

## food habits

**Adolescence is an important period of life to study health behaviours, as physical inactivity habits and dietary behaviours may become established during this period (Kelder et al., 1994). Adolescence is a time of increasing autonomy that provides opportunities to consume more food away from the influence of the family (Johnson, Wardle & Griffith, 2002; Story, Neumark-Sztainer & French, 2002). Many adolescents have some discretionary income and may choose to spend this income on food and drinks (Story, Neumark-Sztainer & French, 2002). Research conducted in the US suggests that, among adolescents, up to one-third of all food is eaten outside the home (Story, Neumark-Sztainer & French, 2002), and while adolescents may receive and understand healthy food messages, they do not necessarily consume accordingly (Croll, Neumark-Sztainer & Story, 2001). Taste, value and convenience have been identified as the major determinants of consumption through focus group discussions involving adolescents (Neumark-Sztainer et al., 1999).**

The SPANS food habits questionnaire was designed to examine the consumption of a set of 'indicator' foods. The foods chosen were fruits, vegetables, bread, rice and pasta, meat, chicken and fish, hot chips and fried potato products, milk, fruit juice, soft drinks, confectionery and potato chips and salty snacks, as consumption of these foods has been associated with overweight and health status. Questions were included that examined not only food habits, but also the patterns of eating (eg missing breakfast, family meals) that may be associated with risk of overweight.

The validity of several of the survey questions was assessed as part of the *1995 National Nutrition Survey* and the *Tasmanian Dietary Key Indicators Study* by comparison with more detailed methods of dietary intake assessment among adults (Riley, Rutishauser & Webb, 2001; Rutishauser et al., 2001). The results of that work showed that the questions performed reasonably well in terms of ranking and classifying people according to their intakes, and indicated differences in the nutrient quality between response categories. For example, the questions about quantity of usual serves of fruits and vegetables were able to discriminate between groups with significantly different intakes based on the 24-hour recall. In addition, those who reported a greater number of serves had higher intakes of several nutrients contained in those foods, eg vitamin C. However, the number of reported serves overestimated intakes, particularly of fruit. For example, those who reported that they usually consumed two to three serves of fruit actually consumed 1.3 standard serves and those who reported four plus serves actually consumed 2.5 standard serves, according to a more accurate measure of dietary intake. Thus, the questions employed in SPANS can provide information on the proportions of people who consume higher and lower amounts, but not provide a precise estimate of intakes.

## FRUIT

Fruit is a good source of vitamins, including vitamin C, folate and phytochemicals, and provides natural sugars and fibre, especially in the edible skins. Consumption of fruit has many health benefits for people of all ages and may protect against the development of cardiovascular disease and cancer (Hu et al., 2000; Liu et al., 2000). The *Dietary Guidelines for Children and Adolescents in Australia* recommend that adolescents should eat a minimum of three servings of fruit each day.



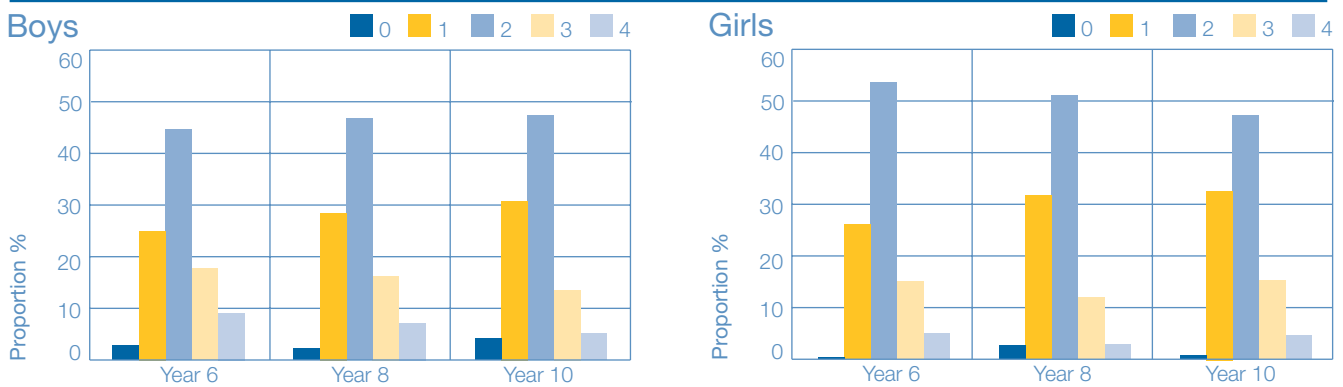
### Question

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

### USUAL FRUIT CONSUMPTION BY SEX AND YEAR GROUP

Figure 10.1 and Table 10.1 show usual consumption of fruit among boys and girls in Years 6, 8 and 10. Almost three quarters of Year 6 students and 65-70% of boys and girls in Years 8 and 10 reported that they consumed at least two serves of fruit each day and less than 5% of students reported that they didn't eat any fruit.

Figure 10.1. Usual consumption of fruit among boys and girls in Years 6, 8 and 10 (%)



0 = I don't eat fruit, 1 = 1 serve or less/day, 2 = 2-3 serves/day, 3 = 4-5 serves/day, 4 = 6 serves or more/day

Table 10.1. Usual consumption of fruit among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	3.0	25.0	44.7	18.0	9.4	2.2	28.3	47.0	15.8	6.7	4.3	30.6	46.9	13.5	4.5
Girls	0.0	26.1	53.7	15.0	5.0	2.6	31.5	51.2	12.0	2.8	0.7	32.3	47.2	15.2	4.6

0 = I don't eat fruit, 1 = 1 serve or less/day, 2 = 2-3 serves/day, 3 = 4-5 serves/day, 4 = 6 serves or more/day

### CONSUMPTION OF AT LEAST TWO SERVES OF FRUIT A DAY BY SEX AND YEAR GROUP

Figure 10.2 and Table 10.2 show the consumption of at least two serves of fruit a day among boys and girls in Years 6, 8 and 10. Unfortunately, the response categories (two to three serves, four to five serves a day) were not perfectly consistent with the recommended serves a day (three serves a day) so the response category which included the recommended number of serves was employed as the criterion. Validation studies have shown that adults over-estimate fruit consumption by about 100% (Flood, Webb & Rangan, 2005), although it is not known if adolescents also over-estimate by the same amount. Consequently, the prevalence of consumption of a particular number of serves of fruit cannot be reported with confidence. The data are presented solely for the purpose of making comparisons between the various demographic groups.

The differences between boys and girls were all small and none were statistically significant.

Figure 10.2. Consumption of at least two serves of fruit per day among boys and girls in Years 6, 8 and 10 (%)

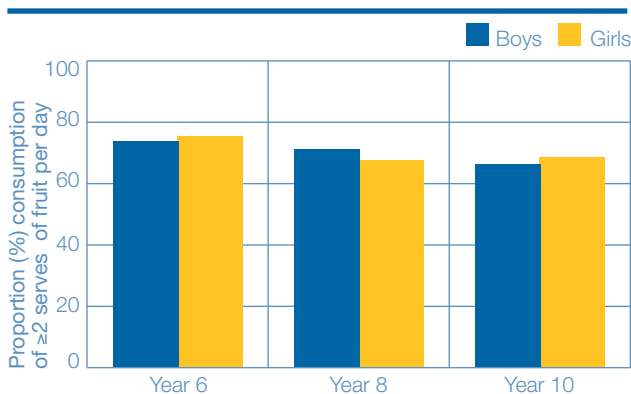


Table 10.2. Consumption of at least two serves of fruit per day among boys and girls in Years 6, 8 and 10 (%)

	Year 6	Year 8	Year 10
Boys	72.0	69.5	64.0
Girls	73.7	66.0	67.0

\* Indicates a statistically significant difference at  $P < .05$  between boys and girls within the same Year group.

### PREVALENCE OF CONSUMPTION OF AT LEAST TWO SERVES OF FRUIT PER DAY BY RURALITY, SOCIOECONOMIC STATUS, CULTURAL BACKGROUND AND BMI CATEGORY

Figure 10.3 and Table 10.3 show the consumption of at least two serves of fruit per day among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status, cultural background and BMI category.

#### Rurality

Among five of the six sex/Year groups (all except Year 8 boys), the consumption of at least two serves of fruit per day was slightly higher among rural students. However, the differences were generally small and only the difference between urban and rural Year 6 boys was statistically significant.

#### Socioeconomic status

Although there was a tendency for fruit consumption to rise with increasing socioeconomic status (except among Year 6 boys), in only one case (Year 8 girls) was the difference statistically significant.

#### Cultural background

Year 6 and Year 8 boys from Middle-Eastern cultural backgrounds were least likely to consume fruit, with inconsistent differences between the other cultural groups. Among girls, Year 8 students from Middle-Eastern cultural backgrounds were most likely to consume fruit and Year 10 Middle-Eastern girls were the least likely. However, because very few Middle-Eastern Year 8 girls were in the study, the results should be viewed with caution. None of the differences were statistically significant.

#### BMI CATEGORY

Among boys, there were no clear associations between BMI category and the consumption of fruit. Overweight Year 8 boys were significantly less likely to consume fruit compared with healthy weight boys, but no other differences were statistically significant among boys. Among girls, fruit consumption generally increased across BMI categories for all Years. Obese Year 6 girls reported having a higher usual intake than healthy weight girls, but no other differences were statistically significant.

Figure 10.3. Consumption of at least two serves of fruit per day among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status (SES), cultural background and BMI category (%)

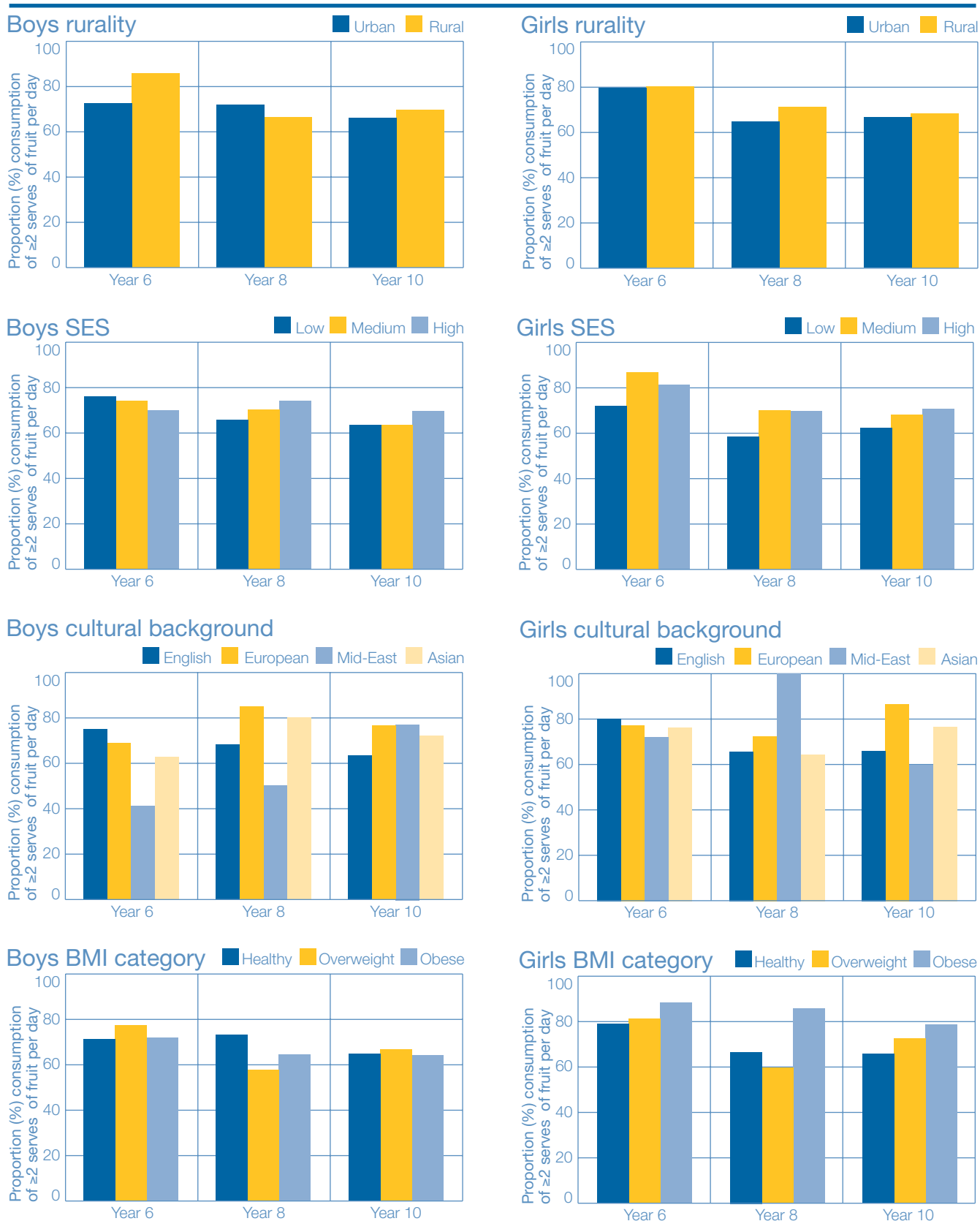


Table 10.3. Consumption of at least two serves of fruit per day among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status (SES), cultural background and BMI category (%)

	Boys			Girls		
	Year 6	Year 8	Year 10	Year 6	Year 8	Year 10
<b>Rurality</b>						
Urban	70.9	70.5	64.6	79.9	64.9	66.7
Rural	84.1*	64.9	68.1	80.3	71.2	68.5
<b>SES</b>						
Low	75.5	65.2	63.2	71.9	58.5*	62.1
Medium	73.7	69.8	63.1	86.6	70.1	68.0
High	69.4	73.6	69.1	81.3	69.8	70.7
<b>Cultural background</b>						
English-speaking	71.5	68.2	63.4	73.4	65.8 <sup>n</sup>	65.2
European	75.0	84.6	76.5	69.2	72.7	85.7
Middle-Eastern	88.2	50.0	76.9	71.4	100.0	60.0
Asian	66.7	80.0	72.0	78.9	64.3	76.5
<b>BMI category</b>						
Healthy weight	71.2	73.0	71.8	78.9	66.6	65.8
Overweight	77.1	57.7*	64.3	81.1	59.7	72.4
Obese	71.8	66.7	63.9	88.2*	85.7	78.6

\* Indicates a statistically significant difference at  $P < .05$ . Comparisons are: between urban and rural; low and medium socioeconomic status compared with high socioeconomic status; European, Middle-Eastern and Asian cultural backgrounds compared with English-speaking cultural background; and overweight and obese compared with healthy weight. Comparisons are within each sex/Year group category.

<sup>n</sup> Indicates that statistical significance could not be calculated due to low numbers.

## VEGETABLES

Vegetables are good sources of a range of vitamins and minerals, phytochemicals, dietary fibre and carbohydrates. Consumption of vegetables is directly associated with reduced risk of many chronic diseases, including cardiovascular disease and some cancers (Hu et al., 2000; Liu et al., 2000). *The Dietary Guidelines for Children and Adolescents in Australia* recommend that adolescents should eat a minimum of four servings of vegetables each day. Validation studies (Riley, Rutishauser & Webb, 2001; Rutishauser et al., 2001) have found that the validity of the questions on usual consumption of vegetables in SPANS is good (although intakes are overestimated at the lower end of consumption) and that prevalence estimates are fairly accurate.

full report



### ? Question

How many serves of vegetables do you usually eat each day? (A serve = 1/2 cup cooked vegetables or one cup of salad vegetables.)

### USUAL VEGETABLE CONSUMPTION BY SEX AND YEAR GROUP

Figure 10.4 and Table 10.4 show the usual consumption of vegetables among boys and girls in Years 6, 8 and 10. Although a very small proportion of students reported that they did not eat vegetables, approximately 30% of Year 6 students and 25% of secondary school students reported eating only one serve a day or less and it must be noted that 'vegetables', in this context, included potatoes. Only 15-25% of students reported eating at least four serves per day.

Figure 10.4. Consumption of vegetables among boys and girls in Years 6, 8 and 10 (%)

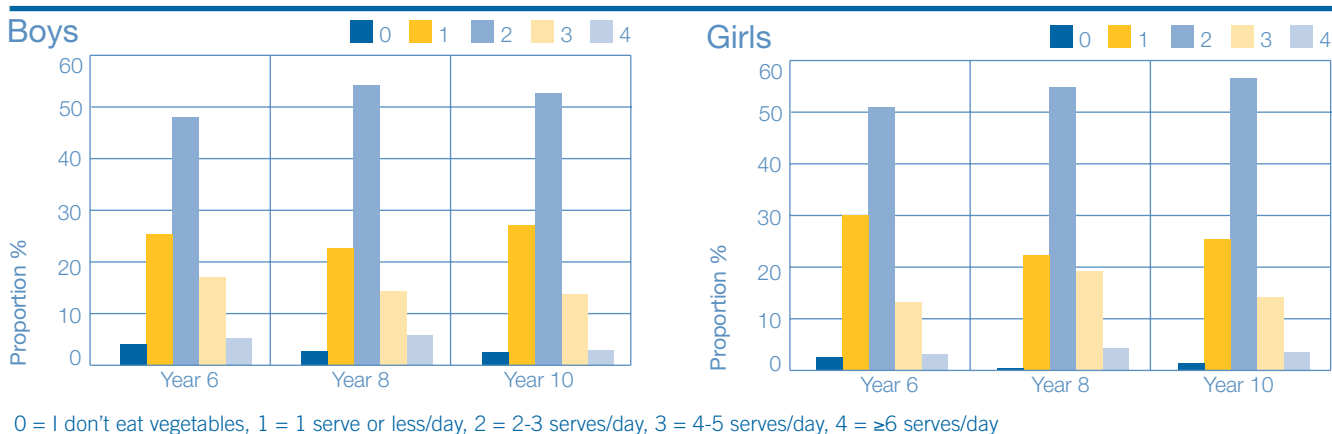


Table 10.4. Consumption of vegetables among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	4.1	25.3	48.1	17.2	5.4	2.7	22.8	54.2	14.4	5.9	2.5	27.4	53.0	14.0	3.1
Girls	2.5	29.7	51.6	13.2	3.1	0.5	22.1	54.1	19.0	4.4	1.5	25.1	55.9	14.0	3.6

0 = I don't eat vegetables, 1 = 1 serve or less/day, 2 = 2-3 serves/day, 3 = 4-5 serves/day, 4 = ≥6 serves/day

**PREVALENCE OF CONSUMPTION OF AT LEAST FOUR SERVES OF VEGETABLES PER DAY BY SEX AND YEAR GROUP**

Figure 10.5 and Table 10.5 show the prevalence of reported consumption of at least four serves of vegetables per day among boys and girls in Years 6, 8 and 10. The prevalence of consumption of the minimum recommended number of serves of vegetables was low at approximately 20% among all students. The differences between Year 8 and 10 boys and girls were small and statistically non-significant, but the prevalence was significantly higher among Year 6 boys than girls.

Figure 10.5. Consumption of at least four serves of vegetables per day among boys and girls in Years 6, 8 and 10 (%)

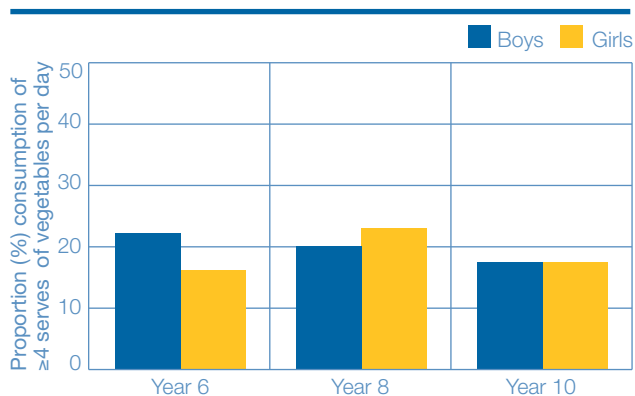


Table 10.5. Consumption of at least four serves of vegetables per day among boys and girls in Years 6, 8 and 10 (%)

	Year 6	Year 8	Year 10
Boys	22.5	20.3	17.7
Girls	16.3*	22.3	17.6

\* Indicates a statistically significant difference at P<.05 between boys and girls within the same Year group.

### PREVALENCE OF CONSUMPTION OF AT LEAST FOUR SERVES OF VEGETABLES PER DAY BY RURALITY, SOCIOECONOMIC STATUS, CULTURAL BACKGROUND AND BMI CATEGORY

Figure 10.6 and Table 10.6 show the prevalence of consumption of at least four serves of vegetables a day among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status, cultural background and BMI category.

#### Rurality

Generally, the prevalence of consumption of at least four serves of vegetables per day tended to be higher among urban students, with the clear exception of Year 6 boys. Whereas the prevalence was significantly higher among rural Year 6 boys compared with urban boys, the opposite was true among Year 6 girls. None of the other differences between urban and rural students were statistically significant.

#### Socioeconomic status

There was a direct association between socioeconomic status and the prevalence of consumption of a least four serves of vegetables a day among Year 6 boys and Year 8 and 10 girls, but not for any other groups. Among Year 6 boys, those in the high socioeconomic status tertile had a higher prevalence than the medium and low tertiles, although the difference

was not statistically significant. Among girls, the prevalence of vegetable consumption was higher in the medium and high tertiles compared with the low tertile. Year 8 girls in the low socioeconomic status tertile had a significantly lower prevalence than girls in the high tertile and Year 10 boys in the medium tertile had a significantly higher prevalence than boys in the high tertile.

#### Cultural background

Among Year 6 students, the prevalence of consumption of at least four serves of vegetables a day tended to be highest among students from a Middle-Eastern cultural background, but among Year 8 and 10 students Middle-Eastern students had the lowest prevalence of vegetable consumption. Students from Asian cultural backgrounds generally had the highest prevalence among secondary school students. None of the differences were statistically significant.

#### BMI category

There was no consistent association between BMI category and the prevalence of vegetable consumption. Although the prevalence was significantly lower among overweight Year 8 boys, that was the only sex/Year group in which the prevalence was low in an overweight category.

Figure 10.6. Consumption of at least four serves of vegetables per day among Year 6, 8 and 10 boys and girls by rurality, socioeconomic status (SES), cultural background and BMI category (%)

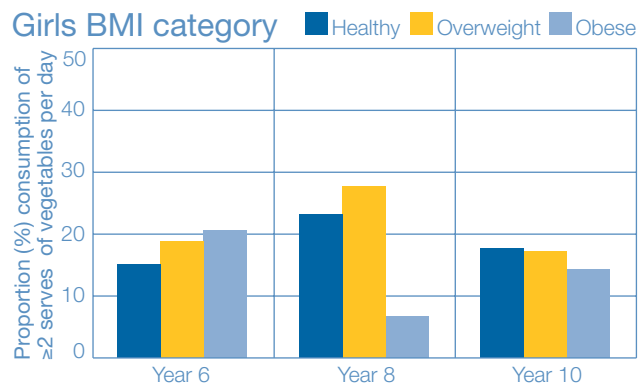
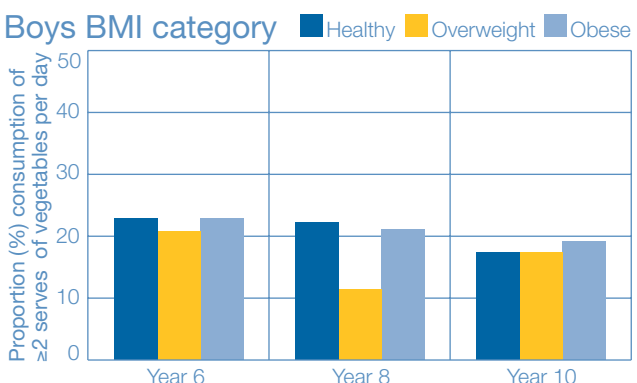
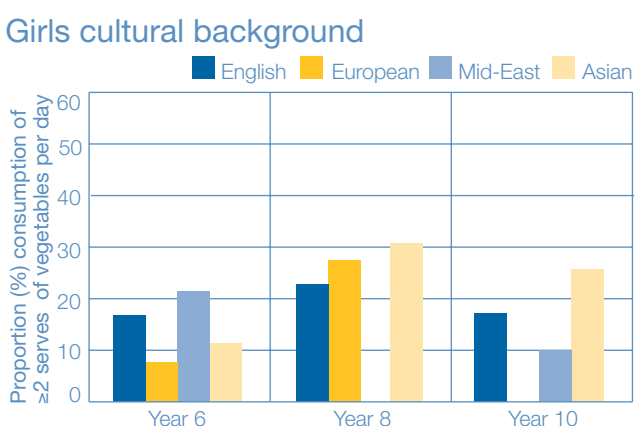
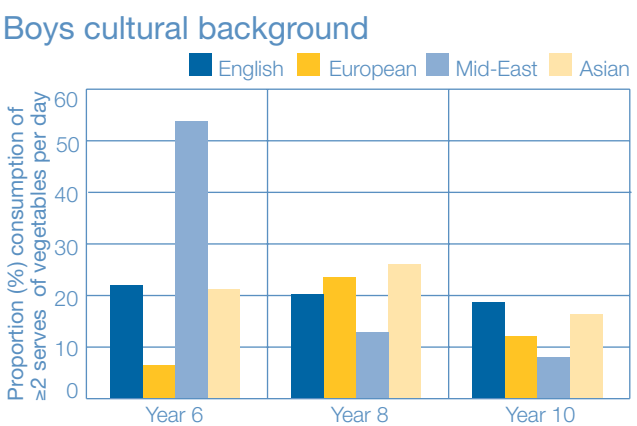
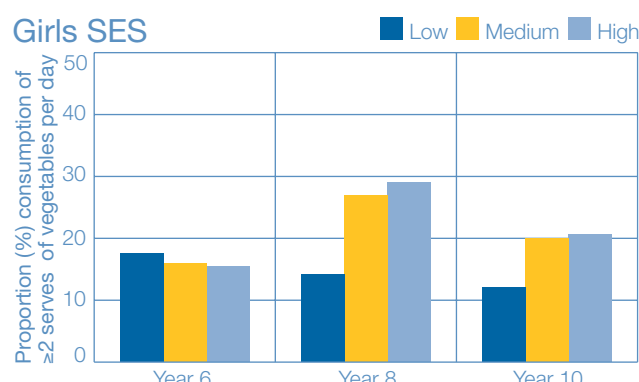
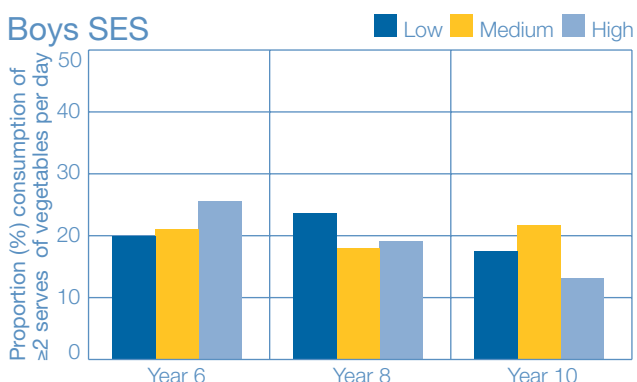
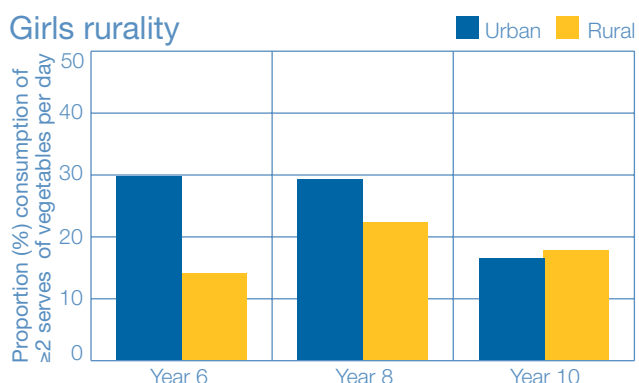
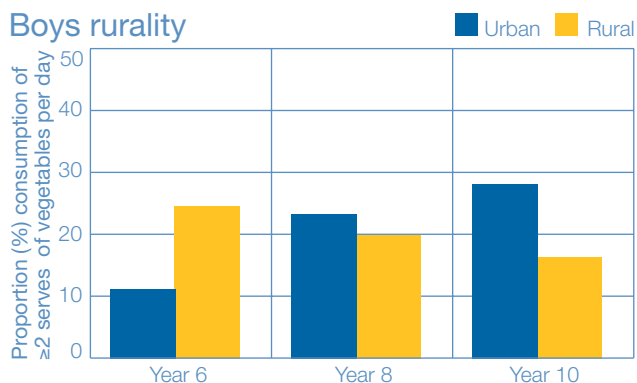


Table 10.6. Consumption of at least four serves of vegetables per day among Year 6, 8 and 10 boys and girls by rurality, socioeconomic status, cultural background and BMI category (%)

	Boys			Girls		
	Year 6	Year 8	Year 10	Year 6	Year 8	Year 10
<b>Rurality</b>						
Urban	11.1	23.0	27.8	29.6	29.2	16.4
Rural	24.3*	19.7	16.1	14.0*	22.2	17.8
<b>SES</b>						
Low	20.0	23.8	17.6	17.5	14.2*	12.1
Medium	21.2	18.1	21.7*	15.9	27.0	20.0
High	25.7	19.2	13.1	15.5	29.1	20.7
<b>Cultural background</b>						
English-speaking	21.5	19.8	18.2	16.7	22.8 <sup>n</sup>	17.1 <sup>n</sup>
European	6.3	23.1	11.8	7.7	27.3	0.0
Middle-Eastern	52.9	12.5	7.7	21.4	0.0	10.0
Asian	20.8	25.7	16.0	13.2	32.1	25.5
<b>BMI category</b>						
Healthy weight	23.1	22.5	17.6	15.2	23.3	17.8
Overweight	21.0	11.5*	17.6	18.9	27.8	17.2
Obese	23.1	21.4	19.4	20.6	6.7	14.3

\* Indicates a statistically significant difference at  $P < .05$ . Comparisons are: between urban and rural; low and medium socioeconomic status compared with high socioeconomic status; European, Middle-Eastern and Asian cultural backgrounds compared with English-speaking cultural background; and overweight and obese compared with healthy weight. Comparisons are within each sex/Year group category.

<sup>n</sup> Indicates that statistical significance could not be calculated due to low numbers.

## 100% FRUIT JUICE

100% fruit juice is a source of vitamins and carbohydrates (especially sugar) in the diet, but provides very little fibre; much less than fresh fruit. The validity of self-reported fruit juice consumption has not been determined.



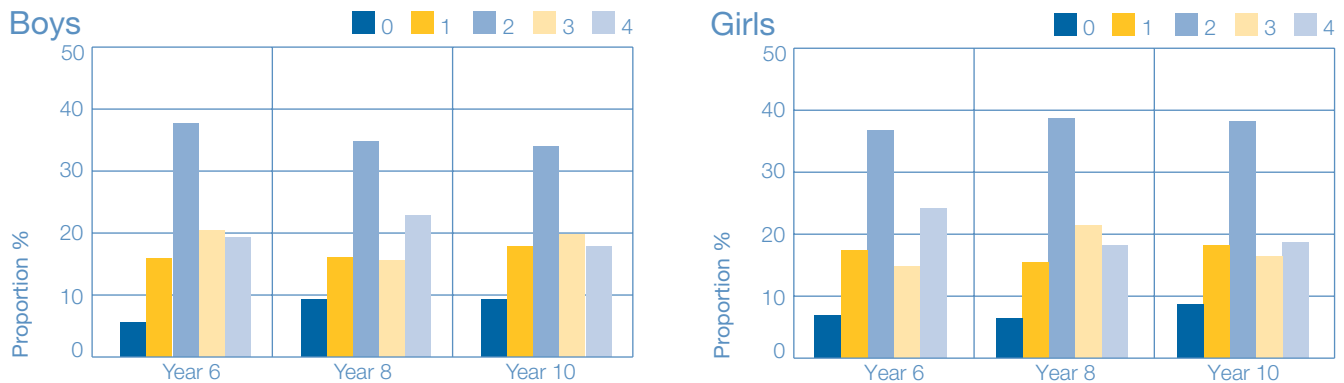
### ? Question

How often do you usually do the following?  
Drink pure or 100% fruit juice (such as orange, apple, pineapple, grapefruit, tomato)?

### USUAL CONSUMPTION OF FRUIT JUICE BY SEX AND YEAR GROUP

Figure 10.7 and Table 10.7 show the usual consumption of 100% fruit juice among boys and girls in Years 6, 8 and 10. About 20% of students in all Years reported consuming fruit juice every day and 35-40% of all students consumed it at least four times per week.

Figure 10.7. Usual consumption of fruit juice among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.7. Usual consumption of fruit juice among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	5.6	16.1	38.2	20.6	19.5	9.4	16.3	35.3	15.8	23.2	9.4	18.1	34.4	20.1	18.1
Girls	6.9	17.4	36.8	14.7	24.2	6.4	15.4	38.6	21.5	18.2	8.7	18.1	38.2	16.4	18.6

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

## MILK

Milk and milk products (eg cheese and yoghurt) are important sources of calcium and other nutrients. Adolescents experience a rapid growth phase and an adequate intake of calcium is particularly important for healthy bone development. The *Australian Guide to Healthy Eating* recommends that adolescents consume three to five serves of milk (750-1250 ml) or equivalent dairy foods (eg cheese, yoghurt) per day and choose reduced-fat varieties where possible. This section does not attempt to address the adequacy of milk intake, because that can only be assessed in the context of knowledge of the consumption of all dairy foods. This section simply describes the patterns of milk consumption.

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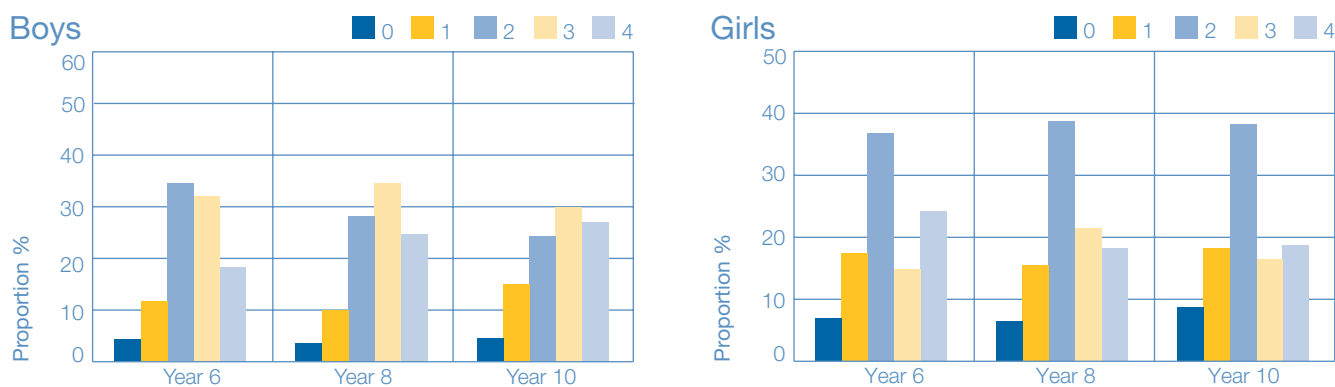
? Question

How much milk in total do you usually drink each day? (Include all types of milk including flavoured milk, and milk on cereal.)

### USUAL MILK CONSUMPTION BY SEX AND YEAR GROUP

Figure 10.8 and Table 10.8 show usual milk consumption among boys and girls in Years 6, 8 and 10. Between 13% and 19% of boys and approximately 25% of girls reported drinking less than 150 ml (one small glass) of milk per day. Whereas 50-60% of boys reported drinking at least 300 ml of milk/day, only 30-40% of girls did so.

Figure 10.8. Usual consumption of milk among boys and girls in Years 6, 8 and 10 (%)



0 = I don't drink milk, 1 = <150 ml/day, 2 = 150-300 ml/day, 3 = 301-600 ml/day, 4 = >600 ml/day

Table 10.8. Usual consumption of milk among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	4.3	11.5	34.2	31.8	18.2	3.5	9.9	27.9	34.3	24.4	4.5	14.9	24.1	29.6	26.9
Girls	4.4	21.8	41.3	25.0	7.6	8.3	16.8	34.9	27.7	12.4	8.2	20.2	33.5	28.4	9.6

0 = I don't drink milk, 1 = <150 ml/day, 2 = 150-300 ml/day, 3 = 301-600 ml/day, 4 = >600 ml/day

## TYPE OF MILK

The *Dietary Guidelines for Children and Adolescents in Australia* (NGHMRC) (2003) suggest that consumption of reduced-fat milk should be encouraged among older children and adolescents. Full milk has a fairly high fat content and while reduced-fat milk has the same nutritional value, contains much less energy.



### ? Question

What type of milk do you usually drink?  
(If you usually use more than one type of milk, mark the one you use most often.)

## PREVALENCE OF CONSUMPTION OF TYPES OF MILK BY SEX AND YEAR GROUP

Figure 10.9 and Table 10.9 show the type of milk usually consumed by boys and girls in Years 6, 8 and 10. The majority of students in all Years reported drinking full-cream (whole) milk. Among girls, the proportion of students who reported drinking reduced-fat milk increased with age, from around 15% in Year 6 to over 25% in Year 10. Among boys, only 10% of Year 6 and 16% of Year 8 and 10 students reported usually drinking reduced-fat milk. Less than 5% of students reported usually drinking soy milk.

Figure 10.9. Type of milk usually consumed among boys and girls in Years 6, 8 and 10 (%)

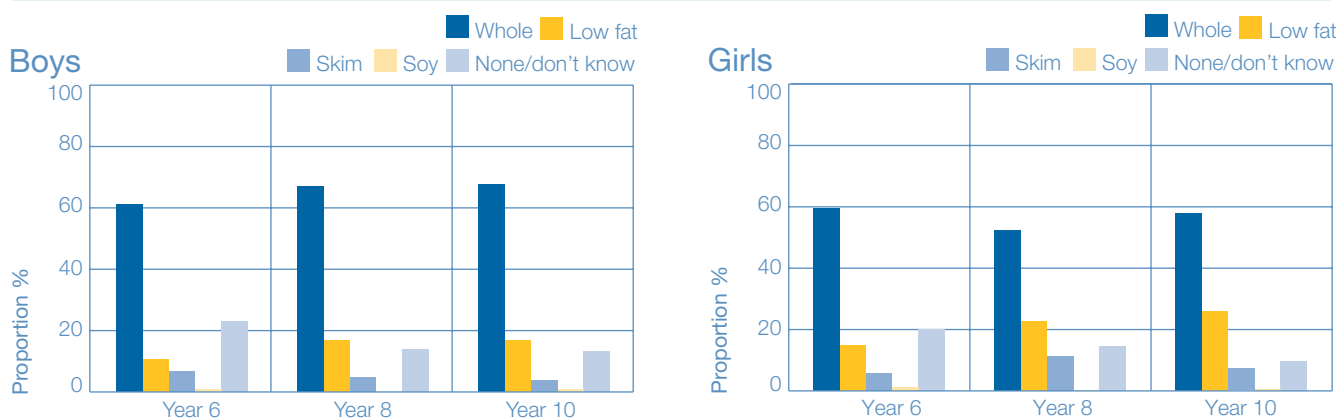


Table 10.9. Type of milk usually consumed among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Boys	59.8	10.4	6.7	0.7	22.4	65.5	16.3	4.7	0.0	13.5	66.2	16.4	3.6	0.8	13.0
Girls	58.8	14.8	5.6	1.1	19.7	51.8	22.4	11.1	0.3	14.4	57.2	25.7	7.1	0.5	9.5

1 = whole, 2 = low fat, 3 = skim, 4 = soy, 5 = none/don't know

As less than one per cent of students reported drinking evaporated or sweetened condensed milk, that category was combined with 'other' and 'don't know' to simplify presentation of the data.

## CONSUMPTION OF BREAD, PASTA AND RICE

### BREAD

Bread is a member of the group of foods that includes cereals, rice, pasta and noodles. The nutrients provided include carbohydrate, protein, fibre and a wide range of vitamins and minerals. The *Australian Guide to Healthy Eating* recommends that adolescents consume three to 11 serves a day (depending on energy needs) from this food group. One serve of bread is equivalent to two slices or one medium roll. This section does not present data on the adequacy of bread intake because that can only be interpreted in the context of information on the consumption of all of the major foods in this food group. The information below should only be interpreted as the pattern of bread consumption.



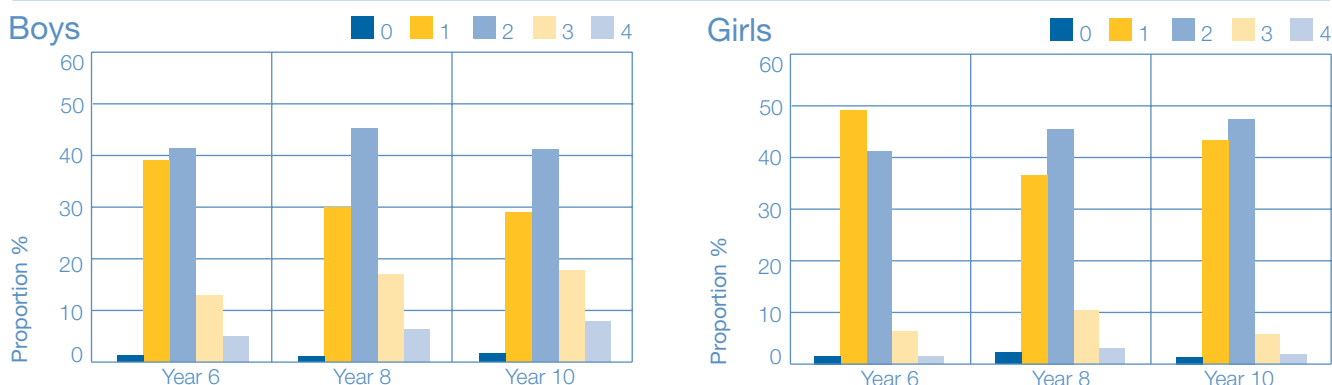
### ? Question

How many slices of bread do you usually eat each day?

### Usual consumption of bread by sex and Year group

Figure 10.10 and Table 10.10 show the usual consumption of bread among boys and girls in Years 6, 8 and 10. Among boys, 40% of Year 6 and approximately 30% of Year 8 and 10 students reported eating two slices of bread or less each day, with slightly more than 40% of all Years consuming three to four slices a day. Among girls, approximately 50% of Year 6 and 40% of Years 8 and 10 reported eating two slices a day or less. Like boys, 40-50% reported eating three to four slices per day.

Figure 10.10. Usual consumption of bread among boys and girls in Years 6, 8 and 10 (%)



0 = I don't eat bread, 1 = 2 slices or less, 2 = 3-4 slices, 3 = 5-6 slices, 4=more than 6 slices

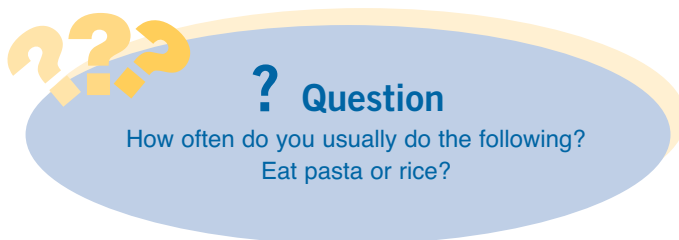
Table 10.10. Usual consumption of bread among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	1.3	39.3	41.6	12.9	4.9	1.0	30.1	45.5	17.0	6.4	1.6	29.2	41.4	17.8	7.9
Girls	1.7	49.3	41.3	6.3	1.5	2.3	36.6	45.6	10.4	3.1	1.5	43.4	47.5	5.8	1.9

0 = I don't eat bread, 1 = 2 slices or less, 2 = 3-4 slices, 3 = 5-6 slices, 4 = more than 6 slices

### PASTA OR RICE

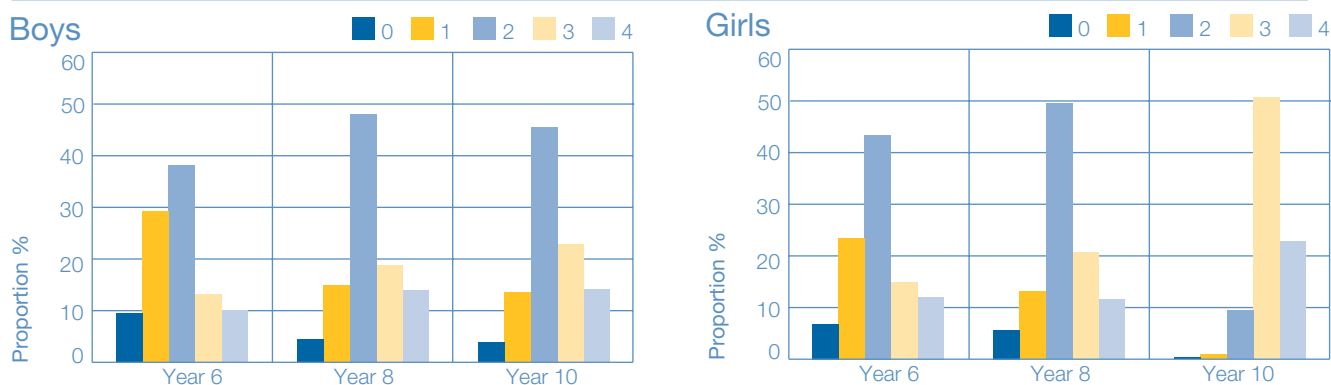
Pasta and rice are important sources of carbohydrate in the Australian diet and contain similar nutrients to bread (described previously).



### Usual consumption of pasta or rice by sex and Year group

Figure 10.11 and Table 10.11 show the usual consumption of pasta or rice each week among boys and girls in Years 6, 8 and 10. Over 80% of Year 8 and Year 10 boys and girls reported consuming rice or pasta at least once per week and approximately 70% of Year 6 girls and 60% of Year 6 boys reported consuming pasta or rice at least once per week. Year 10 girls were the most frequent consumers of pasta and rice with nearly 40% consuming pasta or rice at least four times per week. Ten to 15 per cent of all boys and girls consumed pasta or rice every day.

Figure 10.11. Usual consumption of pasta or rice among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.11. Usual consumption of pasta or rice among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	9.5	29.2	38.1	13.2	10.0	4.5	15.0	47.9	18.7	14.0	3.8	13.6	45.6	23.0	14.1
Girls	6.7	23.4	43.2	14.7	12.0	5.6	13.1	49.2	20.5	11.5	1.0	9.4	50.5	22.7	16.4

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

## CONSUMPTION OF MEAT, CHICKEN AND FISH

### RED MEAT

Red meat is a member of a group of foods that includes fish, poultry, eggs, nuts, legumes and some seeds, all of which are good sources of protein, iron, niacin and vitamin B12. Within this group, red meats are particularly good sources of iron and zinc. The *Australian Guide to Healthy Eating* recommends that adolescents consume one to two serves a day from this food group and that red meat be eaten three to four times per week.



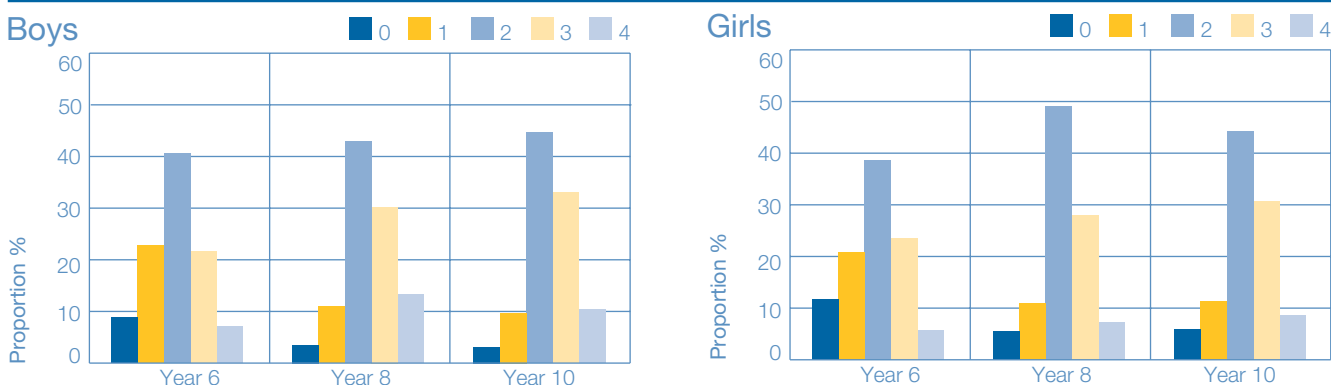
### ? Question

How often do you usually do the following?  
Eat 'red' meat, including lamb, beef, pork, goat, minced meat?

### Usual consumption of red meat by sex and Year group

Figure 10.12 and Table 10.12 show the usual consumption of red meat among boys and girls in Years 6, 8 and 10. In all Year groups, except Year 6 girls, fewer than 10% of students reported that they didn't eat red meat. Slightly more than 40% of Year 8 and 10 boys and 35-40% of girls ate red meat at least four times per week, meeting the recommended frequency of intake. In contrast, about 28% of Year 6 students reported eating red meat at least four times per week. Among Year 8 and 10 boys and girls, almost 85% of students reported that they ate red meat at least once each week.

Figure 10.12. Usual consumption of red meat among boys and girls in Years 6, 8 and 10 (%)



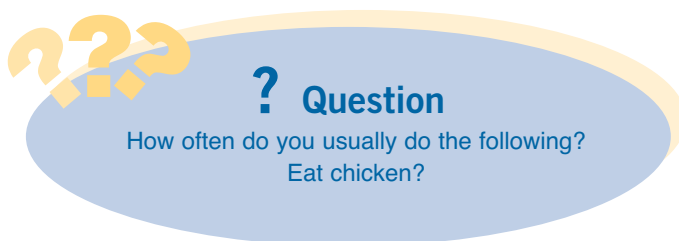
0 = Never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.12. Usual consumption of red meat among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	8.8	22.5	40.3	21.4	7.0	3.5	10.9	42.6	30.0	13.1	3.1	9.6	44.3	32.7	10.3
Girls	11.7	20.7	38.4	23.5	5.8	5.4	10.8	48.8	27.8	7.2	5.8	11.2	44.0	30.4	8.5

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

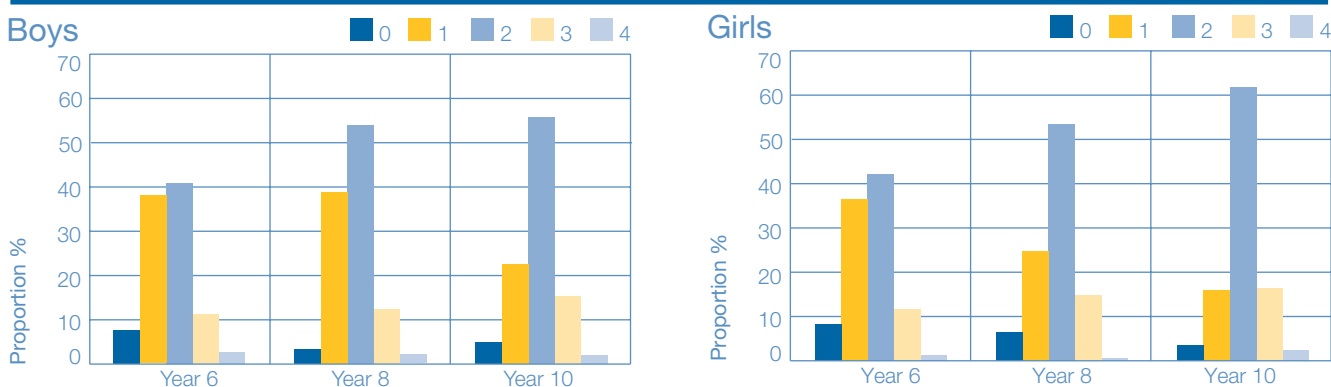
### CHICKEN



### Usual consumption of chicken by sex and Year group

Figure 10.13 and Table 10.13 show the usual consumption of chicken among boys and girls in Years 6, 8 and 10. Approximately 15% of Year 8 and 10 boys and girls reported eating chicken four or more times/week, but slightly fewer Year 6 students did so. Most students reported eating chicken one to three times/week. Among Year 6 students, approximately 55% of boys and girls ate chicken at least once per week and among Year 8 boys and girls, the proportion was approximately 70%.

Figure 10.13. Usual consumption of chicken among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.13. Usual consumption of chicken among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	7.6	37.9	40.7	11.1	2.6	3.2	28.7	53.9	12.2	2.0	4.9	22.4	55.7	15.2	1.8
Girls	8.3	36.5	42.2	11.7	1.3	6.5	24.8	53.5	14.7	0.5	3.4	16.1	61.8	16.3	2.4


0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

**FISH**

Fish is a rich source of omega-3 fatty acids, which provide specific health benefits in relation to brain development and cardiovascular health. Inclusion of two to three meals of fish high in omega-3 fatty acids has been recommended by some health authorities (NHMRC, 2003).

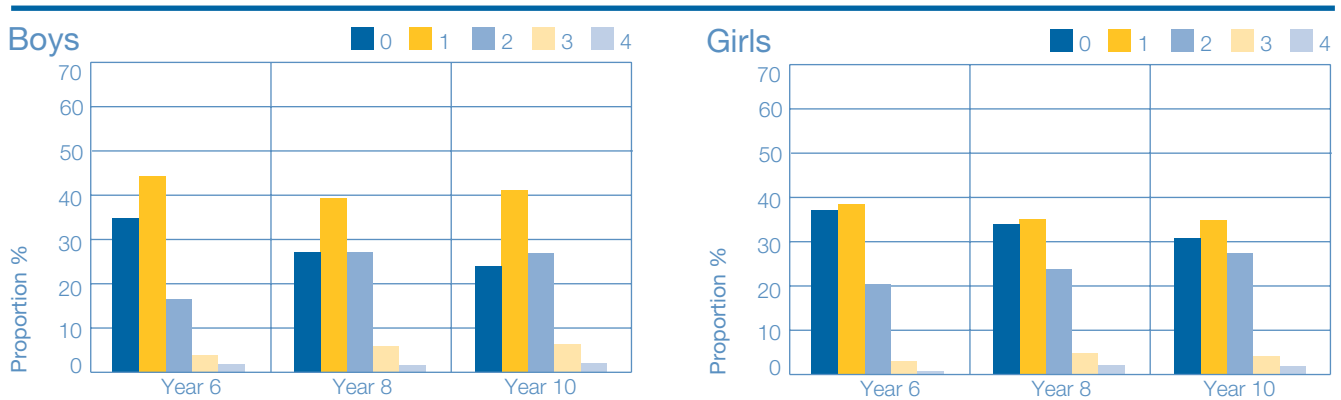
**Usual consumption of fish by sex and Year group**

Figure 10.14 and Table 10.14 show the usual consumption of fish among boys and girls in Years 6, 8 and 10. Between 27% and 37% of students reported that they never or rarely ate fish and a further 35-45% reported eating fish less than once per week. About one quarter of students reported eating fish one to three times per week, but only very small proportions (4-8%) ate fish more frequently.



**? Question**  
How often do you usually do the following?  
Eat fish, including canned fish?

Figure 10.14. Usual consumption of fish among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.14. Usual consumption of fish among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	34.3	43.8	16.4	3.8	1.8	26.9	38.8	26.9	5.8	1.5	23.6	40.7	26.5	6.2	2.0
Girls	37.1	38.6	20.4	3.0	0.9	34.1	35.1	23.8	4.9	2.1	30.8	35.0	27.4	4.1	1.9

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

## SOFT DRINKS

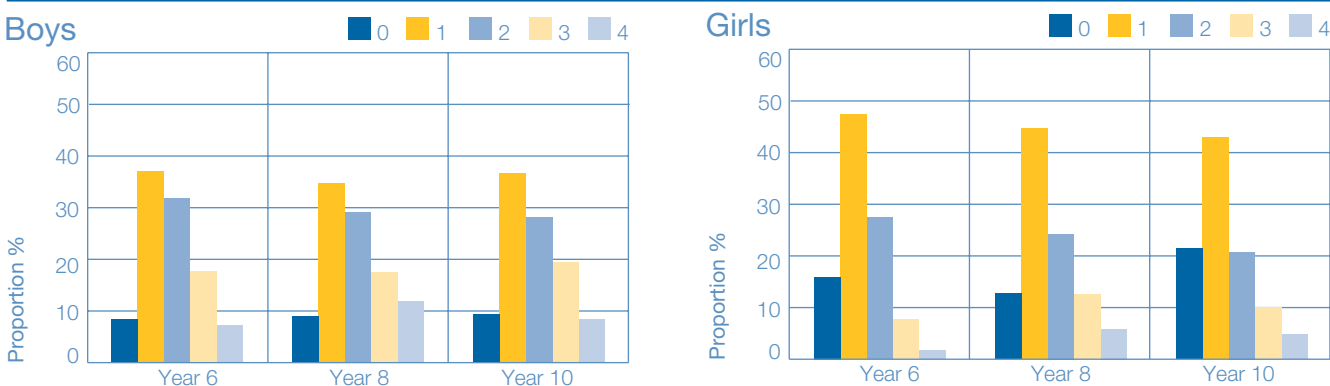
Soft drinks are a non-nutritive, high-energy group of products and consumption among adolescents exceeds that of the more nutritious beverages such as fruit juice and milk (Rampersaud, Bailey & Kauwell, 2003). A recent study found a significantly increased risk of becoming obese with every additional serve of soft drink (Ludwig, Peterson & Gortmaker, 2001).

## USUAL SOFT DRINK CONSUMPTION BY SEX AND YEAR GROUP

Figure 10.15 and Table 10.15 show the usual soft drink consumption among boys and girls in Years 6, 8 and 10. Approximately 40-45% of boys and 55-65% of girls drink more than 250 ml/day. However, 25-30% of boys drink at least 400 ml/day with 7-12% drinking more than 1 L/day. Among girls, less than 10% of Year 6 girls drink more than 400 ml, but nearly 20% of Year 8 girls and 15% of Year 10 girls do so.

**? Question**  
 How much soft drink do you usually drink each day?  
 (Include all types of soft drink including fruit flavoured drinks and 'sport' drinks, but exclude any fruit juice or plain water.)

Figure 10.15. Usual consumption of soft drink among boys and girls in Years 6, 8 and 10 (%)



0 = I don't drink soft drink, 1 = <250 ml, 2 = 250-400 ml, 3 = 400 ml-1 L, 4 =>1L

Table 10.15. Usual consumption of soft drink among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	8.3	36.3	31.1	17.3	7.0	8.9	33.9	28.5	17.2	11.6	9.2	35.9	27.6	19.1	8.3
Girls	15.9	47.3	27.4	7.7	1.7	12.8	44.6	24.2	12.5	5.9	21.5	42.9	20.7	10.1	4.8

0 = I don't drink soft drink, 1 = <250 ml, 2 = 250-400 ml, 3 = 400 ml-1 L, 4 =>1L

### PREVALENCE OF CONSUMPTION OF MORE THAN ONE CUP PER DAY OF SOFT DRINK BY SEX AND YEAR GROUP

Figure 10.16 and Table 10.16 show the prevalence of consuming more than one cup per day of soft drink among boys and girls in Years 6, 8 and 10.

The soft drink consumption data have been collapsed into two categories:

- 1 One cup or less per day (250ml).
- 2 More than one cup per day.

Over 50% of boys in each Year group consumed more than one cup per day of soft drink. Soft drink consumption was significantly lower among girls: approximately 35-40% of girls consumed more than one cup per day. The differences between boys and girls were highly statistically significant in each school Year.

Figure 10.16. Prevalence of consumption of more than one cup per day of soft drink among boys and girls in Years 6, 8 and 10 (%)

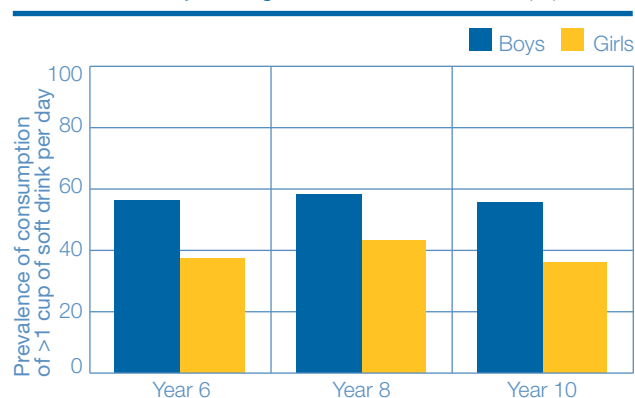


Table 10.16. Prevalence of consumption of more than one cup per day of soft drink among boys and girls in Years 6, 8 and 10 (%)

	Year 6	Year 8	Year 10
Boys	55.4	57.3	55.0
Girls	36.8*	42.6*	35.7*

\* Indicates a statistically significant difference at  $P < .05$  between boys and girls within the same Year group.

### PREVALENCE OF CONSUMPTION OF MORE THAN ONE CUP PER DAY OF SOFT DRINK BY RURALITY, SOCIOECONOMIC STATUS, CULTURAL BACKGROUND AND BMI CATEGORY

Figure 10.17 and Table 10.17 show the prevalence of consuming more than one cup per day of soft drink among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status, cultural background and BMI category.

#### Rurality

Among both boys and girls, the prevalence of consuming more than one cup per day of soft drink was slightly lower among rural Year 6 students, but higher among Year 8 and 10 students. The difference between urban and rural Year 8 boys was statistically significant and the difference between urban and rural Year 6 boys approached statistical significance.

#### Socioeconomic status

Soft drink consumption was inversely associated with socioeconomic status among both boys and girls in each Year group, with the exception of Year 6 boys. However, even among Year 6 boys those in the highest tertile had the lowest prevalence of consuming more than one cup per day. Among Year 6 boys, the prevalence was significantly higher for students in the medium category than in the high category and the difference approached significance for the low category. Among Year 10 boys, the prevalence was significantly higher for both the low and medium categories compared with the high category. Among Year 6 and Year 8 girls, the prevalence was higher in the low and medium categories than in the high socioeconomic status category.

#### Cultural background

Across almost all Year groups, boys and girls from Asian cultural backgrounds had the lowest prevalence of consuming more than one cup per day of soft drink. Boys from Middle-Eastern cultural backgrounds had the highest prevalence of consuming more than one cup a day across all Year groups. There were no consistent patterns of consumption among girls. None of the differences were statistically significant.

**BMI category**

Among all boys and Year 6 girls, obese students had the highest prevalence of consumption of more than one cup a day and among Year 8 and 10 girls the prevalence was the same for overweight and

obese girls. The prevalence of soft drink consumption was significantly higher among obese Year 6 girls and overweight Year 8 girls compared with their respective healthy weight categories.

Figure 10.17. Prevalence of consumption of more than one cup of soft drink per day among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status (SES), cultural background and BMI category (%)

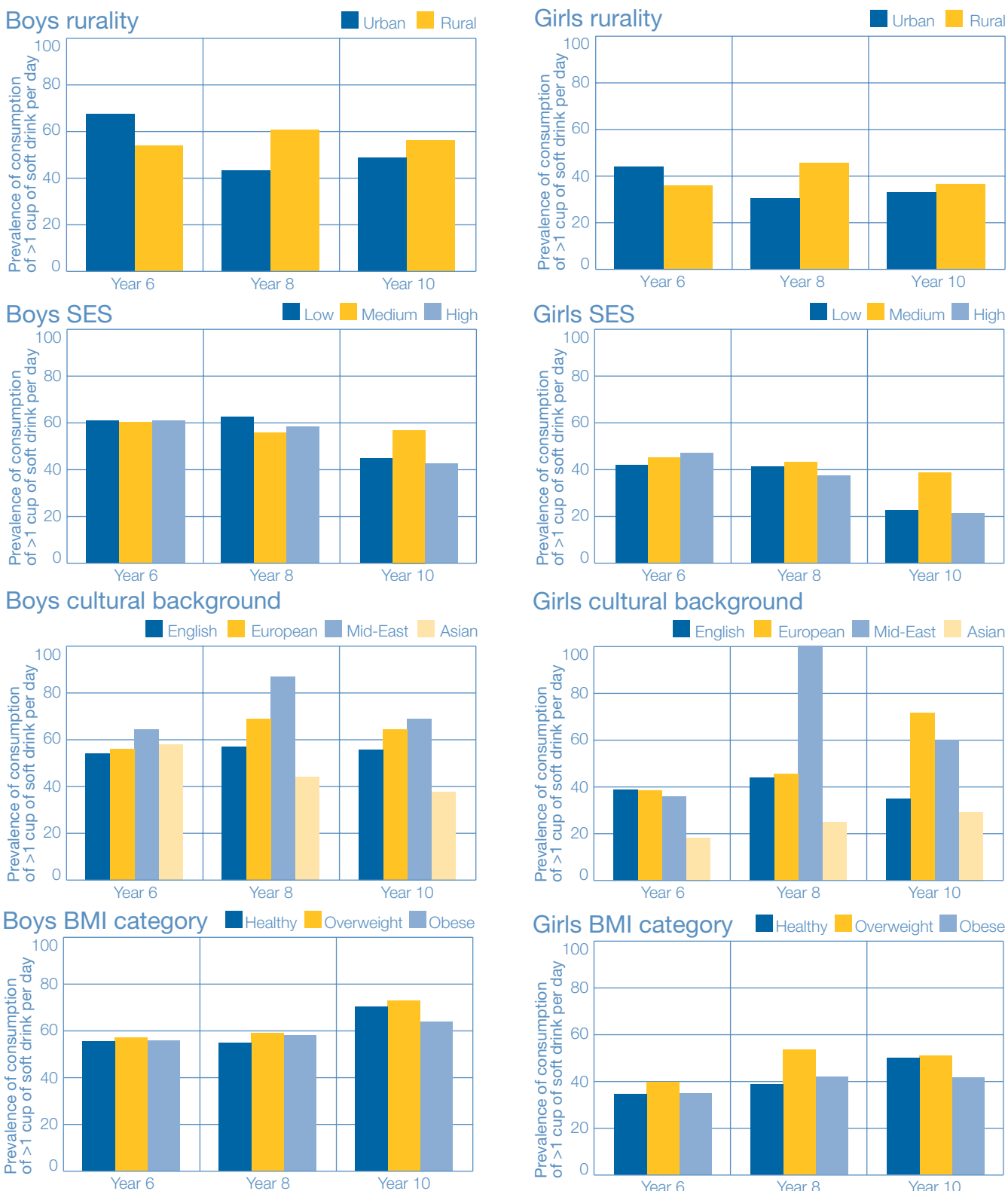


Table 10.17. Prevalence of consumption of more than one cup per day of soft drink among boys and girls in Years 6, 8 and 10 by rurality, socioeconomic status (SES), cultural background and BMI category (%)

	Boys			Girls		
	Year 6	Year 8	Year 10	Year 6	Year 8	Year 10
<b>Rurality</b>						
Urban	67.2	43.2	48.6	43.7	30.3	32.9
Rural	53.6	60.5*	55.9	35.8	45.3	36.3
<b>SES</b>						
Low	60.6	59.8	61.0*	43.1*	47.4	48.6*
Medium	62.7*	56.0	58.6	42.1*	43.6	36.0*
High	45.6	56.3	44.6	25.2	37.6	23.3
<b>Cultural background</b>						
English-speaking	54.4	57.3	56.0	38.6	43.7 <sup>n</sup>	34.8
European	56.3	69.2	64.7	38.5	45.5	71.4
Middle-Eastern	64.7	87.5	69.2	35.7	100.0	60.0
Asian	58.3	44.4	38.0	18.4	25.0	29.4
<b>BMI category</b>						
Healthy weight	54.6	55.8	53.4	35.0	39.9	33.9
Overweight	53.3	58.2	57.4	39.2	54.2*	43.1
Obese	69.2	71.4	63.9	53.0*	53.3	42.9

\* Indicates a statistically significant difference at  $P < .05$ . Comparisons are: between urban and rural; low and medium socioeconomic status compared with high socioeconomic status; European, Middle-Eastern and Asian cultural backgrounds compared with English-speaking cultural background; and overweight and obese compared with healthy weight. Comparisons are within each sex/Year group category.

<sup>n</sup> Indicates that statistical significance could not be calculated due to low numbers.

### Patterns of soft drink consumption

Table 10.18 shows responses to statements regarding patterns of soft drink consumption among boys and girls in Years 6, 8 and 10.

Twenty-five per cent of boys and 20% of girls agreed that they would normally choose soft drinks over water or milk. Almost a half of boys and slightly more than one half of girls reported that they would not normally make soft drinks their first choice.

Among boys, approximately 60-70% reported that they would not normally choose diet soft drinks and a slightly smaller proportion (55-65%) of girls held similar views. Among both boys and girls, these proportions increased with increasing age. That is, older adolescents were less likely than younger adolescents to select diet soft drinks.

Approximately 20-25% of boys reported that they usually drank soft drinks with their meals at home and slightly fewer than 20% of girls reported doing the same. The pattern of responses was fairly consistent across school Years.

When asked if they drank soft drink with lunch at school, 78% of Year 6 boys and 89% of Year 6 girls reported that they did not and less than 10% reported that they did. However, 18% and 23% of Year 8 and Year 10 boys, respectively, reported that they usually drank soft drink with their lunch. Among secondary school girls, only 10-15% reported that they usually drank soft drink with their lunch.

Table 10.18. Patterns of soft drink consumption among boys and girls in Years 6, 8 and 10 (%)

	Year 6			Year 8			Year 10		
	-	+/-	+	-	+/-	+	-	+/-	+
<b>Boys</b>									
I usually choose soft drinks instead of water or milk	46.5	30.4	23.1	45.6	28.1	26.4	47.9	27.0	25.0
I usually choose diet soft drinks	59.6	16.1	24.3	66.0	18.0	16.0	72.6	18.0	9.4
I usually drink soft drink with my meals at home	57.8	16.1	26.0	61.8	16.7	21.4	55.9	18.6	25.6
I drink soft drink with lunch at school	77.7	13.7	8.6	64.4	17.8	17.8	53.3	23.4	23.2
<b>Girls</b>									
I usually choose soft drinks instead of water or milk	55.0	27.2	17.8	46.1	32.8	21.1	55.9	22.2	21.9
I usually choose diet soft drinks	55.0	25.9	19.0	56.3	24.8	18.9	63.1	21.0	15.9
I usually drink soft drink with my meals at home	65.3	15.6	19.2	67.2	13.5	19.3	65.1	16.9	18.1
I drink soft drink with lunch at school	88.6	6.4	5.1	72.0	17.8	10.2	72.2	13.8	14.0

'-' = disagree strongly or very strongly, '+/-' = neither agree nor disagree, '+' = agree strongly or very strongly

## CONFECTIONERY

Confectionery is considered an 'extra' food. Other examples include chocolates, lollies, biscuits, cakes, pies, sausage rolls and soft drinks. Extra foods generally contain large amounts of fat and/or sugar. Most people enjoy eating them and those who are growing or are very active can eat more of them, but they should still be consumed in moderation. The *Australian Guide to Healthy Eating* recommends that they be eaten sometimes, in small amounts, or not at all.



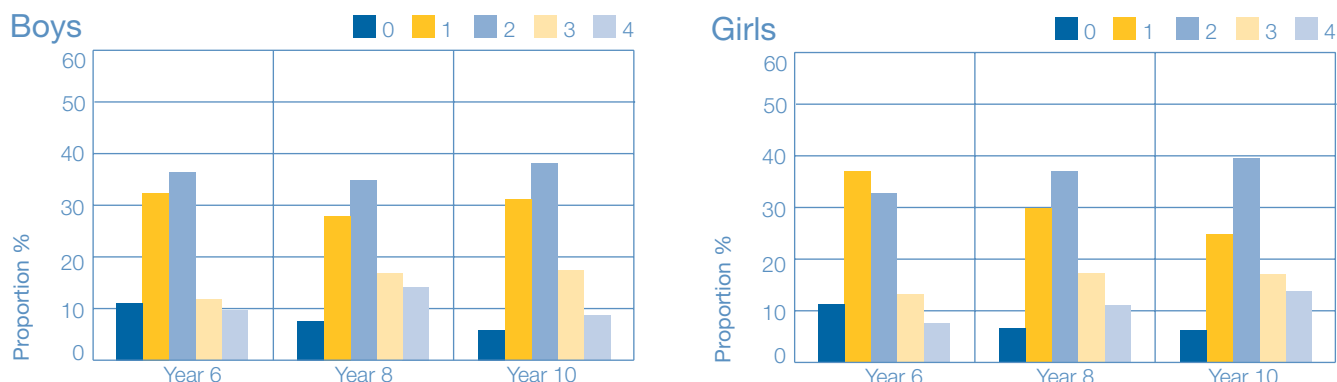
### ? Question

How often do you usually do the following?  
Eat confectionery (including chocolate, confectionery bars and lollies)?

### USUAL CONSUMPTION OF CONFECTIONERY BY SEX AND YEAR GROUP

Figure 10.18 and Table 10.19 show the usual consumption of confectionery (chocolate, confectionery bars and lollies) among boys and girls in Years 6, 8 and 10. Approximately 20% of Year 6 students and 25-30% of Year 8 and Year 10 students reported eating confectionery at least four times per week. Year 10 girls and Year 8 boys were most likely to eat confectionery at least four times per week. Approximately 10% of boys and girls reported consuming confectionery daily.

Figure 10.18. Usual consumption of confectionery among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.19. Usual consumption of confectionery among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	11.0	32.0	35.9	11.6	9.5	7.5	27.6	34.3	16.5	14.0	5.8	30.8	37.7	17.2	8.5
Girls	11.0	36.5	32.3	12.9	7.4	6.4	29.4	36.6	16.9	10.7	6.1	24.5	39.1	16.7	13.6

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

## HOT CHIPS, FRIED POTATO PRODUCTS, POTATO CRISPS AND SALTY SNACKS

### HOT CHIPS AND FRIED POTATO PRODUCTS

Hot chips and other fried potato products, crisps and other salty snack foods are all 'extra' foods (other examples are soft drinks, confectionery, biscuits, sausage rolls etc.). The *Australian Guide to Healthy Eating* recommends that adolescents eat no more than one or two extra foods per day and this applies to the sum of all extra foods.

???

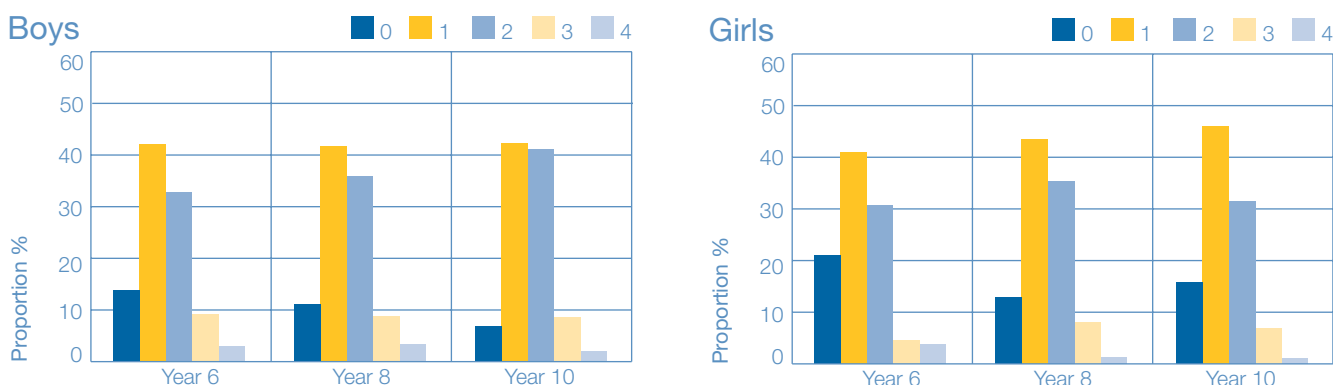
? Question

How often do you usually do the following?  
Eat hot chips, French fries, wedges or fried potatoes?

### Usual consumption of chips and fried potato products by sex and Year group

Figure 10.19 and Table 10.20 show the usual consumption of hot chips and fried potato products among boys and girls in Years 6, 8 and 10. Consumption of fried potato was more prevalent among boys than girls. Among Year 6, 8 and 10 boys the prevalence of consuming fried potato at least once per week was 44.5%, 47.5% and 51.3%, respectively. Among Year 6, 8 and 10 girls, the prevalence of consuming fried potato at least once per week was 38.7%, 44.2% and 38.8%, respectively.

Figure 10.19. Usual consumption of hot chips and fried potato products among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

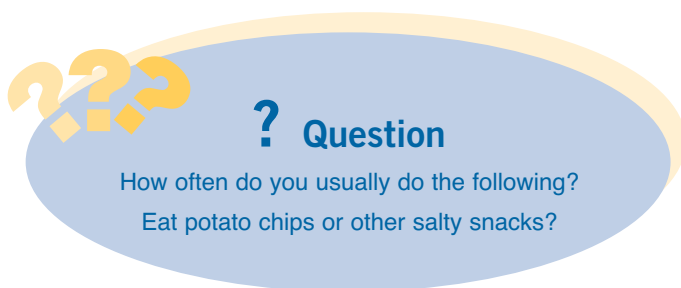
Table 10.20. Usual consumption of hot chips and fried potato products among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	13.5	41.9	32.7	9.0	2.8	10.9	41.6	35.6	8.7	3.2	6.7	42.1	41.0	8.5	1.8
Girls	20.8	40.6	30.4	4.5	3.8	12.8	43.0	35.0	7.9	1.3	15.7	45.5	31.1	6.7	1.0

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

### POTATO CHIPS AND SALTY SNACKS

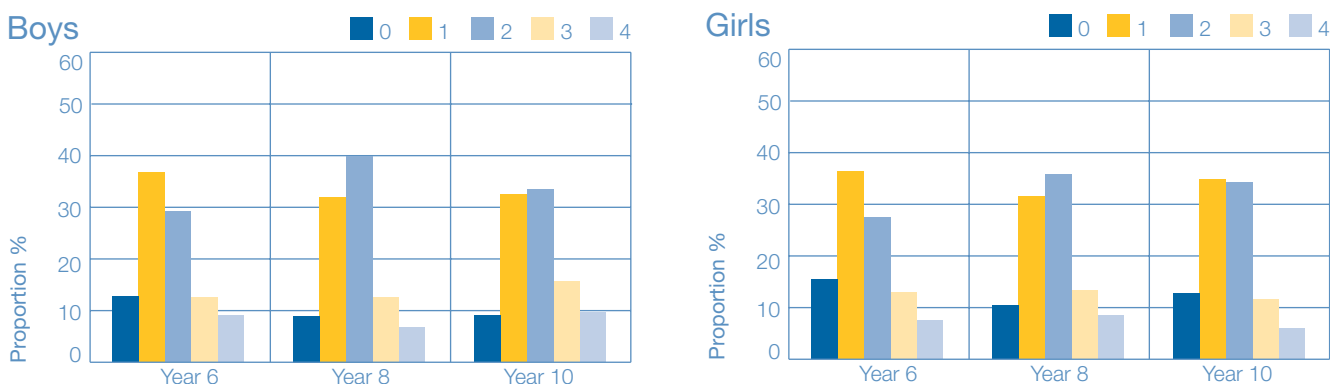
Fried potato products are classified in the 'extra foods' group, like confectionery and soft drinks, and should be eaten sometimes, in small amounts, or not at all.



### Usual consumption of potato chips and salty snacks by sex and Year group

Figure 10.20 and Table 10.21 show the usual consumption of potato chips and salty snacks among boys and girls in Years 6, 8 and 10. The consumption of potato snacks was fairly similar for boys and girls. Approximately 20% of Year 6 and Year 8 students consumed these snacks at least four times per week. However, there was a large difference between Year 10 boys and girls with 25.2% and 17.7% of boys and girls, respectively, consuming these snacks at least four times per week.

Figure 10.20. Usual consumption of potato chips and salty snacks among boys and girls in Years 6, 8 and 10 (%)



0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

Table 10.21. Usual consumption of potato chips and salty snacks among boys and girls in Years 6, 8 and 10 (%)

	Year 6					Year 8					Year 10				
	0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
Boys	12.7	36.6	29.1	12.5	9.1	8.9	31.9	39.9	12.6	6.7	9.1	32.4	33.3	15.6	9.6
Girls	15.5	36.7	27.5	12.9	7.4	10.5	31.7	36.1	13.3	8.4	12.8	35.1	34.4	11.6	6.1

0 = never/rarely, 1 = <1/week, 2 = 1-3 times/week, 3 = 4-6 times/week, 4 = every day

## DISCUSSION

Although the majority of young people reported eating two or more serves of fruit per day, evidence suggests that fruit consumption is typically over-reported. Consequently, there remains considerable scope to encourage greater fruit consumption.

The very low consumption of vegetables by young people is of considerable concern, in terms of their current health and nutritional status, as well as the increased risks of a range of health problems.

While the low level of vegetable consumption does not appear to be associated with BMI category, it may nevertheless contribute indirectly to increased risk of becoming overweight or obese. Increased vegetable consumption may reduce consumption of other foods, and thus contribute to reduced energy-density of the diets, as well as improved nutrition overall.

Given the high proportion of young people drinking full-fat rather than reduced-fat milk, there is a clear opportunity to increase the consumption of reduced-fat milk. This would retain the nutritional benefits, with reduced energy density.

Relatively few young people consumed fish regularly. Considering the substantial health benefits associated with eating fish, the reasons for the infrequent consumption should be further explored. No conclusions can be reached with regard to the adequacy of consumption of meats because data were not collected on many of the meats and meat products young people might eat (eg processed meats). Similarly, conclusions cannot be drawn regarding pasta, rice and bread because there are many other foods in this food group for which data were not collected.

The very high proportion of young people consuming soft drinks regularly is a concern. This concern is magnified in relation to overweight and obese young people, who were found to consume larger quantities of soft drink. Soft drink consumption was markedly higher among boys and was also strongly inversely associated with socioeconomic status. Reducing the amount of soft drink consumed by replacing it with water or reduced-fat milk should be recommended to the community and strongly supported, particularly among boys and young people of lower socioeconomic status. Significant proportions of young people reported consuming 'extra' foods in addition to soft drinks (chips and other fried potato, confectionery) and efforts clearly need to be made to reduce the consumption of these foods. Extra foods are generally very energy-dense and have little nutritional value. Even modest amounts of these foods add considerable energy to the diet.

Overall, there appear to be a broad range of issues which, if addressed successfully, might contribute to reduced energy consumption among young people.

The SPANS questions regarding indicator foods were not designed to provide a comprehensive picture of overall energy intake or of the extent to which young people's diets are in accordance with dietary guidelines. Rather, they indicate food habits that may influence and be part of an overall pattern of consumption related to obesity risk. Further analyses of the extent to which the survey indicators cluster into patterns of food consumption, as well as trend data from future surveys, are required to develop a more complete interpretation of the reported results. As a snapshot of contemporary food habits among young people, the survey findings identify some potential areas for action.

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