years or more	189	184
Average intake of vegetables among adults aged 18 years or more	93	109
Source: Volatier and Verger (1999).		
United Kingdom, 2000–01		
Average intake of fruit (excluding fruit juice)[(a)]	87	103
Average intake of vegetables and vegetable dishes (excluding potatoes)[(a)]	137	132
Average daily number of portions of fruit consumed (including composite dishes)[(b)(c)]	*1.3*	*1.4*
Average daily number of portions of vegetables consumed (including composite dishes)[(b)(d)]	*1.4*	*1.4*
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Tables 2.1 (vol. 5) and 2.15 (vol. 1)).		

Data available for 'persons' only.

(a) Mean intakes for 7 day reporting period were divided by 7 to give g/day.

(b) Portion is defined as 80g.

(c) All fruit juice counted as one portion.

(d) All baked beans and other pulses counted as one portion.

Table A2.3: Usual consumption of fruit and vegetables

Existing measures (by country)	Males	Females
Australia, 2001	**Per cent**	
Proportion of people (19 years and over) usually consuming 2 or more serves of fruit per day[(a)]	27	34
Proportion of people (19 years and over) usually consuming 4 or more serves of vegetables per day[(b)]	47	58
Source: AIHW analysis of the 2001 National Health Survey, age standardised to the 2001 Australian population.		
New Zealand, 2002–03		
Proportion of people (15 years and over) usually consuming 2 or more serves of fruit per day[(c)]	44	64
Proportion of people (15 years and over) usually consuming 3 or more serves of vegetables per day[(c)]	65	72
Source: National Health Survey (Ministry of Health (2004), Tables 11 and 12).		
Canada, 2003		
Proportion of people (12 years and over) consuming fruit and vegetables less than 5 times per day[(c)]	61	49
Source: Canadian Community Health Survey (Statistics Canada 2005a).		
United Kingdom (England), 2003		
Proportion of adults (19–64 years) consuming 5 portions or more of fruit and vegetables per day[(d)]	22	26
Source: Health Survey for England (National Statistics 2003:76).		
United Kingdom, 2000–01		
Proportion of adults (19–64 years) consuming 5 or more portions of fruit and vegetables per day[(e)]	13	15
Source: The National Diet and Nutrition Survey (National Statistics (2004a), vol. 1:18).		
United States, 2003		
Proportion of adults (20 years and over) consuming less than 5 serves of fruit and vegetables per day[(c)]	82	72
Source: Behavioural Risk Factor Surveillance System (WHO 2005).		

(a) One serve of fruit is 150 g. Based on self-reported data on average intakes.

(b) One serve of vegetables is 75 g. Based on self-reported data on average intakes.

(c) Based on self-reported data on average intakes.

(d) Portion is defined as 80 g. Based on data from a 24-hour recall.

(e) Portion is defined as 80 g. Based on data from a 7-day dietary record.

Cereals

Table A2.4: Apparent consumption of cereals

Existing measures (by country)	Apparent consumption
Australia, 1998–99	**g/capita/day**
Wheaten flour	191
Breakfast foods	22
Table rice	20
Bread	146
Source: ABS 2000.	
Canada, 2004	
Cereal products (retail weight)	250
Source: Statistics Canada (2005c).	
Japan, 2002	
Rice	172
Wheat	87
Barley	1
Miscellaneous cereals	3
Source: Statistics Bureau (2005), Table 7-60.	
United Kingdom, 2002–03	
Household apparent consumption of total cereals including bread	238
Average household apparent consumption of fibre	14
Source: UK Expenditure and Food Survey (National Statistics (2004b), Tables 1.5, 1.3).	
United States, 2003	
Total flour and cereal products (including grains)	241
Source: Economic Research Service (2005a).	

Note: Converted (where applicable) to g/capita/day from published figures.

Table A2.5: Average intakes of cereals

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average intake of cereals and cereal products[(a)]	250	181
Average intake of cereal-based products and dishes[(a)]	154	100
Source: National Nutrition Survey (ABS & DHAC 1999).		
Japan, 2002		
Average intake of cereals[#]	461	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2001–02		
Average intake of:[(b)]		
Pasta, rice and other miscellaneous cereals	84	62
Bread	122	81
Breakfast cereals	32	27
Source: National Diet and Nutrition Survey (National Statistics (2004a), Table 2.1 (vol. 5)).		

Data available for 'persons' only.

(a) '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).

(b) Mean intakes for 7 day reporting period were divided by 7 to give g/day.

Table A2.6: Usual consumption of cereals

Existing measures (by country)	Males	Females
Australia, 1995	**Per cent**	
Proportion meeting core food group targets (7 servings/day)	34	21
Source: National Nutrition Survey (NHMRC 2003:33).		
New Zealand, 1997		
Proportion meeting guideline of 6 or more servings per day	28	9
Proportion usually consuming:		
less than 4 servings of cereals per week	31	33
10 or more servings of cereals per week	18	13
less than 1 serving of bread per day	4	6
3–4 servings of bread per day	40	44
5 or more servings of bread per day	35	12
Source: National Nutrition Survey (Ministry of Health (1999), Table E2).		

Table A2.7: Average intakes of fibre

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average intake of fibre	26	20
Source: National Nutrition Survey (ABS 1998).		
New Zealand, 1997		
Average intake of fibre	24	18
Source: National Nutrition Survey (Ministry of Health (1999), Table A4).		
United Kingdom, 2002		
Average intake of non-starch polysaccharides (fibre)	15	13
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Table 3.14 (vol. 2)).		

Meat, fish, poultry and/or alternatives

Table A2.8: Apparent consumption of meat, meat products and alternatives, and iron

Existing measures (by country)	Apparent consumption
Australia, 1998–99	**g/capita/day**
Total carcass meat	196
Bacon and ham	24
Poultry	84
Total seafood	30
Nuts (in shell)	
Peanuts	6
Tree nuts	13
Eggs *(no. of eggs/capita/day)*	*0.4*
Source: ABS 2000.	
Canada, 2004	
Red meat, carcass weight equivalent	168
Poultry, eviscerated weight equivalent	99
Fish, edible weight equivalent (2001—no data for 2004)	26
Pulses and nuts	27
Eggs *(no. of eggs/capita/day)*	*0.5*
Source: Statistics Canada (2005c).	
Japan, 2002	
Meat (g/capita/day)	78
Beef	18
Pork	31
Chicken	28
Fish and shellfish	102
Hen eggs	46
Source: Statistics Bureau (2005), Table 7-60.	

(continued)

Table A2.8 (continued): Apparent consumption of meat, meat products and alternatives, and iron

Existing measures (by country)	Apparent consumption
United Kingdom, 2002–03	**g/person/day**
Carcass meat	33
Other meat and meat products	116
Total fish	22
Eggs *(no. of eggs/capita/day)*	*0.2*
Source: UK Expenditure and Food Survey (National Statistics (2004b), Tables 1.3, 1.5).	
United States, 2003	
Total red meat (boneless, trimmed equivalent)	139
Total poultry (boneless, trimmed equivalent)	88
Fish and shellfish (boneless, trimmed equivalent)	20
Nuts	
Peanuts (including peanut products)	8
Tree nuts (g/capita/day)	4
Eggs *(no. of eggs/capita/day)*	*0.7*
Source: Economic Research Service (2005a).	
Australia, 1997–98	**mg/capita/day**
Iron	14
Source: AIHW: Field et al. 2003.	
United States, 2000	
Iron	23
Source: Economic Research Service (2005a).	
United Kingdom, 2002–03	
Iron	11.9
Source: UK Expenditure and Food Survey (National Statistics (2004b), Tables 1.3, 1.5).	

Note: Converted (where applicable) to g/capita/day from published figures.

Table A2.9: Average intakes of meat, meat products and alternatives

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average intake:		
Meat, poultry and game products and dishes	200	116
Fish and seafood products and dishes	29	23
Legumes and pulse products and dishes	12	7
Seed and nut products and dishes	5	4
Egg products and dishes	16	11
Source: National Nutrition Survey (ABS & DHAC 1999).		
Japan, 2002 [#]		
Average intake among adults[#]:		
Fish and shellfish	88	
Meats	78	
Eggs	37	
Seeds and nuts	2	
Pulses	59	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2000–01		
Average intake:		
Meat, meat dishes and meat products[(a)]	200	124
Fish and fish dishes[(a)]	31	31
Eggs and Egg dishes[(a)]	22	16
Nuts[(a)]	2	2
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Table 2.1 (vol. 5)).		

Data available for 'persons' only.

(a) Mean intakes for 7-day reporting period were divided by 7 to give g/day.

Table A2.10: Average intakes of iron and iron status

Existing measures (by country)	Males	Females
Australia, 1995		
Estimated average intake of iron for adults aged 19 years and over (mg/person/day)	16	12
Source: National Nutrition Survey (ABS 1998).		
Australia, 1989		
Proportion of adults with iron deficiency (aged 20–69 years) (per cent)	0.4	8
Source: National Risk Factor Prevalence Survey (Lester 1994).		
New Zealand, 1997		
Average iron intake (mg/person/day)	15	10
Proportion of people with inadequate iron intake (per cent)[(a)]	1	26
Proportion of people aged 15 years and over (per cent) with:		
Low iron stores[(b)]	0	6
Iron deficiency[(b)]	0	3
Iron deficiency anaemia[(b)]	0	2
Source: National Nutrition Survey (Ministry of Health (1999), Table A8.2, F3).		
Japan, 2002		
Average intake of iron among adults (mg/person/day)[#]	8	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2000–01		
Average iron intake (mg/person/day)	14	12
Proportion of adults aged 19–64 with average iron intakes below the LRNI[(c)] (per cent)	1	24
Mean plasma iron (μmol/L)	17	16
Mean plasma iron per cent saturation	28	26
Source: The National Diet and Nutrition Survey (National Statistics (2004a), Tables 3.2 and 3.3 (vol. 3), 4.4 and 4.6 (vol. 4)).		
United States, 1999–2000		
Average iron intake, all ages (mg/person/day)[(d)]	17	13
Prevalence of iron deficiency (males 16–69, females 12–49) (per cent)	2	12
Source: NHANES (Wright et al. 2003; Looker et al. 2002) .		

Data available for 'persons' only.

(a) Calculated by probability analysis. It was assumed that all females 45 years and over were not menstruating.

(b) Note: Percentage of the population. Participants were only included in this calculation if they had a value for each of the following: ferritin, c-reactive protein, haemoglobin, and zinc protoporphyrins. Also their c-reactive protein was less than or equal to 8 mg/L.

(c) Lower Reference Nutrient Intakes.

(d) Excludes nursing infants and children.

Milks, yoghurts, cheeses and/or alternatives

Table A2.11: Apparent consumption of milk and milk products, and calcium

Existing measures (by country)	Apparent consumption
Australia 1998–99	**per capita/day**
Fluid milk (ml)	281
Powdered milk (g)	
Full cream	3
Skim	5
Condensed, concentrated and evaporated milk (g)	
Full cream	1
Skim	3
Cheese (natural equivalent weight) (g)	29
Total (converted to milk solids fat and non-fat) (g)	64
Source: ABS 2000.	
Australia 1997–98	
Calcium (mg)	892
Source: AIHW: Field et al. 2003.	
Canada, 2004	
Fluid milk, retail weight (ml)	234
Cream, retail weight (ml)	23
Cheese, retail weight (g)	33
Other dairy products, retail weight (g)	74
Source: Statistics Canada (2005c).	
Japan, 2002	
Cow milk and dairy products (g)	254.5
Source: Statistics Bureau (2005), Table 7-60.	
United Kingdom, 2002–03	
Total milk and cream (ml)	284
Total cheese (g)	16
Calcium (mg)	993
Source: UK Expenditure and Food Survey (National Statistics (2004a), Tables 1.3, 1.5).	

(continued)

Table A2.11 (continued): Apparent consumption of milk and milk products, and calcium

Existing measures (by country)	Apparent consumption
United States, 2003	**per capita/day**
Whole milk, total plain and flavoured (ml)	79
Lower fat and skim milk (ml)	145
Yoghurt (ml)	10
Cream (ml)	9
Specialty products (ml)	5
Cheese (g)	38
Cottage cheese (g)	3
Frozen dairy products (g)	33
Evaporated and condensed milk (g)	7
Dry dairy products (g)	5
Source: Economic Research Service (2005a).	
United States, 2000	
Calcium (mg)	960
Source: Economic Research Service (2005a).	

Note: Converted (where applicable) to g/capita/day from published figures.

Table A2.12: Average intakes of milks, yoghurts, cheeses and alternatives

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average intake among adults of:		
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
Source: National Nutrition Survey (ABS & DHAC 1999).		
Japan, 2002		
Average intake of milk among adults[#]	169	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2000–01		
Average intake:		
Milk (whole, semi-skimmed, skimmed)[(a)]	217	192
Other milk and cream[(a)]	7	8
Cheese[(a)]	17	14
Yoghurt and fromage frais[(a)]	19	24
	Per cent	
Proportion of adults aged 19–64 years reporting 'do not have milk as a drink'	45	56
Proportion of adults aged 19–64 years reporting 'did not have any milk'	18	13
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Tables 2.1 (vol. 5) and 2.2, 2.3 (vol. 1)).		

Data available for 'persons' only.

(a) Mean intakes for 7-day reporting period were divided by 7 to give g/day.

Table A2.13: Average intakes of calcium

Existing measures (by country)	Males	Females
Australia, 1995		**mg/person/day**
Estimated average intake of calcium	946	749
Source: National Nutrition Survey (ABS 1998).		
New Zealand, 1997		
Average calcium intake	908	735
Proportion with inadequate daily calcium intake[(a)] *(per cent)*	*14*	*25*
Source: National Nutrition Survey (Ministry of Health (1999), Table A8.1).		
Japan, 2002		
Average intake of calcium[#]		546
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2000–01		
Average calcium intake	1,016	809
Proportion of adults aged 19–64 with average calcium intakes below the LRNI[(b)] *(per cent)*	*2*	*5*
Source: The National Diet and Nutrition Survey (National Statistics (2004a), Table 3.12 (vol. 3)).		
United States, 1999–2000		
Average calcium intake	966	765
Source: NHANES, all ages[(c)] (Wright et al. 2003).		

Data available for 'persons' only.

(a) Calculated by probability analysis.

(b) Lower Reference Nutrient Intakes.

(c) Excludes nursing infants and children.

Fluids

Table A2.14: Average intakes of fluids

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average intake among adults:		
Total moisture[(1)]	3,426	2,817
Non-alcoholic beverages:[(2)]	2,052	1,917
Mineral waters and water[(a)]	855	849
Tea	345	452
Coffee and substitutes	475	379
Soft drinks, flavoured mineral waters and electrolyte drinks	236	126
Source: National Nutrition Survey (1) ABS 1998; (2) ABS & DHAC 1999.		
New Zealand, 1997	**Per cent**	
Per cent consuming 'regularly'[(b)]		
Water	74	85
Carbonated drinks	30	18
Fruit juice	27	25
Powdered drinks	23	18
Diet carbonated drinks	7	10
Cordial	7	4
Sports drinks	5	2
Fruit drinks	3	3
Tea	58	65
Coffee	64	58
Herbal tea	4	11
Source: National Nutrition Survey (Ministry of Health (1999), Table E6).		
Japan, 2002	**g/capita/day**	
Average intake of beverages among adults[#]	532	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		

(continued)

Table A2.14 (continued): Average intakes of fluids

Existing measures (by country)	Males	Females
United Kingdom, 2000–01	**g/person/day**	
Average intakes of beverages:[(c)]		
Fruit juice	48	47
Soft drinks, not low calorie	154	100
Soft drinks, low calorie	85	101
Tea, coffee and water	977	991

Source: The National Diet and Nutrition Survey (National Statistics (2004a), Table 2.1 (vol. 5)).

\# Data available for 'persons' only

(a) Tap water, bottled water or plain mineral water.

(b) 'Regularly' includes all those who consume these beverages at least 3 times per week.

(c) Mean intakes for 7-day reporting period were divided by 7 to give g/day.

Fat

Table A2.15: Fat intake

Existing measures (by country)	Males	Females
Australia, 2001		
Proportion consuming whole cow's milk (aged 12 and over)	56	42
Source: National Health Survey (ABS 2003a).		
Australia, 1995		
Average daily intake of fat for adults (g/person/day)	99	68
Average contribution of fat to energy intake (per cent total energy)	32	33
Average contribution of saturated fat to energy intake (per cent total energy)	13	13
Source: National Nutrition Survey (ABS 1998).		
New Zealand, 1997		
Average fat intake (g/person/day)	114	75
Average contribution of fat to energy intake (per cent total energy)	35	35
Average contribution of saturated fat to energy intake (per cent total energy)	15	15
Proportion usually choosing standard milk (per cent)	66	54
Proportion who remove chicken skin (per cent)		
Always	17	24
Often	18	25
Proportion who trim excess fat from pork, beef, mutton, hogget, or lamb (per cent)		
Always	32	45
Often	28	27
Source: National Nutrition Survey (Ministry of Health (1999), Tables A2.1, A2.2, A2.3, D7.2).		
France, 1993–94		
Average contribution of fat to energy intake (per cent total energy)	38	40
Average contribution of saturated fat to energy intake (per cent total energy)	15	16
Source: Volatier & Verger (1999).		
Japan, 2002		
Average intake of fats and oils among adults (g/person/day)[#]	11	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		

(continued)

Table A2.15 (continued): Fat intake

Existing measures (by country)	Males	Females
United Kingdom, 2000–01		
Average fat intake (g/person/day)	87	61
Average contribution of fat to energy intake (per cent total energy)	36	35
Average contribution of saturated fat to energy intake (per cent total energy)	13	13
Proportion choosing whole cow's milk (per cent):		
As a drink	18	12
On cereal/in puddings	22	19
Source: The National Diet and Nutrition Survey (National Statistics (2004a), Tables 5.1, 5.2, 5.4 (vol. 2), 2.2, 2.3 (vol. 1)).		
United States, 1999–2000		
Average fat intake (g/person/day) (Ervin et al. 2004)	91	67
Average contribution of fat to energy intake (per cent total energy) (Wright et al. 2003)	33	33
Average contribution of saturated fat to energy intake (per cent total energy) (Wright et al. 2003)	11	11
Source: NHANES, all ages.[(a)]		

\# Data available for 'persons' only.

(a) Excludes nursing infants and children.

Salt

Table A2.16: Salt intake and use

Existing measures (by country)	Males	Females
Australia, 2001		
Proportion of people who add salt to food after it is cooked (aged 12 and over) (per cent)		
Never/rarely	49	60
Sometimes	21	18
Usually	30	21
Source: National Health Survey (ABS 2003a).		
United Kingdom, 2000–01		
Average dietary sodium intake (mg/person/day) estimated from total urinary sodium[(a)]	4,310	3,186
Average salt intake (g/person/day) estimated from total urinary sodium	11	8
Source: The National Diet and Nutrition Survey (National Statistics (2004a), Tables 4.1, 4.2 (vol. 3)).		
United States, 1999–2000		
Average sodium intake (mg/person/day)	3,877	2,896
Source: NHANES, all ages[(b)] (Wright et al. 2003).		

(a) Converted from mmol/24 h to mg/day where 1 mmol is equal to 23 mg.

(b) Excludes nursing infants and children.

Alcohol

Table A2.17: Apparent consumption of alcohol

Existing measures (by country)	Apparent consumption
Australia, 2003–04	**g/capita/day**
Apparent consumption of alcohol	21
Source: ABS 2005.	
New Zealand, 2004	
Apparent consumption of alcohol per person 15 years and over	25
Source: Statistics New Zealand 2005.	
France, 2003	
Annual average consumption of alcohol per person 15 years and over	38
Source: INSEE 2005.	
United Kingdom, 2002–03	
Average household consumption of alcohol	11
Source: UK Expenditure and Food Survey (National Statistics (2004b), Table 1.3).	
USA, 2002	
Apparent consumption of alcohol (ethanol) per person 14 years and over	23
Source: Lakins et al. (2004), Table 1.	

Note: Converted (where applicable) to g/capita/day from published figures.

Table A2.18: Alcohol intake and use

Existing measures (by country)	Males	Females
Australia, 1995	**g/person/day**	
Average alcohol intake among adults	19	7
Average alcohol intake among adults who consumed alcohol on the survey day	44	30
Source: National Nutrition Survey (ABS 1998).		
New Zealand, 1997		
Average alcohol intake	20	8
Source: National Nutrition Survey (Ministry of Health (1999), Table A5).		
United Kingdom, 2000–01		
Average alcohol intake	22	9
Source: The National Diet and Nutrition Survey (National Statistics (2004a), Tables 4.1, 4.3 (vol. 2)).		

(continued)

Table A2.18 (continued): Alcohol intake and use

Existing measures (by country)	Males	Females
Australia, 2004	**Per cent**	
Proportion consuming alcohol at risky and high-risk levels (short-term harm) (14 years and over):		
At least weekly	10	6
At least monthly	14	12
At least yearly	16	14
Proportion consuming alcohol at risky or high-risk levels (long-term harm)	10	10
Source: National Drug Strategy Household Survey (AIHW 2005a)		
New Zealand, 2002–03		
Proportion of adult drinkers with a potentially hazardous drinking pattern	25	10
Source: National Health Survey (Ministry of Health (2004), Tables 11, 12).		
Canada, 2003		
Heavy episodic/binge drinker (5 or more, 12 or more occasions per year) (12 years and over)	29	12
Source: Canadian Community Health Survey (Statistics Canada 2005a).		
Canada, 2004		
Prevalence of heavy drinking among past year drinkers[(a)]		
At least once per week	9	3
At least once per month	34	17
Percentage exceeding low-risk drinking guidelines among past-year drinkers	30	15
Source: Canadian Addiction Survey (Health Canada (2005), Tables 3.4, 3.5).		
Japan, 2002		
Heavy episodic/binge drinker (5 or more standard drinks per usual drinking occasion)	11	2
Source: WHO (2005) (adults aged 20+).		
United Kingdom, 2000–01		
Proportion of adults consuming at levels:		
Greater than the daily guidelines on at least 1 day during the 7-day reporting period[(b)]	60	44
Greater than the weekly guidelines over the 7-day reporting period[(b)]	36	22
Source: The National Diet and Nutrition Survey (National Statistics (2004a), Tables 4.1, 4.3 (vol. 2)).		
United States, 2004		
Median proportion of heavy drinkers and binge drinkers[(c)] #		
Heavy drinkers	6	
Binge drinkers	16	
Source: Behavioral Risk Factor Surveillance System (National Center for Chronic Disease Prevention and Health Promotion 2005).		

\# Data available for 'persons' only.

(a) Heavy drinking is defined as five drinks or more on a single occasion for men, and four or more drinks on a single occasion for women.

(b) Current guidelines are a maximum daily amount of 4 units for men and 3 units for women. Weekly guidelines were set at a maximum number of 21 units of alcohol a week for men, and 14 units a week for women.

(c) Heavy drinking is defined as having more than two drinks per day (men) and more than one drink per day (women); binge drinking is defined as having five or more drinks on one occasion.

Sugars

Table A2.19: Apparent consumption of sugar

Existing measures (by country)	Apparent consumption
Australia, 1998–99	**g/capita/day**
Cane sugar	103
Total sugar	119
Source: ABS (2000).	
Canada, 2001	
Sugars and syrups	99
Source: Statistics Canada (2005c).	
Japan, 2002	
Sugar	55
Source: Statistics Bureau (2005), Table 7-60.	
United States 2003	
Total caloric sweeteners, including honey	176
Source: Economic Research Service (2005a).	
United Kingdom, 2002–03	
Mean household apparent consumption of total sugar	136
Mean household apparent consumption of non-milk extrinsic sugars	92
Source: UK Expenditure and Food Survey (National Statistics (2004b), Table 1.3).	

Note: Converted (where applicable) to g/capita/day from published figures.

Table A2.20: Average intakes of sugar

Existing measures (by country)	Males	Females
Australia, 1995	g/person/day	
Average daily intake among adults of:		
Sugar, honey and syrups	16.8	9.1
Total sugar	133.5	97.0
Sugar as a proportion of total energy intake:	19.3	20.8
Added sugars	10.4	9.4
Natural sugars	8.9	11.4
Source: National Nutrition Survey (ABS & DHAC 1999; ABS 1998; Cobiac et al. 2003).		
New Zealand, 1997		
Average sugar intake:	139	105
Glucose	24	19
Lactose	16	14
Fructose	25	20
Maltose	5	3
Sucrose	69	49
Source: National Nutrition Survey (Ministry of Health (1999), Table A3.2).		
Japan, 2002		
Average intake of sugar and preserves among adults[#]	7	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2000–01		
Average intake of sugars, preserves and sweet spreads	19	11
Average sugar intake		
Non-milk extrinsic sugars	79	51
Intrinsic and milk sugars	39	37
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Tables 3.8, 3.11 (vol. 2), 2.1 (vol.5)).		

Data available for 'persons' only.

Energy intake, physical activity, and overweight

Table A2.21: Average intakes of energy

Existing measures (by country)	Males	Females
Australia 1995	**kJ/person/day**	
Average energy intake	11,050	7,481
Average ratio of energy intake to basal metabolic rate *(ratio)*	*1.5*	*1.3*
Source: National Nutrition Survey (ABS 1998).		
New Zealand, 1997		
Average energy intake	11,942	7,969
Source: National Nutrition Survey (Ministry of Health (1999), Table A1).		
France, 1993–94		
Average energy intake	10,000	7,200
Source: Volatier & Verger (1999).		
Japan, 2002		
Average energy intake[#]	8,075	
Source: National Nutrition Survey (Statistics Bureau (2005), Table 21-1).		
United Kingdom, 2000–01		
Average energy intake	9,678	6,828
Source: UK National Diet and Nutrition Survey Adults (National Statistics (2004a), Table 2.3 (vol. 2)).		
United States, 1999–2000		
Average energy intake	10,355	7,669
Source: NHANES, all ages[(a)] (Wright et al. 2003).		

Data available for 'persons' only.

(a) Excludes nursing infants and children.

Note: Converted (where applicable) to kJ/person/day from published figures.

Table A2.22: Physical activity

Existing measures (by country)	Males	Females
Australia, 2000	**Per cent**	
Proportion of adults (18–75 years) reporting insufficient physical activity[(a)]	54	55
Source: AIHW analysis of the 2000 National Physical Activity Survey.		
New Zealand, 2002-03		
Proportion sedentary (<30 mins physical activity in the last week)	11	15
Source: National Health Survey (Ministry of Health (2004), Tables 11, 12).		
Canada, 2003		
Proportion of people physically inactive in leisure time[(b)]	44	50
Source: Canadian Community Health Survey (Statistics Canada 2005a).		
France, 1993–94		
Proportion undertaking no exercise[#]	35	
Source: (Vaz de Almeida et al. 1999).		
Japan, 2002		
Proportion undertaking physical activity (more than twice per week, 30 minutes or more per occasion, continued for more than 1 year)	32	28
Source: National Nutrition Survey (WHO 2005).		
United Kingdom, 2000–01		
Proportion self-reporting 'not at all physically active'	5	6
Proportion participating in 30 minutes or more physical activity of at least moderate intensity:		
None	21	20
One or two days a week	24	31
Three or four days a week	19	23
Five or more days a week	36	26
Source: National Diet and Nutrition Survey (National Statistics (2004a), Tables 5.1, 5.4 (vol. 4)).		
United States, 2003[#]		
Proportion of adults who do not undertake:[#(c)]		
Moderate physical activity (median per cent)	53	
Vigorous physical activity (median per cent)	74	
Source: Behavioral Risk Factor Surveillance System (National Center for Chronic Disease Prevention and Health Promotion 2005).		

Data available for 'persons' only.

(a) 'Sufficient' physical activity is at least 150 minutes of activity accrued over at least five separate sessions in the previous week.

(b) Respondents are classified as inactive based on an index of average daily physical activity over the past 3 months. For each leisure time physical activity engaged in by the respondent, an average daily energy expenditure is calculated by multiplying the number of times the activity was performed by the average duration of the activity by the energy cost (kilocalories per kilogram of body weight per hour) of the activity. The index is calculated as the sum of the average daily energy expenditures of all activities. Inactive = less than 1.5 kcal per day.

(c) 'Moderate physical activity' is defined as 30+ minutes of moderate physical activity 5 or more days per week, or vigorous physical activity for 20+ minutes 3 or more days per week; 'vigorous physical activity' is defined as 20+ minutes of vigorous physical activity 3 or more days per week.

Table A2.23: Overweight and obesity

Existing measures (by country)	Males	Females
Australia, 1999–2000	**Per cent**	
Proportion of adults who are overweight or obese (BMI)[(a)]		
Overweight (total)	67	52
Overweight but not obese	48	30
Obese	19	22
Proportion of adults who are abdominally obese (waist circumference)		
Increased risk (total)	56	56
Increased risk[(b)]	28	22
Substantially increased risk	27	34
Source: AIHW analysis of the 1999–2000 Australian Diabetes, Obesity and Lifestyle (AusDiab) Study (measured height, weight and waist circumference).		
New Zealand, 2002–03		
Proportion overweight but not obese(25.0 < BMI <30.0)	42	28
Proportion obese (BMI >=30)	20	22
Proportion gaining 10 kg or more since turning 18 (NZ)	58	56
Proportion abdominally obese[(c)]	28	37
Source: National Health Survey (Ministry of Health (2004), Tables 11 and 12) (measured height, weight and waist circumference).		
New Zealand, 1997		
Proportion with excess waist–hip ratio[(d)]	48	36
Source: National Nutrition Survey (Ministry of Health (1999), Table F1) (measured waist and hip circumference).		
Canada, 2004		
Proportion overweight but not obese (25.0 <BMI <30.0)	42	30
Proportion obese (BMI>= 30)	23	23
Source: Canadian Community Health Survey: Nutrition Focus (Statistics Canada 2005b) (measured height and weight).		
France, 1997 [#]		
Proportion overweight but not obese (25.0 <BMI <30.0)	23	
Proportion obese (BMI>= 30)	7	
Source: (Vaz de Almeida et al. 1999) (self-reported height and weight).		

(continued)

Table A2.23 (continued): Overweight and obesity

Existing measures (by country)	Males	Females
Japan, 2002	**Per cent**	
Proportion overweight (BMI >=25)[(e)]		
20–29	18	7
30–39	31	11
40–49	32	19
50–59	32	26
60–69	30	33
70+	26	31
Source: National Nutrition Survey (WHO 2005) (measured height and weight).		
United Kingdom 2000–01		
Proportion overweight but not obese (25.0 <BMI <30.0)	42	32
Proportion obese (BMI >=30)	25	20
Proportion with waist circumference indicating a substantially increased risk of metabolic complications of obesity[(c)]	29	26
Source: National Diet and Nutrition Survey (National Statistics (2004a), vol. 4:17, 18) (measured height, weight and waist circumference).		
United States, 1999–2002		
Proportion obese (BMI >=30)	27	32
Source: NHANES 1999–2002 (WHO 2005) (age 20+) (measured height and weight).		
United States, 2003		
Proportion overweight but not obese (25.0 =<BMI <30.0)	44	28
Proportion obese (BMI >=30)	23	23
Source: National Health Interview Survey (age 18+) (Lethbridge-Çejku & Vickerie (2005), Table 31) (self-reported height and weight).		

\# Data available for 'persons' only.

(a) Results are based on body mass index calculated from measured height and weight.

(b) But not substantially increased risk.

(c) Waist circumference greater than 102 cm for men and greater than 88 cm for women.

(d) Percentage with a W/H ratio >0.9 for men and >0.8 for women.

(e) Data available for age groups only.

Food safety

Table A2.24: Foodborne illness

Existing measures (by country)	Number of outbreaks
Australia, 2003	
Number of outbreaks by vehicle category	
Cakes	4
Custard	1
Dessert	1
Dips	1
Eggs	1
Fish	10
Mixed dish	5
Mixed meat dish	6
Oysters	4
Pizza	4
Pork	1
Poultry	6
Salad	1
Sandwiches	3
Seafood	6
Suspected eggs	2
Suspected poultry	2
Suspected red meat	1
Suspected water	1
Vegetable dish	1
Unknown	57
Total	**118**

(continued)

Table A2.24 (continued): Foodborne illness

Existing measures (by country)	Number of outbreaks
Australia (continued), 2003	
Number of outbreaks by setting category:	
Aged care	5
Bakery	4
Café	2
Camp	1
Commercial caterer	16
Contaminated primary produce	7
Grocery store/delicatessen	2
Hospital	4
Institution	2
National franchised fast food	7
Private residence[(a)]	14
Restaurant	40
Takeaway	8
Other	1
Unknown	5
Total	**118**
Source: OzFoodNet Working Group 2005.	
United States, 2003	
Number of food borne disease outbreaks by etiology:	
Bacterial	196
Chemical	54
Parasitic	3
Viral	149
Multiple etiologies	7
Unknown etiologies	664
Total	1073
Source: Foodborne Outbreak Response and Surveillance Unit 2005 (detail on vehicles and locations available for each etiology).	

(continued)

Table A2.24 (continued): Foodborne illness

Existing measures (by country)	Number of outbreaks
New Zealand, 2003	
Number of reported cases by vehicle:	
Beef	12
Chicken	63
Chicken burger	4
Chicken liver	8
Chicken OR untreated water	3
Chicken pie	4
Chicken pizza	5
Contaminated fruit	12
Dairy	5
Eggs	5
Falafel[(b)]	2
Fish, seafood, shellfish	47
Lamb	4
Mayonnaise	3
Meat[(c)]	43
Meat OR untreated water	2
Mixture[(d)]	77
Pork	19
Rice	13
Tahini	6
Unknown	288
Vegetables	8
Water	5
Number of reported cases by setting:	
Commercial food operators	582
Institutions	1381
Community groups	83
Workplace	63
Household	352
Other	461

Source: Public Health Surveillance (2004).

(continued)

Table A2.24 (continued): Foodborne illness

Existing measures (by country)	Number of laboratory reports
United Kingdom 2003	
Number of laboratory reports for:	
Campylobacter	49,309
Salmonella	16,354
Clostridium perfringens[(e)]	55
E. coli	876
Listeria monocytogenes	239
All pathogens being monitored	66,833

Source: Advisory Committee on the Microbiological Safety of Food (2004).

(a) Includes one outbreak where food prepared included food prepared by takeaway stores.

(b) Served as a kebab—may have included imported tahini.

(c) Infers a mixture of meat products, e.g. beef, lamb, pork, chicken.

(d) Infers a mixture of products, e.g. egg, pork, lamb, chicken, vegetables.

(e) England and Wales figures not available.

Breastfeeding

Table A2.25: Breastfeeding

Existing measures (by country)	Infants
	Per cent
Australia, 2001	
Proportion of infants ever breastfed (aged 0–3 years)	87
Proportion of children receiving any breastmilk at:	
6 months	48
12 months	23
Proportion of infants fully breastfed:	
at 3 months	54
at 6 months	32
Source: National Health Survey (ABS 2003b).	
New Zealand, 2004	
Breastfeeding practices—infants aged 6 weeks[(a)]	
Exclusive	50
Full	18
Partial	14
Breastfeeding practices—infants aged 3 months[(a)]	
Exclusive	37
Full	18
Partial	15
Source: Royal New Zealand Plunket Society 2004.	
Canada 2003	
Breastfeeding practices, females aged 15 to 55 who had a baby in the previous 5 years[(b)]	
Initiated breastfeeding	85
Breastfed at least 4 months	48
Breastfed at least 4 months exclusively	38
Breastfed at least 6 months	39
Breastfed at least 6 months exclusively	19
Source: Canadian Community Health Survey (Statistics Canada, 2005a).	

(continued)

Table A2.25 (continued): Breastfeeding

Existing measures (by country)	Infants
	Per cent
United Kingdom 2000	
Percentage who breastfed initially	69
Breastfeeding prevalence at:	
1 week	55
2 weeks	52
6 weeks	42
4 months	28
6 months	21
8 months	16
9 months	13
Percent exclusively breastfed at:	
3–6 weeks	29
6–8 weeks	25
8 weeks–3 months	20
3–5 months	16
5–7 months	10
7–9 months	7
9–10 months	7
10–12 months	4
Source: Feeding Survey (Hamlyn et al. (2002), Tables 2.1, 2.12, 2.24).	
United States 1993–94	
Per cent of babies breastfed	58
Per cent of babies breastfed for 3 months or more	56
Source: National Survey of Family Growth (National Center for Health Statistics (2004), Table 18).	

(a) New Zealand Ministry of Health definitions (Ministry of Health 2002):

Exclusive breastfeeding: The infant has never, to the mother's knowledge, had any water, formula or other liquid or solid food. Only breastmilk, from the breast or expressed, and prescribed medicines have been given from birth.

Full breastfeeding: The infant has taken breastmilk only, and no other liquids or solids except a minimal amount of water or prescribed medicines, in the past 48 hours. (This matches the WHO exclusive rate indicator.)

Partial breastfeeding: The infant has taken some breastmilk and some infant formula or other solid food in the past 48 hours.

(b) Analysis excludes non-response ('don't know', 'not stated' and 'refusal'). Exclusive breastfeeding refers to an infant receiving only breastmilk, without any additional liquid (even water) or solid food.

Food security

Table A2.26: Food security

Existing measures (by country)	Men	Women
Australia, 2001	**Per cent**	
Proportion who ran out of food in the last 12 months and did not have money to buy more (adults 18 years and over)	5	6
Source: National Health Survey (ABS 2003a).		
New Zealand 1997[(a)]		
The household can afford to eat properly		
Always	87	85
Sometimes	12	14
Because of lack of money, the household:		
Food runs out		
Often	1	2
Sometimes	10	14
Eat less		
Often	1	2
Sometimes	11	12
Variety of foods limited		
Often	4	6
Sometimes	21	23
Rely on others		
Often	1	2
Sometimes	5	7
Use grants/food banks		
Often	0	1
Sometimes	2	5
The household:		
Stressed about lack of money for food		
Often	1	3
Sometimes	8	12
Stressed when no food for social occasions		
Often	1	2
Sometimes	8	13
Source: National Nutrition Survey (Ministry of Health (1999), Table D8).		

(continued)

Table A2.26 (continued): Food security

Existing measures (by country)	Men	Women
Canada, 1998–99#	**Per cent**	
Total proportion of people food insecure	9	
Proportion of people food insecure—anxious that there would not be enough food to eat(b)	7	
Proportion of people food insecure—compromised diet (not eating the quality or the variety of foods that they wanted)(b)	7	
Proportion of people food insecure—food poor (not having enough food to eat)(b)	4	
Source: Canada National Population Health Survey 1998-99 (Rainville & Brink (2001), Table 3.1).		
United States, 2004#		
Total proportion of households food insecure:	12	
Without hunger	8	
With hunger	4	
Source: December 2004 Current Population Survey Food Security Supplement (Nord et al. 2005).		

\# Data available for 'persons' only.

(a) Percentage of population response—other options ('never' and 'don't know') are not reported.

(b) Not mutually exclusive categories.

Folate

Table A2.27: Folate intake, status and use

Existing measures (by country)	Males	Females
Australia, 1995	**µg/person/day**	
Average daily folate intake	307	233
Source: National Nutrition Survey (ABS 1998).		
New Zealand 1997		
Average folate intake	286	220
Source: National Nutrition Survey (Ministry of Health (1999), Tables A7.2, C1).		
United Kingdom 2000–01		
Average folate intake	359	292
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Tables 2.2, 2.27 (vol. 3), 2.6 (vol. 1), 4.14, 4.15 (vol. 4)).		
United States 1999–2000		
Average folate intake, all ages[(a)]	405	319
Source: NHANES (Wright et al. 2003).		
Australia, 2001	**Per cent**	
Proportion of women of child-bearing age (18–49 years) intentionally using:		
Folate-fortified foods	*	7
Folate-fortified drinks		2
vitamin/mineral supplements for folate		7
Source: National Health Survey (ABS 2003a).		
New Zealand 1997		
Proportion taking folic acid supplements[(b)]	0	1
Proportion with inadequate folate intake (%)	1	13
Source: National Nutrition Survey (Ministry of Health (1999), Tables A7.2 and C1).		
United Kingdom 2000–01		
Proportion taking folic acid supplements (%)		
Prescribed folic acid	n.a.	2
Non-prescribed folic acid only	0	6
Proportion of adults with average folate intakes below the LRNI[(c)] (%)	0	2
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Tables 2.2, 2.27 (vol. 3), 2.6 (vol. 1), 4.14, 4.15 (vol. 4)).		

(continued)

Table A2.27 (continued): Folate intake, status and use

Existing measures (by country)	Males	Females
United Kingdom 2000–01	**nmol/L**	
Average red cell folate (nmol/L)	694	685
Average serum folate (nmol/L)	21	22
Source: UK National Diet and Nutrition Survey (National Statistics (2004a), Tables 2.2, 2.27 (vol. 3), 2.6 (vol. 1), 4.14, 4.15 (vol. 4)).		
United States 1999–2000	**ng/ml**	
Mean serum folate (women aged 15–44 years)	n.a.	16
Mean red blood cell folate (women aged 15–44 years)	n.a.	315
Source: NHANES (National Centre for Health Statistics 2000).		

* Men not surveyed.

n.a. not available.

(a) Excludes nursing infants and children.

(b) Does not include multivitamin supplements.

(c) Lower Reference Nutrient Intakes.

Table A2.28: Apparent consumption of folate

Existing measures (by country)	Apparent consumption
Australia, 1997–98	**µg/capita/day**
Folate	320
Source: AIHW: Field et al (2003).	
United Kingdom, 2002–03	
Folate[(a)]	288
Source: UK Expenditure and Food Survey (National Statistics (2004a), Table 5.1).	
United States, 2000	
Folate (DFE)	907
Source: Economic Research Service (2005a).	

(a) contributions from pharmaceutical sources not included.

Glossary

anaemia A reduced level of haemoglobin, the protein that carries oxygen in the red blood cells. It has many causes, including bleeding (loss of red blood cells), low production of red blood cells, and processes that damage them. It can cause paleness, tiredness and even breathlessness.

apparent consumption A measure of the food supply available for human consumption after allowing for other uses and losses (see Appendix 1 for further detail).

basal metabolic rate (BMR) Represents the amount of energy expended at rest over a 24-hour period by an individual. The energy intake to BMR ratio provides an indication of whether the reported energy intake for one day is consistent with the energy intake required for a person to live a normal (not bed-bound) lifestyle.

blood cholesterol Fatty substance produced by the liver and carried by the blood to supply the rest of the body. Its natural function is to supply material for cell walls and for steroid hormones, but if levels in the blood become too high, this can lead to atherosclerosis and heart disease.

blood pressure The force exerted by blood against the walls of the arteries. The force is created by the pumping action of the heart, at contraction (systolic) and at relaxation (diastolic).

body mass index (BMI) The most commonly used method of assessing whether a person is healthy weight, underweight, overweight or obese. It is calculated by dividing the person's weight (in kilograms) by their height (in metres) squared, i.e. kg ÷ m^2.

cancer A range of diseases where some of the body's cells begin to multiply out of control, can invade and damage the area around them, and can also spread to other parts of the body to cause further damage.

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

cholesterol See *blood cholesterol*.

dental caries Tooth decay.

diabetes (diabetes mellitus) A chronic condition in which the body makes too little of the hormone insulin, or cannot use it properly. This raises the blood level of the body's major energy source, the sugar glucose, and causes other widespread disturbance of the body's energy processes. The three main types of diabetes are Type 1 diabetes, Type 2 diabetes and gestational diabetes.

epidemic An outbreak of a disease or its occurrence at a level that is clearly higher than previously existed.

HDL cholesterol Cholesterol packaged in high-density lipoprotein particles. The HDLs are good acceptors of membrane-free cholesterol and transport it back from tissues to the liver (compare with *LDL cholesterol*).

health Term relating to whether the body (which includes the mind) is in a good or bad state. With good health the state of the body and mind are such that a person feels and functions well and can continue to do so for as long as possible.

immuno-compromised Having an immune system that has been impaired by disease or treatment.

indicator A key statistic chosen to describe (indicate) a situation concisely, help assess progress and performance, and act as a guide to decision making. It may have an indirect meaning as well as a direct one; for example, Australia's overall death rate is a direct measure of mortality but is often used as a major indicator of population health.

insulin A hormone produced in the pancreas that helps glucose to enter body cells for energy metabolism.

LDL cholesterol Cholesterol packaged in low-density lipoprotein particles. LDLs carry cholesterol to the various tissues for use (compare with *HDL cholesterol*).

median The midpoint of a list of observations ranked from the smallest to the largest.

neural tube defects Defects such as spina bifida and anencephalus that have arisen in the neural tube, the part of the embryo that develops into the brain and spinal cord.

obesity Marked degree of overweight, defined as *body mass index* 30 and over. See also *overweight*.

osteoporosis Thinning and weakening of the bone substance, with a resulting risk of fracture.

overweight Defined as *body mass index* 25 and over. See also *obesity*.

Population-adjusted RDI A population-weighted RDI. This allows for assessment of the adequacy of the food supply in relation to the needs of the population.

prevalence The number or proportion (of cases, instances, etc.) present in a population at a given time.

prevention (of disease) Action to reduce or eliminate the onset, causes complications or recurrence of disease.

public health Term variously referring to the level of health in the population, to actions that improve that level or to related study. Activities that aim to benefit a population tend to emphasise prevention, protection and health promotion as distinct from treatment tailored to individuals with symptoms. Examples include provision of a clean water supply and good sewerage, conduct of anti-smoking education campaigns, and screening for diseases such as cancer of the breast and cervix.

recommended dietary intake (RDI) the levels of intake adequate to meet the known nutritional needs of practically all healthy people. RDIs exceed the actual requirements of practically all healthy persons and are not synonymous with requirements.

risk factor Any factor which represents a greater risk of a health disorder or other unwanted condition or event. Some risk factors are regarded as causes of disease; others are not necessarily so.

saturated fats Fats, most often of animal origin, that are solid at room temperature and whose fatty acid chains cannot incorporate additional hydrogen atoms. In excess, they tend to raise *blood cholesterol*.

statistical significance An indication from a statistical test that an observed difference or association may be significant or 'real' because it is unlikely to be due just to chance. A statistical result is usually said to be 'significant' if it would occur by chance only once in twenty times or less often.

underweight Defined as *body mass index* less than 18.5.

References

Abraham B, Webb K 2001. Interim evaluation of the voluntary folate fortification policy. Canberra: Commonwealth of Australia.

ABS (Australian Bureau of Statistics) 1998. National Nutrition Survey: nutrient intakes and physical measurements, Australia. Cat. no. 4805.0. Canberra: ABS.

ABS & DHAC (Commonwealth Department of Health and Aged Care) 1999. National Nutrition Survey: foods eaten, Australia 1995. ABS Cat. no. 4804.0. Canberra: ABS.

ABS 2000. Apparent consumption of foodstuffs 1997–98 to 1998–99. Cat. no. 4306.0. Canberra: ABS.

ABS 2003a. Measuring dietary habits in the 2001 National Health Survey, Australia. Cat. no. 4814.0.55.001. Canberra: ABS.

ABS 2003b. Breastfeeding in Australia, electronic delivery. Cat. no. 4810.0.55.001. Canberra: ABS.

ABS 2005. Apparent consumption of alcohol, Australia. Cat. no. 4307.0.55.001. Canberra: ABS.

Advisory Committee on the Microbiological Safety of Food 2004. Information paper ACM/719: FSA foodborne disease strategy: trends in foodborne disease: figures. Food Standards Agency, UK. Viewed 29 June 2005, <http://www.food.gov.uk/multimedia/pdfs/acm719.pdf#page=3>.

AFNMU (Australian Food and Nutrition Monitoring Unit) 2002. National Food and Nutrition Monitoring and Surveillance Project: end of project report. Australian Food and Nutrition Monitoring Unit. Viewed 24 June 2005, <ftp://www.sph.uq.edu.au/pdf.ftp/EndReport.pdf>.

AIHW (Australian Institute of Health and Welfare) 2004a. Australia's health. Cat. no. AUS-44. Canberra: AIHW.

AIHW 2004b. Heart, stroke and vascular diseases: Australian facts 2004. Cat. no. CVD-27. Canberra: AIHW.

AIHW 2005a. Statistics on drug use 2004. Cat. no. PHE-62. Canberra: AIHW.

AIHW 2005b. A picture of Australia's children. Cat. no. PHE-58. Canberra: AIHW.

AIHW: Dixon T, Waters A-M 2003. A growing problem: trends and patterns in overweight and obesity among adults in Australia, 1980 to 2001. Bulletin no. 8. Cat. no. AUS 36. Canberra: AIHW.

AIHW: Field B, Harlow T & Webbie K 2003. Apparent consumption of nutrients. Health Division Working Paper number 4. Canberra: AIHW.

AIHW: Mathers C, Vos T & Stevenson C 1999. The burden of disease and injury in Australia. Cat. no. PHE-17. Canberra: AIHW.

Baghurst K 2005. Richard Read memorial plenary: nutrient reference values for Australia and New Zealand: process and outcomes. Asia Pacific Journal of Clinical Nutrition 14(Suppl.):S16.

Baghurst K, Record S & Leppard P 2000. Red meat consumption in Australia: nutrient contribution and changes over time. Australian Journal of Nutrition and Dietetics 57(4):S1–S36.

Cobiac L, Record S, Leppard P, Syrette J & Flight I 2003. Sugars in the Australian diet: Results from the 1995 National Nutrition Survey. Australian Journal of Nutrition and Dietetics 60(3):152–73.

Cook T, Rutishauser IHE & Seelig M 2001a. Comparable data on food and nutrition from the 1983, 1985 and 1995 national nutrition surveys. Canberra: Commonwealth of Australia.

Cook T, Rutishauser IHE & Allsopp R 2001b. The bridging study—comparing results from the 1983, 1985 and 1995 Australian national nutrition surveys. Canberra: Commonwealth of Australia.

DoHA (Department of Health and Ageing) 2003. Australian alcohol guidelines. Viewed 17 May 2005, <http://www.alcoholguidelines.gov.au/everyone.htm#guideline1>.

DoHA 1999. National physical activity guidelines for adults. Viewed 25 July 2005, <http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/phd-physical-activity-adults-pdf-cnt.htm/$FILE/adults_phys.pdf>.

Desmarchelier P 1996. Foodborne disease: emerging problems and solutions. Medical Journal of Australia 156(11/12): 668–71.

DHFS (Department of Health and Family Services) 1998a. The Australian guide to healthy eating: background information for nutrition educators. Canberra: DHFS.

DHFS 1998b. Developing an active Australia: a framework for action for physical activity and health. Commonwealth of Australia, Canberra.

Economic Research Service 2005. Food and nutrient availability data. United States Department of Agriculture. Viewed 27 July 2005, <http://www.ers.usda.gov/data/foodconsumption/FoodAvailIndex.htm>.

Ervin RB, Wright JD, Wang C-Y & Kennedy-Stephenson J 2004. Dietary intake of fat and fatty acids for the United States population: 1999–2000. Advance Data from Vital and Health Statistics, number 348. Viewed 5 July 2005, <http://www.cdc.gov/nchs/data/ad/ad339.pdf>.

FAO (UN Food and Agriculture Organization) 2005a. FAOSTAT data, food balance sheets. Viewed 24 June 2005, <http://faostat.fao.org/faostat/collections?version=ext&hasbulk=0&subset=nutrition>.

FAO 2005b. Economics; nutrition; statistics: regional role. Viewed 28 June 2005, <http://www.fao.org/world/regional/rap/economics_nutrition_regional.asp>.

Flood V, Webb K, Lazarus R & Pang G 1999. Use of self-report to monitor overweight and obesity in populations: some issues for consideration. Australian and New Zealand Journal of Public Health 24:96–9.

Foodborne Outbreak Response and Surveillance Unit 2005. 2003 summary statistics. Centres for Disease Control and Prevention. Viewed 27 July 2005, <http://www.cdc.gov/foodborneoutbreaks/us_outb/fbo2003/summary03.htm>.

Gill T, Holden K, Taylor A & Carter P 2004. Status of indicators and monitoring of nutrition and food behaviour in South Australia. Rundle Mall, South Australia: South Australian Department of Human Services.

Hamlyn B, Brooker S, Oleinikova K & Wands S 2002. Infant feeding 2000. Department of Health, UK. Viewed 29 June 2005, <http://www.dh.gov.uk/assetRoot/04/05/97/63/04059763.pdf>.

Health Canada 2005. Canadian Addiction Survey: a national survey of Canadians' use of alcohol and other drugs, prevalence of use and related harms. Viewed 27 July 2005, <http://www.ccsa.ca/pdf/ccsa-004028-2005.pdf>.

INSEE (Institut National de la Statistique et des Etudes Economiques) 2005. La France en faits et chiffres [France in Facts and Figures]. Viewed 16 August 2005, <http://www.insee.fr/fr/ffc/chifcle_fiche.asp?ref_id=NATTEF06219&tab_id=213>.

Lakins NE, Williams GD, Yi H & Smothers BA 2004. Apparent per capita alcohol consumption: national, state and regional trends, 1977–2002. Surveillance report #66. Maryland, USA: National Institute on Alcohol Abuse and Alcoholism.

Lester IH 1994. Australia's food and nutrition. Canberra: Australian Government Publishing Service.

Lethbridge-Çejku M & Vickerie J 2005. Summary health statistics for U.S. adults: National Health Interview Survey, 2003. National Center for Health Statistics. Vital Health Stat 10(225). Viewed 27 July 2005, <http://www.cdc.gov/nchs/data/series/sr_10/sr10_225.pdf>.

Looker AC, Cogswell ME & Gunter EW 2002. Iron deficiency—United States, 1999–2000. Morbidity and Mortality Weekly Report, 51(40):897–899.

Marks GC, Rutishauser IHE, Webb K & Picton P 2001a. Key food and nutrition data for Australia 1990–1999. Australian Food and Nutrition Monitoring Unit. Viewed 5 July 2005, <ftp://www.sph.uq.edu.au/pdf.ftp/P5.pdf>.

Marks GC, Webb K, Rutishauser IHE & Riley M 2001b. Monitoring food habits in the Australian population using short questions. Canberra: Commonwealth Department of Health and Aged Care.

Masters G, Coles-Rutishauser I, Webb K, Marks G & Pearse J 2005. Final draft report, a national food and nutrition monitoring and surveillance system: a framework and a business case. Sydney: Nexus Management Consulting.

McComb J, Webb K, Marks GC 2000. What do we mean by 'food access' and 'food supply'? Food Chain, newsletter of the Strategic Intergovernmental Nutrition

Alliance, March 2000:3–4. Canberra: Commonwealth Department of Health and Aged Care.

McLennan W & Podger A 1998. National Nutrition Survey user's guide, 1995. Canberra: Australian Bureau of Statistics and Commonwealth Department of Health and Family Services.

Ministry of Health 1999. NZ food: NZ people, key results of the 1997 National Nutrition Survey. Wellington: Ministry of Health.

Ministry of Health 2002. Breastfeeding: A guide to action. Wellington: Ministry of Health. Viewed 24 August 2005, <http://www.moh.govt.nz/moh.nsf/0/b2c10ff5e960e1edcc256dc10077c608/$FILE/breastfeedingAGuidetoAction.pdf>.

Ministry of Health 2003. Food and nutrition monitoring in New Zealand. Wellington: Ministry of Health.

Ministry of Health 2004. A portrait of health: key results of the 2002/03 New Zealand Health Survey. Wellington: Ministry of Health.

National Center for Chronic Disease Prevention and Health Promotion 2005. Behavioral Risk Factor Surveillance System: prevalence data. Centres for Disease Control and Prevention. Viewed 27 July 2005, <http://apps.nccd.cdc.gov/brfss/>.

National Center for Health Statistics 2004. Health, United States, 2004: with chartbook on trends in the health of Americans. Maryland: US Department of Health and Human Services. Viewed 27 July 2005, <http://www.cdc.gov/nchs/data/hus/hus04trend.pdf#069>.

National Center for Health Statistics 2005. National Health and Nutrition Examination Survey: NHANES 2001–2002 data files, data, docs, codebooks, SAS code. Centres for Disease Control and Prevention. Viewed 27 July 2005, <http://www.cdc.gov/nchs/about/major/nhanes/nhanes01-02.htm>.

National Statistics 2004a. The National Diet and Nutrition Survey (UK): adults aged 19 to 64 years, 2002. Vols 1–5. Viewed 27 July 2005, <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=9761>.

National Statistics 2004b. Family food: a report on the 2002–03 Expenditure and Food Survey. Viewed 27 July 2005, <http://statistics.defra.gov.uk/esg/publications/efs/2003/familyfood.pdf>.

NHMRC (National Health and Medical Research Council) 1991. Recommended Dietary Intakes for use in Australia. Commonwealth of Australia. Canberra: Australian Government Publishing Service.

NHMRC 1992. Dietary guidelines for Australians. Canberra: Australian Government Publishing Service.

NHMRC 1995. Folate fortification: report of the expert panel on folate fortification. Canberra: Australian Government Publishing Service.

NHMRC 1999. Dietary guidelines for older Australians. Canberra: Commonwealth of Australia.

NHMRC 2003. Food for health: dietary guidelines for Australian adults. Canberra: Commonwealth of Australia.

Nord M, Andrews M & Carlson S 2005. Food security in the United States: conditions and trends. Economic Research Report no. ERR11. United States Department of Agriculture. Viewed 2 November 2005, <http://www.ers.usda.gov/Publications/err11/>.

NZFSA (New Zealand Food Safety Authority) 2005. Risk profiles. Viewed 25 July 2005, <http://www.nzfsa.govt.nz/science-technology/risk-profiles/index .htm#P35_8387>.

OzFoodNet Working Group 2004. Foodborne disease investigation across Australia: annual report of the OzFoodNet network, 2003. Communicable Diseases Intelligence 28(3):359–89. Viewed 10 May 2005, <http://www.health.gov.au/internet/wcms/Publishing.nsf/Content/cda-2004-cdi2803h.htm>.

OzFoodNet Working Group 2005. Reported foodborne illness and gastroenteritis in Australia: annual report of the OzFoodNet network, 2004. Communicable Diseases Intelligence 29:164–90. Viewed 15 November 2005, < http://www.health.gov.au/ internet/wcms/publishing.nsf/Content/cda-cdi2902-pdf-cnt.htm/$FILE/ cdi2902f.pdf>.

Public Health Surveillance 2004. Information for New Zealand public health action: Annual outbreak summary 2003. Viewed 19 August 2005, <http://www.surv.esr.cri.nz/PDF_surveillance/AnnSurvRpt/2003OutbreakRpt. pdf>.

Rainville B & Brink S 2001. Food security in Canada 1998–1999. Human Resources Development Canada. Viewed 24 June 2005, <http://dsp-psd.pwgsc.gc.ca/Collection/MP32-29-01-2E.pdf>.

Royal New Zealand Plunket Society 2004. National database. Viewed 25 July 2005, <http://www.plunket.org.nz/Other_Information_Page.htm>.

Rutishauser IHE, Webb K, Abraham B & Allsopp R 2001. Evaluation of short dietary questions from the 1995 NNS. Canberra: Commonwealth Department of Health and Aged Care.

Schoeller DA 2002. Validation of habitual energy intake. Public Health Nutrition, 5(6A): 883–8.

SIGNAL (Strategic Inter-Governmental Nutrition Alliance) 2001. Eat well Australia: an agenda for action for public health nutrition. Canberra: National Public Health Partnership.

Sjöström M, Poortvliet E, Nelson M, Burr S, Yngve A, Ovesen L, Elmadfa I, König J, Trichopolou A & Naska A (Report Committee) 2003. Making way for a healthier lifestyle in Europe: monitoring public health nutrition in Europe. Summary Report—

list of indicators. Viewed 24 June 2005, <http://europa.eu.int/comm/health/ph_projects/2000/monitoring/fp_monitoring_2000_a16_frep_02_en.pdf>.

Statistics Bureau 2005. Japan statistical yearbook. Viewed 27 July 2005, <http://www.stat.go.jp/english/data/nenkan/index.htm>.

Statistics Canada 2005a. Canada health indicators 2005, data tables and profiles. Cat. no. 82-221. Viewed 27 July 2005, <http://www.statcan.ca/english/freepub/82-221-XIE/2005001/tables.htm#health>.

Statistics Canada 2005b. Nutrition: findings from the Canadian Community Health Survey. Viewed 27 July 2005, <http://www.statcan.ca/cgi-bin/downpub/listpub.cgi?catno=82-620-MIE>.

Statistics Canada 2005c. Per capita consumption of major food groups. Viewed 27 July 2005, <http://www40.statcan.ca/l01/cst01/famil102a.htm>.

Statistics New Zealand 2005. Alcohol and tobacco available for consumption (year ended december 2004). Viewed 16 August 2005, <http://www2.stats.govt.nz/domino/external/pasfull/pasfull.nsf/web/Hot+Off+The+Press+Alcohol+and+Tobacco+Available+For+Consumption+Year+Ended+December+2004?open>.

Vaz de Almeida MD, Graca P, Afonso C, D'Amicis A, Lappalainen R & Damkjaer S 1999. Physical activity levels and body weight in a nationally representative sample in the European Union. Public Health Nutrition 2(S1):105–113.

Volatier JL & Verger P 1999. Recent national French food and nutrient intake data. British Journal of Nutrition 18:S57–S59.

Webb K & Gill T 2001. Data sources for food and nutrition monitoring in NSW and guidelines for preparing 'special issue' monitoring reports. Sydney: NSW Centre for Public Health Nutrition.

Webb K, Marks GC, Lund-Adams M, Rutishauser IHE & Abraham B 2001. Towards a national system for monitoring breastfeeding in Australia: recommendations for population indicators, definitions and next steps. Canberra: Commonwealth of Australia.

WHO (World Health Organization) 2000. Obesity: preventing and managing the global epidemic. Report of a WHO consultation. WHO Technical Report Series 894. Geneva: WHO.

WHO 2002. The optimal duration of exclusive breastfeeding: report of an expert consultation, Geneva, Switzerland 28–30 March 2001. World Health Organization. Viewed 31 May 2005, <http://www.who.int/nut/documents/optimal_duration_of_exc_bfeeding_report_eng.pdf>.

WHO 2003. Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO expert consultation. WHO Technical Report Series 916. Geneva: WHO.

WHO 2005. WHO Global Infobase SuRF 2 country profiles. Viewed 24 June 2005, <http://www.who.int/ncd_surveillance/infobase/web//surf2/country_list.html>.

Wright JD, Wang C-Y, Kennedy-Stephenson J & Ervin RB 2003. Dietary intake of ten key nutrients for public health, United States: 1999–2000. Advance Data from Vital and Health Statistics, number 334. Viewed 5 July 2005, <http://www.cdc.gov/nchs/data/ad/ad334.pdf>.