

Key food and nutrition data for Australia 1990 - 1999

Prepared by

**Dr Geoffrey C Marks
Ingrid HE Rutishauser
Dr Karen Webb
Peta Picton**

Australian Food and Nutrition Monitoring Unit

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The Australian Food and Nutrition Monitoring Unit comprises a consortium from The University of Queensland, The University of Sydney and Deakin University. Contact details: The University of Queensland, Nutrition Program, Level 3, Edith Cavell Building, RBH, Herston Qld 4029, Australia. Telephone: +61 - 7 - 3365 5400; Facsimile: +61 - 7 - 3257 1253.

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Acknowledgements

This report began with discussion by the Advisory Committee of the National Food and Nutrition Monitoring and Surveillance Project about the evolution of Australia's national nutrition goals and targets and the set of indicators needed to measure and monitor progress towards achieving these. There are no longer nationally agreed goals and targets, however the Committee considered it important to reach agreement on a set of indicators that could be used to describe key aspects of food and nutrition in the Australian population that are relevant to current policies and priorities.

Agreement on a core set of indicators was reached at the end of 1999 in consultation with the Advisory Committee and with the Strategic Intergovernmental Nutrition Alliance (SIGNAL), the committee of the National Public Health Partnership with responsibility for progressing matters related to public health nutrition. The input of these committees was significant in defining the core set of indicators reported here. The Advisory Committee has also guided development of the report.

The indicators are presented in this report in the context of the *Dietary Guidelines for Australians* and *Eat Well Australia* to link with the policy context. Other data have been added in various sections to provide a more complete description for particular issues.

The contribution of Bonnie Abraham in assessing national nutrition goals and targets and the set of indicators, and the assistance of Heena Akbar and Monica Seelig in preparation of the report are also gratefully acknowledged.

Australian Food and Nutrition Monitoring Unit

Dr Geoff Marks (Director), Dr Karen Webb (Deputy Director), Ingrid Coles-Rutishauser (Technical Advisor), Tricia Cook (Project Co-ordinator), Bonnie Abraham (Senior Project Officer), Rick Allsopp (Project Officer), Monica Seelig (Administrative Officer).

Advisory Committee Members (as at June 2001)

Dr Joy Eshpeter (Commonwealth Department of Health and Aged Care - Chair), Dr Geoffrey Annison (Australian Food and Grocery Council), Ms Janis Baines (ANZFA), Dr Stan Bennett (AIHW), Prof Annette Dobson (The University of Queensland), Ms Kathleen Graham (Commonwealth Department of Health and Aged Care), Ms Jo Ketzer (Office of Aboriginal and Torres Strait Islander Health), Ms Marelle Rawson (ABS) and Ms Judy Seal (SIGNAL representative).

SIGNAL membership (as at December 1999)

Professor John Catford (Chair), Michele Herriot (SA), Vivienne Hobson (NT), Lynne Brown (ACT), Dymna Leonard (Qld), Judy Seal (Tas), Jane Moxon (NSW), Rowland Watson (Vic), Janine Lewis (ANZFA), Dr Tim Armstrong (AIHW), Dr Karen Webb (NHMRC), Elizabeth Aitken (NZMOH), Judy Blazow (CDHAC), Professor Colin Binns, Dr Geoffrey Marks, Aletia Twist. CDHAC observers included Fidelma Rogers, Catherine Deeps and Michelle Patterson.

Abbreviations

1995NNS	National Nutrition Survey, 1995 (Australia)
ABS	Australian Bureau of Statistics
AGPS	Australian Government Printing Services
AFGC	Australian Food and Grocery Council
AFNMU	Australian Food and Nutrition Monitoring Unit
AIHW	Australian Institute of Health and Welfare
ANZFA	Australia New Zealand Food Authority
BMI	Body mass index
BNF	British Nutrition Foundation
CATI	Computer assisted telephone interviewing
CDCSH	Commonwealth Department of Community Services and Health
CDHAC	Commonwealth Department of Health and Aged Care
CI	Confidence Interval
CURF	Confidentialised Unit Record File
FFQ	Food frequency questionnaire
NHMRC	National Health and Medical Research Council
NHS	National Health Survey
NNS	National Nutrition Survey
NTD	Neural tube defects
OATSIH	Office of Aboriginal and Torres Strait Islander Health
PAL	Physical activity level
RDI	Recommended Dietary Intake
SEIFA	Socio Economic Indexes for Areas
SES	Socio Economic Status
SIGNAL	Strategic Inter-Governmental Nutrition Alliance
UQ	University of Queensland
WHR	Weight-to-hip ratio

1. Introduction

This report describes key aspects of diet and nutrition for Australians over the last decade compared to the recommendations made in Australian dietary guidelines and national nutrition policy. It has been written for health professionals, educators and others with an interest in the area.

Eating habits are associated with the risk of a range of health problems and influence health and wellbeing at all stages of life. The potential benefits of healthy eating have long been promoted through development of dietary advice for Australians and other strategies to improve availability and consumption of a healthy range of foods.

The National Health and Medical Research Council (NHMRC) provides authoritative dietary advice through the development and periodic updating of Australian dietary guidelines. Current publications provide guidelines for adults, children and adolescents, and older Australians (respectively NHMRC 1992a, 1995 and 1999a). These three sets of dietary guidelines are presented in Text box 1. The first two of these are currently being reviewed by the NHMRC. Australian governments have recently endorsed *Eat Well Australia*, a public health nutrition strategy developed in consultation with a broad range of organisations to provide guidance to government agencies and other organisations for activities to further improve the nutritional health of the population (SIGNAL 2001).

Section 2 of this report presents data to describe the dietary habits of Australians in relation to the dietary guidelines and selected issues from *Eat Well Australia*. Data are not currently available to describe the situation for all of the guidelines and issues of interest, but this serves to identify data gaps to be addressed in the future. Section 3 reports on some other food and nutrition issues that are relevant to current policies and priorities but not covered by the dietary guidelines.

The data are drawn from a range of sources, the major ones being the 1995 National Nutrition and National Health Surveys to describe current/recent dietary habits and physical measurements and the Apparent Consumption series of reports to describe longer term trends. Specific sources are noted in the text. A more detailed description of these data and consideration of changes in the dietary habits of Australians over the last decade can be found in the original sources and in the following Australian Food and Nutrition Monitoring Unit publications:

Rutishauser IHE 2000, *Getting it right: how to use the data from the 1995 National Nutrition Survey*, Commonwealth Department of Health and Aged Care, Canberra.

Cook P, Rutishauser IHE and Seelig M 2001, *Comparable data on food and nutrient intake and physical measurements from the 1983, 1985 and 1995 national nutrition surveys*, Commonwealth Department of Health and Aged Care, Canberra.

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

This report was produced as part of a program of work by the Australian Food and Nutrition Monitoring Unit (AFNMU) and was funded by the Commonwealth Department of Health and Aged Care.

Text box 1: Dietary guidelines for Australians

General population (NHMRC 1992a)	Children & adolescents (NHMRC 1995)	Older Australians (NHMRC 1999a)
<ol style="list-style-type: none"> 1. Enjoy a wide variety of nutritious foods. 2. Eat plenty of breads and cereals (preferably wholegrain), vegetables (including legumes) and fruit. 3. Eat a diet low in fat and, in particular, low in saturated fats. 4. Maintain a healthy body weight by balancing physical activity and food intake. 5. If you drink alcohol, limit your intake. 6. Eat only a moderate amount of sugars and foods containing added sugars. 7. Choose low salt foods and use salt sparingly. 8. Encourage and support breastfeeding. 	<ol style="list-style-type: none"> 1. Encourage and support breastfeeding. 2. Children need appropriate food and physical activity for normal growth and development. Growth should be checked regularly. 3. Enjoy a wide variety of nutritious foods. 4. Eat plenty of breads, cereals, vegetables (including legumes) and fruits. 5. Low fat diets are not suitable for young children. For older children, a diet low in fat and in particular, low in saturated fat, is appropriate. 6. Encourage water as a drink. Alcohol is not recommended for children. 7. Eat only moderate amounts of sugars and foods containing added sugars. 8. Choose low salt foods. 	<ol style="list-style-type: none"> 1. Enjoy a wide variety of nutritious foods. 2. Keep active to maintain muscle strength and a healthy body weight. 3. Eat at least three meals every day. 4. Care for your food: prepare and store it correctly. 5. Eat plenty of vegetables (including legumes) and fruit. 6. Eat plenty of cereals, breads and pastas. 7. Eat a diet low in saturated fat. 8. Drink adequate amounts of water and/or other fluids. 9. If you drink alcohol, limit your intake.
<p><u>Guidelines on specific nutrients</u></p>	<p><u>Guidelines on specific nutrients</u></p>	
<ol style="list-style-type: none"> 1. Eat foods containing calcium. This is particularly important for girls and women. 2. Eat foods containing iron. This applies particularly to girls, women, vegetarians and athletes. 	<ol style="list-style-type: none"> 1. Eat foods containing calcium. 2. Eat foods containing iron. 	<ol style="list-style-type: none"> 10. Choose foods low in salt and use salt sparingly. 11. Include foods high in calcium. 12. Use added sugars in moderation.

National Health and Medical Research Council 1992a, *Dietary Guidelines for Australians*, Australian Government Printing Service, Canberra.

National Health and Medical Research Council 1995, *Dietary Guidelines for Children and Adolescents*, Australian Government Publishing Service, Canberra.

National Health and Medical Research Council 1999a, *Dietary Guidelines for Older Australians*, Australian Government Publishing Service, Canberra.

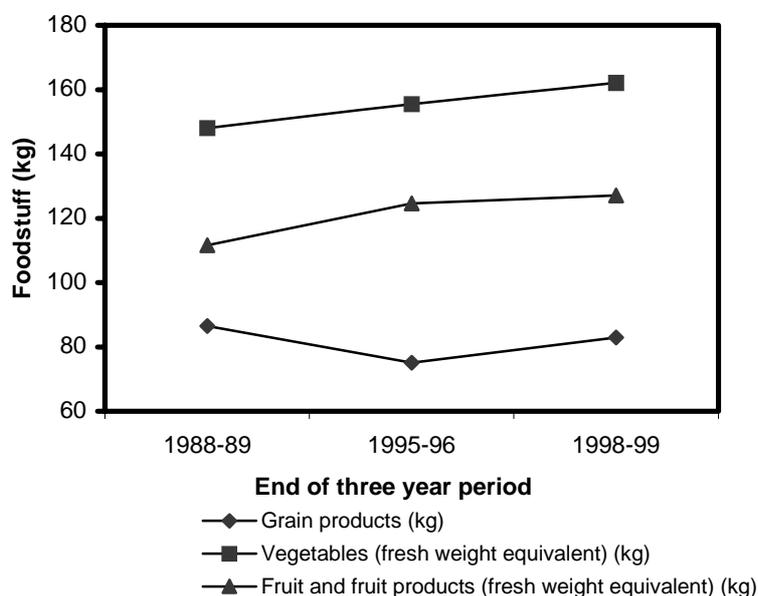
2. Key Food and Nutrition Data Relevant to Dietary Guidelines for Australians

2.1 Dietary guideline: eat plenty of breads and cereals (preferably wholegrain), vegetables (including legumes) and fruit

Breads and cereals are excellent sources of a range of nutrients. They generally are important sources of carbohydrate and dietary fibre, and a significant source of protein. In their basic forms, they tend to be low in fat and are particularly good sources of B-group vitamins and vitamin E and many minerals, including iron, zinc, magnesium and phosphorus (NHMRC 1999a). Fruit and vegetables are good sources of carbohydrate, a wide variety of vitamin and minerals and phytochemicals (NHMRC 1999b). Diets high in these plant foods may help to prevent conditions such as cardiovascular disease, hypertension, some cancers, Type 2 diabetes and constipation (NHMRC 1991).

Figure 2.1.1 shows the trends in availability or ‘apparent consumption’¹ of grain products, vegetables and fruit and fruit products in Australia since the late 1980s. These national estimates of the availability of foodstuffs are averaged over three year periods, the most recent estimates being for the three years ending 1998/99.

Figure 2.1.1: Apparent consumption of foodstuffs in Australia in kg/head/year



Source: ABS 2000 Catalogue No 4306.0

¹ Apparent consumption = (Commercial production + Estimated home production + Imports + Opening stocks) MINUS (Exports + Usage for processed foods + Non-food use + Wastage + Closing stocks)

The figure shows a slight increase in the quantity of vegetables and fruit and fruit products available over the decade. Grain products showed an initial drop between 1988-89 and 1995-96 and then a slight rise in the period ending 1998-99.

These data are presented in table 2.1.1 in terms of the average daily amount available per person.

Table 2.1.1: Apparent consumption of grains, vegetables and fruit and fruit products in g/head/day for the end of three-year period

Foodstuff	Average amount available for consumption in grams per head per day		
	1988-89	1995-96	1998-99
Grain products	237	205	227
Vegetables (fresh weight equivalent)	406	426	444
Fruit and fruit portions (fresh weight equiv)	306	341	348

Source: ABS 2000 Catalogue No 4306.0

While the Apparent Consumption data are the best available to describe trends, they do not represent actual direct intakes of these foodstuffs. For example, part of the growth in fruit and fruit products is due to rising consumption of fruit juices rather than fruit per se; similarly, the amounts likely overestimate actual consumption because the wastage from domestic residences, restaurants and other food outlets are not considered. Nevertheless, the data show modest increases over the period in availability of vegetables and fruit and products (about 40 g per head per day for each), while availability of grain products dropped by about 10 g per head per day.

The results from the 1995 National Nutrition Survey (1995NNS) give more specific information on the consumption of vegetables and fruit by the population. Survey participants were asked

How many serves of vegetables do you usually eat each day? (A serve = ½ cup cooked vegetables or 1 cup of salad vegetables), and

How many serves of fruit do you usually eat each day? (a serve = 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces).

The results are presented in the following table.

Table 2.1.2: Proportion of adults (19+ years) by usual number of serves of vegetables and fruit per day; 1995 National Nutrition Survey

Food	Fruit and vegetables consumed per day in grams per head per day	
	Male (%)	Female (%)
Vegetables (including potatoes)		
1 serve or less per day	29.7	22.4
2 to 3 serves per day	55.0	55.6
4 serves or more per day	15.4	22.0
Fruit and fruit products (excluding fruit juice)		
1 serve or less per day	54.2	44.6
2 serves or more per day	45.8	55.4

Source: ABS 1998b Catalogue No 4807.0 and Rutishauser et al 2001

The *Australian Guide to Healthy Eating* (Smith, Kellett and Schmerlaib 1998) recommends that adults (19 + years) consume 5 or more serves of vegetables (including legumes) and 2 or more serves of fruit each day.

The 1995NNS results show that less than one-fifth of the population meet this recommendation for vegetables while about half meet it for fruit (the vegetable question used predetermined response categories and it was not possible to analyse it in terms of 5 or more serves per day). For both fruit and vegetables, a higher percentage of females report intakes that meet the recommendations than do males.

2.2 Dietary guideline: eat a diet low in fat and, in particular, low in saturated fats

High intakes of fat, especially saturated fats, are associated with elevated blood cholesterol levels and increased risk of death from cardiovascular disease in populations where levels of physical activity are low (NHMRC 1991). Fat is also the most energy dense of all the nutrients and there is evidence to suggest that high fat intakes and the resulting high-energy intakes are important in the causation of obesity.

The 1995NNS included a detailed assessment of dietary intakes. A useful way of assessing the contribution of fat and saturated fat to the overall diet is to calculate the proportion of total energy intake that they comprise. A common recommendation has been that total fat should comprise about 30% of total energy intake (NHMRC 1992b). The mean intakes for participants in the 1995NNS are presented in table 2.2.1.

Table 2.2.1: Mean total fat and saturated fat intakes as a proportion of total energy intakes; 1995 National Nutrition Survey

Nutrient	Age Group (Years)	Male (%)	Female (%)
Total fat	25-44	32.8	33.0
	45-64	31.9	32.0
Saturated fat	25-44	13.1	13.1
	45-64	12.3	12.2

Source: ABS 1998a Catalogue No 4805.0

Both males and females in the age group 25-44 years obtain marginally higher proportions of energy from total and saturated fat than the older age group. The results for males and females are very similar.

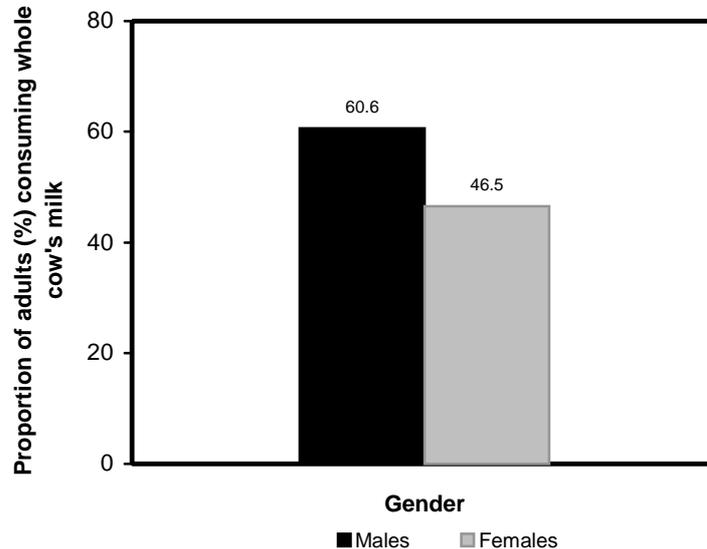
These mean intakes are significantly lower than those observed in 1983 when the mean proportion of energy intake from total fats in the National Dietary Survey of Adults was 37% (CDCSH 1987). Mean fat intakes also fell between the 1983 and 1995 surveys by 6 g for men and 3 g for women (Cook, Rutishauser and Seelig 2001).

In the 1995NNS saturated fat accounted for 12-13% of the total energy intake which is higher than the recommended maximum of 10% (NHMRC 1991).

Milk provides just over 10% of the total saturated fat in diets of both adult males and females. This is the highest contribution to saturated fat from an individual food item (ABS 1998a Catalogue No

4805.0). The survey participants were also asked ‘*What type of milk do you usually consume?*’. The figure below shows the proportion of adult males and females who reported that they usually consume whole/full cream cow’s milk, the type highest in fat.

Figure 2.2.1: Proportion of adults consuming whole cow’s milk; 1995 National Nutrition Survey



Overall 53.5% of the sample usually consumed whole milk and a higher proportion of males than females usually consume whole cow’s milk. The 1995NNS also showed that those who consumed whole milk had a higher contribution of both total fat and saturated fat to energy intake than those who used reduced fat/skim milk (Rutishauser et al. 2001):

- whole milk consumers – 34.1% and 13.9% from total fat and saturated fat respectively;
- low/reduced fat milk consumers – 31.0% and 11.7% from total fat and saturated fat respectively.

Choosing low or reduced fat milk would decrease the intake of both total and saturated fats assuming the rest of the diet remained unchanged.

2.3 Dietary guideline: maintain a healthy weight by balancing physical activity and food intake

Excess body fat has been identified as a key risk factor for many diseases particularly hypertension, cardiovascular diseases and Type 2 diabetes. The cost of obesity in Australia has been conservatively estimated at 2% of the total health budget (Segal, Carter and Zimmet 1994) or \$840 million (in 1992-3 dollar terms per year). In addition, it has been estimated that consumers spend a further \$500 million on weight control programs (NHMRC 1997). Overweight and obesity represent a major public health problem in Australia.

At the other end of the scale is the problem of underweight. Individuals who are underweight are also more prone to nutritional deficiencies. An inadequate food intake or increased requirements are the primary cause of these deficiencies.

Mortality risk is higher at the extremes both of underweight and overweight/obesity (NHMRC 1992a).

The measure most commonly used to assess body weight and identify underweight, overweight and obesity is the Body Mass Index (BMI²). It is often used as an estimate of body fatness in sedentary populations. Height and weight were measured for adults in the 1995NNS. Figure 2.3.1 shows the proportion of adults falling into the categories of obese, overweight and underweight. Sixty-four percent of males were either overweight or obese while 47% of women were in these categories. Overall 2.2% of females and 0.6% of males were classified as underweight.

Figure 2.3.1: Proportion of adults within the body mass index categories; 1995 National Nutrition Survey



Source: ABS 1998a Catalogue No 4805.0

Table 2.3.1 presents the BMI results by age group and gender. This shows that:

- the proportion overweight and/or obesity increases with age for both males and females;
- amongst those 19 to 24 years of age, 1 in 3 males and 1 in 4 females are overweight or obese;
- for those 45 to 64 years of age this rises to 3 of every 4 males and almost 2 of every 3 females being overweight or obese; and
- the highest proportions of adults who are underweight are aged 19-24 years with more females than males underweight in each age group.

² BMI = (weight in kilograms) / (height in metres)²

Table 2.3.1: Proportion of adults (19+ years) within the body mass index (BMI) categories; 1995 National Nutrition Survey

Nutrient	Age Group (Years)	Proportion of age group	
		Male (%)	Female (%)
Underweight (BMI 18.5 or less)	19-24	2.4	5.4
	25-44	0.5	2.2
	45-64	-	1.0
	19+ (All)	0.6	2.2
Overweight (BMI 25+ - 30 or less)	19-24	27.7	17.4
	25-44	46.1	24.7
	45-64	50.4	35.5
	19+ (All)	45.2	28.8
Obese (BMI 30+)	19-24	9.9	8.6
	25-44	16.2	14.5
	45-64	25.4	25.1
	19+ (All)	18.5	18.2

Source: ABS 1998a Catalogue No 4805.0

Irrespective of body size, the distribution of body fat can influence an individual's risk of conditions such as Type 2 diabetes and cardiovascular disease. The simplest ratio that measures the distribution of body fat is the waist-to-hip ratio (WHR). This ratio is calculated by dividing the abdominal circumference (cm) by the hip circumference (cm). A WHR greater than 0.9 in men and 0.8 in women indicates abdominal obesity and an increased risk of certain diseases (Ball et al 1993). This distribution of abdominal obesity in the 1995NNS is described in table 2.3.2.

Table 2.3.2: Proportion of adults (19+ years) with abdominal obesity; 1995 National Nutrition Survey

Age Group (Years)	Proportion with waist to hip ratio > cut-off (%)	
	Male (%)	Female (%)
19-24	12.6	11.7
25-44	45.6	22.3
45-64	77.8	48.0
19+ (All)	55.5	36.3

Source: ABS 1998a Catalogue No 4805.0

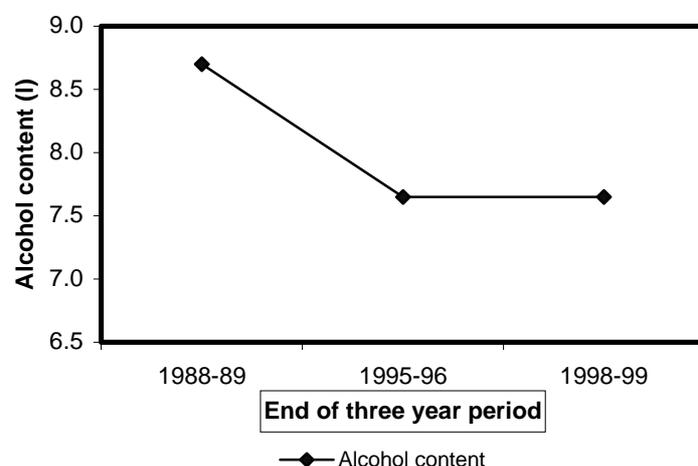
The trends for WHR are similar to those for BMI. A higher proportion of males than females in each age group are abdominally obese, and the highest proportion of abdominal obesity is found in the older age group for both sexes.

2.4 Dietary guideline: if you drink alcohol, limit your intake

High intake of alcohol (and particularly binge drinking) is associated with higher blood pressure and death from stroke. However, research suggests that a small amount of alcohol taken regularly may be protective against coronary heart disease (NHMRC 1992a). An additional benefit, for those with poor appetites, is that alcohol can help to create a pleasant environment that is conducive to eating (NHMRC 1999a). The cardiovascular benefit of low to moderate alcohol consumption (one to two standard drinks per day) relates mainly to men over 40 years and post-menopausal women (NHMRC 1999a).

Figure 2.4.1 shows the trends in availability or 'apparent consumption' of alcohol in Australia since the late 1980s. These national estimates are averaged over three year periods, the most recent estimates being for the three years ending 1998/99.

Figure 2.4.1: Apparent consumption of alcohol in Australia in litres per person per year



Source: ABS 2000 Catalogue No 4306.0

Table 2.4.1 presents this in terms of apparent daily intakes. These estimates show a decrease in the apparent consumption of alcohol to 1996 and then a stabilisation of consumption. These figures are alcohol content and should not be confused with mls of alcoholic beverage.

Table 2.4.1: Apparent consumption of alcohol in ml/person/day for the three years period

	Average content of alcoholic beverages available for consumption		
	1988-89	1995-96	1998-99
Alcohol ml/person/day	24	21	21

Source: ABS 2000 Catalogue No 4306.0

Comparison of results from the 1983 *National dietary survey of adults* and the 1995NNS show that mean alcoholic beverage intake fell for men over this period, but not for women. The mean daily intake in the 1995NNS was about 40g lower for men than in 1983 (Cook, Rutishauser and Seelig 2001).

2.5 Dietary guideline: eat only a moderate amount of sugars and foods containing added sugars

Over the years sugar has been implicated as a causal agent in a wide range of diseases including diabetes, coronary heart disease, obesity and dental caries. However no causal relationship for the role of sugar in diabetes or heart disease has been established (NHMRC 1999a). On the other hand, the evidence for the role of sugars in the cause of dental caries is strong (BNF 1999).

The role of sugar in the development of obesity is controversial. While excess dietary fat is stored more efficiently than excess dietary carbohydrates, it is important to stress that excess energy in any form will promote the accumulation of excess body fat (NHMRC 1999a). There is some evidence that the consumption of sugar-sweetened drinks is an independent risk factor for obesity in children aged 11-12 years (Ludwig and Peterson 2001).

‘Sugar’ is a naturally occurring component of many foods. However, refined sugar is also frequently added to foods, both by the food industry and at home. This guideline is concerned with refined and added sugars.

The Australian dietary guidelines for adults, or for children and adolescents, do not specify quantities or limits for consumption. However, the recommendations for older Australians state “an average consumption of approximately 15-20% of energy as sugar is compatible with a healthy diet. Consumption of greater amounts than this would lead to a decrease in nutrient density” (NHMRC 1999a).

Data are not available to describe the intakes of added sugar. However, the pattern of intake of total sugars (those occurring naturally in food plus those added during processing) is informative. Table 2.5.1 presents intake of sugars as a proportion of total energy intake for various age groups in the 1995NNS.

Table 2.5.1: Estimated proportion of total energy intake from sugars^a; 1995 National Nutrition Survey

Nutrient	Proportion for age group		
	Age Group (Years)	Male (%)	Female (%)
Total sugars	4-7	27.3	28.4
	12-15	24.7	25.6
	19-24	21.5	22.7
	19+	19.4	20.9

Source: ABS 1998a Catalogue No 4805.0

a. Includes all sugars occurring naturally and those added during processing.

These results show a trend for a decreasing percentage of energy from total sugar with age. The contribution of sugars to total energy intake for males and females within each age group are similar.

2.6 Dietary guideline: choose low salt foods and use salt sparingly

The relationship between salt intake and hypertension is now well recognised (Law 1997 and Alderman 2000). High salt consumption is possibly also associated with increased risk of cardiovascular illness and death (NHMRC 1999a).

Salt is found naturally in many foods and is also added to many foods in processing, before and during food preparation and after cooking. The various forms of salt are sodium chloride, sodium bicarbonate and monosodium glutamate (NHMRC 1999b). Three quarters of our salt intake comes from salt that is added to food during manufacturing (James, Ralph and Sanchez-Castillo 1987).

No national data exist on the current levels of salt consumption by Australians. In one Tasmanian study only 6% of men and 36% of women had intakes below the recommended maximum level of 100 mmol/day (2,300 mg/day) (Beard et al. 1997).

In the 1995NNS participants were asked whether they added salt to their foods during and/or after cooking. The results are presented in table 2.6.1.

Table 2.6.1 Proportion of adults (19+ years) adding salt during and after cooking; 1995 National Nutrition Survey

Category	Adding salt during cooking		Adding salt after cooking	
	Male (%)	Female (%)	Male (%)	Female (%)
Never/rarely	52.5	53.3	51.9	63.0
Usually	26.7	29.2	29.5	18.0

Source: ABS 1998b Catalogue No 4807.0

Overall, about a quarter of the sample usually added salt to their food during cooking, with a similar proportion adding salt after cooking. Slightly more than half of the sample reported never or rarely adding salt to their food both during and after cooking. The proportions adding salt during cooking are similar for males and females while fewer females than males added salt after cooking.

2.7 Dietary guideline: encourage and support breastfeeding

Breastfeeding is widely recognised as the optimal method of feeding during early infancy, conferring a wide variety of health benefits to infants (NHMRC 1995). Breast milk contains factors that are crucial to development of the immune system of the infant and which help protect against many bacteria and viruses. Nutritionally, human milk is particularly suited to the growth and requirements of the infant. Evidence is accumulating that in both developed and less developed countries, breastfeeding protects against a number of acute and possibly chronic diseases in childhood and into adulthood. Greater health benefits are seen when breastfeeding is exclusive or predominant, indicating that 'more breastfeeding is better' in early infancy (WHO 2001).

Key breastfeeding practices recommended in the current *Dietary guidelines for children and adolescents* (NHMRC 1995) and the *Infant feeding guidelines* (NHMRC 1996) include exclusive breastfeeding for the first four to six months of life, breastfeeding complemented with appropriate foods from four to six months and continued breastfeeding up to at least 12 months of age while receiving

appropriate complementary foods. It is anticipated that the World Health Organization will update these recommendations in the near future in accordance with a change in infant feeding policy. It now promotes exclusive breastfeeding for the first six months followed by breastfeeding complemented with appropriate foods from six months.

National goals and targets for breastfeeding relating to increasing the proportions of mothers who fully and partially breastfeed to at least six months were proposed in 1991 (Nutbeam et al. 1993).

The 1995 National Health Survey showed that while most mothers were breastfeeding initially, this high level was not maintained (Donath and Amir 2000).

Table 2.7.1 Proportion of children still breastfed at specific ages, and proportion fully breastfed by age; 1995 National Health Survey

	Time	Proportion
Duration of any breastfeeding	Hospital discharge	82%
	3 months	63%
	6 months	46%
	12 months	21%
Full breastfeeding	3 months	57%
	6 months	19%

Source: Donath and Amir 2000

Among women who were breastfeeding, most were fully breastfeeding in the early weeks and months. However, after three months, a substantial proportion of mothers introduced other fluids and solids so that by six months, only 19% of mothers were fully breastfeeding.

A strong relationship between socio-economic status (SES) and breastfeeding was observed in the 1995 NHS. There was a difference of nearly 20% in the prevalence of any breastfeeding at six months between the lowest and highest SES groups as defined by SEIFA quintiles (37% vs 53% breastfeeding respectively) (Donath and Amir 2000).

2.8 Dietary guideline: eat foods containing calcium

This is particularly important for girls and women

Calcium is required for the normal development and maintenance of the skeleton (NHMRC 1999a). Currently one in two post menopausal women is likely to develop osteoporosis while one in three men over the age of 60 years could suffer osteoporosis (NHMRC 1999b). Osteoporosis is a condition of thinning of the bone that tends to manifest at older ages and cause fractures from little or no trauma. Calcium is one of the most important nutritional factors that determine peak bone strength however other factors such as vitamin D status, genetics, oestrogen levels and physical activity are also important determinants of this condition (NHMRC 1995).

Calcium has a number of other roles in the body but it is recognised that a lack of calcium has a key role in the development and progression of osteoporosis (NHMRC 1999a).

The main source of calcium in the Australian diet is dairy foods. Dairy foods are recommended as a source of calcium for the diet because they are calcium rich and provide the most readily absorbed source of calcium. Non-dairy food sources of calcium such as calcium enriched soymilk and fish with bones can also contribute to the daily calcium intake (NHMRC 1992a).

Table 2.8.1 presents the calcium intakes for the 1995NNS participants. Adjusting the intakes for day-to-day variation provides an estimate of the distribution of 'usual' intakes in the population (see Rutishauser 2000 for more details). The current Recommended Dietary Intakes (RDIs) are also given as a point of reference (NHMRC 1991). Note that the RDIs are intended for groups and so individual intakes below this level do not necessarily indicate dietary deficiency.

Table 2.8.1: Centile distribution of intake for calcium (mg) after adjustment for day-to-day variation in intake; 1995 National Nutrition Survey

Age Group (Years)	Centile distribution of calcium intake (mg) to RDI							
	Male				Female			
	10 centile	25 centile	50 centile	RDI (mg)	10 centile	25 centile	50 centile	RDI (mg)
4-7	536	629	800	800	508	575	675	800
12-15	643	794	1006	1200	355	521	732	1000
19-24	596	763	1005	800 ^a	336	477	691	800
19+	511	649	866	800	413	528	688	800-1000 ^b

Source: ABS 1998a Catalogue No 4805.0

^a RDI for 19-64 yrs for males and 19-54 yrs for females

^b RDI for females aged 19-54 yrs and 54+ yrs

For each of the age groups in table 2.8.1 males have higher calcium intakes than females. In all age groups at least 25% of males consumed less than the RDI on the day of the survey and at least 50% of females consumed less than the RDI.

2.9 Dietary guideline: eat foods containing iron

This is particularly important for girls, women, vegetarians and athletes

Iron deficiency remains one of the most common nutrient deficiencies in the world. Iron is required for the development of haemoglobin in red blood cells and has a number of other functions. Iron deficiency results in a reduced capacity for work and sufferers may appear unmotivated and less physically fit (Whitney and Rolfes 1999). Iron deficiency in infants and young children results in developmental delays (NHMRC 1995).

Iron intakes and status are a particular concern for infants, young children, adolescents and pregnant women due to the increased iron requirements at these stages of life. Vegetarians and athletes are also at increased risk because they often have lower absorption of iron or increased requirements (NHMRC 1991, NHMRC 1995).

Meat, poultry and fish are important sources of iron in the Australian diet, both as a direct source of iron and because they promote iron absorption from foods with low iron bioavailability (NHMRC 1992a). Consumption of ascorbic acid (vitamin C) also promotes absorption of iron. The other major sources of iron in the diet are fortified bread and cereals, spinach, peas and legumes. But iron in these foods is less easily absorbed than that from animal products (Whitney and Rolfes 1999).

Table 2.9.1 presents the iron intakes for the 1995NNS participants. As for calcium, the intakes were adjusted for day-to-day variation to provide an estimate of the distribution of 'usual' intakes in the population (see Rutishauser 2000 for more details), and the current Recommended Dietary Intakes (RDIs) are given as a point of reference (NHMRC 1991).

For each of the age groups shown in table 2.9.1 males have higher iron intakes than females.

Except for those aged 12-15 years males of all ages met or exceeded the RDI.

In contrast, at least 50% of females in the reproductive age groups (19 – 44 years) had intakes below the lower end of the RDI range for iron intake.

Table 2.9.1: Centile distribution of intake for iron (mg) after adjustment for day-to-day variation in intake

Age Group (Years)	Centile distribution of iron intake (mg) to RDI							
	Male				Female			
	10 centile	25 centile	50 centile	RDI (mg)	10 centile	25 centile	50 centile	RDI (mg)
12-15	9.2	12.1	15.1	10-13	6.8	8.4	10.5	10-13
19-24	10.7	13.2	17.2	7	7.1	8.8	11.0	12-16
24-44	10.7	13.2	17.2	7 ^a	8.5	9.9	11.5	12-16
19+	11.1	13.1	15.7	7	8.1	9.7	11.4	5-16 ^b

Source: ABS 1998a Catalogue No 4805.0

^a RDI for 19-64 yrs for males and 19-54 yrs for females

^b RDI for females aged 19-54 yrs and 54+ yrs

3. Other Food and Nutrition Data Relevant to Current Policies and Priorities

3.1 Folate intake

Folate is required for the synthesis of DNA and is important in the formation of new cells (Whitney and Rolfes 1999). Of particular policy significance in recent years has been research that has confirmed that folate also has a role in preventing neural tube defects (NTD) which result from defective closure of the neural tube in early pregnancy. Studies have shown conclusively that folate supplementation in the period leading up to conception and during early pregnancy can significantly reduce both the occurrence and recurrence of NTD (Cziesel and Dudas 1992; Kirke, Daly and Elwood 1992; Werle, Shapiro and Michell 1993).

The NHMRC (1993) recommends that:

1. All women planning a pregnancy or likely to become pregnant should be offered advice about folate in the diet and encouraged to increase their dietary intake of folate-rich foods, particularly in the month before and in the first three months of pregnancy.
2. In addition,
 - Low risk women: should be offered peri-conceptual folic acid supplementation (0.5mg daily).
 - High risk women: should be advised to take peri-conceptual folic acid supplementation (5mg daily).

The RDI for folate is 200µg for girls and women who are not pregnant in the age groups shown in table 3.1.1. This increases to 400µg for those who are pregnant and 350µg for those that are breastfeeding.

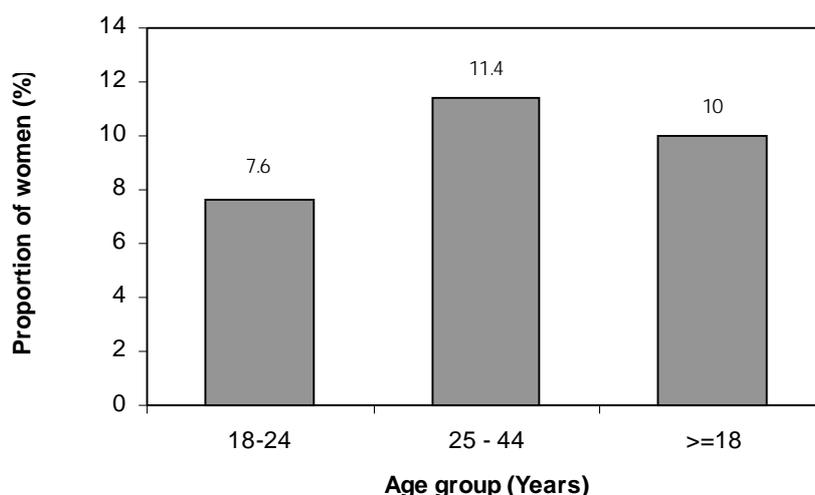
Table 3.1.1: Centile distribution of folate intake after adjustment for day-to-day variation in intake

Female Age group (Years)	Centile distribution of folate intake (µg)		
	10 centile	25 centile	50 centile
12-15	154	171	193
19-24	164	188	224
25-44	166	189	218
19+	166	193	225

Source: ABS 1998a Catalogue No 4805.0

Table 3.1.1 shows that while at least 25% of all females did not meet the RDI for non-pregnant females, 50% of females in the age groups 19-24 years, 25-44 years met or exceeded this RDI.

Figure 3.1.1: Proportion of women who had taken a folate supplement on the day before the survey in 1995/96



Source: Lawrence, Rutishauser and Lewis 2001

Women 25-44 years of age are more likely to take folate supplements than those in the younger age group. Considering the results from both table 3.1.1 and figure 3.1.1 suggests that a large proportion of females in the childbearing age group are not meeting the folate requirements either from dietary or supplemental sources.

Additional results show that the average folate intake from supplements in the age group 18-44 years is 29.7 μ g/day (Lawrence, Rutishauser and Lewis 2001), well below the level recommended by the NHMRC for preventing NTDs.

These estimates of folate intake were obtained in the 1995NNS, prior to the introduction of a voluntary folate fortification policy in Australia. Under this legislation, a broad range of staple foods are permitted the addition of folate up to 50% of the RDI. An evaluation of the folate fortification program showed that up to 1999 there had been little change in the folate intakes of women of child bearing age from fortification and most eligible products had not been fortified (Webb and Abraham 2001).

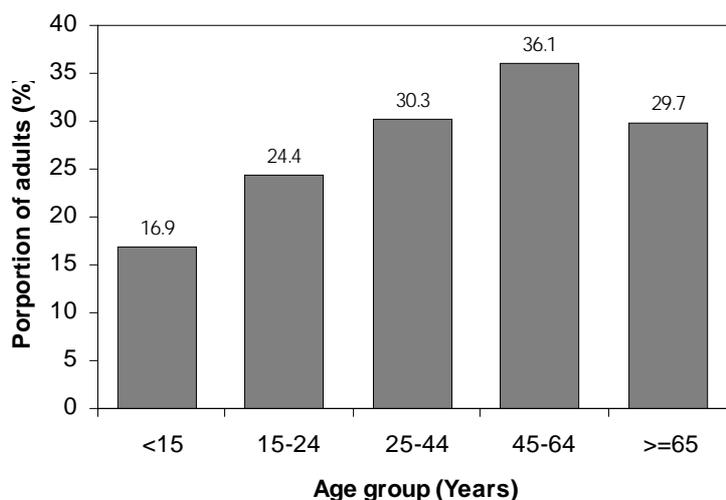
3.2 Vitamin and mineral supplementation.

While research has shown a definite benefit of supplementing certain vitamins and minerals to prevent or treat specific conditions, the general use of most vitamins and minerals supplements is far more controversial. There is strong evidence to show the benefits of healthier eating habits in preventing certain diseases and improving health and wellbeing. However it does not follow that taking supplements will also achieve these outcomes.

Vitamin and mineral supplements are generally only recommended in circumstances where dietary intakes are inadequate. The only exceptions to this are specific circumstances as described for folate above.

Nevertheless, vitamin and mineral supplements are widely consumed. Figure 3.2.1 and table 3.2.1 present the results of recent surveys that included questions about supplement consumption, asking about intake over the previous fortnight and the previous 24 hours, respectively.

Figure 3.2.1: Proportion of adults who took a vitamin or mineral supplement in the last 2 weeks



Source: ABS 1997 Catalogue No 4364.0

Figure 3.2.1 shows that supplement intake is widespread, consumed by between a quarter and a third of those in any given age group for adults. The proportion of those taking supplements is lower for children and adolescents.

Table 3.2.1: Took a vitamin or mineral supplement yesterday

Age group (Years)	Proportion of adults taking a mineral or vitamin yesterday (%)	
	Males	Females
19-24	12.8	21.0
25-44	13.7	24.8
45-64	17.3	32.5
65+	19.2	29.8
19+	15.4	27.4

Source: ABS 1998b Catalogue No 4807.0

Table 3.2.1 shows a similar age trend as figure 3.2.1. However, there was a marked gender difference. For each age group as well as overall, more females than males used supplements on the day prior to the survey (27.4% vs 15.4%).

3.3 Food insecurity

It is often assumed that access to a healthy diet cannot be a problem in an affluent country such as Australia. Indeed, residents of advantaged urban areas have access to an impressive range of high quality foods, of varying nutritional value, at competitive prices. However, those with lower incomes, or with a 'locational disadvantage' such as residents on the urban fringe and in rural and remote areas, are likely to experience less access to the same range and quality of food at affordable prices. A lack of easy access to a sufficient variety of affordable foods is likely to lead to food insecurity for some households, a factor contributing to the inequalities in health status between advantaged and disadvantaged population groups in Australia (McComb, Webb and Marks 2000). Those with poorer food security have been shown in several studies to have poorer diet quality.

At present there are few data to assess the extent and nature of food insecurity in Australia. One of the few indications comes from the 1995NNS where survey participants were asked:

In the last 12 months were there any times that you ran out of food and you couldn't afford to buy more?

Overall 5.2% of adults (19+ years) gave a positive response to the question.

The proportion of positive responses was highest in those categories associated with greater socioeconomic disadvantage (Rutishauser et al 2001). Tables 3.3.1 and 3.3.2 show the proportion of positive responses by employment status and housing status respectively. Of the socioeconomic indices selected for analysis the nature of house occupancy showed the greatest differential. On average almost 16% of those paying rent or board gave a positive response to the food security question.

Table 3.3.1: Percentage of respondents 19+ years who reported running out of food in the last 12 months, by labour force status#; 1995 National Nutrition Survey

Population subgroup	Employed (95% CI)	Unemployed or not in labour force (95%)
All aged 19 yrs and over	4.0 (3.4-4.5)	11.3 (9.8-12.8)
Sex		
Males	3.3 (2.6-3.9)	13.2 (10.4-16.1)
Females	4.9 (4.0-5.8)	10.3 (8.6-12.0)

Analysis excludes those who were coded as 'Not applicable' or 'Not stated'.
Source: Rutishauser et al 2001

Table 3.3.2: Percentage of respondents 19+ years who reported running out of food in the last 12 months, by type of expenditure on housing#; 1995 National Nutrition Survey

Population subgroup	Paying rent or board to reside in dwelling	Paying off house/ dwelling (95% CI)	Owner of dwelling (95% CI)
All aged 19 yrs and over	15.8 (13.7-17.8)	4.3 (3.2-5.4)	1.6 (1.0-2.1)
Sex			
Males	15.0 (12.0-18.0)	2.7 (1.4-4.0)	1.4 (0.7-2.2)
Females	16.4 (13.7-19.2)	5.8 (4.1-7.5)	1.7 (0.9-2.5)

The analysis excludes those who were coded as 'Other' or 'Not applicable'.
Source: Rutishauser et al 2001

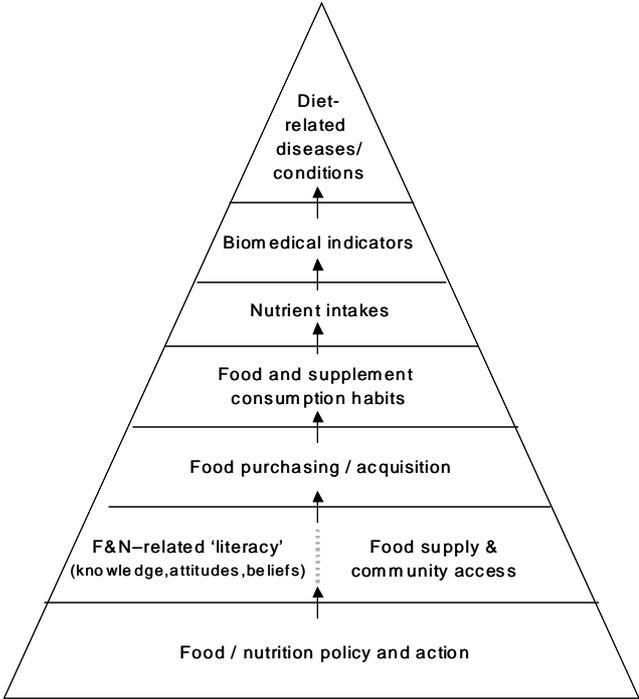
In the sample as a whole, a positive response to the food security question was associated both with a significantly greater likelihood of socio-economic disadvantage and a lower intake of some food groups (meat and fruit) but not other food groups (milk and milk products) that are important sources of nutrients in the Australian diet

4. Recommendations

The sections above present data describing aspects of diet and nutrition for Australians in relation to the dietary guidelines and selected issues from *Eat Well Australia*. The data are drawn from a range of sources, the major ones being the 1995 National Nutrition and National Health Surveys and the Apparent Consumption report series (the latter presently being the primary data source for national food and nutrition monitoring in Australia). However, there are gaps and limitations in the data available that limit our capacity to address several of the dietary guidelines and issues of interest. This section briefly discusses the types of data needed to monitor diet and nutrition relevant to policy in Australia, and recommendations for future developments to meet this need.

Figure 4.1 describes a conceptual framework that identifies the types of public health nutrition data relevant to monitoring food and nutrition in the general population and/or particular sub-groups. These range from measures of food supply and other determinants of dietary behaviour through to those reflecting disease outcomes in the population. A comprehensive assessment of food and nutrition in the population, for a particular issue (such as chronic disease risk factors) or particular population group (such as infants and children) would usually involve collating data from several levels of the pyramid, while routine monitoring might focus on selected aspects such as food consumption habits and food supply.

Figure 4.1: A conceptual framework for monitoring public health nutrition indicators in Australia



Source: Webb K, in Marks et al 2001.

The core elements of a national food and nutrition monitoring system should comprise:

- **Comprehensive dietary assessment at least every 10 years.** A comprehensive national dietary assessment survey covering all foods consumed, such as that undertaken in the 1995 National Nutrition Survey.
- **Biomedical measurement survey at least every 10 years.** A national health measurement survey in conjunction with the national dietary survey to assess specific nutritional factors that cannot be assessed in a dietary survey (such as serum homocysteine, urinary sodium) and other physiological conditions related to diet.
- **Food and supplement consumption habits in the intervening years.** Short questions in population health surveys such as the National Health Surveys and CATI surveys, using validated and standardised questions. While many of these perform well, they are best used in conjunction with periodic comprehensive surveys to calibrate them.
- **Food supply and purchasing patterns in the intervening years.** Trends in the food supply are well described in the Apparent Consumption series (this will remain an invaluable collection for monitoring national food supply and apparent consumption). Food access (availability, price, quality) is collected in some states using a range of methods. CDHAC is considering a project to develop standard methods for monitoring food access. Household expenditure on food is collected as part of the ABS survey program, but does not yet include quantities purchased.

Assessing diet and nutrition for a particular population group would usually involve collating data from these and other data sources. Table 4.1 lists the population groups identified in *Eat Well Australia* as being a focus group for particular initiatives

Table 4.1: Priority groups identified in *Eat Well Australia* - Part 3 'Health Gain Initiatives'

General population
Indigenous Australians
Children (1 –16 yrs)
Infants
Young people
Remote & rural communities
Women of child bearing age
Indigenous women & teenagers
People on low incomes
People with disabilities (physical, intellectual and developmental)
Chronically ill people (including people with mental health problems)
People with dementia
Frail older people
Refugees
Alcohol or drug abusers
Homeless people
People on pensions
Older people

Reports from the Australian Food and Nutrition Monitoring Unit (AFNMU) include recommendations on:

- use and interpretation of dietary data from national nutrition surveys (Rutishauser IHE 2000);
- the design of future population nutrition surveys (Cook, Rutishauser and Seelig 2001);
- standard methods for monitoring dietary habits using short questions (Marks et al 2001);
- indicators for monitoring breastfeeding (Webb et al 2001); and
- methods for collection and collation of anthropometric data in children (Davies, Roodveldt and Marks 2001).

The reader is referred to these publications for further information on these matters.

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