



## Prevalence of Meeting Healthy Eating Guidelines in Australian Secondary Students

---

### Background:

The National Secondary Students' Diet and Activity (NaSSDA) survey 2009-10 is jointly funded by the state Cancer Councils, Cancer Council Australia and the National Heart Foundation of Australia. The study fills a significant gap in existing data in Australia by establishing an ongoing commitment to the standardised monitoring of adolescents' body weight, and dietary and physical activity behaviour at both a state and national level.

### Methods:

A nationally representative sample of 12,188 secondary school students from year levels 8 to 11, from 237 schools was surveyed. Data on students' dietary, physical activity and sedentary behaviour were collected via a web-based questionnaire, and anthropometric measurements of students' height, weight and waist circumference were taken by trained researchers in a confidential setting. Active parental consent was required for students to participate in each component of the study. An audit of the school food and activity environment was also conducted.

This research memo reports on the dietary habits of Australian secondary school students focusing on key indicators of a healthy (vegetables and fruit) and an unhealthy (soft drink and fast food) diet. Food intake was measured using a questionnaire developed by the NSW Centre for Public Health Nutrition.<sup>1</sup> The vegetable and fruit items have been shown to provide reasonable validity when compared to 24-hour recall of vegetable and fruit intake for adults,<sup>2</sup> and allow direct comparison with the *Dietary Guidelines for Children and Adolescents in Australia* that recommend adolescents eat at least four serves of vegetables and at least three serves of fruit each day.<sup>3</sup>

Data were weighted by state, year level, sex and education sector to the population of students enrolled in Australia and the reported prevalence estimates are based on these weighted data.<sup>4</sup> Analyses adjusted for school level clustering using Stata SE 11.1. Logistic regression analysis was used to test for significant differences ( $p < 0.01$ ) in proportions by sex, year level, body mass index (BMI) category, socio-economic status (SES) and home location.

### Vegetable and fruit consumption:

Overall, only 24% of students reported meeting the recommended daily requirement of four or more serves of vegetables. Similar proportions of male and female students reported eating recommended quantities of vegetables, as did overweight/obese and healthy weight students. Year 8 students (27%) were more likely than years 10 (22%) & 11 (21%) students to report consuming the recommended daily amount of vegetables. Significant differences by SES and home location were also found (see Table 1).

<b>Table 1: Proportion of students meeting dietary recommendations for vegetables by sex, year level, BMI category, SES and home location</b>			
	<b>Males</b>	<b>Females</b>	<b>All</b>
Total	24.1%	23.4%	23.8%
<b>Year Level</b>			
8	28.6%	26.2%	27.5%
9	24.5%	24.1%	24.3%
10	22.8%	20.5%	21.7%*
11	20.3%	22.7%	21.5%*
<b>BMI Category</b>			
Healthy weight	24.4%	23.0%	23.7%
Overweight / obese	23.3%	24.7%	23.9%
<b>SES</b>			
Low	24.0%	22.0%	23.0%
Medium	22.4%	24.1%	23.2%
High	27.2%	24.6%	26.1%*
<b>Home Location</b>			
Metropolitan	24.0%	21.9%	23.1%
Rural	24.3%	25.4%	24.8%*

\* Significant difference at  $p < 0.01$

Note: Reference groups for significance testing were males, Year 8, healthy weight, low SES, and metropolitan.

Overall, 41% of students reported eating the recommended three or more daily serves of fruit. As illustrated in Table 2, males were more likely than females to report meeting dietary recommendations for fruit (43% cf. 39%). Compared to the youngest students (Year 8; 47%), students in years 9 (41%), 10 (40%) and 11 (38%) were less likely to report eating at least three daily serves of fruit. No significant differences by SES, BMI or home location were found.

**Table 2: Proportion of students meeting dietary recommendations for fruit by sex, year level, BMI category, SES and home location**

	Males	Females	All
Total	43.4%	39.3%*	41.5%
<b>Year Level</b>			
8	49.3%	45.5%	47.5%
9	43.0%	38.3%	40.8%*
10	41.6%	37.3%	39.6%*
11	39.4%	36.0%	37.8%*
<b>BMI Category</b>			
Healthy weight	43.4%	38.6%	41.2%
Overweight / obese	43.3%	41.7%	42.6%
<b>SES</b>			
Low	41.6%	40.3%	41.0%
Medium	42.1%	36.0%	39.2%
High	48.2%	43.5%	46.2%
<b>Home Location</b>			
Metropolitan	45.3%	41.2%	43.4%
Rural	40.7%	36.7%	38.9%

\* Significant difference at  $p < 0.01$

Note: Reference groups for significance testing were males, Year 8, healthy weight, low SES, and metropolitan.

When combined, only 14% of students reported meeting both the vegetable and fruit dietary recommendations.

### **Soft drink and fast food consumption:**

Almost one in three students (30%) reported consuming four or more cups of soft drink, cordials and sports drinks (excluding diet varieties) per week. Males were more likely than females to report drinking at least four cups of soft drink in a usual week (38% cf. 22%). Students in years 10 (32%) and 11 (34%) were also more likely than Year 8 students (27%) to consume this amount of soft drink. There was no significant difference in soft drink consumption based on students' BMI classification or their home location; however a significant SES difference did emerge (see Table 3).

**Table 3: Prevalence of consuming four or more cups of soft drink, cordials and sports drinks per week by sex, year level, BMI category, SES and home location**

	Males	Females	All
Total	38.1%	21.7%*	30.4%
<b>Year Level</b>			
8	32.7%	19.7%	26.6%
9	36.4%	20.7%	29.2%
10	41.4%	21.5%	32.1%*
11	42.3%	25.1%	34.0%*
<b>BMI Category</b>			
Healthy weight	38.2%	21.2%	30.1%
Overweight / obese	37.7%	23.6%	31.4%
<b>SES</b>			
Low	41.2%	25.2%	33.2%
Medium	39.6%	21.7%	31.3%
High	31.2%	15.4%	24.2%*
<b>Home Location</b>			
Metropolitan	36.9%	21.2%	29.6%
Rural	39.8%	22.4%	31.6%

\* Significant difference at  $p < 0.01$

Note: Reference groups for significance testing were males, Year 8, healthy weight, low SES, and metropolitan.

Forty-three percent of all students reported eating meals or snacks from fast food or takeaway outlets at least once a week. Males were more likely than females to report eating fast food on a weekly basis (49% cf. 36%). In addition, students in years 10 (45%) and 11 (46%) were more likely than those in Year 8 (39%) to report consuming fast food this regularly. As shown in Table 4, fast food consumption was associated with SES and home location, but not BMI.

### **Association between healthy and unhealthy food consumption:**

Students who reported drinking at least four cups of soft drink, cordials and sports drinks in a usual week were more likely than those with less frequent consumption, to indicate eating low daily amounts (one serve or less) of vegetables (32% cf. 21%) and fruit (34% cf. 26%). Similarly, students who reported eating fast food at least once a week were more likely than those who ate it less frequently, to indicate low daily consumption of vegetables (32% cf. 19%). A similar association was found between students reporting they eat fast food on a weekly basis and low fruit intake (31% cf. 26%), though the difference was not statistically significant.

**Table 4: Prevalence of consuming fast food at least once a week by sex, year level, BMI category, SES and home location**

	Males	Females	All
Total	49.4%	36.4%*	43.3%
<b>Year Level</b>			
8	44.2%	34.1%	39.4%
9	49.3%	34.3%	42.3%
10	49.7%	40.0%	45.2%*
11	55.1%	37.2%	46.5%*
<b>BMI Category</b>			
Healthy weight	49.6%	37.1%	43.6%
Overweight / obese	49.1%	33.8%	42.2%
<b>SES</b>			
Low	51.4%	39.8%	45.6%
Medium	51.1%	36.2%	44.2%
High	43.8%	30.2%	37.8%*
<b>Home Location</b>			
Metropolitan	50.0%	38.3%	44.5%
Rural	48.7%	33.7%	41.6%*

\* Significant difference at  $p < 0.01$

Note: Reference groups for significance testing were males, Year 8, healthy weight, low SES, and metropolitan.

### Summary:

This survey shows that adolescents' fruit and vegetable intake remains well below the Australian recommendations, suggesting there is considerable scope to encourage greater consumption of these foods among young people. In addition, the dietary habits of Australian secondary students appear to become further removed from healthy eating guidelines as they advance in year levels, with reduced fruit and vegetable intake and increased consumption of soft drink and fast food.

Although no relationship was observed between fruit and vegetable intake and BMI, low consumption may lead to an absence of nutrients and risk of overweight or obesity,<sup>5-7</sup> possibly as a result of replacement of these foods with consumption of those with greater energy density.<sup>8,9</sup> Evidence to support this hypothesis comes from the finding here that students who reported eating low amounts of fruit and particularly vegetables were also those with high frequency of consumption of soft drinks and fast food.

## References:

1. Flood V, Webb K & Rangan A. (2005). *Recommendations for short questions to assess food consumption in children for the NSW Health surveys*. NSW Centre for Public Health Nutrition.
2. Rutishauser IHE, Webb K, Abraham B, et al. (2001). *Evaluation of short dietary questions from the 1995 National Nutrition Survey*. Australian Food and Nutrition Monitoring Unit, The University of Queensland.
3. National Health and Medical Research Council (NHMRC). (2003). *Dietary Guidelines for Children and Adolescents in Australia*, Canberra: Commonwealth of Australia.
4. Australian Bureau of Statistics. (2010). *Schools Australia, 2009*. Catalogue No. 4221.0. Canberra: Australian Bureau of Statistics.
5. Field AE, Gillman MW, Rosner B, et al. (2003). Association between fruit and vegetable intake and change in body mass index among a large sample of children and adolescents in the United States. *International Journal of Obesity and Related Metabolic Disorders*, 27: 821-826.
6. Lin BH & Morrison RM. (2002). Higher fruit consumption linked with lower body mass index. *Food Review*, 25: 28-32.
7. Smith A, Kellett E & Schmerlaib Y. (1998). *The Australian guide to healthy eating*. Canberra: Department of Health and Family Services.
8. Harnack L, Stang J & Story M. (1999). Soft drink consumption among US children and adolescents: nutritional consequences. *Journal of the American Dietetic Association*, 99(4): 436-441.
9. Vartanian LR, Schwartz MB & Brownell KD. (2007). Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *American Journal of Public Health*, 97(4): 667-675.