

# What Australians eat for breakfast: an analysis of data from the 1995 National Nutrition Survey

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## Abstract

**Objective:** To analyse data on the patterns of food consumption at breakfast reported in the 1995 National Nutrition Survey.

**Design:** The Australian Bureau of Statistics was commissioned to undertake additional analysis of data on food intake collected using 24-hour recall interviews, a food frequency questionnaire and a food habits questionnaire.

**Subjects:** Nationally representative sample of 13 858 Australians, from age two years, surveyed in the 1995 National Nutrition Survey.

**Main outcome measures:** Characteristics of people eating breakfast regularly, mean amount of food groups consumed at breakfast, the percentage of respondents consuming each food item, and the mean serving sizes.

**Statistical analyses:** Data are presented as frequencies and mean intakes. Pearson's chi-square tests were used for comparisons of consumption of breakfast by household income, special diet and use of vitamin and mineral supplements.

**Results:** People on special diets, those taking vitamin or mineral supplements, and people in the lowest quintile of household income were more likely to eat breakfast regularly. Breakfast was mostly eaten at home, although 15% of 19- to 24-year-old adults obtained breakfast away from home. Cereals, bread and milk were the most popular breakfast foods and less than 10% of Australians ate a cooked breakfast. Sugar added to cereals contributed less than 2% of the total sugar intake over the day in all age groups.

**Conclusion:** The high proportion of adolescents and young adults who miss breakfast regularly is of concern. The most popular breakfast food items are consistent with dietary guidelines for Australians that promote consumption of cereals and bread and adequate intakes of dairy foods. There is an opportunity to increase fruit intake by promoting its consumption at the breakfast occasion. *Nutr Diet* 2002;59:103–112

Key words: breakfast, National Nutrition Survey, dietary intake

## Introduction

A number of reviews have emphasised the importance of breakfast for overall good nutrition (1,2). Regular breakfast consumption has been identified as one of seven health practices associated with better health (3) and the Dietary Guidelines for Older Australians note the importance of breakfast for older people (4). It has been reported intakes of vitamins and minerals that are missed when breakfast is skipped are not fully compensated during the remainder of the day (5–8). Results from the 1976–80

National Health and Nutrition Examination Survey (NHANES II) in the US showed serum cholesterol concentrations were lowest among adults eating a breakfast that included ready-to-eat cereal and highest among breakfast skippers (9). Recent research has also suggested that there may be benefits from breakfast consumption on general mood and mental performance (10) and consumption of an adequate breakfast may also positively affect school performance in children (11).

However, in Australia—aside from some important work on the meal patterns of children (12,13) and a report from CSIRO on the nutritional influence of breakfast cereal usage (14)—there have been no studies describing what Australians are eating at breakfast or the contribution of breakfast to dietary intake or health.

The recent National Nutrition Survey (NNS), conducted jointly by the Commonwealth Department of Health and Family Services and the Australian Bureau of Statistics, provides an opportunity to examine this topic with comprehensive national data. Detailed results of the NNS have recently been published (15–17), however, these reports do not describe the foods consumed at each meal, nor the contribution of individual meals to the overall daily intake of nutrients. Kellogg (Australia) commissioned the Australian Bureau of Statistics to analyse the data from the NNS in relation to dietary patterns of breakfast and preliminary summary results from that analysis have been presented elsewhere (18). This paper reports the detailed findings from this analysis about the patterns of food consumption at breakfast by Australian adults and children and additional data on the groups of the population consuming breakfast regularly. It discusses these findings along with those previously published in the NNS Selected Highlights report (15). It is planned to publish elsewhere analyses of the results on the contribution of the breakfast meal to nutrient intake, as well as data on the relationship between breakfast consumption and health.

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The author planned and commissioned these analyses when previously employed as Director of Scientific and Consumer Affairs at Kellogg (Aust) Pty Ltd.

## Method

Kellogg (Australia) commissioned the Australian Bureau of Statistics to analyse data collected in the NNS related to breakfast dietary patterns. The NNS covered a nationally representative subsample of the National Health Survey and provided detailed data, collected between February 1995 and March 1996, on total food and beverage intake. The primary method of dietary data collection was a 24-hour recall conducted by trained nutritionists, hence the data indicate the intake of food items on the day prior to the interview, i.e. the day of recall. The response rate among those selected from the National Health Survey participants for the NNS sample was 61%. The total sample consisted of 13 858 people aged two years and over from urban and rural areas in all states and territories, including 3007 individuals aged two to 18 years. Full details of the methodology and the sampling have been published (19).

As well as the 24-hour recall, two other approaches were used to collect data on food intake. A food frequency questionnaire was used to assess frequency of intake of selected foods including nutrient supplements over the previous 12 months. In addition, a food habits questionnaire asked a series of questions including whether the respondents followed any special diet and 'How many days per week do you usually have something to eat at breakfast?' Throughout this paper, those who indicated they ate breakfast five or more days per week are classified as regular breakfast 'eaters'; those who responded 'rarely or never' are classified as breakfast 'skippers'. In the 24-hour recalls, participants were asked to nominate the meal at which each food item was consumed, from a list of seven options which included breakfast. Therefore, the breakfast meal was self-defined by the participants, rather than being identified by the time of consumption or the type of food.

The additional analyses were undertaken by staff of the Australian Bureau of Statistics using the Confidential Unit Record File (CURF), which includes food and nutrient intake for each individual. Foods were categorised using the groupings of the NNS (19). Throughout this paper the category 'breakfast cereals' includes both cold cereals and hot porridge-type cereals (group 128). 'Cold cereal' includes the following two NNS groups: breakfast cereals, plain single sourced (group 123), and breakfast cereals, mixed source (group 127). 'Breads' includes regular breads and rolls (group 122) and fancy breads such as crumpets and English style muffins (group 124). The category 'Pastries/cakes/biscuits' includes groups 131, 133, 134 and 136.

Descriptive statistics were used to report the mean daily intake of each food item at the breakfast occasion for the whole sample population and the percentage of respondents consuming each food item. In addition the mean serving size, among those who consumed a particular food item, was reported by various age and sex categories. Of those respondents who consumed breakfast cereal, the percentage who consumed this food with added sugar was reported, as well as the mean amount added. In addition the mean intake of added sugar for the whole sample was reported, by age and sex.

Breakfast eaters and skippers were compared in terms of the proportion who reported regularly taking vitamin

and mineral supplements or being on a special diet such as vegetarian, weight reduction, diabetic or fat-modified, as categorised in the NNS Selected Highlights report (15). The proportion of regular breakfast eaters was also compared across quintiles of household income. Chi-square analyses were used to test the associations between categorical data with  $P < 0.05$  considered to be statistically significant.

## Results

### Regular breakfast eaters

Regular breakfast eaters were more likely to take vitamin or mineral supplements on the day of the survey than breakfast skippers: 20.7% of breakfast eaters compared to only 13.5% of skippers took supplements ( $P < 0.001$ ). More regular breakfast eaters also reported being on some sort of special diet, 31.9% compared to 21.3% of skippers ( $P < 0.001$ ). When survey respondents were divided into quintiles of household income, a greater proportion of regular breakfast eaters was found in the lowest quintile compared with the other quintiles ( $P < 0.003$ ) (Table 1).

### Where breakfast is eaten

Table 2 shows the source of the breakfast meal for each age and sex category, as reported from the 24-hour recall data. More than 92% of children and adolescents ate breakfast at home. Ninety-eight percent of adults over the age of 64 years ate breakfast at home, however, the percentage was only 85% in the 19 to 24 years age group, which was significantly lower than the proportion of adults generally ( $P < 0.001$ ). None of the differences between sexes were significant.

### What Australians eat for breakfast

#### Adults

Tables 3 and 4 show the mean intakes (g per person) of the major food groups, and the percentage of adults who consumed each food type, at the breakfast meal on the day of the 24-hour recall. Considering the mean intakes per person, the typical breakfast was based on cereals, bread, milk and fruit (including juice). Less than 10% of adult Australians ate a cooked breakfast. The pattern of foods consumed was relatively similar between men and women, although women were more likely to eat fruit ( $P < 0.001$ ) and less likely to eat sugar and honey ( $P < 0.001$ ) than men. The average amount consumed by

**Table 1. Percentage of people in the National Nutrition Survey 1995 consuming breakfast at least five days a week by quintiles of household income (Q1 lowest; Q5 highest)**

Quintile	Percentage	P values			
		Compared to Q1	Compared to Q2	Compared to Q3	Compared to Q4
Q1	83.9				
Q2	77.1	0.000			
Q3	79.5	0.001	0.103		
Q4	78.6	0.001	0.318	0.609	
Q5	79.7	0.003	0.121	0.871	0.427

**Table 2. Percentage of people eating breakfast grouped by source of meal; data from the National Nutrition Survey 1995**

Age group (years)	Home	School canteen or Child care centre	Shop or restaurant or cafe	Other
2-3				
males	95.3	1.4	2.4	0.9
females	91.1	2.6	2.8	0.0
4-7				
males	96.0	0.4	2.1	1.0
females	95.1	0.0	3.0	1.9
8-11				
males	93.5	0.4	2.5	3.6
females	93.3	0.0	2.3	4.4
12-15				
males	95.0	1.3	1.5	2.2
females	91.3	0.0	1.9	6.8
16-18				
males	91.2	0.6	4.8	3.4
females	89.7	0.1	5.0	5.2
19-24				
males	84.9	0	13.7	1.4
females	85.0	0	11.0	4.0
25-44				
males	87.0	0	12.7	0.3
females	92.6	0	5.9	1.5
45-64				
males	93.6	0	5.5	0.9
females	96.0	0	3.1	0.9
65+				
males	98.0	0	0.7	1.3
females	98.0	0	1.2	0.8
19+				
males	90.6	0	8.5	0.9
females	93.8	0	4.8	1.4

women at breakfast was less than that consumed by men for all foods except fruit.

Compared to other adults, Australians aged 65 years or older were more likely to eat cereal products ( $P < 0.001$ ), especially hot cereals like porridge, and dairy foods ( $P < 0.001$ ). In particular, a higher proportion of these older Australians ate unprocessed bran or bran-based cereals: 9.3% of males aged 65 years and older and 12.8% of females aged 55 years and older ate processed bran cereals compared to only 2.1% (males) and 2.3% (females) of adults aged 25 to 44 (both,  $P < 0.001$ ). Australians aged 65 years or older also ate more fruit ( $P < 0.001$ ), and drank more tea and coffee at breakfast ( $P < 0.001$ ) than younger adults.

#### Children and adolescents

Tables 5 and 6 show the mean daily intakes (g per person) of the major food groups, and the percentage of children and adolescents who consumed each food type, at the breakfast meal on the day of the survey. As with adults,

the typical breakfast was based on cereals, bread and milk. Very few children ate a cooked breakfast.

A high proportion of children ate dairy and cereal products at breakfast, however the proportion declined with age. Milk consumption at breakfast reduced from around 80% at ages two to three years to 46% of girls and 66% of boys at ages 16 to 18 years. The proportion of respondents eating bread at breakfast was around 40% in all age and sex categories. Consumption of cold cereals declined from 68% in the youngest age groups to only 28% of girls and 47% of boys at ages 16 to 18 years. Less than 1% of children and adolescents ate bran-based cereal. Fruit consumption was noticeably low at breakfast—with less than 10% of children or adolescents consuming it, except in the very youngest age groups. Very few children consumed tea or coffee at breakfast and even by age 16 to 18 years, less than 20% did so.

The mean total amount of food and beverages consumed at breakfast per person (including those who did not eat breakfast) varied from 623 g by males aged over 65 years to 279 g by girls aged 16 to 18 years. However, a large proportion of the volume of the meal was due to fluids with a low nutrient density (i.e. tea and coffee). If these are excluded, the mean intake of food (including milk and juice) at breakfast was highest in males aged 16 to 18 years (483 g) and lowest in females aged 25 to 44 years (230 g).

Tables 7 to 10 show the mean serving sizes of foods when they were consumed at breakfast. For each age group, the mean serving sizes of foods consumed by females were smaller than those of males, with the exception of legumes and vegetables.

#### Sugar consumption at breakfast

Children were the highest consumers of sweetened breakfast cereals (i.e. those with more than 25% sugar): the percentage consuming these products ranged from 22.8% of two- to three-year-old boys to 16.4% at 12 to 15 years and 12.8% at 16 to 18 years (for girls the figures were 14%, 8.8% and 6.7%, respectively). The proportion of total daily sugar intake provided by sweetened cereals averaged 4% for all age groups up to 18 years.

Only quite small amounts of added sugars were consumed at the breakfast meal. Table 11 shows the addition of sugar to breakfast cereals. When it was added to cereal the mean amount varied from one to two teaspoons. At all ages adolescent and adult females added smaller amounts than males. The mean sugar intake added to cereal contributed less than 2% of the total daily sugar intake in children or adults of any age.

## Discussion

#### Regular breakfast eating

The Selected Highlights report of the NNS (15) provides full results on the number of times per week that breakfast was normally consumed. A summary of some of these data is given in Figure 1, which shows the proportion of Australians who reported eating breakfast regularly (at least five days per week), by age. In summary, 77.2% of adult participants reported eating breakfast on five or more days per week, 6.3% on three to four days, 7.5% on

**Table 3. Food consumed by male adults at breakfast as reported in the National Nutrition Survey 1995: mean daily intake of all males in grams (percent of males consuming these foods)**

	Age in years				
	19-24	25-44	45-64	65+	19+
Cereal products (g)	74.3 (66.6%)	72.9 (69.4%)	83.6 (81.4%)	107.6 (94.7%)	81.3 (76.2%)
- cold cereal (g)	28.6 (34.7%)	27.2 (38.3%)	25.9 (48.6%)	27.4 (63.7%)	27.1 (44.4%)
- hot cereal (g)	6.7 (1.1%)	11.8 (2.8%)	22.3 (5.5%)	44.8 (13.5%)	19.0 (4.9%)
- breads (g)	26.6 (36.3%)	24.2 (35.4%)	29.9 (50.6%)	32.1 (63.2%)	27.3 (44.0%)
- pastries/cakes/biscuits (g)	4.9 (2.6%)	4.4 (4.2%)	2.1 (2.8%)	0.9 (2.8%)	3.3 (3.4%)
Dairy (g)	158.5 (60.2%)	130.9 (66.6%)	120.9 (71.4%)	138.9 (81.9%)	132.8 (69.4%)
- milk (incl flavoured) (g)	151.2 (55.8%)	121.1 (62.9%)	113.5 (67.9%)	131.2 (78.3%)	124.3 (65.6%)
- milk substitutes (g)	2.9 (0.9%)	3.8 (1.6%)	3.3 (1.4%)	2.9 (2.2%)	3.4 (1.5%)
- yoghurt (g)	1.6 (1.2%)	3.7 (1.9%)	2.5 (2.3%)	2.5 (2.9%)	2.9 (2.1%)
- cheese (g)	1.5 (4.6%)	1.3 (3.6%)	1.5 (4.9%)	1.4 (6.3%)	1.4 (4.5%)
Fruit (g)	10.0 (5.8%)	16.5 (9.8%)	22.8 (16.2%)	39.4 (31.3%)	20.8 (14.3%)
Vegetables and legumes (g)	6.6 (4.8%)	4.8 (4.9%)	7.7 (7.0%)	8.0 (7.1%)	6.4 (5.8%)
Sugar and honey (g)	4.4 (36.3%)	5.0 (45.4%)	6.1 (49.4%)	8.0 (54.2%)	5.7 (46.6%)
Jam and spreads (g)	0.7 (4.5%)	1.6 (9.5%)	2.6 (17.4%)	4.6 (26.0%)	2.2 (13.6%)
Meat and fish (g)	5.8 (7.9%)	6.4 (7.8%)	6.8 (9.4%)	5.1 (9.4%)	6.3 (8.5%)
Eggs (g)	6.0 (6.4%)	5.9 (6.9%)	7.8 (9.3%)	4.6 (7.0%)	6.3 (7.6%)
Fats and oils (g)	3.5 (32.1%)	3.3 (32.3%)	4.0 (41.7%)	5.6 (55.9%)	3.8 (38.4%)
Juices (g)	61.1 (18.3%)	37.8 (12.2%)	32.4 (13.4%)	27.8 (16.1%)	37.9 (14.0%)
Tea and coffee (g)	82.9 (27.4%)	172.3 (51.7%)	235.0 (70.4%)	257.9 (76.7%)	192.1 (57.5%)
Total (g)	437.8	478.3	542.0	623.1	512.4

**Table 4. Food consumed by female adults at breakfast as reported in the National Nutrition Survey 1995: mean daily intake of all females in grams (percent of females consuming these foods)**

	Age in years				
	19-24	25-44	45-64	65+	19+
Cereal products (g)	55.2 (68.9%)	56.4 (75.5%)	66.1 (86.1%)	79.9 (95.6%)	63.2 (81.2%)
- cold cereal (g)	17.5 (31.2%)	17.3 (35.2%)	19.7 (48.7%)	20.1 (59.2%)	18.5 (42.7%)
- hot cereal (g)	8.0 (2.1%)	10.3 (3.5%)	17.9 (7.0%)	30.5 (12.9%)	15.8 (6.0%)
- breads (g)	20.7 (36.8%)	22.8 (44.2%)	23.7 (50.2%)	24.9 (59.2%)	23.1 (47.6%)
- pastries/cakes/biscuits(g)	5.0 (4.5%)	2.1 (3.2%)	4.1 (2.8%)	0.9 (4.6%)	2.2 (3.6%)
Dairy (g)	99.1 (62.7%)	92.4 (71.5%)	103.0 (77.5%)	110.8 (81.7%)	99.5 (73.9%)
- milk (incl flavoured) (g)	92.2 (58.2%)	84.8 (66.4%)	94.4 (72.4%)	100.5 (75.1%)	91.2 (68.7%)
- milk substitutes (g)	2.9 (1.5%)	3.1 (1.6%)	4.5 (2.4%)	5.4 (3.7%)	3.9 (2.2%)
- yoghurt (g)	2.2 (2.1%)	2.9 (2.3%)	2.8 (3.5%)	3.6 (4.1%)	2.9 (2.9%)
- cheese (g)	0.8 (3.4%)	1.4 (4.9%)	1.0 (4.2%)	1.0 (5.6%)	1.1 (4.7%)
Fruit (g)	14.2 (10.0%)	23.4 (14.7%)	30.6 (24.4%)	34.6 (31.6%)	26.3 (19.9%)
Vegetables and legumes (g)	6.6 (6.1%)	4.5 (5.2%)	5.0 (5.4%)	4.2 (6.3%)	4.8 (5.6%)
Sugar and honey (g)	2.7 (33.0%)	3.0 (35.0%)	2.8 (31.7%)	3.9 (37.8%)	3.1 (34.3%)
Jam and spreads (g)	0.6 (5.5%)	1.1 (10.0%)	2.1 (17.0%)	2.8 (23.9%)	1.6 (13.9%)
Meat and fish (g)	34 (4.4%)	2.8 (4.5%)	2.1 (5.2%)	2.2 (5.2%)	2.6 (5.0%)
Eggs (g)	2.3 (5.0%)	2.2 (4.9%)	2.8 (5.5%)	1.9 (4.1%)	2.3 (4.9%)
Fats and oils (g)	2.4 (31.1%)	2.6 (37.9%)	2.9 (41.8%)	3.5 (52.2%)	2.8 (40.8%)
Juices (g)	42.0 (14.5%)	27.1 (11.2%)	23.5 (11.9%)	26.3 (15.7%)	27.8 (12.7%)
Tea and coffee (g)	105.0 (35.2%)	193.8 (60.0%)	244.1 (75.2%)	233.9 (76.1%)	204.0 (64.1%)
Total (g)	351.6	424.1	498.0	519.5	452.9

**Table 5. Food consumed by male children and adolescents at breakfast as reported in the National Nutrition Survey 1995: mean daily intake of all males in grams (percent of males consuming these foods)**

	Age in years				
	2-3	4-7	8-11	12-15	16-18
Cereal products (g)	53.1 (94.8%)	55.3 (92.9%)	75.3 (95.3%)	96.1 (91.2%)	83.1 (73.3%)
- cold cereal (g)	18.1 (68.4%)	22.9 (62.2%)	34.1 (56.2%)	41.4 (58.4%)	40.8 (47.2%)
- hot cereal (g)	18.1 (6.3%)	6.7 (2.5%)	5.4 (1.6%)	11.0 (1.7%)	4.2 (1.1%)
- breads (g)	13.6 (42.9%)	17.8 (38.7%)	26.9 (44.6%)	24.9 (29.2%)	24.0 (36.3%)
- pastries/cakes/biscuits (g)	0.7 (1.0%)	1.4 (2.3%)	1.6 (2.5%)	1.9 (2.5%)	4.9 (2.9%)
Dairy (g)	175.3 (87.8%)	196.8 (77.7%)	199.6 (74.0%)	226.5 (74.9%)	230.5 (68.6%)
- milk (incl flavoured) (g)	162.6 (82.1%)	189.5 (78.9%)	191.9 (70.1%)	220.1 (72.0%)	224.7 (66.3%)
- milk substitutes (g)	8.3 (3.4%)	2.9 (1.7%)	3.1 (1.2%)	2.5 (1.2%)	0.8 (0.3%)
- yoghurt (g)	0.6 (0.6%)	2.6 (1.8%)	3.3 (2.2%)	0.8 (0.6%)	2.6 (1.7%)
- cheese (g)	0.7 (3.7%)	0.6 (3.0%)	1.0 (3.1%)	1.7 (2.6%)	1.9 (4.0%)
Fruit (g)	17.2 (14.5%)	15.8 (6.0%)	13.5 (8.4%)	7.3 (4.9%)	6.4 (5.1%)
Vegetables and legumes (g)	0.4 (1.0%)	5.4 (4.7%)	1.2 (1.5%)	7.2 (4.3%)	4.3 (4.2%)
Sugar and honey (g)	1.5 (36.3%)	2.9 (38.3%)	3.1 (35.0%)	5.1 (34.2%)	6.2 (33.7%)
Jam and spreads (g)	1.1 (14.2%)	1.1 (8.1%)	1.4 (11.0%)	1.1 (6.1%)	0.7 (4.3%)
Meat and fish (g)	0.3 (2.2%)	2.0 (4.2%)	4.6 (5.8%)	6.3 (5.6%)	5.8 (7.7%)
Eggs (g)	1.9 (4.0%)	4.0 (6.0%)	4.0 (4.6%)	4.5 (9.6%)	8.3 (6.4%)
Fats and oils (g)	1.4 (40.4%)	2.2 (36.2%)	3.4 (37.7%)	3.7 (35.3%)	2.2 (23.9%)
Juices (g)	37.1 (27.8%)	37.4 (18.8%)	45.6 (20.4%)	43.2 (16.3%)	98.0 (26.3%)
Tea and coffee (g)	3.1 (5.2%)	7.9 (4.9%)	9.9 (4.9%)	19.6 (8.0%)	37.3 (13.9%)
Total (g)	320.5	347.2	382.0	438.0	520.6

**Table 6. Food consumed by female children and adolescents at breakfast as reported in the National Nutrition Survey 1995: mean daily intake of all females in grams (percent of females consuming these foods)**

	Age in years				
	2-3	4-7	8-11	12-15	16-18
Cereal products (g)	47.4 (94.1%)	55.8 (94.1%)	53.7 (88.0%)	57.9 (81.2%)	49.8 (63.6%)
- cold cereal (g)	17.6 (68.9%)	19.9 (62.3%)	21.2 (49.1%)	20.2 (41.4%)	15.1 (28.2%)
- hot cereal (g)	6.5 (3.6%)	8.2 (3.1%)	3.5 (1.4%)	7.6 (2.4%)	4.7 (2.0%)
- breads (g)	16.0 (44.6%)	17.4 (43.1%)	21.3 (40.9%)	22.5 (43.7%)	20.1 (37.0%)
- pastries/cakes/biscuits (g)	0.5 (2.3%)	0.8 (1.8%)	2.8 (2.5%)	1.6 (2.4%)	1.8 (2.2%)
Dairy (g)	164.9 (85.9%)	161.4 (80.2%)	157.5 (71.4%)	122.8 (64.1%)	92.4 (52.2%)
- milk (incl flavoured) (g)	158.3 (80.1%)	155.7 (76.7%)	149.6 (67.8%)	131.7 (64.4%)	92.4 (46.3%)
- milk substitutes (g)	3.8 (2.9%)	2.2 (1.4%)	2.0 (0.8%)	0.3 (0.7%)	0.0 (0%)
- yoghurt (g)	2.0 (2.6%)	2.4 (1.6%)	2.8 (1.9%)	9.1 (3.8%)	3.8 (2.1%)
- cheese (g)	0.2 (1.6%)	1.0 (3.2%)	1.1 (3.7%)	1.6 (5.6%)	1.5 (5.1%)
Fruit (g)	17.8 (16.7%)	5.8 (7.3%)	7.8 (6.2%)	7.6 (5.6%)	11.0 (8.9%)
Vegetables and legumes (g)	0.6 (1.5%)	3.0 (3.7%)	1.0 (1.7%)	3.6 (3.3%)	4.1 (5.0%)
Sugar and honey (g)	1.8 (34.9%)	2.4 (35.3%)	2.6 (31.1%)	2.1 (23.8%)	1.5 (19.7%)
Jam and spreads (g)	0.6 (9.1%)	1.0 (10.9%)	0.9 (8.6%)	0.9 (11.0%)	1.5 (6.1%)
Meat and fish (g)	0.2 (1.4%)	2.1 (4.5%)	3.1 (5.0%)	0.6 (1.6%)	6.0 (9.0%)
Eggs (g)	1.9 (4.5%)	3.2 (5.4%)	3.2 (4.0%)	2.3 (2.9%)	2.0 (3.1%)
Fats and oils (g)	1.8 (40.5%)	1.9 (39.3%)	2.7 (38.1%)	2.6 (35.8%)	1.8 (28.8%)
Juices (g)	39.6 (25.4%)	48.1 (24.7%)	43.8 (19.6%)	53.2 (20.9%)	49.5 (19.1%)
Tea and coffee (g)	4.1 (3.1%)	6.0 (3.1%)	11.1 (5.2%)	21.3 (8.4%)	48.0 (18.0%)
Total (g)	293.9	297.6	303.9	305.7	279.2

one or two days, and 8.5% rarely or never. Overall, nearly a quarter of adult Australians reported regularly missing breakfast at least three days of the week.

These findings are similar to recent estimates of regular breakfast consumption in some other countries: 75% in the US (20) and 71% in Canada (1). It is not possible to say from these results of the NNS whether the rate of breakfast skipping is changing with time. However, in the US regular breakfast consumption amongst adults has declined progressively between 1965 and 1991 from 86% to 75% (20) and some unpublished studies suggest a similar trend in this country (personal communication, Manager Market Research, Kellogg (Australia) Pty Ltd, 30 March 2000).

The rates of breakfast-skipping found in children is also consistent with the patterns reported in other countries. In Canada in 1993 five to eight percent of 4079 Ontario children in Grades 1–3 (age six to eight years) arrived at school without eating or drinking anything on the day of testing (21). An earlier study of 184 American Grade 3 and 4 children (age eight to nine years) found a breakfast skipping rate of 9.4% (22) and the Bogalusa Heart Study reported 16% of ten-year-old students did not consume breakfast (23). In the US there has been a progressive decline in regular breakfast consumption among 15- to 18-year-olds from 87% in 1965 to 70% in 1991 (24). The findings from the NNS on the percentage of adolescents skipping breakfast are also consistent with the results of a study of the food habits of young Australian adolescents aged 11 to 15 years, that found 14.9% were regularly skipping breakfast (25).

It is not clear whether the pattern of breakfast skipping shown in Figure 1 represents the typical changes in behaviour as people move through different life stages or is indicative of declining total levels of breakfast eating in younger generations. It may be that people in the 19 to 24 year age cohort in 1995 will continue their low rates of breakfast consumption as they get older. However, the higher proportion of adults who reported eating breakfast

regularly after the age of 25 years may reflect the establishment of more stable partnerships and living patterns. One of the changes in the food habits of newly married couples is an increase in the frequency of consumption of breakfast cereal by both husbands and wives (26).

The reasons for skipping breakfast are not known. In one study of breakfast skipping in Australian adolescents, lack of time in the morning (52%) and not being hungry (22%) were the main reasons cited (27). It is also reported that more skippers than eaters believe missing breakfast is an effective means to control or reduce weight (1). O’Dea has reported that a higher proportion of adolescent girls than boys use skipping meals as a method of weight loss (25) and that socio-economically disadvantaged girls were more likely to skip breakfast than non-disadvantaged adolescents (28). Milligan et al. have also reported a higher rate of breakfast skipping in Australian 18-year-old girls (but not boys) from lower socioeconomic groups (29). By contrast, in an adolescent South African population breakfast skipping was found to be independent of social class (30).

The finding of a slightly higher proportion of regular breakfast eaters among those in the lowest quintile of household incomes differs from the situation reported elsewhere. In the US higher income has been positively associated with the probability of eating breakfast (20,31) and in Sweden a study of adolescents in 1996 found those from areas of high socioeconomic status ate breakfast more often (32).

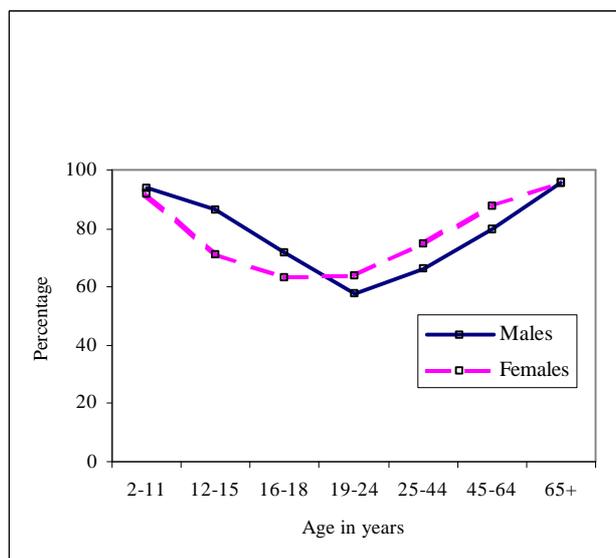
School breakfast programs have been promoted to address perceived problems of poor dietary intake and inattention in school (33–36). Most of these programs have been in primary schools. While such initiatives may have some value in particular target areas, in general the age at which regular breakfast eating begins to decline most markedly is in the early high school years (ages 12 to 15 years), so primary school breakfast programs are unlikely to have an impact. The high proportion of adolescents and young adults who skipped breakfast regularly is a cause for concern. Dietitians and nutritionists could take an active role in promoting regular consumption of a balanced breakfast to these age groups.

More than any other meal, breakfast continues to be eaten at home. The finding that almost all children ate breakfast at home is consistent with the findings from a study of eight-year-old children in 1985, which found that 97% ate breakfast with their family (37). More than 10% of young adults reported obtaining breakfast at a shop, restaurant or café. A higher proportion of adults might have had their first food of the day when they arrived at work, but if they did not identify this meal occasion as a breakfast, it was not reported in these results.

### Foods eaten at breakfast

This paper did not attempt to examine the different patterns of food combinations at breakfast, but it is clear that bread, cereal and milk were the main components of the typical breakfast for most Australians in 1995. This American-style breakfast pattern developed during the second half of the twentieth century; previous to that consumption of cooked English breakfasts was much more common (38–41). When a hot breakfast was eaten, a greater

**Figure 1. Percentage of Australians, grouped by age, eating breakfast at least five days per week, reported in the National Nutrition Survey, 1995 (15)**



**Table 7. Mean serving sizes (in grams) of foods consumed by male adults at breakfast as reported in the National Nutrition Survey 1995**

	<i>Age in years</i>				
	<i>19–24</i>	<i>25–44</i>	<i>45–64</i>	<i>65+</i>	<i>19+</i>
Cereal products					
- plain cold cereal	60.2	49.3	37.0	28.1	40.9
- fruited cold cereal	67.0	86.6	55.7	49.7	69.0
- hot cereal	616.3	424.9	406.1	329.0	386.0
- breads and rolls	71.3	64.2	56.2	49.0	58.9
Dairy					
- milk	217.2	143.7	117.6	114.6	137.2
- yoghurt	136.2	194.0	108.6	77.8	136.9
- cheese	33.5	34.1	30.3	21.0	30.2
Fruit	131.5	114.5	100.4	87.6	102.1
Vegetables	97.8	55.2	70.4	87.7	70.1
Legumes	115.9	157.2	155.9	88.2	137.2
Sugar and honey	10.8	8.8	9.5	10.7	9.5
Jam and spreads	15.8	16.5	14.6	17.1	15.9
Meat	72.2	72.1	67.2	55.8	68.3
Eggs	94.3	83.5	83.2	64.7	82.0
Fats and oils	10.6	9.6	9.4	9.5	9.6
Juices	302.2	298.2	234.4	169.1	260.1
Tea and coffee	293.8	320.4	322.2	309.9	320.8

**Table 8. Mean serving sizes (in grams) of foods consumed by female adults at breakfast as reported in the National Nutrition Survey 1995**

	<i>Age in years</i>				
	<i>19–24</i>	<i>25–44</i>	<i>45–64</i>	<i>65+</i>	<i>19+</i>
Cereal products					
- plain cold cereal	36.9	32.3	27.0	20.9	27.3
- fruited cold cereal	62.2	49.4	48.1	36.7	48.2
- hot cereal	388.4	290.9	257.6	237.1	263.3
- breads and rolls	52.4	48.9	45.6	40.6	46.3
Dairy					
- milk	131.2	97.5	94.2	93.3	98.8
- yoghurt	107.4	123.0	79.6	85.0	97.7
- cheese	24.1	27.4	23.4	17.1	23.8
Fruit	115.2	113.2	95.2	73.5	95.2
Vegetables	71.6	55.8	66.4	51.2	59.7
Legumes	124.7	112.4	129.2	89.9	116.0
Sugar and honey	7.3	7.2	7.1	8.1	7.4
Jam and spreads	9.9	10.6	12.6	11.2	11.4
Meat	68.1	54.2	35.9	43.4	49.2
Eggs	84.6	76.1	62.6	62.2	71.0
Fats and oils	7.6	6.8	6.8	6.5	6.8
Juices	286.3	227.8	185.7	164.1	210.7
Tea and coffee	286.2	311.0	305.2	280.9	302.9

**Table 9. Mean serving sizes (in grams) of foods consumed by male children and adolescents at breakfast as reported in the National Nutrition Survey 1995**

	<i>Age in years</i>				
	<i>2-3</i>	<i>4-7</i>	<i>8-11</i>	<i>12-15</i>	<i>16-18</i>
Cereal products					
- plain cold cereal	22.1	33.5	42.8	54.2	59.3
- fruited cold cereal	26.3	43.0	69.3	107.3	73.0
- hot cereal	287.9	271.5	340.6	638.2	369.2
- breads and rolls	31.3	44.9	58.3	58.3	78.2
Dairy					
- milk	169.2	203.7	232.0	267.9	285.1
- yoghurt	100.0	146.1	154.3	123.9	152.0
- cheese	19.9	19.3	31.1	67.0	43.4
Fruit	100.0	206.4	94.8	122.5	117.4
Vegetables	16.7	31.3	73.1	66.3	61.9
Sugar and honey	3.9	7.2	8.4	13.0	15.3
Jams and spreads	7.7	12.9	12.5	18.5	16.2
Meat	16.1	36.6	59.0	103.5	68.4
Eggs	48.2	66.8	76.6	98.6	86.3
Fats and oils	3.3	5.7	8.7	9.8	9.2
Juices	128.7	191.9	219.1	264.7	365.4
Tea and coffee	58.6	148.5	175.8	245.2	257.5

**Table 10. Mean serving sizes (in grams) of foods consumed by female children and adolescents at breakfast as reported in the National Nutrition Survey 1995**

	<i>Age in years</i>				
	<i>2-3</i>	<i>4-7</i>	<i>8-11</i>	<i>12-15</i>	<i>16-18</i>
Cereal products					
- plain cold cereal	20.7	27.1	32.5	36.0	34.8
- fruited cold cereal	36.3	40.9	74.1	42.6	60.9
- hot cereal	181.0	261.9	251.0	321.1	237.4
- breads and rolls	34.9	39.7	48.2	48.1	53.0
Dairy					
- milk	162.0	175.9	192.6	203.2	160.8
- yoghurt	76.5	144.8	146.1	237.5	181.7
- cheese	12.0	29.2	23.2	28.6	27.1
Fruit	79.1	70.9	104.2	122.1	123.6
Vegetables	32.4	46.4	34.0	90.6	58.8
Sugar and honey	5.0	6.4	7.6	8.0	6.5
Jams and spreads	6.2	9.4	10.3	8.0	24.4
Meat	15.9	47.3	60.1	38.0	39.7
Eggs	42.5	59.4	80.6	76.4	65.2
Fats and oils	4.4	4.8	7.0	7.2	6.1
Juices	155.6	182.6	221.1	236.7	258.7
Tea and coffee	115.4	97.9	106.8	221.0	269.3

**Table 11. Addition of sugar to breakfast cereal as reported in the National Nutrition Survey 1995**

Age group (years)		% Cereal eaters adding sugar to cereal	Mean amount of sugar (g) added by those who add sugar to cereal	Mean intake (g) of sugar added to cereal in all breakfast eaters
2-3	males	33.3	3.3	0.8
	females	35.3	4.7	1.2
4-7	males	41.2	6.1	1.6
	females	41.6	6.0	1.6
8-11	males	40.2	7.7	1.8
	females	37.3	4.8	0.9
12-15	males	44.5	10.7	2.9
	females	26.8	6.8	0.8
16-18	males	33.9	10.7	1.9
	females	20.0	6.7	0.4
19-24	males	30.1	11.9	1.3
	females	29.4	7.4	0.7
25-44	males	38.5	8.2	1.3
	females	25.4	7.3	0.7
45-64	males	37.3	9.4	1.7
	females	22.7	6.5	0.8
65+	males	37.0	10.2	2.5
	females	27.9	8.5	1.5
19+	males	37.0	9.3	1.6
	females	25.6	7.4	0.9

proportion of men consumed eggs at breakfast than women ( $P < 0.001$ ), a difference that has also been reported in the US population (31).

The low consumption of fruit at breakfast by children is consistent with other reports; one quarter of all children and adolescents surveyed in the NNS did not eat any fruit on the day of the survey (42). Thus there is an opportunity to promote breakfast as an occasion for greater fruit consumption to this age group in particular. Adding some sliced or chopped fresh fruit to a serving of cereal and milk is an easy and appealing strategy for most children.

The low proportion of girls over the age of eight years consuming any dairy foods at breakfast may be contributing to the low daily intake of calcium that has been reported in this group (15). The mean amount (g per person) of milk products consumed at breakfast by eight- to 11-year-old girls (158 g) is lower than the 196 g reported in a study of Spanish school children aged 12 years (43), although the amount consumed by boys was similar in the two countries (200 g and 204 g respectively).

The reported serving sizes of foods eaten at breakfast are mostly close to those usually given on food labels (44), in food database references (45) and food selection guides (46), with the exception of hot cereal—which

appears to be eaten in larger quantities than has been reported elsewhere (47).

## Conclusions

This analysis has found that in 1995 the typical Australian breakfast was mainly based on cereal and dairy foods, making it a nutritious meal—consistent with dietary guidelines for Australians that promote a diet including plenty of grain-based foods and adequate dairy products. There is an opportunity to promote greater fruit consumption at the breakfast meal to children and adolescents. However, as in the US, the high proportion of older children and adolescents who are now skipping breakfast regularly is cause for concern. There is a need for further studies to establish whether this represents a permanent decline over the whole population and to identify the health implications of this behaviour.

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