

**Recommendations for short questions
to assess food consumption in children
for the NSW Health Surveys**

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Vicki Flood

Karen Webb

Anna Rangan

NSW Centre for Public Health Nutrition

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Executive Summary

Monitoring key food habits of children is important for planning and improving health services in New South Wales. The NSW Health Department conducts the NSW Health survey program using Computer Assisted Telephone Interviews (CATI). This survey includes questions for monitoring food habits of children aged 0-16 years. In this report, we recommend survey questions to be used in the NSW Health survey for this purpose, which meet a range of criteria for good survey questions about nutrition and food habits.

The first NSW Child Health Survey was conducted in 2001, and included dietary survey questions developed by a working group of the NSW Health Department.

In this report the authors review these questions, and others, in relation to a number of criteria listed below.

Each survey question should:

- a) Be relevant to current diet and nutrition policies, e.g. Dietary Guidelines for Children and Adolescents and the Australian Guide to Healthy Eating, which reflect nutrition issues of concern in children;
- b) Have a focus on foods/food groups that make a significant contribution to the nutrients or food components of concern in “a” above;
- c) Be focused on a dietary issue that can be assessed by short questions, as a reasonable method of assessment of children’s diet in population surveys;
- d) Have available, specific information about its validity, tested previously, along with information about the validity of similar or additional questions that could be included;
- e) Be consistent with recommendations from national and state data/survey groups for short survey questions about food and nutrition and food-related questions;
- f) Have been used in previous dietary surveys, preferably of children and adolescents;
- g) Have taken into account information from CATI survey teams (in NSW and elsewhere) about difficulties and issues in administering previous relevant questions.

Summary of recommendations

This review contains recommendations for 17 food and nutrition survey questions pertaining to children 2-15 years, and 15 questions pertaining to infant feeding practices. The latter questions will be of survey respondents who have children aged less than two years old or less than four years old, depending on the question. The nature of these recommendations and brief rationale are summarised below. Recommendations include the retention of a number of the questions used in the NSW Child Health Survey 2001 (NSW CHS 2001), the elimination of a few questions, and the addition or substitution of several questions.

Breastfeeding questions

The questions previously used in the NSW CHS 2001 to assess breastfeeding practices require substitution with six questions. Four out of these six have been recommended by the Australian Food and Nutrition Monitoring Unit for use in monitoring national breastfeeding indicators, and are used widely by WHO in collecting data for their global data bank on breastfeeding (Webb et al 2001). Question 3 applies only to mothers with infants aged less than 7 months at the time of the survey, and are based on what the infant consumed the day prior to the survey, thus minimising recall bias. Questions 1-4 can be used to determine rates of 'ever breastfed', duration of 'exclusive' and 'predominant' breastfeeding, time of introduction of breastmilk substitutes and of solid foods prior to 7 months of age, and duration of any breastfeeding to four years.

Questions 5 and 6 have been included previously in CATI surveys and provide information of the reasons why mothers don't breastfeed or stop breastfeeding prior to recommendations. The data collected to date from these questions are currently being examined to identify the usefulness or otherwise of continuing to include these questions in the child survey. Note that Questions 5 and 6 are currently only asked of mothers who wish to respond, so cannot be used to generalise about the survey population.

Questions 7-15 relating to breastfeeding were used in the 2001 NSW Child Health Survey and in 2003/2004 and have been included primarily to provide trend data with past surveys (these questions are asked to carers of children less than two years of age). It is

anticipated that the longer-term recall questions 7 to 15 will not remain in the survey beyond the next couple of years.

Fruit and Vegetables questions

The recommended questions differ from those in the NSW CHS 2001. While these earlier questions demonstrated reasonable validity when evaluated among 18 month old children (Lymer and Gill 2003), two ‘global’ questions about number of fruit and vegetable serves consumed, taken from the 1995 NNS, have been recommended for inclusion in future health surveys in NSW. These questions are more widely used, have been validity tested in a wide range of age groups (including the study of 18 month old children), and are recommended for use by the National CATI reference group. The use of these will allow comparisons with other datasets, and between different age groups in NSW.

An alternate ‘b’ question is recommended for younger age groups (1-2 years), in order to reflect serve sizes more likely to be consumed by younger children. Survey questions using half of the adult reference serve were validity tested in the study of 18 month old children (Lymer and Gill 2003), and were found to be reasonable discriminators between children consuming lower and higher quantities of fruits and vegetables. This ‘b’ question, with modified serve sizes for young children, will be evaluated after an initial period to assess its ease of administration to parents of young children (compared with asking parents to report in small fractions of an adult serve).

Questions about milk and other dairy products

The recommended questions assess quantity and type of milk consumed, in accordance with Dietary Guidelines 3.4 (milk and alternatives) and 3.6 (limit saturated fat and moderate total fat). The milk quantity and milk type questions distinguish between respondents with higher and lower calcium intake, and higher and lower saturated fat intake, respectively. However, without further testing of the validity of these questions, they cannot be used to derive an indicator of the percentage consuming the recommended serves of dairy products, as outlined in the Australian Guide to Healthy Eating. Soy milk has been included in the response categories, to reflect the apparent increasing use of soy products in the community. Further information about the calcium and fat content of soy milks has also resulted in the addition of regular and reduced fat soy milk categories to types of milk.

Feedback from the CATI survey team indicated that a substantial minority (15%) of carers report that their children do not consume milk, but consume cheese, yoghurt or other dairy alternatives and wish to respond with these in the survey. Two questions about the frequency of cheese and yoghurt consumption, which have been validity tested among adults, are recommended for use in the children's survey. These questions, rather than two previously untested questions about number of serves consumed, are recommended because we have information about the validity of the frequency questions, amongst adults. The question about custard consumption has not been included as previous use of this question indicates only 3% of respondents consumed custard daily, so it is not considered an important contributor to daily calcium intake. If survey space permits, the inclusion of the yoghurt and cheese questions may prove to be useful for monitoring dairy food consumption patterns among children of various ages. An appropriate validation study could assess the ability of these questions (along with the milk questions) to identify the proportion with low intakes of dairy foods and to track these over time.

Meats Questions

Two questions on meat intake have been recommended, one question relates to processed meat consumption (and was included previously in the NSW Adult Surveys) and one new question is recommended relating to the frequency of red meat consumption. These questions are linked to the dietary guidelines on lean red meat, and limiting saturated fat. Two similar questions have been previously validity tested among adults although not among children, and these questions were modified slightly in this report, to reflect types of meats commonly consumed by children.

Breads and Cereals Questions

Following a review of the literature about nutrient concerns in children's diets, and discussion with NSW Health and other health professionals, it has been decided not to include questions about breads and cereals. The literature suggests that children's diets are high in breads and cereals, and in the nutrients these foods contain. Data from the NNS indicates that breads and cereals provide about 20% of energy to diets of young people (not including mixed cereal based products, such as biscuits). Thus, these foods were not regarded as a priority for inclusion in the survey questions.

'Extra' foods questions

The Australian Guide to Healthy Eating identifies a group of foods high in fat and/or sugar as “extra foods” (AGHE, 1998). These are energy dense, nutrient-poor foods, and it is suggested that these foods be consumed occasionally and/or in limited amounts (Webb et al, in press). The greatest contribution of single foods in this class, to energy intake among 18 month old children have been found to be sweetened drinks, cereal based products (particularly biscuits), and hot chips (Webb et al, in press). Fast foods are also a contributor. To cover these food habits, it is recommended that the question on sweetened drinks from the previous CHS be retained, and questions be added regarding the frequency of eating hot chips (previously asked about quantity of hot chips), and the frequency of eating food from fast food outlets (obtained from the Queensland DIAT survey). This latter question identifies and defines fast foods eaten at both meals and snacks.

Questions about Other drinks including Water

It is recommended that two questions on quantity and types of water consumed, be included in the survey, relating to the dietary guideline on water. A question about fruit juice consumption has also been retained from the previous survey because juice and sweetened drinks may replace water or more nutrient dense drinks such as milk, particularly among older children. There are no specific recommendations about the quantity of water required for children (though it is recommended adults drink 8 glasses of water every day). These questions, along with information about other fluids (juice, milk, sweetened drinks) may indicate the practice of particular types of fluids replacing others.

Food Security questions

Previous questions relating to food security have been retained, because improving food security for disadvantaged families is a nominated priority of NSW Health in the nutrition strategic directions document.

Folate questions

The questions about folate consumption used previously in the NSW CHS 2001, have not been recommended for continued use in NSW surveys of eating habits of children. Folate is not an identified policy issue in diets of children. The questions are intended for women of childbearing age, and do not directly assess use of food products fortified with folate and folate supplements, two issues of most concern. The validity of questions about periconceptional use is questionable, and advice is being sought from researchers in this area. Suitable questions about the use of fortified foods and folate supplements are being investigated, with the anticipation of recommending two questions for the adult surveys, which have been tested by ABS and used in the National Health Survey.

Parent-reported weights and heights

Parent-reported heights and weights were considered to be too inaccurate for inclusion in the survey. Reporting the weights and heights of children is particularly difficult given the relatively rapid weight and height changes of growing children.

Reporting and interpretation of the data

A key issue for consideration by public health practitioners are the analyses, reporting, and interpretation of the data collected in dietary surveys. Short dietary survey questions do not generally provide accurate estimates of the quantity of particular foods and nutrients consumed, and there is some variation in the direction of the error. For example, the vegetable question tends to underestimate the amount of vegetables people are actually consuming (as reflected in a more detailed assessment), while the milk quantity question overestimates the actual amount consumed, especially for the highest response category. The main use of short questions is to distinguish between those with higher and lower intakes or more and less frequent intakes of selected foods. Thus, for most questions, it is recommended that the distribution of responses (by category) be reported rather than reporting the percentage meeting the 'recommended' intakes. This will give more information about the direction of change in the distribution, and groups which require further targeting. It will also avoid the problem of attaching unwarranted certainty to the point estimates, and hence the size of the group still to be 'targeted' for interventions.

Consideration of other survey questions and survey vehicles

NSW Health has recently implemented the NSW Healthy School Canteen Strategy, and wishes to document changes in the intake by children of foods which are being minimised or prohibited from sale in school canteens. Measuring food intakes in a general population survey of children is not likely to be sufficiently sensitive, nor precise enough, to pick up changes in consumption resulting from the strategy. This is, in part, because school food contributes only a portion of the total diet, and foods eaten infrequently are not likely to be accurately estimated with short survey questions. Further consideration needs to be given to methods of surveying school children to measure consumption of foods at school.

Recommended Questions

The recommended questions and response categories follow at the end of this summary. In section 7 of the report, each recommended question is followed by documentation regarding the source of the question, its relevance to nutrition guidelines/policy, what is known about the validity of the question in assessing food habits and as a means of ranking respondents on their intake of selected nutrients, and any special issues for consideration in the analysis and interpretation of the responses.

Recommended Questions

Breastfeeding

The first question is to be asked of all children aged less than 48 completed months of age, and then follow sequence.

1. Has [child] ever been breastfed?
(‘Ever breastfed’ means ever given breastmilk, even just once. This includes putting the infant to the breast to feed or giving expressed breastmilk.)
Yes (*go to Q.2*)
No (*go to Q.6*)

2. Since this time yesterday, has [child] been breastfed?
(Breastfed includes giving expressed breastmilk)
Yes (*If Yes and the child is aged less than seven months, go to Q.3*)
No (*go to Q.4*)

3. Since this time yesterday, did [child] receive any of the following?

3.1 Vitamins, mineral supplements, medicine	Yes	No
3.2 Plain water	Yes	No
3.3 Sweetened or flavoured water	Yes	No
3.4 Fruit juice	Yes	No
3.5 Tea or infusion	Yes	No
3.6 Infant formula	Yes	No
3.7 Tinned, powdered or fresh milk	Yes	No
3.8 Solid or semi-solid food	Yes	No
3.9 Other (<i>specify</i>) _____	Yes	No

4. Including times of weaning, what is the total time that [child] was breastfed?
_____ weeks (1-12 weeks)
_____ months (1-48 months)
Less than one week.
Don’t know
Refused

5. If response to Question 4 <12 months and MOTHER ASK: What was the main reason you stopped breastfeeding [child]?

6. If MOTHER ASK: What were the main reasons you decided not to breastfeed [child]?

Somewhere in the survey, also ask

For each child less than 48 months old, ask the respondent:

- a) Can you tell me how old the child is today?
(in completed months and weeks _____)
- b) If possible ask, the exact date of birth is _____

Breastfeeding questions, cont.

The following breastfeeding questions, from 2001 Child Health Survey, are included in order to provide trend data with past surveys. It is anticipated that these questions will not remain in future rounds of the survey.

Ask these questions of parents with children less than 24 months.

7. Has [child] ever been given infant formula regularly?
(Prompt if necessary: regularly means at least once a day).
 - Yes
 - No (go to Q.9)
 - Don't know (go to Q.9)
 - Refused (go to Q.9)

8. At what age was [child] first given infant formula regularly?
 - _____ weeks
 - _____ months
 - Less than one week
 - Don't know
 - Refused

9. Has [child] ever been given cow's milk regularly?
 - Yes
 - No (go to Q. 11)
 - Don't know (go to Q.11)
 - Refused (go to Q. 11)

10. At what age was [child] first given cow's milk regularly?
 - _____ weeks
 - _____ months
 - Less than one week
 - Don't know
 - Refused

11. Has [child] ever been given any other type of milk substitute on a regular basis? (Prompt: apart from breastmilk, infant formula, cows milk)
 - Yes
 - No (go to Q. 14)
 - Don't know (go to Q.14)
 - Refused (go to Q.14)

12. What type of milk substitutes did [child] have?
(Multiple responses)
 - Soya bean milk
 - Goat's milk
 - Evaporated milk
 - Other (specify) _____
 - Don't know
 - Refused

13. At what age was [child] first given [this/any of these] milk substitute(s) regularly?

_____ weeks

_____ months

Less than one week

Don't know

Refused

In children 7 months or less

14. Has [child] ever been given solid food?

Yes

No (go to drinks section)

Don't know (go to drinks section)

Refused (go to drinks section)

In children less than 24 months

15. At what age was [child] first given solid food regularly?

_____ weeks

_____ months

Never given solid food, not yet started

Don't know

Refused

Fruit and Vegetables

2-15 years

16a. How many serves of fruit does your child usually eat each day? (a serve= 1 medium piece or 2 small pieces of fruit or 1 cup diced pieces).

_____ serves per day
_____ serves per week
Don't eat fruit
Don't know

1-2 years

16b. How many serves of fruit does your child usually eat each day? (a serve= 1 small pieces of fruit or 1/2 cup diced pieces).

_____ serves per day
_____ serves per week
Don't eat fruit
Don't know

2-15 years

17a. How many serves of vegetables does your child usually eat each day? (A serve = 1/2 cup cooked vegetables or 1 cup of salad vegetables).

_____ serves per day
_____ serves per week
Don't eat vegetables
Don't know

1-2 years

17b. How many serves of vegetables does your child usually eat each day? (A serve = 1/4 cup cooked vegetables or 1/2 cup of salad vegetables).

_____ serves per day
_____ serves per week
Don't eat vegetables
Don't know

Milk

1-15 years.

For those <4 yrs, only ask question 18 if answer 'no' to q.2 in breastfeeding questions, i.e. not currently breastfeeding child

18. How many cups of milk does [child] usually drink in a day?
(1 cup=250ml, a household tea cup).
(milk=cow's milk, soy milk, milk on cereal, flavoured milks).
_____ number of cups per day.
_____ number of cups per week
Doesn't drink cow's milk or other milk
Don't know
Refused

19. What type of milk does [child] usually consume?
Whole
Low/reduced fat
Skim
Evaporated or sweetened condensed
Soy milk, regular. Please specify _____
Soy milk, reduced fat. Please specify _____
None of the above
Don't know

Additional questions to ask if room in the survey:

20. How often does [child] eat cheese (include all cheeses: ricotta, cottage, processed, cream, hard and soft cheeses).
_____ times per day
_____ times per week
_____ times per month
Rarely/ never
Don't know

21. How often does [child] eat yoghurt? (do not include dairy desserts)
_____ times per day
_____ times per week
_____ times per month
Rarely/ never
Don't know

Meats

In 2-15 years:

22. How often does [child] eat red meat, such as beef or lamb? Include all steaks, chops, roasts, mince, stir fries and casseroles. Do not include pork or chicken.

Longer list (do not read out): Veal, Offal (liver, kidney), Mutton, Game (buffalo, crocodile, goanna, goat, hare, kangaroo, rabbit, snake, venison, wild boar)

_____ times per day
_____ times per week
_____ times per month
Rarely/never
I don't know/ can't say

23. How often does [child] eat meat products such as sausages, frankfurters, devon, ham, hamburgers or chicken nuggets?

Longer list (do not read out): Salami, bacon, meat pies, sausage rolls, luncheon meats, delicatessen meats, meat paste, liver paste, pate, saveloys, cheerios, hot dogs, rissoles, canned meats, smoked chicken, other smoked meats.

_____ times per day
_____ times per week
_____ times per month
Rarely/never
I don't know/ can't say

'Extra' foods

24. How often does [child] eat chips, French fries, wedges, fried potatoes or crisps?

_____ times per day
_____ times per week
_____ times per month
Rarely/never
I don't know/ can't say

25. How often does [child] have meals or snacks such as burgers, pizza, chicken, or chips from places like McDonalds, Hungry Jacks, Pizza Hut, KFC, Red Rooster or local takeaway food places?

_____ times per week
_____ times per month
Rarely/never
I don't know/ can't day

26. How many cups of soft drink, cordials, or sports drink, such as lemonade or Gatorade does [child] usually drink in a day? (1 cup=250ml. One can of soft drink = 1 ½ cups. One 500ml bottle of Gatorade = 2 cups)

_____ cups per day
_____ cups per week
Doesn't drink soft drink
Don't know
Refused

Other drinks

In 1-15 years:

27. How many cups of fruit juice does [child] usually drink in a day? (1 cup=250ml, a household tea cup or 1 large popper)

_____ cups per day
_____ cups per week
Doesn't drink juice
Don't know
Refused

In 2-15 years:

28. How many cups of water does [child] usually drink in a day? (1 cup=250ml, a household tea cup, 1 average bottle of water = 1 ½ cups)

_____ cups per day
_____ cups per week
Doesn't drink water
Don't know
Refused

29. What source of water does [child] usually drink?

Tap water
Filtered water
Bottled water
Don't know

Food security

All:

30. In the last twelve months, were there times that you ran out of food and couldn't afford to buy more?

Yes

No

Don't know

Refused

31. How do you cope with feeding [child] when this happens?
(multiple response)

1. Parent/guardian skips meals or eats less
2. Children/child skips meals or eat less
3. Cut down on variety of foods family eats
4. Seek help from relatives
5. Seek help from friends
6. Seek help from Government/ Social Security
7. Seek help from welfare agencies
8. Other [Specify] _____
9. Don't know
10. Refused

32. There are a number of agencies that can help with making sure your family has enough food. Would you like the phone numbers of these agencies?

Yes Refer to list

No

Don't know

Refused

Table 1: Summary of questions and age categories recommended

Question	Purpose	Age group targeted for the question	Question source	Comments
1. Has [child] ever been breastfed?	Q 1-4: duration of breastfeeding and intro of solids	< 48 months	National recommended questions; NHS 1995; NSW CHS 2001.	
2. Since this time yesterday, has [child] been breastfed?		< 48 months	National recommended questions	
3. Since this time yesterday, did [child] receive any of the following?		≤7 months	National recommended questions	
4. Including times of weaning, what is the total time that [child] was breastfed?		< 48 months	National recommended questions; NHS 1995; NSW CHS 2001.	
5. What was the main reason you stopped breastfeeding?		If response to q.4<12 months and mother asks.		Included in response to feedback from parents.
6. What were the main reasons you decided not to breastfeed [child]?		If response to Q.1 is no, and mother asks.		Included in response to feedback from parents.
7. Has [child] ever been given infant formula regularly?	Q. 7-15 to track changes from previous surveys	< 24 months	NSW CHS 2001	Questions 7-15 are asked to provide trend data; include for about the next year of surveying.
8. At what age was [child] first given infant formula regularly?		<24 months	NSW CHS 2001	
9. Has [child] ever been given cow's milk regularly?		<24 months	NSW CHS 2001	
10. At what age was [child] first given cow's milk regularly?		<24 months	NSW CHS 2001	

11. Has [child] ever been given any other type of milk substitute on a regular basis?		< 24 months	NSW CHS 2001	
12. What type of milk substitutes did [child] have?		< 24 months	NSW CHS 2001	
13. At what age was [child] first given milk substitutes?		< 24 months	NSW CHS 2001	
14. Has child ever been given solid food?		≤ 7 months	NSW CHS 2001	
15. At what age was [child] first given solid food regularly?		< 24 months	NSW CHS 2001	
16a. How many serves of fruit does your child usually eat each day?	Usual serves of fruit	2-15 years	NNS 1995; NHS. Also in adults NSW HS, ASSAD, SPANS.	Changed categories of answers to allow more accurate data collection
16b. How many serves of fruit does child usually eat each day?	Usual ½ serves of fruit	1-2 years	CAPS validation study	Has reasonable validity for dose response and nutrients.
17. How many serves of vegetables does your child usually eat each day?	Usual serves of vegetables	2-15 years	NNS 1995; NHS. Also in adults NSW HS, ASSAD, SPANS.	Changed categories of answers to allow more accurate data collection
17b. How many serves of vegetables does child usually eat each day?	Usual ½ serves of vegetables	1-2 years	CAPS validation study	Has reasonable validity for dose response and nutrients.
18. How many cups of milk does [child] usually drink in a day?	Assess milk intake, and indicator of calcium intake	1-15 years, and in those <4 years answered no to Q.2	NSW CHS 2001	
19. What type of milk does [child] usually consume?	Assess type of milk consumed, and indicator of saturated fat intake.	1-15 years	NNS 1995; similar question asked in ASSAD and SPANS	Even though 1-2 years recommended to use whole milk, interested to know proportion who follow this rec.
20. How often does [child] eat cheese?	Further indicator of calcium intake.	2-15 years	1996 Tasmanian DKIS adults	Ask these two questions (20 and 21) if room in the survey.

21. How often does [child] eat yoghurt?	Further indicator of calcium intake.	2-15 years	1996 Tasmanian DKIS adults	
22. How often does [child] eat red meat, such as beef or lamb?	Indicator for iron and zinc intake.	2-15 years	1996 Tasmanian DKIS adults, modified to reflect children's meat consumption habits.	Question slightly modified to reflect types of meat children commonly consume.
23. How often does [child] eat meat products such as sausages, frankfurters, devon, ham, hamburgers or chicken nuggets?	Indicator of energy and saturated fat intake.	2-15 years	1996 Tasmanian DKIS adults, modified to reflect children's meat consumption habits.	Question slightly modified to reflect types of processed meat children commonly consume.
24. How often does [child] eat chips, French fries, wedges, fried potatoes or crisps?	Usual intake of hot or cold fried potatoes. Indicator of energy, fat and sat fat intake.	2-15 years	1996 Tasmanian DKIS adults	
25. How often does [child] have meals or snacks such as burgers, pizza, chicken or chips from places like McDonald's, Hungry Jacks, Pizza Hut, KFC, Red Rooster or local take-away places?	Frequency of take-away meals and snacks.	2-15 years	Qld DIAT survey	
26. How many cups of soft drink, cordials or sports drink, such as lemonade or Gatorade does [child] usually drink in a day?	Indicator of high sugars intake. May replace other fluids.	2-15 years	NSW CHS 2001	
27. How many cups of fruit juice does [child] usually drink in a day?	Fruit juice consumption.	1-15 years	NSW CHS 2001.	Validity tested in CAPS study in 18 mth olds.
28. How many cups of water does [child] usually drink in a day?	Water consumption.	2-15 years	New question. Similar question in Qld DIAT survey.	Do other fluids replace this?

29. What source of water does [child] usually drink?	Use of fluoridated water.	2-15 years		Possible relationship of low use of fluoridated water with increased dental caries.
30. In the last twelve months, were there times that you ran out of food and couldn't afford to buy more?	Some limited aspects of food insecurity.	All	1995 NNS	Does not measure food insecurity in terms of quality of food; anxiety about food intake.
31. How do you cope with feeding [child] when this happens?		All	NSW CHS 2001	
32. There are a number of agencies that can help with making sure your family has enough food. Would you like the phone numbers of these agencies?		All	NSW CHS 2001	

NNS National Nutrition Survey

NHS National Health Survey

NSW CHS 2001 NSW Child Health Survey 2001

CAPS Childhood asthma prevention study

ASSAD Australian School Students Alcohol and Drug Survey

NSW Schools Physical Activity and Nutrition Survey (SPANS)

DKIS Tasmanian Dietary Key Indicator Study, in adults, 1996

Qld DIAT Queensland Dietary Survey

1. Background

Short dietary questions can be used to collect information about selected food habits in the population and population sub-groups. Such information can be applied to monitor and report on key indicators of food intake, food habits, food security, food access and infant feeding. Compared to more comprehensive methods of assessing food and nutrient intake, short dietary questions are less demanding for participants, are relatively inexpensive to administer and can supply information quickly (Rutishauser et al 2001). Short dietary questions do have several limitations, in particular they can not be used to provide accurate quantitative estimates of food or nutrient intake, or more detailed information about food patterns, and they may not be sensitive or robust enough to detect small but important changes over time (Rutishauser et al 2001). Thus, short questions should not be viewed as a replacement for more extensive dietary collection methods, such as 24 hour recalls and weighed food records, which are used routinely in the USA and United Kingdom to monitor the food and nutrient intake of those populations. Australia's National Nutrition Survey, conducted in 1995, supplied valuable and detailed information about the food and nutrient intake of the population. Beyond this, up to date information about some aspects of food intake is required at regular intervals to monitor progress towards the achievement of diet and nutrition policy goals. Short dietary questions, used as part of the computer assisted telephone interviews (CATI), conducted by State Health Departments, are a useful means of obtaining information about population food habits in the interval between national nutrition surveys. The eventual repeat of a large national nutrition survey will be important to monitor the dietary intakes (food and nutrient) of Australians.

Attributes of a 'good' short question about food habits include (Rutishauser et al 2001; Marks et al 2001):

1. Indicative of important aspects of dietary quality, of public health relevance;
2. Valid, usually described relative to another dietary method;
3. Reproducible, providing same results when repeated under the same conditions;
4. Consistent, performing the same way in different sub-groups of the population;
5. Responsive, capable of measuring change in the factor of interest;
6. Independent of the method of administration, suitable for use in a variety of ways (face-to-face, self-administered, CATI), and should therefore require minimal accompanying information.

2. Food and nutrition policy issues of importance for children

The 2003 NHMRC Dietary Guidelines for Children and Adolescents are shown in Box 1. Box 2 highlights selected sections from the Infant Feeding Guidelines for Health Workers. Box 3 lists the priority issues in the 2004 NSW Nutrition Strategic directions. Box 4 and Table 2.1 summarise the recommendations and serve sizes for diet planning recommended for children in the 1998 Australian Guide to Healthy Eating. Together these highlight the key food and nutrition policy issues in NSW pertaining to children and adolescents.

Box 1. Dietary Guidelines for Children and Adolescents in Australia*

1. Encourage and support breastfeeding

2. Children and adolescents need sufficient nutritious foods to grow and develop normally

- Growth should be checked regularly for young children
- Physical activity is important for all children and adolescents

3. Enjoy a wide variety of nutritious foods

Children and adolescents should be encouraged to:

- 3.1 Eat plenty of vegetables, legumes and fruits
- 3.2 Eat plenty of cereals (including breads, rice, pasta and noodles), preferably wholegrain
- 3.3 Include lean meat, fish, poultry and/or alternatives
- 3.4 Include milks, yoghurts, cheese and/or alternatives
 - Reduced-fat milks are not suitable for young children under 2 years, because of their high energy needs, but reduced-fat varieties should be encouraged for older children and adolescents
- 3.5 Choose water as a drink
- 3.6 Limit saturated fat and moderate total fat intake
 - Low-fat diets are not suitable for infants
- 3.7 Choose foods low in salt
- 3.8 Consume only moderate amounts of sugars and foods containing added sugars

4. Care for your child's food: prepare and store it safely

*National Health and Medical Research Council, 2003
These guidelines are not in order of importance.

Box 2: Selected sections from the Infant Feeding Guidelines for Health Workers

1. Encourage, support and promote exclusive breastfeeding for the first six months of life. An initiation rate in excess of 90 per cent and 80 per cent of infants being breastfed at the age of six months are objectives for Australia.
2. Encourage community-based programs supporting breastfeeding families: such programs are of increasing importance as the length of hospital stays decreases.
3. Encourage support in the community and workplace for flexible work schedules, 'part-time' breastfeeding, and the use of expressed breastmilk.
4. Use cow's milk-based formulas until 12 months of age. (All infant formulas available in Australia are iron-fortified). Use soy-based or other special formulas only for infants who cannot take dairy-based products or because of specific medical, cultural or religious reasons.
5. After six months, encourage continued breastfeeding, along with complementary foods for at least 12 months. (WHO recommends that breastfeeding continue for up to two years and beyond).
6. Pasteurised whole cow's milk may be introduced to a child's diet at around 12 months of age and be continued throughout the second year of life – and, of course, beyond. It is an excellent source of protein, calcium and other nutrients.
7. Reduced-fat milks (skim milk and milk with 1 or 2 per cent fat) are not recommended in the first two years of life.
8. Soy (except soy formula where specifically indicated), rice and other vegetarian beverages – whether or not they are fortified – are inappropriate alternatives to breastmilk, formula or pasteurised whole cow's milk in the first two years of life.
9. Limit an infant's fruit juice intake, to avoid interfering with their intake of breastmilk or infant formula.
10. Do not use herbal teas, soft drinks or other beverages.
11. Introduce solid foods at around six months, to meet the infant's increasing nutritional and developmental needs.
12. Start with low-allergenic foods such as single-grain baby cereals; follow this with vegetables and fruits and then meats. Add only one food at a time and wait several (ideally five to 10) days before introducing a new food. To prevent iron deficiency, iron-containing foods such as iron-fortified cereals are recommended as the first foods, followed later by foods containing meats and other protein-rich foods.

13. Small, frequent, nutritious and energy-dense feedings of a variety of foods from the different food groups are important to meet nutrient and energy needs during the second year of life. The regular family diet (see the *Australian Guide to Healthy Eating*, 1998) should be the basis of the child's meals.

14. Encourage exclusive breastfeeding for six months to decrease the risk of allergy in infants with a positive family history. If there is a strong family history of allergy, delay introducing some or all of the highly allergenic foods during the first year; among these foods are cow's milk and other dairy products, soy, eggs, nuts, peanuts and fish. It is best to continue avoiding eggs, nuts and shellfish until the age of three years.

15. Restriction of dietary fat is not recommended during the first two years of life because it may compromise the intake of energy and essential fatty acids and adversely affect growth, development, and the myelination of the central nervous system.

16. Manage mild to moderate dehydration with an oral electrolyte solution and early refeeding.

17. Choose iron-containing formula for infants who are not breastfed and for infants receiving formula as well as breastmilk.

18. Continue to offer iron-fortified and meat-containing foods beyond 12 months of age.

Infant Feeding Guidelines for Health Workers, Binns C and Davidson G, NHMRC, 2003.

Box 3. Public Health Nutrition Priorities, Eat Well NSW: strategic directions for public health nutrition, 2003-2007*

1. Promote healthy weight
2. Promote increased consumption of vegetables and fruit
3. Promote breastfeeding
4. Achieve improved food security
5. Achieve effective and sustainable action in public health nutrition.

*NSW Health, 2004

Box 4. The Australian Guide to Healthy Eating

To eat a healthy diet:

1. Eat enough food from each of the five food groups every day.

The five food groups are:

¥ bread, cereals, rice, pasta, noodles

¥ vegetables, legumes

¥ fruit

¥ milk, yogurt, cheese

¥ meat, fish, poultry, eggs, nuts, legumes.

2. Choose different varieties of foods from within each of the five food groups from day to day, week to week and at different times of the year.

3. Eat

plenty of plant foods (bread, cereal, rice, pasta, noodles, vegetables, legumes and fruit); *moderate* amounts of animal foods (milk, yogurt, cheese, meat, fish, poultry, eggs) in the proportions shown by the Guide; and *small* amounts of the extra foods, and margarines and oils.

4. Drink plenty of water.

The Australian Guide to Healthy Eating, Public Health Division, Commonwealth Department of Health and Family Services, 1998

Table 2.1: Sample serves from the Australian Guide to Healthy Eating suggested for children and adolescents

	Bread, cereals, rice, pasta, noodles	Vegetables, legumes	Fruit	Milk, yoghurt, cheese	Meat, fish, poultry, eggs, nuts, legumes	Extra foods
Children 4-7 y	5-7 3-4	2 4	1 2	2 3	½ ½-1	1-2 1-2
Children 8-11 y	6-9 4-6	3 4-5	1 1-2	2 3	1 1-1½	1-2 1-2
Adolescents	5-11	4	3	3	1	1-3
12-18 years	4-7	5-9	3-4	3-5	1-2	1-3

*Select from a diet based on eating a lot of bread, cereal, rice, pasta and noodles (shown in the first row of each age group) or one which includes more from all of the groups (shown in the second row of each age group).

Standard serves sizes: 150g fruit or 1 medium piece fruit, 1 cup diced pieces fruit, ½ cup fruit juice, 75 g or ½ cup cooked vegetables, 1 cup salad vegetables, 2 slices of bread, 1 cup cooked rice, pasta or noodles, 1 cup porridge, 1 1/3 cup breakfast cereal flakes, 250ml milk, 40g cheese, 200g yoghurt, 65-100g cooked meat, ½ cup cooked dried beans, 80-120g fish, 2 small eggs, 1/3 cup nuts.

Table 2.2 indicates whether a question has been recommended to cover each of these policy areas.

Table 2.2: Aspects of food and nutrition policies, in relation to recommended use of short questions in this report

Food / Nutrition Guideline	Measured by short questions	Short questions recommended for use in this report
1. Encourage and support breastfeeding (DG and EW NSW*)	Yes	4 main questions, 2 supplementary questions; repeat of 9 questions from previous survey.
2. Need sufficient nutritious foods to grow and develop normally (DG); promote healthy weight (EW NSW); food security (EW NSW).	No, some questions for related food habits	No self-reported height/weight. Yes, selected food habits questions. Yes, 3 food security questions
3. Enjoy a wide variety of nutritious foods (DG, AGHE)	No	No existing tools for children.
4. Eat plenty of vegetables, legumes and fruit (DG, EW NSW, AGHE)	Yes	Global fruit and vegetable questions.
5. Eat plenty of cereals, preferably wholegrain (DG, AGHE)	No	Not identified as a priority; requires several questions.
6. Include lean meat, fish, poultry and alternatives (DG, AGHE)	Yes	1 question about lean meats (indirect measure of iron and zinc); 1 question about processed meats.
7. Include milks, yoghurt, cheese and alternatives (DG, AGHE)	Yes	Key calcium sources.
8. Choose water as a drink (DG, AGHE)	Yes	New question.
9. Limit saturated fat and moderate total fat intake (DG)	Yes	Milk (quantity and type); processed meats (indirect measure of fat and saturated fat).
10. Choose foods low in salt (DG)	No, not directly.	Requires full dietary assessment. 1 processed meat questions (indirect measure of sodium).
11. Consume only moderate amounts of sugars (DG)	Some	Sweetened drinks questions (juice and sweetened drinks)
12. Prepare and store food safely (DG)	No	Some questions asked in environmental section of survey.

*DG Dietary guideline for children and adolescents in Australia, 2003

EW NSW: Eat Well NSW: strategic directions for public health nutrition, 2004

AGHE: The Australian Guide to Healthy Eating, 1998.

3. Highlights of selected data sources about dietary intakes of children and adolescents

This section highlights recent information about dietary intakes of children and adolescents, which are related to the policy issues outlined in the previous section, and have been useful in considering suitable short questions.

1. 1995 National Nutrition Survey, based on 24 hour recalls, aged 2-18 years, n=3007:
 - Refer to Appendix 1 for summary information about food sources contributing to energy, sugar, saturated fat and fat intake, by gender 2-11 years and 12-18 years.
 - Cereals, cereal- based products and milk and milk products provided greater than 50% contribution to energy.
 - Other important contributors to energy were meat and sweetened drinks (about 10% each).
 - Major contributors to fat and saturated fat were: milk and milk products (fat: 20-27%; saturated fat: 31-39%), cereal based products (such as sweet biscuits and pastries - about 20%), meat (12-18%), and hot chips (up to 10% in males 12-18 years).
 - Major contributors to sugars were: fruit juices and sweetened drinks (32-39%) and milk and milk products (18-22%).
 - Less than half of the children aged 2-18 years, met the Australian Guide to Healthy Eating (AGHE) recommended serves of fruit and only about one-third met the recommended serves of vegetables; one quarter did not eat fruit on the day of the NNS and one fifth did not eat vegetables; less than 20% of all those children 2-18 years achieved adequate intakes of both fruit and vegetables (Magarey et al 2001; Flood et al 2003).

2. Childhood Asthma Prevention Study (CAPS), 1998-2000, collected weighed food records (3 days) of 18-month old children (n=429); a sample recruited antenatally based on the presence of asthma in at least one parent, based in Western Sydney:
 - 'Extra' foods (energy dense, nutrient-poor foods) contributed 27% energy, mainly from sweetened beverages, cereal-based products (such as biscuits, cakes, pastry, muffins) and fried potatoes (Webb et al, in press);
 - The most commonly consumed meats were: chicken nuggets, beef mince, beef sausages with median portion sizes of 20-50 grams (Webb et al 2005).

3. National Health Survey (NHS), 1995, collected information about breastfeeding and introduction of solids from parents of children aged less than 4 years (n=3252) (Donath and Amir, 2000 and 2002):
 - 78% of children were breastfed at discharge (NSW);
 - 60% of children breastfed at 3 months (NSW);
 - 44% of children breastfed at 6 months (NSW);
 - 21% of children breastfed at 12 months (Australia);
 - 61% of children were regularly given solid foods before 6 months (Australia);
 - 57% of children were regularly given breastmilk substitutes before 6 months (Australia).
4. NSW Child Health Survey (NSW CHS), 2001, collected information about breastfeeding and introduction of solids from mothers or carers of children aged less than 2 years (n=1489): (Hector et al 2004)
 - 86% of children breastfed at discharge (NSW);
 - 61% of children breastfed at 3 months (NSW);
 - 42% breastfed of children breastfed at 6 months (NSW);
 - 18% of children breastfed at 12 months (NSW);
 - 70% of children were regularly given solid foods before 6 months (NSW);
 - 60% of children were regularly given breastmilk substitutes before 6 months (NSW).

4. Overview of issues in assessing children's diets

Children are a unique group of subjects of dietary surveys, requiring purpose-specific methods of dietary assessment. Stein et al (1992) identified a number of reasons why the assessment of the diets of children is challenging:

- a) They may eat small amounts of foods at frequent intervals;
- b) Young children are unable to complete questionnaires on their own;
- c) They often spend time under the care or supervision of several different persons.

In most surveys of children aged 10 or less, children's diets are assessed by asking a parent to report. Thus, the accuracy of the information collected may vary by how much time the child is under the parent's care. It may also be affected by the rapid rate of change in diets as the child grows. Baranowski et al (1991) observed that mothers of preschool children who were separated from their child for more than four hours per day were less able to report on their child's food intake, particularly in relation to estimates of portion sizes. The use of both parents together with other care-givers such as child minders in the reporting process can provide more reliable information (Livingstone et al, 2000). Of course, accurate reporting by parents is influenced by other variables such as weight. For example, obese parents are more likely to under-report food intakes of obese six to seven year old children, but not of lean children (McGloin et al 2002).

Adolescents and older primary children are usually asked to report their own food intakes, because, as children get older, parents tend to have less control over the child's food intake. For this reason, most studies assessing adolescents' food intake have been directed at questioning the adolescent themselves (McPherson et al 2000). Children aged 10 years and over have been shown to give reasonable dietary information, as they start to develop the cognitive abilities needed to answer questions. As with adults, they tend to report more accurate information if asked about the last meal or last 24 hours, rather than averaging over a larger time span (Frank 1994, Baranowski and Domel 1994). Children's varying cognitive abilities influence their ability to record or remember their food intake. Their limited knowledge of food and food preparation can also reduce the accuracy of the assessment (Rockett and Colditz, 1997). Baranowski and Domel (1994) have proposed a model of cognitive processing for understanding children's self-reports of dietary intake (at about 10 years of age). The model categorizes errors that relate to attention,

perception, organisation, retention, retrieval and response. For example, an attention error occurs when a child does not notice information, eg. if a child does not attend to the margarine on the cob of corn, then she/he would not be able to report it.

The CATI system used by NSW Health for children under 16 years only allows for questions to be asked of parents about their children's diets, so the questions recommended in this report are designed for report by parents. The emphasis of the questions is about usual consumption and frequency, for which we have some information about validity, rather than foods consumed very recently, i.e. in the past 24 hours or past week (except for some of the breastfeeding questions). By contrast, some other questionnaires used with samples of adolescents, such as the Youth Risk Behaviour Survey (YRBS) (see Appendix 4.3 for more details), focus on recent intake. Appendix 4 includes examples of short questions used in Australia and other western countries, and information about the validity of the questions, if known.

5. Review of validity studies of short diet survey questions

There is limited information about the validity of short questions used to assess food habits in children. Most of the information we have on short questions used in Australia has been conducted with adults.

The majority of the information about validity presented in this report refers to the following studies:

1. The Childhood Asthma Prevention Study (CAPS), conducted with 18 month old children from Western Sydney (n=429) who provided three day weighed food records (WFR) and responses to short questions (Lymer and Gill 2003).
2. The 1996 Tasmanian Dietary Key Indicators study (DKIS), conducted amongst adults (n=794), aged 20-65 years, who provided three day WFR and responses to short questions (Riley et al 2001).
3. The 1995 National Nutrition Survey (NNS), in adults (19 years and over) (n~10 000) who were asked to provide a quantitative 24 hour recall of foods eaten and respond to various short questions (Rutishauser et al 2001).

See Appendix 2.1 for a summary of the results of the CAPS validation study and Appendix 2.2 for a summary of the results from adult validation studies.

The information available pertains to ‘relative validity’ of the short questions, that is, the ability of the questions to rank people into categories of food intake based on the short questions, compared with more detailed quantitative dietary intake assessment methods.

‘Direct’ validity in relation to short questions pertains to the ability of the question to correctly identify a dose response in a relevant food or food group (Rutishauser et al, 2001). That is, the mean intakes of a food or food group (measured on the full dietary assessment) are compared for each response category on the short question. This has been expressed as a ratio relative to the lowest response category on the short question calculated from the gram weights of food from the more detailed dietary assessment method (eg. 24 hr recall). Generally, most questions assessed indicated a clear dose-response, so that amongst those who claimed larger or more frequent intakes, more of the food was consumed compared to those who claimed smaller or less frequent intakes

(Rutishauser et al 2001, Riley et al 2001). Note that these ratios do not necessarily reflect actual serves consumed as described in the response categories used in the short questions (Marks et al 2001). Additional information has been provided comparing results to standard serves.

'Indirect validity' has been used to describe the ability of short questions to indicate differences in intakes of selected nutrients, as measured by a more detailed dietary assessment method (Rutishauser et al 2001). Those questions with a trend for statistically significant increases to the response category are indicated ($p < 0.05$). A 'good' short question will be able to show a statistically significant trend for increased nutrient intake with an increased intake of a food or food group. Most questions showed some association with the nutrients that might be expected to differ by increasing or decreasing intakes of a food or food group (Rutishauser et al 2001, Riley et al 2001, Lymer and Gill unpublished).

5.1 Parent-reported weights and heights

Results from a study of adult respondents in the NSW CATI survey (1997) have shown that self-reported (SR) weight and height data indicate considerable underestimation of prevalence of overweight and obesity. This is mainly because people tend to underestimate their weight and over-estimate their height. The mean differences between SR and measured data collected in Western Sydney ($n=227$) were: height in men 2cm, in women 0.8 cm; weight in men -1.4kg, in women -3.0kg. Based on measured data, 62% of men and 47% of women were classified as overweight or obese, compared to 39% of men and 32% of women using SR data (Flood et al, 2000).

A study of 572 adolescents aged 15-19 years, who participated in the 1995 Australian National Health Survey and National Nutrition Survey, found that the use of self-reported weight and height resulted in the correct classification of overweight and obesity in 69% boys and 70% girls (Wang et al 2002). Self-reported weights were significantly lower than measured weights (mean weight about 2 kg less) and self-reported heights were significantly higher than measured heights (mean height about 1.1cm more), in both girls and boys. The bias in reporting height and weight was higher in overweight and/or obese adolescents than in normal/ underweight adolescents.

These differences in self-reported weight and height versus measured weight and height have been reported in a number of other studies conducted overseas (Brenner et al 2003; Abalkhail 2002). Although it has been argued that while some mis-classification occurs, self-report can still be used as a tool to track changes, as has occurred in surveys of adults. Also, the most recent US Youth Risk Behaviour Survey (YRBS) includes self reported weight and height questions (CDC 2004) (see Appendix 4.4). Of course, it is probable that the bias in reporting will increase over time, with increasing policy emphasis on public awareness of the problem of obesity, and intensified public health actions to reduce the problem.

There are few published papers relating to the accuracy of parental reports of children's weight and height. In a recent study in the UK, 227 parents were asked to classify their child's weight on a five point scale, ranging from 'very underweight' to 'very overweight'. The weights and heights of the parents and children were then both measured (Jeffery et al, 2005). Only a quarter of parents correctly identified their child as overweight and parents were less likely to identify overweight in sons compared to daughters (Jeffery et al 2005). Because children are growing and changing their weights and heights, it is likely that more regular measurement would improve accuracy of the information provided. If questions about weights and heights were being considered for inclusion in the children's telephone survey, a validation study would need to be conducted which examined methods to improve accuracy. Such methods could include asking parents to weight and measure their child prior to the survey, or at least asking about frequency of weight and height measures to identify reports likely to be more or less accurate (Flood et al 2000).

6. Issues in administering short diet questions in the NSW Child Health Survey, 2001

NSW Health compiled a summary of issues around the administering of the short questions used in 2001 and the Centre for Epidemiology and Research, NSW Health has provided feedback about these questions (personal communication, Eyeson-Annan; Epidemiology Unit, 2003). These issues have been considered in generating the recommended questions for future surveys.

The issues related to the nutrition questions can be summarised as follows:

1. Fruit and vegetable questions: the previous short questions about fruit and vegetable consumption were difficult to answer by some sub-groups of the population. For example, the portion prompts were small and were difficult to answer for people with older children.

New recommendation: The questions used in 2001 are no longer recommended and have been replaced by global fruit and vegetable questions.

2. Folate questions: the 2001 questions were long, personal (in relation to pregnancy planning), perhaps guilt inducing, and difficult to answer, particularly the phrases such as: “thinking about becoming pregnant”; “how long have you been trying to become pregnant?”. Also there is a need to include a ‘not applicable’ response for women who are not the child’s birth mother.

New recommendation: The folate questions will no longer be included in the children’s survey and a revised set of questions will be investigated for use in the adult survey. Folate is not identified as a policy issue in children’s diets. Suitable questions about the use of fortified foods and folate supplements will be investigated, with the anticipation of recommending two questions for the adult surveys, which have been tested by ABS and used in the National Health Survey.

3. Breastfeeding questions: the questions used in 2001 did not ask about water or juice consumption, which prevented determination of exclusive breastfeeding – a key recommended breastfeeding practice for the first six months of life. Also, asking the parent or carer to recall breastfeeding practices and timing of introduction of solid foods for a period of up to two years may involve a large recall error. It was noted that mothers were keen to give reasons why they decided

not to breastfeed or why they stopped breastfeeding early, rather than reasons why they decided to breastfeed.

New recommendation: A number of the recommended breastfeeding questions ask about the drinks and foods consumed in the previous 24 hours (for those respondents with children aged less than seven months). The questions about initiation of breastfeeding ('ever breastfed') and total time of breastfeeding (duration) have been retained as research indicates that these indicators are better recalled over time (Webb et al 2001). Two questions relating to reasons why mothers decide not to breastfeed or stop breastfeeding have been included.

4. Dairy questions: the previous survey only asked only about milk consumption, but there was an indication that parents wanted to provide answers about yoghurt and cheese consumption, especially if the child did not consume much milk.

New recommendation: New recommended questions will enable determination of the quantity and type of milk consumed, and frequency of cheese and yoghurt consumed.

5. Food security questions: The previous survey asked an initial question about running out of food and then another six questions about further details of food security. Generally, respondents were not comfortable with the level of probing of the questions, and appeared to mistrust the interviewer (personal communication, NSW Health).

New recommendation: The food security questions have been reduced in number and now only ask about running out of foods and coping mechanisms, followed by information about agencies that can help.

7. Recommended Questions for future CHS and documentation

A total of 32 questions have been recommended to cover many of the nutrition policy areas of concern in children: 17 questions pertaining to children 2-15 years (asking eight of these questions about children aged one to two years), and 15 questions pertaining to infant feeding practices, among respondents with infants and children aged up to two or four years (varying depending on the question).

However, not all nutrition policy areas are reliably assessable by short questions (Marks et al 2001), in particular we have not included recommendations to ask about self-reported weight and height, food variety, salt intake, or other food habits which may be related to overweight (e.g. portion sizes). Questions about these areas have not been recommended either because they : provide unreliable data (e.g. self-reported weights and heights for children); there are no tested questions available for measurement; the research (e.g. on obesity) has not identified clearly which food habits to assess, or the assessment of relevant food habits would require a number of questions or a more extensive dietary assessment method. The recommended questions are listed below and documentation related to each one is given in each section. The questions cover the specific topic areas of: infant feeding practices, including breastfeeding and introduction of solids, fruit and vegetable serves, dairy intake, including type and quantity of milk, frequency of cheese and yoghurt intake, frequency of red meat, processed meat, frequency of ‘extra’ foods, quantity of drinks consumed (sweetened drinks, fruit juices, and water), and food security.

Age group included in the sample frame for various questions

A few changes have been recommended regarding the age group included in the sample frame for various survey questions. For example, the new breastfeeding questions are recommended for use amongst those less than 48 months of age, rather than 24 months as used previously. This is to obtain comparable data with the National Health Survey, and also to accumulate sufficient numbers of infants aged less than seven months for the assessment of exclusive breastfeeding.

The adult health surveys ask questions of people aged 16 years and over, so in general, this survey targets those younger than 16 years. There has been some discussion about the reliability of the nutrition questions for very young children, in particular those aged one to two years, since they tend to have very small serves of food that may be difficult to

reliably report about in short questions. In addition, there has been some concern about the number of questions for parents with young children, given they are also answering about breastfeeding related questions. Therefore, it is proposed that only those questions shown to have reliable validity from the CAPS study of 18 month old children be included. Therefore, no new questions or untested questions of children will be asked of those aged one to two years. Those aged one to two years, in addition to the breastfeeding and food security questions, will be asked about usual fruit and vegetable intake (1/2 serves as tested in the CAPS study), quantity and type of milk and fruit juice consumption.

7.1 Breastfeeding

The first breastfeeding question is to be asked of the parent of all children aged less than 48 months, and then follow sequence.

1. Has [child] ever been breastfed?
(‘Ever breastfed’ means ever given breastmilk, even just once. This includes putting the infant to the breast to feed or giving expressed breastmilk.)
Yes (*go to Q.2*)
No (*go to Q.6*)
2. Since this time yesterday, has [child] been breastfed?
(Breastfed includes giving expressed breastmilk)
Yes (*If Yes and the child is aged seven months or less, go to Q.3*)
No (*go to Q.4*)
3. Since this time yesterday, did [child] receive any of the following?

3.10	Vitamins, mineral supplements, medicine	Yes	No
3.11	Plain water	Yes	No
3.12	Sweetened or flavoured water	Yes	No
3.13	Fruit juice	Yes	No
3.14	Tea or infusion	Yes	No
3.15	Infant formula	Yes	No
3.16	Tinned, powdered or fresh milk	Yes	No
3.17	Solid or semi-solid food	Yes	No
3.18	Other (<i>specify</i>)_____	Yes	No
4. Including times of weaning, what is the total time that [child] was breastfed?
_____ weeks (1-12 weeks)
_____ months (1-48 months)
Less than one week.
Don’t know
Refused
5. If response to Question 4 <12 months and MOTHER ASKS: What was the main reason you stopped breastfeeding [child]?
6. If MOTHER ASKS: What were the main reasons you decided not to breastfeed [child]?

Somewhere in the survey, also ask

For each child less than 48 months old, ask the respondent:

- a) Can you tell me how old the child is today?
(in completed months) _____
- b) If possible, the exact date of birth is _____

Ask these questions of parents with children less than 24 months.

7. Has [child] ever been given infant formula regularly?
(Prompt if necessary: regularly means at least once a day).

- Yes
- No (go to Q.9)
- Don't know (go to Q.9)
- Refused (go to Q.9)

8. At what age was [child] first given infant formula regularly?

- _____ weeks
- _____ months
- Less than one week
- Don't know
- Refused

9. Has [child] ever been given cow's milk regularly?

- Yes
- No (go to Q. 11)
- Don't know (go to Q.11)
- Refused (go to Q. 11)

10. At what age was [child] first given cow's milk regularly?

- _____ weeks
- _____ months
- Less than one week
- Don't know
- Refused

11. Has [child] ever been given any other type of milk substitute on a regular basis?
(Prompt: apart from breastmilk, infant formula, cows milk)

- Yes
- No (go to Q. 14)
- Don't know (go to Q.14)
- Refused (go to Q.14)

12. What type of milk substitutes did [child] have?

- (Multiple responses)
- Soya bean milk
- Goat's milk
- Evaporated milk
- Other (specify) _____
- Don't know
- Refused

13. At what age was [child] first given [this/any of these] milk substitute(s) regularly?

- _____ weeks
- _____ months
- Less than one week
- Don't know
- Refused

In children 7 months or less

14. Has [child] ever been given solid food?

Yes

No (go to drinks section)

Don't know (go to drinks section)

Refused (go to drinks section)

In children less than 24 months

15. At what age was [child] first given solid food regularly?

_____ weeks

_____ months

Never given solid food, not yet started

Don't know

Refused

Questions assess:	‘Ever breastfed’ (initiation of breastfeeding); duration of any breastfeeding, duration of exclusive breastfeeding; timing of introduction of solid foods and breastmilk substitutes.
Policy relevance:	Eat Well NSW priority; NHMRC Dietary guideline 1 (breastfeeding); WHO and NHMRC recommendations for infant feeding.
Source:	<p>Questions 1- 4 are recommended as national breastfeeding indicators in the report by the Australian Food and Nutrition Monitoring Unit (Webb et al 2001). Q.1 and Q.4 were also used in NHS 1995 and NSW CHS 2001; Q.2 and 3 recommended for use by WHO.</p> <p>Questions 5 and 6 are currently in use in CATI surveys for children, recently added by the NSW CATI team, in response to feedback from mothers.</p> <p>Questions 7-15 were used in CHS 2001.</p>
Modifications:	Q.3 WHO includes the response ‘oral rehydration salts’ which has been changed to ‘other’.
Background:	Published evidence suggests that mothers report current feeding practices (within last 24 hours) about the introduction of solids and liquids more accurately than when asked to recall over months or years (Webb et al 2001). Thus, 24 hour recall questions relating to these practices are included. However, evidence also suggests that information about ‘ever breastfed’ and duration of any breastfeeding (not intensity) are reported relatively accurately over several years, and so these aspects of breastfeeding can be based on longer recall (Webb et al 2001).
Validation:	No current validation data are available but several of the recommended questions are widely used by WHO for the global data bank on breastfeeding rates worldwide (Webb et al 2001).
Indicators:	<ol style="list-style-type: none"> 1. Percent of infants ever breastfed. 2. Percent of infants breastfed at each completed month of age to 12 months. 3. Median duration of breastfeeding among ‘ever breastfed’ children. <p>These three indicators are comparable to other survey data collected by NSW Health and NHS.</p> <ol style="list-style-type: none"> 4. Percent of infants exclusively breastfed in the previous 24 hours at each completed month of age up to six completed months (less than 7 months). 5. Percent of infants fully breastfed in the previous 24 hours at each completed month of age to six months (less than 7 months). 6. Percent of infants receiving solid foods in the previous 24 hours at each completed month of age to six months (less than 7 months).

7. Percent of infants receiving breastmilk substitutes in the previous 24 hours at each completed month of age to six months (less than 7 months).

Questions 7-15:

Questions 7-15 were used in the 2001 NSW Child Health Survey and have been included primarily to provide trend data with past surveys (asked about children less than 24 months). These questions can also be used as a measure of internal consistency with the data collected in question 3, relating to what children aged less than 7 months consumed. The questions provide an estimate of the proportion of infants exclusively breastfed as measured in a sample requiring longer recall, and compared to the response from the 24 hour recall questions. Because recall bias tends to increase with age of child (and hence, generally, length of recall), the recalled information about timing of introduction of solids or breastmilk substitutes may differ from that obtained from the 24-hour recall. Thus, internal inconsistency does not necessarily imply measurement error in the question about yesterday's intake. Nonetheless, it will be of interest to monitor at least initially. It is anticipated that the longer-term recall questions 7 to 15 will not remain in future rounds of the survey.

Comments:

Note that Questions 5 and 6 can not be used to assess population-level reasons for breastfeeding cessation since these questions are currently only asked of individuals who wish to provide this information. If this is considered important, then these questions should be asked of all the mothers who have ceased breastfeeding children < 12 months of age.

7.2 Fruit and Vegetables

2-15 years

16a. How many serves of fruit does your child usually eat each day? (a serve= 1 medium piece or 2 small pieces of fruit or 1 cup diced pieces).

_____ serves per day
_____ serves per week
Don't eat fruit
Don't know

1 -2 years

16b. How many serves of fruit does your child eat each day? (a serve = 1 small piece or ½ cup diced pieces)

_____ serves per day
_____ serves per week
Don't eat fruit
Don't know

2-15 years

17a. How many serves of vegetables does your child usually eat each day? (A serve = ½ cup cooked vegetables or 1 cup of salad vegetables).

_____ serves per day
_____ serves per week
Don't eat vegetables
Don't know

1-2 years:

17b. How many serves of vegetables does your child usually eat each day? (A serve = 1/4 cup cooked vegetables or 1/2 cup of salad vegetables).

_____ serves per day
_____ serves per week
Don't eat vegetables
Don't know

Questions assess:	Usual distribution of parent-reported number of serves of fruit and vegetables consumed.																		
Policy relevance:	Eat Well NSW priority; Dietary guideline 3.1.																		
Source:	NNS 1995; NHS																		
Other surveys:	Adult questions NSW HS, ASSAD, CRASH survey																		
Modifications:	<p>Replaced ‘your child’ for ‘you’.</p> <p>Use ‘open’ response categories, not pre-coded responses of NNS: 1 serve or less, 2-3 serves, 4-5 serves, 6 serves or more, don’t eat. Open response categories increase ability to analyse data specific to purposes. If comparisons with other datasets are required, then the results can be categorised accordingly.</p> <p>An alternate ‘b’ question is recommended for younger age groups (1-2 years), in order to reflect serves more likely to be consumed by younger children (see note below about further research).</p>																		
Background:	The previous NSW CHS 2001 included different fruit and vegetable questions (see Appendix 3). These alternative questions have not been recommended; although they demonstrated comparably good validity amongst 18-month-old children, the recommended questions are more widely used, have been validity tested and will provide more comparisons with other datasets.																		
Validation:	<p>Information about validity comes from Rutishauser et al 2001 and Lymer and Gill 2003.</p> <p>Validity data are expressed as dose-response and comparisons to standard serve amounts (or ½ serves, as appropriate) (also see tables 1 and 2 in Appendix 2).</p> <p>Fruit 16a. in adults:</p> <table border="0" style="margin-left: 20px;"> <tr> <td>Direct validity (p<0.001):</td> <td>Comparison to 1 serve (150g)</td> </tr> <tr> <td> ≤ 1 serve/day</td> <td>1 (70g) 0.5</td> </tr> <tr> <td> 2-3 serves</td> <td>2.7 (189g) 1.3</td> </tr> <tr> <td> 4+ serves</td> <td>5.3 (371g) 2.5</td> </tr> </table> <p>Indirect validity for vitamin A, folate and vitamin C (p<0.001)</p> <p>Fruit 16b.in 18 month old children:</p> <table border="0" style="margin-left: 20px;"> <tr> <td>Direct validity (p<0.0001):</td> <td>Comparison to ½ serve (75g)</td> </tr> <tr> <td> Rarely/never</td> <td>1 (15g) 0.2</td> </tr> <tr> <td> ≤ 1 serve</td> <td>4.1 (62g) 0.8</td> </tr> <tr> <td> 2-3 serves</td> <td>6.7 (100g) 1.3</td> </tr> <tr> <td> 4+serves</td> <td>10.5 (157g) 2.1</td> </tr> </table> <p>Indirect validity for fibre (p<0.001).</p> <p>The responses need to be halved to relate to full serve size recommendations.</p>	Direct validity (p<0.001):	Comparison to 1 serve (150g)	≤ 1 serve/day	1 (70g) 0.5	2-3 serves	2.7 (189g) 1.3	4+ serves	5.3 (371g) 2.5	Direct validity (p<0.0001):	Comparison to ½ serve (75g)	Rarely/never	1 (15g) 0.2	≤ 1 serve	4.1 (62g) 0.8	2-3 serves	6.7 (100g) 1.3	4+serves	10.5 (157g) 2.1
Direct validity (p<0.001):	Comparison to 1 serve (150g)																		
≤ 1 serve/day	1 (70g) 0.5																		
2-3 serves	2.7 (189g) 1.3																		
4+ serves	5.3 (371g) 2.5																		
Direct validity (p<0.0001):	Comparison to ½ serve (75g)																		
Rarely/never	1 (15g) 0.2																		
≤ 1 serve	4.1 (62g) 0.8																		
2-3 serves	6.7 (100g) 1.3																		
4+serves	10.5 (157g) 2.1																		

Vegetables 17a in adults:

Direct validity (p<0.001):		Comparison to 1 serve (75g)
≤ 1 serve	1 (204g)	2.7
2-3 serves	1.25 (255g)	3.4
4+ serves	1.65 (337g)	4.5

Indirect validity for vitamin A, folate and vitamin C (p<0.01).

Vegetables 17b.in 18 month old children:

Direct validity p<0.0001:		Comparison to ½ serve (37.5g)
≤ 1 serve/day	1 (42g)	1.1
2-3 serves	1.6 (67g)	1.8
4+ serves	2.6 (112g)	3.0

Indirect validity: B-carotene (p<0.0001), fibre p=0.0005.

Indicators:

1. Proportion of children consuming for different numbers of serves, and changes in consumption over time: <1 serve, 1-<2 serves, 2-<3 serves, 3-<4 serves, 4-<5 serves, 5+ serves.
2. Mean and median intake.
3. Proportion of children eating no fruit or vegetables.

Comments:

It should be noted that the serve sizes for fruit consumption in the validity studies are lower than standard size recommendations. Thus the number of serves reported and the percent meeting policy recommendations are probably a considerable overestimate (Rutishauser et al 2001, Mackerras 2004). Consequently the use of global fruit and vegetable questions should be interpreted with caution when compared to quantitative targets, such as the AGHE recommendations. The preferred approach is to report the distribution of intakes in various sub groupings, and compare the distribution of responses over time, to establish trends. Comments about percent meeting policy guidelines are not advisable because of the large error in point estimates.

An alternate 'b' question is recommended for younger age groups (1-2 years), in order to reflect serve sizes more likely to be consumed by younger children. Questions involving half serves were validity tested in the study of 18 month old children, and were a reasonable predictor of dose-response (refer to the detail above and Table A2.1). Field work and validation studies, which outline portion sizes consumed by younger children, will provide further information. Consideration will be given to whether small portion sizes are a more practical way of accurately determining usual quantities consumed by other young children, rather than the use of determining small fractions of an adult serve.

7.3 Milk and dairy foods

1-15 years.

For those <4 yrs, only ask question 18 if answer 'no' to q.2 in breastfeeding questions, i.e. not currently breastfeeding child

18. How many cups of milk does [child] usually drink in a day?
(1 cup=250ml, a household tea cup).
(milk=cow's milk, soy milk, milk on cereal, flavoured milks).
_____ number of cups per day.
_____ number of cups per week
Doesn't drink cow's milk or other milk
Don't know
Refused

19. What type of milk does [child] usually consume?
Whole
Low/reduced fat
Skim
Evaporated or sweetened condensed
Soy milk, regular. Please specify _____
Soy milk, reduced fat. Please specify _____
None of the above
Don't know

Other questions to ask parents who wish to provide further information about alternative dairy products:

20. How often does [child] eat cheese (include all cheeses: ricotta, cottage, processed, cream, hard and soft cheeses).
_____ times per day
_____ times per week
_____ times per month
Rarely/ never
Don't know

21. How often does [child] eat yoghurt? (do not include dairy desserts)
_____ times per day
_____ times per week
_____ times per month
Rarely/ never
Don't know

- Questions assess:** Type and quantity of milk intake.
- Policy relevance:** Dietary guideline 3.4 (milk and alternatives) and 3.6 (limit saturated fat and moderate total fat).
- Source:** Q.18 NSW CHS 2001.
Q.19 NNS 1995.
- Modifications:** SPANS and ASSAD surveys ask a similar ‘type’ question: What type of milk do you usually drink? (SPANS). In this survey the responses have added in ‘soy’ milk as an added response category.
What type of milk do you usually have? (ASSAD) The ASSAD survey provides examples of the types of milk.
The SPANS survey also asks about the volume of milk consumed: ‘How much milk in total do you usually drink each day?’ Don’t drink milk, <150 ml, 15-300ml, 301-600ml, more than 600ml.
- Background:** Reduced fat sources of milk are not recommended for use by children less than two years of age. Older children may consume larger quantities of reduced fat milks, and this may be an emerging food pattern of interest, given current recommendations to prevent overweight and obesity. The use of reduced fat milk by children has been low (27% of adolescent males and 38% of adolescent females used reduced fat milk in 1999) (1999 ASSAD survey). However, its use may increase with the increased emphasis on reducing fat and saturated fat intake among children (Gill et al 2003).
- There is a concern in the literature about adolescent girls consuming lower intakes of calcium at an important time to attain good peak bone mass (NHMRC 2003). Data from the NNS also documents lower intakes of milk by adolescents compared with younger children, which are replaced by other fluids such as soft drinks.
- Validation:** Information comes from Riley et al 2001, Rutishauser et al 2001, and Lymer and Gill, 2003.
Quantity of milk (Q.18): in 18 month children:
Direct validity (p<0.0001) Comparison to 1 serve (250g)
- | | | |
|--------------|------------|-----|
| < 1 cup /day | 1 (124g) | 0.5 |
| 1-2 cups/day | 2.2 (277g) | 1.1 |
| 2-3 cups/day | 3.7 (454g) | 1.8 |
| >3cups/day | 5.6 (696g) | 2.8 |
- Indirect validity: (p<0.01) ↑ fat, sat fat, calcium, protein (see Table 7.1 and appendix A2.1).

Table 7.1: Measures of indirect validity of quantity of milk short questions amongst 18 month old children.

Nutrient	< 1cup/day	1-2 cups/day	2-3 cups /day	>3 cups/day	P for trend
Energy kJ	4042	4204	4522	4591	0.0415
Fat g	38	40	44	48	0.0005
Saturated fat g	16	20	23	27	<0.0001
Protein g	35	37	41	46	<0.0001
Calcium mg	520	606	812	1023	<0.0001

Note (RDI for calcium for children 1-3 yrs 700mg)

The type of milk question (Q.19) was less useful in the validity study of 18 month children as 92% of children reported consuming whole milk and only 2% reported consuming skim or reduced fat milk. However, given that the recommendation in children less than two years old, is to use whole milk, it is not surprising that only a small proportion used reduced fat milks. Among those who reported using reduced fat milk, they were more likely to use these milks in the weighed food records and reported a lower intake of saturated fat (16g vs 23 g), ($p < 0.0001$).

Indicators:

1. Proportion who consume less than 1 cup of milk per day.
2. Proportion who usually use whole milk.
3. Proportion who usually use a fat-reduced milk.
4. Proportion who usually don't drink milk.

Comments:

An indicator for attainment of the AGHE dairy recommendations cannot be obtained from these questions because milk is only one of several dairy products likely to contribute to total intake. Parents have indicated they would like to respond about other sources of dairy products in their child's diet. There have been no validity studies of questions on other sources of dairy products among children, and even with this information, we can not assume responses from a series of questions would provide a valid measure of the total intake of dairy products.

Soy milk has been included in the response categories, to reflect the apparent increasing use of soy products in the community (as has occurred in similar type questions asked in other surveys). Further information about the calcium and fat content of soy milks has also resulted in the addition of regular and reduced fat soy milk categories to types of milk (see Appendix 6 for details about fat and calcium content of commonly available soy milks).

Feedback from the CATI survey team indicated that a substantial minority (15%) of carers report that their children do not consume milk, but consume cheese, yoghurt or other dairy alternatives and wish to respond with these in the survey. Two questions about the frequency of cheese and yoghurt consumption, which have been

validity tested among adults, are recommended for use in the children's survey. These questions, rather than two previously untested questions about number of serves consumed, are recommended because we have information about the validity of the frequency questions amongst adults. The question about custard consumption has not been included as previous use of this question indicates only 3% of respondents consumed custard daily, so it is not considered an important contributor to daily calcium intake. If survey space permits, the inclusion of the yoghurt and cheese questions may prove to be useful for monitoring dairy food consumption patterns among children of various ages. An appropriate validation study could assess the ability of these questions (along with the milk questions) to identify the proportion with low intakes of dairy foods and to track these over times.

7.4 Meats

In 2-15 years:

22. How often does [child] eat red meat, such as beef or lamb? Include all steaks, chops, roasts, mince, stir fries and casseroles.) Do not include pork or chicken.

Longer lists of meat types: Veal, Offal (liver, kidney), Mutton, Game (buffalo, crocodile, goanna, goat, hare, kangaroo, rabbit, snake, venison, wild boar)

_____ times per day
_____ times per week
_____ times per month
Rarely/never
I don't know/ can't say

23. How often does [child] eat meat products such as sausages, frankfurters, devon, ham, hamburgers or chicken nuggets?

Longer list: Salami, bacon, meat pies, sausage rolls, luncheon meats, delicatessen meats, meat paste, liver paste, pate, saveloys, cheerios, hot dogs, rissoles, canned meats, smoked chicken, other smoked meats.

_____ times per day
_____ times per week
_____ times per month
Rarely/never
I don't know/ can't say

Questions assess:	Lean red meat and processed meat intake.
Policy relevance:	Dietary guideline 3.3: include red meat and alternatives. Dietary guideline 3.6: limit saturated fat moderate total fat intake. Dietary guideline 3.7: Choose foods low in salt.
Source:	1996 DKIS (Riley et al 2001)
Modifications:	Changed ‘do you’ to ‘does [child]’. The list of meats used in the question has been changed to clarify wording (Q. 22) and to reflect types of meats consumed by children (Q.23) (Webb et al 2005). In addition a longer list of meats has been included, which are to be referred to if respondents ask about different types of meat, but are not required to be asked in the main question.
Validity:	Information comes from Riley et al 2001, from the Dietary Key Indicator Study in adults (DKIS).
Direct validity:	In Q. 22: those who stated they ate red meat at least daily consumed an average of 121g red meat a day, measured by the three day WFR, and those who reported they rarely or never ate red meat consumed an average of 8g red meat a day. In Q.23: those who stated they ate processed meats at least daily consumed on average 72g processed meats, measured by the three day WFR, and those who reported they rarely or never ate these meats consumed an average of 13g.
Indirect validity:	In Q.22: the frequency of red meat measured by the short questions was significantly associated with energy, protein, fat, saturated fat, iron and zinc intake, zinc density ($p < 0.05$). In Q.23: the frequency of processed meat measured by the short questions was significantly associated with energy, protein, fat, saturated fat and zinc, negative association with iron density (not associated with iron content or zinc density), unlike the lean meat question.
Indicators:	Q.22: 1. Proportion who rarely or never eat meat 2. Proportion who usually consume red meat less than 3 times per week. Q.23 3. Proportion who rarely or never eat processed meat products. 4. Proportion who usually consume processed meat products 3 times a week or more.

Comments:

In preparation for the modification for these questions, we assessed the fat, saturated fat, iron, zinc and sodium content of meat types for portion sizes, reported by children (Webb et al 2005). The lean red meat question includes meat with fat content less than 3g per serve and iron and zinc content about 0.5 – 1.0 mg per serve. The processed meat question includes meats greater than 5g fat per serve and/or sodium content greater than 200mg per serve (based on serve sizes for 18 month olds).

There were a few meats which were difficult to assign to one category of questions: many ham products currently available have lower fat contents than other sources of processed meat, however, ham continues to have a high sodium content, and has been included in the processed meat question; sausage was relatively high in zinc and iron compared to other red meats, particularly as it is eaten in larger portion sizes, however it also contains high fat and sodium content, so was assigned to the processed meat question (see Appendix 5 for details about these meat products).

7.5 'Extra' foods and drinks

24. How often does [child] eat chips, French fries, wedges, fried potatoes or crisps?

_____ times per day
_____ times per week
_____ times per month
Rarely/never
I don't know/ can't say

25. How often does [child] have meals or snacks such as burgers, pizza, chicken, or chips from places like McDonalds, Hungry Jacks, Pizza Hut, KFC, Red Rooster or local takeaway food places?

_____ times per week
_____ times per month
Rarely/never
I don't know/ can't day

26. How many cups of soft drink, cordials, or sports drink, such as lemonade or Gatorade does [child] usually drink in a day? (1 cup=250ml. One can of soft drink = 1 ½ cups. One 500ml bottle of Gatorade = 2 cups)

_____ cups per day
_____ cups per week
Doesn't drink soft drink
Don't know
Refused

Question 24 assesses:	Usual intake of hot or cold fried potatoes.										
Source:	1996 DKIS										
Modifications:	Changed ‘do you’ to ‘does [child]’.										
Background:	The increasing prevalence of childhood obesity, suggests the importance of investigating food habits that may be related to weight gain. The Australian Guide to Healthy Eating identifies a group of foods high in fat and/or sugar as “extra foods”. These are energy dense, nutrient-poor foods, and it is suggested that these foods be consumed occasionally and/or in limited amounts. The greatest contribution of single foods in this class, to energy intake among 18 month old children have been found to be sweetened drinks, cereal based products (particularly biscuits), and hot chips (Webb et al 2005).										
Validity:	Information about validity comes from DKIS in adults (Riley et al, 2001). Direct validity: Those who reported eating fried potato at least once a day (3%), the mean intake was 166g and in those who reported rarely or never consuming fried potato, the mean intake was 25g (p<0.001). Indirect validity: Significant association with energy, fat and sat fat (p<0.001), e.g. <table border="0" style="margin-left: 40px;"> <tr> <td>Rarely/never</td> <td>26g sat fat</td> </tr> <tr> <td>1/mth-<1/wk</td> <td>31.6g</td> </tr> <tr> <td>1-2/week</td> <td>32.9g</td> </tr> <tr> <td>3/wk-<1/day</td> <td>35.9g</td> </tr> <tr> <td>≥1/day</td> <td>36.6g</td> </tr> </table>	Rarely/never	26g sat fat	1/mth-<1/wk	31.6g	1-2/week	32.9g	3/wk-<1/day	35.9g	≥1/day	36.6g
Rarely/never	26g sat fat										
1/mth-<1/wk	31.6g										
1-2/week	32.9g										
3/wk-<1/day	35.9g										
≥1/day	36.6g										
Indicators:	<ol style="list-style-type: none"> 1. Percentage who rarely or never eat fried potato. 2. Percentage who usually eat fried potato at least once per week. 3. Percentage who usually eat fried potato daily. 										
Question 25 assesses:	Frequency of take-away meals.										
Source:	DIAT survey; also Qld child health survey, WA adolescent survey.										
Modifications:	Original question used the following response categories: Never or rarely, less than once a week, about 1-3 times a week, about 4-6 times a week, once a day, 2 or more times a day.										
Validity:	No information										

Background:	Given the increasing prevalence of overweight and obesity amongst children, and the high fat content and energy density of these foods, this is likely to be an eating pattern requiring monitoring.
Comments	The response categories were changed to allow finer estimates of frequency, which may allow detection of change over time.
Question 26 assesses:	Quantity of sweetened beverage consumption.
Source:	NSW CHS 2001
Modification:	Compare to the CRASH survey question: How much soft drink does [child] usually drink each day? (include all types of soft drink including fruit flavoured drinks and 'sports' drinks but exclude fruit juice or plain water).
Validity:	No information
Background:	Identified as a high contributor to sugars intake, increasing as children become older (NNS 1995). The apparent consumption of carbonated and aerated beverages in Australia has increased from 87.4 litres per capita, in the late 1980's, to 113.0 litres per capita in 1998-1999.
Comments:	Use the information about quantity of soft drink consumed, and measure against other fluid intake: juice, milk, and water, and determine the displacement of drinks, compared to other drinks consumed. However, further investigation may indicate poor reliability to examine displacement of fluids, as different drinks may perform differently in relation to their accuracy of actual intake.

7.6 Other drinks

In 1-15 years:

27. How many cups of fruit juice does [child] usually drink in a day? (1 cup=250ml, a household tea cup or 1 large popper)

_____ cups per day

_____ cups per week

Doesn't drink juice

Don't know

Refused

In 2-15 years:

28. How many cups of water does [child] usually drink in a day? (1 cup=250ml, a household tea cup, 1 average bottle of water = 1 ½ cups)

_____ cups per day

_____ cups per week

Doesn't drink water

Don't know

Refused

29. What source of water does [child] usually drink?

Tap water

Filtered water

Bottled water

Don't know

Question 27 assesses: Quantity of fruit juice consumption.

Source: NSW CHS 2001

Validity: Validity information from Lymer and Gill 2003. In 18 month old children:

Comparison to one serve (250g)
 Direct validity: > 3 cups/day 290g 1.2
 2-3 cups/day 164g 0.7
 1-2 cups/day 133g 0.5
 <1/week-<1/day 97g 0.4
 rarely/never 45g 0.2
 p<0.0001

Indirect validity: Positive significant association with energy, carbohydrate, sugars, Vitamin C (p<0.05) (see Table 7.2 below):

Table 7.2: Measures of indirect validity of quantity of fruit juice short questions amongst 18 month old children.

Nutrient	>3 cups/day	2-3 cups/day	1-2 cup/day	<1/week - 1/day	Rarely/never	P for trend
Energy kJ	5113	4563	4354	4202	4098	0.0162
Carbohydrate g	155	135	127	124	122	0.0071
Sugars g	95	79	76	73	67	0.0073
Vitamin C mg	142	101	83	74	55	<0.0001

Background: Fruit juice is a high contributor to sugars intake amongst children and adolescents, possibly replacing other fluids such as milk and water. Fruit juice provided about 23% sugars and 6.5% energy in the diets of children 2-11 years (NNS 1995).

Indicators:

1. Proportion who consume no fruit juice.
2. Proportion who report consuming greater than 2 cups of fruit juice per day.

Comments: In the validity study of fruit juice the amount consumed was much lower than that reported in the short questions in this cohort of 18 month old children. It would be useful to know more information about the validity of this question in older children. Nevertheless, it will be of interest to consider trends in fruit juice consumption, and the question can be used as a means to distinguish between lower and greater intakes.

Question 28 assesses:	Usual water consumption.
Policy relevance:	Dietary guideline 3.5.
Source:	New question.
Validity:	No information.
Background:	<p>There are no specific recommendations on the quantity of water required for children (though it is recommended adults drink 8 glasses of water every day). These questions, along with information about other fluids (juice, milk, sweetened drinks) may indicate the possibility of some fluids replacing others.</p> <p>Children who consume water may be less likely to consume sweetened drinks, which are associated with an increased likelihood of overweight and obesity (Gill et al 2004).</p>
Indicators:	<ol style="list-style-type: none"> 1. Proportion of children who consume no water. 2. Distribution of water consumption: <1 cup/day; 1-2 cups/day; 2-3 cups/day; > 3 cups /day. 3. Compare consumption with other drinks: milk, juice, sweetened drinks.
Question 29 assesses:	Source of water.
Policy relevance:	Dietary guideline 3.5.
Source:	New question (though note similar question in environmental section of CATI).
Validity:	No information.
Background:	Dietary guideline 3.5 notes the significant benefit of fluoridated water for the prevention of dental caries in deciduous and permanent teeth. There has been an emerging interest in the decreasing use of fluoridated water and the possible associated increase in dental caries.
Indicators:	<ol style="list-style-type: none"> 1. Proportion of children consuming tap water as main water source. 2. Proportion of children consuming filtered water as main water source. 3. Proportion of children consuming bottled water as main water source. <p>Examine associations with SR dental health.</p>

Comments:

The usefulness of this question needs further field testing and investigation. Some bottled water also has added fluoride, so this may complicate interpretation of the types of water. Additionally, parents may find it difficult to determine most commonly consumed source of water.

7.7 Food Security:

All

30. In the last twelve months, were there times that you ran out of food and couldn't afford to buy more?
- Yes
 - No
 - Don't know
 - Refused
31. How do you cope with feeding [child] when this happens?
(multiple response)
- 1. Parent/guardian skips meals or eats less
 - 2. Children/child skips meals or eat less
 - 3. Cut down on variety of foods family eats
 - 4. Seek help from relatives
 - 5. Seek help from friends
 - 6. Seek help from Government/ Social Security
 - 7. Seek help from welfare agencies
 - 8. Other [Specify] _____
 - 9. Don't know
 - 10. Refused
32. There are a number of agencies that can help with making sure your family has enough food. Would you like the phone numbers of these agencies?
- Yes Refer to list
 - No
 - Don't know
 - Refused

Questions assess:	Some aspects of food security.
Policy relevance:	NSW Health priority.
Source:	1995 NNS; NHS; adult CATI surveys.
Background:	<p>There are various dimensions to food insecurity and these include: quality of food, shortage of food, experiences of hunger, anxiety about food intake and risk of food insecurity among special groups (Marks et al 2001, Rychetnik et al 2003).</p> <p>NSW CHS 2001 asked a number of other questions about food security, however the respondents were generally uncomfortable about this level of questioning for this sensitive issue.</p>
Indicators:	<ol style="list-style-type: none"> 1. Proportion that ran out of food and couldn't afford to buy more at some time over the previous 12 months. 2. Most common coping mechanisms.
Comments:	<p>Further investigation of other questions are needed to reflect other dimensions of food insecurity. These questions will require extensive field testing. Questions used by other CATI groups (see Appendix A4.4 South Australian questions) need to be investigated for future use. Additionally, food security questions used in the USDA Food Consumption Surveys also includes some food security questions which have undergone validity testing (Palmer Keenan et al 2001).</p>

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Selected Annotated Bibliography

Field AE, Colditz GA, Fox MK et al. Comparison of 4 questionnaires for assessment of fruit and vegetable intake. *Am J Public Health* 1998; 88:1216-1218.

Objective: This study compared fruit and vegetable assessments derived from 4 self-administered questionnaires.

Methods: Among 102 adolescents, servings of fruits and vegetables assessed by 4 questionnaires (including those used in the YRBSS and the BRFSS) were compared with estimates from 24-hour recalls.

Results: The prevalence of consuming 5 or more servings of fruits and vegetables a day was underestimated by the questionnaires. Questionnaires asking subjects to recall their diet over the previous year were more effective in ranking subjects (r 's $>$ or $=$.42) than those assessing previous-day diet (r 's $>$ or $=$.30).

Conclusions: Brief assessments of fruit and vegetable intake are more useful for ranking subjects than for estimating prevalence of consumption of 5 or more servings per day.

Marks G, Webb K, Rutishauser I, Riley M. 2001. Monitoring food habits in the Australian population using short questions. Australian Food and Nutrition Monitoring Unit & Department of Health and Aged Care, Canberra.

This report makes recommendations about the selection and interpretation of short dietary questions for use in population health surveys to monitor aspects of food and nutrition. These recommendations are based on information from Rutishauser et al 2001, Riley et al 2001 and Webb et al 2001. It is intended as a guide to health planners, epidemiologists, nutritionists and others involved in nutrition monitoring and surveys. Priorities for further development and testing of questions are also identified. Many gaps exist in our knowledge of the validity and other aspects of the performance of short dietary questions such as suitability for use across population sub-groups, or measuring changes in food habits over time.

McPherson RS, Hoelscher DM, Alexander M, Scanlon KS, Serdula MK. Dietary assessment methods among school-aged children: validity and reliability. *Prev Med* 2000; 31: S11-S33.

Background. Assessing the diets of children presents unique methodological challenges. Validity and reliability studies of recalls, records, food frequency questionnaires (FFQs), diet histories, and observations among children were reviewed.

Methods. Forty-seven studies were published in peer reviewed English journals between January 1970 and April 1999 of children 5–18 years of age with a sample size of at least 30.

Results. Most of the 24-h recall validation studies assessed only a portion of the day, not a 24-h period, with higher agreements for meal versus complete day intake. Food records underestimated energy intake when compared to doubly labeled water. Few studies evaluated children's ability to complete records alone or to record an entire day. FFQs overestimated energy intake; however, validation standards may have over or underestimated intake or used different referent periods. Reliability studies were identified for FFQs and diet history; results showed higher energy intake in first compared to subsequent administrations. Limited data were available on age, ethnicity, and gender effects.

Conclusions. Correlations between the validation standard and dietary method were generally higher for recalls and records than FFQs. It was difficult to generalize the

validity and reliability results of dietary assessment methods because of discrepancies in study design, referent periods, and validation standards.

Riley M, Rutishauser IHE, Webb K. 2001. Comparison of short questions with weighed dietary records. Australian Food and Nutrition Monitoring Unit & Department of Health and Aged Care, Canberra.

This report assessed the performance of 16 short dietary questions from the NHMRC 1996 Tasmanian Food and Nutrition Survey with 3 day weighed food records. The performance of the questions among different population subgroups was also assessed. Subjects (n=794) included 20-65 year old Tasmanian adults and were randomly selected from the electoral roll. The short questions relating to frequency of intake and the response format used were found to provide useful information at a group level for the range of target foods and food categories examined. The performance of some questions varied between subgroups but the differences in performance were generally small.

Rutishauser I, Webb K, Abraham B, Allsopp R. 2001. Evaluation of short dietary questions from the 1995 National Nutrition Survey. Australian Food and Nutrition Monitoring Unit & Department of Health and Aged Care, Canberra.

This report presents the findings of an evaluation of six short dietary questions from the 1995 NNS. The objectives were to assess whether the response categories for each question discriminate between food and/or nutrient intakes (relative validity) and whether the performance for the total population was similar across the main population subgroups of interest (consistency). The comparative dataset was the 1995 NNS 24-hr recall data, completed by over 13,000 people, aged 2 years and over, randomly selected from the Australian population. The results (validity and consistency) ranged from poor to good depending on the question and recommendations were made for future use of the individual questions.

Webb K, Marks GC, Lund-Adams M, Rutishauser IHE, Abraham B. 2001. Towards a national system for monitoring breastfeeding in Australia. Australian Food and Nutrition Monitoring Unit & Department of Health and Aged Care, Canberra.

This report provides a detailed assessment of options for monitoring breastfeeding practices in Australia and includes a basic set of definitions and indicators for monitoring trends in breastfeeding rates in Australia. It also makes recommendations regarding methodological issues such as survey 'vehicles', age of children to be included, current practice vs retrospective practice, survey questions to measure indicators and procedures for data analysis.

Appendix 1:

Table A.1.1: Proportion of energy contributed by food groups to the diets of Australian children, by age and sex categories, NNS 1995

Selected major and sub-major food groups	2 to 11 years		12 to 18 years	
	Males	Females	Males	Females
Cereal and cereal products	20.1	19.4	19.7	19.2
Regular breads	10.6	10.3	9.4	10.6
B'fast cereals, single source	2.4	2.2	2.3	1.1
Pasta	1.8	2.2	2.0	2.2
Rice	1.6	1.6	1.7	2.0
B'fast cereals, mixed	2.6	2.0	3.1	2.1
Cereal-based products & dishes	16.2	15.2	15.8	16.2
Sweet biscuits	2.8	2.8	1.8	1.7
Savoury biscuits	1.5	1.3	0.8	0.9
Cakes, etc	3.5	3.5	2.5	3.5
Pastries	2.7	3.4	4.6	4.1
Mixed cereal dish	4.7	3.1	5.4	5.4
Fruit products	3.9	4.0	2.0	3.0
Pome fruit	1.5	1.5	0.8	1.4
Vegetables products	6.8	7.3	9.4	8.5
Potatoes	5.6	5.8	7.9	6.3
Milk products & dishes	18.5	18.4	15.8	14.1
Dairy milk	10.3	9.7	7.5	5.9
Cheese	2.1	2.2	2.3	2.4
Frozen milk products	3.3	3.1	3.7	3.3
Meat, poultry	9.2	9.1	11.2	11.7
Muscle meat	2.0	1.8	3.3	2.9
Poultry	1.1	1.2	1.8	2.0
Sausages	1.5	1.4	1.1	1.2
Mixed dish, red meat as main meat	1.7	2.2	2.5	2.8
Mixed dish, poultry as main meat	1.8	1.8	1.8	1.9
Fish & seafood	0.9	1.3	1.0	1.5
Snack foods	2.6	2.9	2.2	2.7
Potato snacks	1.3	1.6	1.3	1.5
Sugar products & dishes	2.4	2.0	1.8	2.0
Sugar, honey, syrups	1.0	1.0	1.2	1.2
Confectionery	3.8	4.4	3.5	4.3
Chocolate	1.8	2.4	2.3	3.2

Fats & Oils	3.3	3.2	2.9	2.8
Margarine	2.6	2.5	2.3	1.9
Savoury sauces & condiments	0.9	0.8	1.2	1.4
Non-alcoholic beverages	8.9	9.0	10.1	9.2
Fruit & vege juices	6.2	6.8	4.8	5.0
Soft drinks, fl min water & electrolyte drinks	2.6	2.2	5.2	4.1
Alcoholic beverages	-	-	1.2	1.0
Beers			0.7	0.3
Wines			0.2	0.1

This table only shows major and sub-major food groups contributing 1.5% or more to any age (including adults) by sex group. (Table 37.Nutrient Intakes, NNS 1995)

Table A1.2: Proportion of total fat from selected food groups to the diets of Australian children, by age and sex categories, NNS 1995

Selected major and sub-major food groups	2 to 11 years		12-18 years	
	Males	Females	Males	Females
Cereal and cereal products	6.1	5.8	5.7	5.9
Regular bread and rolls	3.3	3.0	2.9	3.3
Cereal-based products and dishes	19.3	18.1	20.0	20.0
Sweet biscuits	3.4	3.3	2.2	2.1
Savoury biscuits	1.8	1.4	0.9	0.8
Cakes, buns, muffins, scones, cake-type desserts	3.6	3.4	2.6	3.9
Pastries	4.1	5.4	7.1	6.3
Mixed dishes where cereal is the major ingredient	5.1	5.1	6.2	6.0
Vegetable products and dishes	8.2	8.6	11.8	9.8
Potatoes	7.5	7.7	10.5	7.8
Milk products and dishes	26.6	26.4	22.8	20.6
Dairy milk	14.9	13.9	10.1	7.9
Cheese	4.6	4.7	4.9	5.1
Frozen milk products	4.6	4.3	5.1	4.6
Meat, poultry and game products and dishes	14.9	14.0	17.5	18.0
Muscle meat	2.7	2.3	4.5	3.9
Poultry and other feathered game	1.9	1.9	2.7	3.1
Sausages, frankfurts and saveloys	2.9	2.6	2.1	2.3
Mixed dishes where beef or veal is the major component	2.4	3.1	3.9	4.1
Mixed dishes where poultry or game is the major ingredient	3.1	2.9	3.1	3.3
Fish and seafood products and dishes	1.1	1.7	1.2	1.9
Egg products and dishes	1.3	1.6	1.4	1.0
Snack foods	4.3	4.7	3.7	4.3
Potato snacks	2.3	2.8	2.3	2.5
Confectionery	3.6	4.2	3.6	4.8
Chocolate and chocolate-based confectionery	2.4	3.2	3.1	4.3
Seed and nut products and dishes	1.9	2.7	1.2	1.5
Nuts and nut products	1.9	2.7	1.1	1.5
Fats and oils	9.8	9.6	8.6	8.3
Dairy fats	1.6	1.8	1.4	1.8
Margarine	7.8	7.4	6.8	5.8
Savoury sauces and condiments	0.9	1.0	1.6	2.2
Salad dressings	0.3	0.6	0.9	1.1

This table only shows major and sub-major food groups contributing 1.5% or more to any age (incl adults) by sex group. (Table 40. Nutrient Intakes, NNS 1995).

Table A1.3: Proportion of saturated fat from selected food groups to the diets of Australian children, by age and sex categories, NNS 1995

Selected major and sub-major food groups	2 to 11 years		12-18 years	
	Males	Females	Males	Females
Cereal and cereal products	3.1	3.2	2.9	3.1
Cereal-based products and dishes	20.1	18.9	20.7	21.1
Sweet biscuits	4.2	4.1	2.9	2.8
Savoury biscuits	2.2	1.6	1.2	1.1
Cakes, buns, muffins, scones, cake-type desserts	3.2	2.7	2.4	3.7
Pastries	4.6	6.0	7.9	7.2
Mixed dishes where cereal is the major ingredient	4.6	2.9	5.4	5.4
Batter-based products	1.3	1.6	0.9	0.9
Vegetable products and dishes	6.3	7.1	9.6	7.8
Potatoes	6.0	6.7	9.1	6.8
Milk products and dishes	38.9	38.3	34.3	31.2
Dairy milk	22.2	20.6	15.4	12.1
Cream	0.3	0.8	0.7	1.4
Cheese	6.6	6.8	7.2	7.6
Frozen milk products	6.7	6.3	7.8	6.9
Other dishes	1.5	1.9	0.9	0.6
Flavoured milks	1.1	1.1	1.8	1.6
Meat, poultry and game products and dishes	12.8	11.8	14.9	15.2
Muscle meat	2.7	2.2	4.4	4.1
Poultry and other feathered game	1.2	1.3	1.8	2.2
Sausages, frankfurts and saveloys	2.9	2.6	2.1	2.3
Mixed dishes where beef or veal is the major component	2.1	2.6	3.4	3.4
Mixed dishes where poultry or game is the major ingredient	2.3	2.1	2.2	2.3
Fish and seafood products and dishes	0.7	1.1	0.8	1.1
Egg products and dishes	0.9	1.1	1.0	0.8
Snack foods	4.0	4.4	3.5	4.2
Potato snacks	2.2	2.7	2.3	2.5
Confectionery	4.8	5.7	5.1	6.9
Chocolate and chocolate-based confectionery	3.4	4.6	4.5	6.2
Fats and oils	5.5	5.7	4.9	5.3
Dairy fats	2.1	2.5	2.0	2.5
Margarine	3.5	3.0	2.8	2.4
Savoury sauces and condiments	0.7	0.6	0.9	1.4

This table only shows major and sub-major food groups contributing 1.5% or more to any age (incl adults) by sex group. (Table 41. Nutrient Intakes, NNS 1995).

Table A1.4: Proportion of sugars from selected food groups to the diets of Australian children, by age and sex categories, NNS 1995

Selected major and sub-major food groups	2 to 11 years		12-18 years	
	Males	Females	Males	Females
Cereal and cereal products	6.0	5.2	6.7	5.0
Regular bread and rolls	1.5	1.4	1.5	1.7
Breakfast cereals, mixed source	3.4	2.7	4.2	2.7
Cereal-based products and dishes	8.5	9.2	7.4	9.1
Sweet biscuits	2.4	2.4	1.7	1.7
Cakes, buns, muffins, scones, cake-type desserts	3.9	4.6	3.0	4.5
Pastries	0.5	0.8	1.1	1.4
Fruit products and dishes	11.9	12.4	6.5	9.9
Pome fruit	5.1	5.0	2.9	4.8
Citrus fruit	1.0	1.3	0.8	0.8
Stone fruit	0.6	0.6	0.3	0.8
Tropical fruit	2.8	3.0	1.2	1.3
Other fruit	1.1	0.9	0.7	1.3
Vegetable products and dishes	1.6	1.9	2.2	2.7
Milk products and dishes	21.6	21.0	19.9	17.6
Dairy milk	11.4	10.7	9.5	7.5
Yoghurt	1.2	1.5	1.0	1.8
Frozen milk products	5.7	5.3	6.7	5.8
Other dishes where milk or a milk product is the major component	1.9	2.1	0.9	0.7
Flavoured milks	1.2	1.2	1.8	1.6
Meat, poultry and game products and dishes	0.8	1.0	1.0	1.1
Sugar products and dishes	7.5	6.2	6.6	7.2
Sugar, honey and syrups	3.4	3.5	4.8	4.2
Jam and lemon spreads, chocolate spreads	1.6	1.1	0.8	1.0
Dishes and products other than confectionery where sugar is the main component	2.4	1.6	1.1	2.0
Confectionery	7.0	8.2	6.9	8.2
Chocolate and chocolate-based confectionery	3.0	4.0	4.1	5.3
Other confectionery	2.7	3.0	2.2	2.5
Savoury sauces and condiments	1.4	1.2	2.0	1.6
Non-alcoholic beverages incl water	31.9	32.0	39.0	34.8
Fruit and vegetable juices and drinks	22.2	23.9	18.4	18.5
Soft drinks, flavoured mineral waters and electrolyte drinks	9.8	8.1	20.6	16.2
Alcoholic beverages	-	-	0.3	1.1

This table only shows major and sub-major food groups contributing 1.5% or more to any age (incl adults) by sex group. (Table 46. Nutrient Intakes, NNS 1995).

Appendix 2

Table A2.1: Summary of information about short dietary questions recommended for use in population surveys, in children, using data from CAPS (Lymer and Gill 2003)■

Policy relevance	Question	Relative validity (direct)	Relative validity (indirect)																														
Eat plenty of vegetables, legumes and fruits. (DG 3.1; EW NSW; AGHE)	How many serves of fruit does your child usually eat each day? (a serve=1 small piece or ½ cup of diced pieces)	<p style="text-align: center;">Comparison to serve (75g)</p> Rarely or never 15g 0.2 ≤ 1 serve 62g 0.8 2-3 serves 100g 1.3 4+ serves 157g 2.1 p<0.0001	Positive association with fibre Rarely or never 6.2 ≤ 1 serve 7.2 2-3 serves 8.5 4+ serves 10.1 p<0.001																														
Eat plenty of vegetables, legumes and fruits. (DG 3.1; EW NSW; AGHE)	How many serves of vegetables does your child usually eat each day? (a serve=1/4 cup cooked vegetables or ½ cup of salad vegetables)	<p style="text-align: center;">Comparison to serve (37.5g)</p> ≤ 1 serve 42g 1.1 2-3 serves 67g 1.8 4+ serves 112g 3.0 p<0.0001	Positive associations with B-carotene and fibre <table style="width: 100%; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;">B-carotene</th> <th style="text-align: center;">fibre</th> </tr> </thead> <tbody> <tr> <td>≤ 1 serve</td> <td style="text-align: center;">865</td> <td style="text-align: center;">7.5</td> </tr> <tr> <td>2-3 serves</td> <td style="text-align: center;">1064</td> <td style="text-align: center;">8.4</td> </tr> <tr> <td>4+ serves</td> <td style="text-align: center;">3027</td> <td style="text-align: center;">12.2</td> </tr> </tbody> </table> p <0.0001 <0.0005		B-carotene	fibre	≤ 1 serve	865	7.5	2-3 serves	1064	8.4	4+ serves	3027	12.2																		
	B-carotene	fibre																															
≤ 1 serve	865	7.5																															
2-3 serves	1064	8.4																															
4+ serves	3027	12.2																															
Include milks, yoghurts, cheese and/or alternatives. (DG 3.4; AGHE)	How many cups of milk does [child] usually drink in day? (1 cup=250 ml, a household teacup)	<p style="text-align: center;">Comparison to serve (250g)</p> < 1 cup 124g 0.5 1-2 cups 277g 1.1 2-3 cups 454g 1.8 >3 cups 696g 2.8 p<0.0001	Positive associations with energy, fat, saturated fat, protein and calcium <table style="width: 100%; border: none;"> <thead> <tr> <th></th> <th style="text-align: center;">Energy</th> <th style="text-align: center;">Fat</th> <th style="text-align: center;">Sat fat</th> <th style="text-align: center;">Protein</th> <th style="text-align: center;">Ca</th> </tr> </thead> <tbody> <tr> <td><1 c</td> <td style="text-align: center;">4042</td> <td style="text-align: center;">38</td> <td style="text-align: center;">16</td> <td style="text-align: center;">35</td> <td style="text-align: center;">520</td> </tr> <tr> <td>1-2 c</td> <td style="text-align: center;">4204</td> <td style="text-align: center;">40</td> <td style="text-align: center;">20</td> <td style="text-align: center;">37</td> <td style="text-align: center;">606</td> </tr> <tr> <td>2-3 c</td> <td style="text-align: center;">4522</td> <td style="text-align: center;">44</td> <td style="text-align: center;">23</td> <td style="text-align: center;">41</td> <td style="text-align: center;">812</td> </tr> <tr> <td>>3 c</td> <td style="text-align: center;">4591</td> <td style="text-align: center;">48</td> <td style="text-align: center;">27</td> <td style="text-align: center;">46</td> <td style="text-align: center;">1023</td> </tr> </tbody> </table> p <0.05 <0.001 <0.0001 <0.0001 <0.0001		Energy	Fat	Sat fat	Protein	Ca	<1 c	4042	38	16	35	520	1-2 c	4204	40	20	37	606	2-3 c	4522	44	23	41	812	>3 c	4591	48	27	46	1023
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<p>Include milks, yoghurts, cheese and/or alternatives. (DG 3.4; AGHE) Limit saturated fat and moderate total fat (DG 3.6)</p>	<p>What type of milk does [child] usually consume?</p>	<p>92% of children reported usual consumption of whole milk by SQ, which was confirmed by the WFR. Similarly, children reported to consume other milk by SQ, consumed other milk by WFR.</p>	<p>Children who usually consumed whole milk had higher intakes of saturated fat (23g vs 16g) and sugars (78g vs 57g) and lower intakes of iron (5.2mg vs 7.9 mg) compared to children who usually consumed other milks.</p>																																																								
<p>Eat plenty of vegetables, legumes and fruits. (DG 3.1; EW NSW; AGHE) Consume only moderate amounts of sugars and foods containing added sugars. (DG 3.8)</p>	<p>How many cups of fruit juice does [child] usually drink in a day? (1 cup=250 ml, a household tea cup or 1 large popper)</p>	<table border="0"> <tr> <td></td> <td colspan="2" style="text-align: center;">Comparison to serve (250g)</td> </tr> <tr> <td>Rarely/never</td> <td>45g</td> <td>0.2</td> </tr> <tr> <td>1c/w-<1c/d</td> <td>97g</td> <td>0.4</td> </tr> <tr> <td>1-2 c/d</td> <td>133g</td> <td>0.5</td> </tr> <tr> <td>2-3 cups</td> <td>164g</td> <td>0.7</td> </tr> <tr> <td>>3 cups</td> <td>290g</td> <td>1.2</td> </tr> <tr> <td colspan="3" style="text-align: left;">p<0.0001</td> </tr> </table>		Comparison to serve (250g)		Rarely/never	45g	0.2	1c/w-<1c/d	97g	0.4	1-2 c/d	133g	0.5	2-3 cups	164g	0.7	>3 cups	290g	1.2	p<0.0001			<p>Positive associations with energy, carbohydrate, sugars and vitamin C.</p> <table border="0"> <tr> <td></td> <td style="text-align: center;">Energy</td> <td style="text-align: center;">Carb</td> <td style="text-align: center;">Sugars</td> <td style="text-align: center;">Vit C</td> </tr> <tr> <td>Rarely/never</td> <td style="text-align: center;">4098</td> <td style="text-align: center;">122</td> <td style="text-align: center;">67</td> <td style="text-align: center;">55</td> </tr> <tr> <td>1c/w-<1c/d</td> <td style="text-align: center;">4292</td> <td style="text-align: center;">124</td> <td style="text-align: center;">73</td> <td style="text-align: center;">74</td> </tr> <tr> <td>1-2 c/d</td> <td style="text-align: center;">4354</td> <td style="text-align: center;">127</td> <td style="text-align: center;">76</td> <td style="text-align: center;">83</td> </tr> <tr> <td>2-3 cups</td> <td style="text-align: center;">4563</td> <td style="text-align: center;">135</td> <td style="text-align: center;">79</td> <td style="text-align: center;">101</td> </tr> <tr> <td>>3 cups</td> <td style="text-align: center;">5113</td> <td style="text-align: center;">155</td> <td style="text-align: center;">95</td> <td style="text-align: center;">142</td> </tr> <tr> <td>p</td> <td style="text-align: center;"><0.05</td> <td style="text-align: center;"><0.01</td> <td style="text-align: center;"><0.01</td> <td style="text-align: center;"><0.0001</td> </tr> </table>		Energy	Carb	Sugars	Vit C	Rarely/never	4098	122	67	55	1c/w-<1c/d	4292	124	73	74	1-2 c/d	4354	127	76	83	2-3 cups	4563	135	79	101	>3 cups	5113	155	95	142	p	<0.05	<0.01	<0.01	<0.0001
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DG: Dietary Guideline for children and adolescents in Australia, 2003

EW NSW: Eat Well NSW: strategic directions for public health nutrition, 2004

AGHE: The Australian Guide to Healthy Eating, 1998

P values are for trend analyses

Table A2.2: Summary of information about short dietary questions recommended for use in population surveys, in adults ■
(Table from Marks et al 2001)

Policy Relevance	Question	Relative validity (direct) food intake ratio [†]	Relative validity (indirect) nutrient intake ratio [†]	Comments
Dietary Guideline Number 2 (1.1) ^{5*} Eat Well Aus ³ Priority: Veg & Fruit AGTHE ⁴	How many serves of vegetables do you usually eat each day? <i>Source: 1995 NNS¹</i>	≤1serve 1 (204g/d) 2-3 serves 1.25 ≥4 serves 1.65 p<0.001	Vit A, Folate & Vit C ↑ All p<0.001 eg Provitamin A: ≤1serve 1 (2.6mg/d) 2-3 serves 1.4 ≥4 serves 1.9	Useful for: - trends since 1995 - when only limited no of questions possible - an indicator of total vegetable intake including potato - an indicator of provitamin A intake
Dietary Guideline Number 2 (1.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	How many serves of fruit do you usually eat each day? <i>Source: 1995 NNS¹</i>	≤ 1 serve 1 (70g/d) 2-3 serves 2.7 ≥4 serves 5.3 p<0.001	Vit A, Folate & Vit C ↑ All p<0.001 eg Vit C: ≤1serve 1 (110mg/d) 2-3 serves 1.25 ≥4 serves 1.75	Useful for: - trends since 1995 - when only limited no of questions possible - an indicator of fruit intake (excluding juice)
Dietary Guideline Number 2 (1.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	How often do you eat salad? (salad includes mixed green salad and other mixtures of raw vegetables) <i>Source: 1996 Dietary Key Indicators Study²</i>	<1/wk 1 (10.7g/d) 1/wk-2/wk 2.6 3/wk-<7/wk 5.2 ≥7/wk 8.15 p<0.001	No significant correlations with Vit A, Vit C or Folate	Useful as: - an indicator of salad intake - a component of total veg intake
Dietary Guideline Number 2 (1.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	Not counting potatoes and salad, how often do you eat cooked vegetables? <i>Source: 1996 Dietary Key Indicators Study²</i>	<1/wk 1 (12.8g) 1/wk-2/wk 3.9 3/wk-<7/wk 5.75 ≥7/wk 8.0 p<0.001	Only Provitamin A: p<0.001 <1/wk 1 (1.0 mg/d) 1/wk-2/wk 2.4 3/wk-<7/wk 2.8 ≥7/wk 3.7	Useful as: - an indicator of cooked vegetable intake - a component of total veg intake - an indicator of provitamin A intake

■ Information summarised from Rutishauser et al 2001 and Riley et al 2001.

¹ Australian Bureau of Statistics 1998.

² Riley and Rutishauser 1998.

³ SIGNAL 2001.

⁴ Smith et al 1998.

⁵ NHMRC 1992.

* Numbers in brackets are draft dietary guidelines recently circulated for public consultation (NHMRC 2001).

Table A2.2: Continued

Policy Relevance	Question	Relative validity (direct) food intake ratio [†]	Relative validity (indirect) nutrient intake ratio [†]	Comments
Dietary Guideline Number 2 (1.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	How often do you eat potatoes? (not including chips, French fries, wedges, fried potatoes or crisps) <i>Source: 1996 Dietary Key Indicators Study²</i>	<1/wk 1 (26g/d) 1/wk-<3/wk 1.25 3/wk-<7/wk 2.4 ≥7/wk 3.35 p<0.001	Only Provitamin A: p<0.001 eg Provitamin A: <1/wk 1 (2.7 mg/d) 1/wk-2/wk 0.95 3/wk-<7/wk 1.15 ≥7/wk 1.35	Useful as: - an indicator of intake of potato without added fat - a component of total veg intake
Dietary Guideline Number 2,3 (1.1,2.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	How often do you eat chips, French fries, wedges, fried potatoes or crisps? <i>Source: 1996 Dietary Key Indicators Study²</i>	Rarely or never 1 (25g/d) <1/wk 1.7 1/wk-2wk 3.0 3/wk-<7/wk 4.1 ≥7/wk 6.65 p<0.001	Energy, Fat, Sat Fat ↑ Vit A ↓ p<0.001 also tested Vit C and folate	Useful as: - an indicator of intake of potato with added fat - a component of total veg intake
Dietary Guideline Number 2 (1.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	How often do you drink fruit juices such as orange, grapefruit or tomato? <i>Source: 1996 Dietary Key Indicators Study²</i>	<1/wk 1 (19.3g/d) 1/wk-2/wk 2.8 3/wk-<7/wk 4.2 ≥7/wk 8.1 p<0.001	Vit A and Vit C : p<0.001 Rarely/Never 1 (85mg/d) <1/wk 0.95 1/wk-2/wk 1.05 3/wk -<7/wk 1.35 ≥7/wk 1.70	Useful as: - an indicator of fruit juice intake - a component of total fruit intake - an indicator of vitamin C intake
Dietary Guideline Number 2 (1.1) ⁵ Eat Well Aus Priority: Veg & Fruit AGTHE ⁴	Not counting juice, how often do you eat fruit? (fruit includes fresh, canned, frozen, dried) <i>Source: 1996 Dietary Key Indicators Study²</i>	Rarely/Never 1 (11.9g/d) <2/wk 4.15 2/wk-<7/wk 8.5 ≥7/wk 14.1 p<0.001	Vit A, Vit C , Folate: p<0.001 Rarely/Never 1 (63mg/d) <2/wk 1.65 2/wk-<7/wk 1.65 ≥7/wk 1.8	Useful as: - an indicator of fruit intake (excluding juice) - an indicator of vitamin C intake
Dietary Guideline Number 2 (1.2) ⁵ AGTHE ⁴	How often do you eat bread? (include bread rolls, flat breads, crumpets, bagels, English or bread type muffins) <i>Source: 1996 Dietary Key Indicators Study²</i>	< 1/day 1 (69g/d) 1<2/day 1.6 2<4/day 1.95 ≥4/day 2.35 p<0.001	Fibre & Thiamin ↑ p<0.001 CHO, energy ↑ P<0.01 eg Thiamin: <1/day 1 (1.3 mg/d) 1-<2/day 1.25 2-<3/day 1.3 mg ≥3/day 1.45 mg	Useful as: - an indicator of bread intake - a component of total breads and cereals - an indicator of thiamin intake

Table A2.2: Continued

Policy Relevance	Question	Relative validity (direct) food intake ratio [†]	Relative validity (indirect) nutrient intake ratio [†]	Comments
Dietary Guideline Number 2 (1.2) ⁵ AGTHE ⁴	How often do you eat breakfast cereal? (ready-made, home-made or cooked) <i>Source: 1996 Dietary Key Indicators Study²</i>	<2/wk 1 (4.9g/d) 2wk<7/wk 7.4 ≥7/wk 12.8 p<0.001	Fibre, Thiamin & CHO ↑ p<0.001 eg Fibre: <2/wk 1 (17.6 g/d) 2/wk-<7/wk 1.2 ≥7/wk 1.4 Energy - Not Significant	Useful as: - an indicator of breakfast cereal consumption - a component of breads and cereals
Dietary Guideline Number 2 (1.2) ⁵ AGTHE ⁴	How often do you eat pasta, rice noodles or other cooked cereals? (not including cooked breakfast cereal) <i>Source: 1996 Dietary Key Indicators Study²</i>	Rarely/never 1 (23g/d) <1/wk-<2/wk 2.0 2wk<7/wk 3.3 ≥7/wk 4.35 p<0.001	Only Fibre p<0.001 eg Fibre: Rarely/never 1 (18.4 g/d) <1-<2/wk 1.05 2/wk-<7/wk 1.2 ≥7/wk 1.25	Useful as: - an indicator of pasta/rice intake - a component of breads and cereals
Dietary Guideline Number 3 (2.1) ⁵ AGTHE ⁴	How often do you eat meat products such as sausages, frankfurters, devon, salami, meat pies, bacon or ham? <i>Source: 1996 Dietary Key Indicators Study²</i>	Rarely/never 1 (12.9g/d) <2/wk 2.3 2wk-<7/wk 3.95 ≥7/wk 5.6 p<0.001	Sat fat Protein, Energy, Zn, Total Fat, energy % ↑ All p<0.001 eg Sat fat (g) Rarely/never 1 (24.8g/d) <2/wk 1.25 2/wk<7/wk 1.4 >7/wk 1.35	Useful as: - an indicator of processed meat intake
Dietary Guideline Number 3,10 (1.3) ⁵ AGTHE ⁴	How often do you eat red meat? (beef, lamb, liver and kidney but not pork or ham) <i>Source: 1996 Dietary Key Indicators Study²</i>	Rarely/never 1 (7.8g/d) <2/wk 5.4 2wk-<7/wk 10.1 ≥7/wk 15.5 p<0.001	Zn, Protein, Energy, Fat All p<0.001 Iron p<0.01 eg Zinc (mg): Rarely/never 1 (8mg/d) <1/wk-<2/wk 1.15 2/wk<7/wk 1.35 >7/wk 1.60	Useful as: - an indicator of red meat intake - an indicator of zinc intake

Table A2.2: Continued

Policy Relevance	Question	Relative validity (direct food intake ratio) [†]	Relative validity (indirect nutrient intake ratio) [†]	Comments
Dietary Guideline Number 3 (1.4,2.1) ⁵ AGTHE ⁴	What type of milk do you usually have? <i>Source: 1995 NNS¹</i>	WM 212gWM* and 22gRF/SK* RF/SK 183gRF/SK* and 9gWM* p<0.001	Percentage energy from total and Sat Fat : p<0.001 ↑ WM ↓ RF.SK eg Sat Fat (%): Whole milk 13.9% Skim/Reduced fat milk 11.7%	Useful for: - an assessment of trend since 1995 - a measure of main type of milk used - an indicator of % energy from sat fat
Dietary Guideline Number 3 (1.4,2.1) ⁵ AGTHE ⁴	About how much milk (in total do you usually have in a day?) <i>Source: 1996 Dietary Key Indicators Study²</i>	<150ml 115g 150-300ml 203g 301-600ml 293g >600ml 419g p<0.001	Calcium: p<0.001 eg <150ml 1 (640mg) 150-300ml 1.2 301-600ml 1.35 >600ml 1.75 Protein and Energy not significant	Useful as: - an indicator of volume of milk intake - an indicator of calcium intake
Eat Well Aus ³ Priority: Vulnerable Groups EWA & NATSINSAP ³ Action Area: Food Supply and Food Access	In the last 12 months, were there times that you ran out of food and couldn't afford to buy more? <i>Source: 1996 Dietary Key Indicators Study²</i> <i>Source: 1995 NNS¹</i>	% responding yes: 5.2% All (20 to 65yrs) % responding yes: 5.2% (19yrs and over) Yes response related to the following measures of SES: Employment status, SEIFA, main source of income and type of housing eg: Pays rent 15.8% Paying off house 4.3% Home owner 1.6%	Energy, EI/BMR, no significant difference Vit C, Fe, Folate all significantly lower among 'yes' responders Ca significantly higher among 'yes' responders Meat and poultry, Fruit ↓ all p<0.001 Milk and dairy ↑ p<.01 For 'yes' responders eg Fruit Dishes (g/day): Ran out of food 91.8g Did not run out 146.1 g	Useful as: - an indicator of possible food insecurity in population-based surveys

WM= usually consumes whole milk based on short question and WM* = amount consumed in 24-hour recall.

RF/SK= usually consumes reduced fat or skim milk based on short question and RF/SK* = amount consumed in 24-hour recall.

[†] Intake of food/nutrient expressed as a ratio relative to the lowest response category – in effect, a 'dose response'

Appendix 3:

Information about the validity of fruit and vegetable questions used in NSW CHS 2001, as tested in the CAPS study of 18 month old children:

These questions are **not** recommended in future CATI surveys.

1. How many serves of fruit does [child] usually eat in a day, including fresh, canned and dried fruit? (1 serve=1/2 piece fruit, 1/3 cup canned fruit, 1 tablespoon of dried fruit)

Used in NSW CHS 2001. To compare the serves to recommended serves, the responses were halved. However, the serve prompts do not all equal 1/2 serve sizes. The validity data on 18 month old children indicates strong direct validity ($p < 0.0001$) and indirect validity for fibre (< 0.05). However, the question was not validity tested with the serve size references. This question includes a prompt for dried fruit, unlike other fruit questions, which limits comparisons with other short fruit questions. These serve size prompts are also likely to be too low for older children.

2. How many serves of salads or raw vegetables does [child] usually eat each day? (1 serve= 1/4 cup salad or 4 vegetable sticks)

Used in NSW CHS 2001.

Validity in 18 month children:

Direct validity $p < 0.0001$:

Rarely/never	0.1g
1/week-<1 day	1.4 g
1/d-2/d	1.8 g
>2/day	5.7 g

Note: very small quantities were consumed.

Indirect validity: no significant associations for nutrients.

3. How many serves of other cooked vegetables including potato does [child] usually eat in a day? (1 serve=1/4 cup cooked vegetables)

Used in NSW CHS 2001. Asked after the question about hot chips, this question implies that hot chips are excluded.

Validity in 18 month old children:

Direct validity $p = 0.0065$

<1/day	19.9g
1/d-2/d	27.1g
>2/day	38.3g

Indirect: significant trend for fibre $p = 0.0115$

4. How many serves of hot chips or French fries does [child] usually eat in a day? (1 serve=1/2 cup hot chips or French fries)

_____ serves per day
_____ serves per week

Doesn't eat chips

Don't know

Source: NSW CHS 2001

Validity: In 18 month old children: 40% reported consuming hot chips 'rarely or never' and 60% reported consuming hot chips at least once per week. Mean daily intake of those who reported at least once per week was 14g and in those who reported rarely or never 7g ($p=0.0026$). There were no significant correlations with nutrients, though there was a non-significant trend for higher fat intake amongst those who had a serve at least once per week, compared to rarely or never (45 g vs 42g fat, $p=0.076$). The alternate hot chip question about frequency of consumption is recommended instead of this question, because of ease of answering.

Appendix 4: Overview of short questions used in Australia and other western countries

A4.1 Australian Secondary Students Alcohol and Drug Survey (ASSAD), 1996, 1999

This is a national survey on the use of alcohol and drugs by secondary school children in Australia, with individual state components. The sample is designed to represent students from all types of schools, and provides national and state-specific estimates by age and gender. The survey has been administered in 1996 and 1999 in NSW school by the NSW Cancer Council in cooperation with NSW Health.

The core questionnaire covers the use of tobacco, alcohol, over-the-counter medicines and illicit substances. The NSW version of the survey has a range of additional health-related questions added to the base survey.

See more information:

Schofield, WN, Lovelace KS, McKenzie JE. Self-reported behaviours of NSW secondary school students – sun protection, physical activity, injury and eating patterns. *The 1996 Australian School Students' Alcohol and Drugs Survey*. NSW Cancer Council, NSW Department of Health, 1998.

NSW Health. The Cancer Council NSW. Self-reported behaviours of NSW secondary school students – sun protection, physical activity, eating patterns, and injury: the 1999 Australian School Students' alcohol and drugs survey (ASSAD). Draft unpublished report 2002.

Nutrition questions in ASSAD survey:

1. How many serves of vegetables do you usually eat each day? (A serve is equal to ½ cup of cooked vegetables or 1 cup of salad vegetables)
 - 1 serve or less
 - 2-3 serves
 - 4-5 serves
 - 6 serves or more
 - I do not eat vegetables

2. How many serves of fruit do you usually eat each day? (A serve is equal to 1 medium piece or 2 small pieces of fruit or 1 cup of diced pieces of fruit)
 - 1 serve or less
 - 2-3 serves
 - 4-5 serves
 - 6 serves or more
 - I do not eat fruit

3. How many serves of bread and/or cereal do you usually eat each day?
(A serve is 1 slice of bread, ½ bread roll, ½ cup breakfast cereal, or ½ cup pasta, rice or noodles).
 - 1 serve or less

- 2-3 serves
- 4-5 serves
- 6 serves or more
- I do not eat bread or cereals

Nutrition questions in ASSAD Supplement B

1. How many days per week do you usually have something to eat for breakfast?
(Tick one box only)

- Rarely or never
- 1-2 days
- 3-4 days
- 5 or more days
- I don't know

2. What type of milk do you usually have?

(Tick one box only)

- Whole milk (including flavoured milk and full-cream soy milk)
- Reduced fat milk (eg. Lite White, Farmer's Best, Hi-Lite, So Good Lite, Oak and reduced fat flavoured milk)
- Skim milk (including Shape)
- Evaporated or sweetened condensed milk
- None of the above
- I don't know

3. In the past week, how many times have you eaten meals that were bought from fast food outlets like McDonalds, Hungry Jacks, Pizza Hut, Kentucky Fried Chicken (KFC) Red Rooster, Burger King, hamburger shops and fish and chips shops?

(Tick one box only)

- None
- Once
- 2-3 times
- 4-5 times
- 6 times or more
- I don't know

4. Do you think of yourself as being too thin, about the right weight or too fat?

- Too thin (underweight)
- About the right weight
- Too fat (overweight)

5. Which of the following are you trying to do about your weight?

(Tick one box only)

- Lose weight
- Gain weight
- Stay the same weight

I am not trying to do anything about my weight

A4.2 NSW Schools Physical Activity and Nutrition Survey (SPANS)

A self-completed survey of adolescents in years 8 and 10, conducted in 2004.

These questions are about the types of food that you eat each day, in a normal week.....

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

- I don't drink milk (skip to question 3)
- Less than 150ml
- 150-300ml (300ml is a small carton)
- 301-600ml
- More than 600ml

2. What type of milk do you usually drink? (Please shade one circle only)

(If you usually use more than one type of milk mark the one you use most often)

- Whole
- Low/reduced fat
- Skim
- Evaporated or sweetened condensed
- Soy
- None of the above
- Don't know

3. How many serves of vegetables do you usually eat each day? (Please shade one circle only) (a serve=1/2 cup cooked vegetables or 1 cup of salad vegetables)

- I don't eat vegetables
- 1 serve or less
- 2-3 serves
- 4-5 serves
- 6 serves or more

4. How many serves of fruit do you usually eat each day? (Please shade one circle only)
(a serve = 1 medium piece or two small pieces of fruit or 1 cup of diced pieces)

- I don't eat fruit
- 1 serve or less
- 2-3 serves
- 4-5 serves
- 6 serves or more

5. How much soft drink do you usually drink in a day? (Please shade one circle only)
(include all types of soft drink including fruit flavoured drinks and 'sport' drinks but exclude any fruit juice or plain water)

- I don't drink soft drinks
- Less than 250 ml
- Between 250 and 400 ml
- Between 400 and 1 Litre

More than 1 Litre

6. How many slices of bread do you usually eat each day? (Please shade one circle only)
(a bread roll counts as two slices of bread)

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

7. How often do you usually do the following? (Please shade one circle on each row)

	<i>Never or rarely</i>	<i>Less than once/week</i>	<i>About 1-3 times/week</i>	<i>About 4-6 times/week</i>	<i>Every day</i>
a. Drink pure or 100% fruit juice? (such as orange, apple, pineapple, grapefruit, tomato)					
b. Eat pasta or rice?					
c. Eat 'red' meat, including lamb, beef, pork, goat, minced meat?					
d. Eat chicken?					
e. Eat fish, including canned fish?					
f. Eat confectionery? (including chocolate, confectionery bars and lollies)					
g. Eat hot chips, French fries, wedges or fried potatoes?					
h. Eat potato chips or other salty snacks?					
i. Have something to drink for breakfast?					
j. Have something to eat for breakfast?					
k. Have something to drink for lunch?					
l. Have something to eat for lunch?					

8. How many days each week do you usually buy something to eat on the way to school? (Please shade one circle only)

- Never or rarely
- Less than once/week
- 1-2 times/ week
- 3-4 times/ week
- Every day

9. On school days, where do you usually get your lunch? (Please shade one circle only)

- I don't eat lunch
- I usually bring food from home
- Usually from vending machines at school
- Usually from the school canteen
- Usually from a shop near school
- Usually from a fast food outlet

10. How often each week do you usually buy the following meal or snack from the school canteen? (Please shade one circle only)

- a. Breakfast Never/rarely Once/week Twice/week Daily
- b. Recess Never/rarely Once/week Twice/week Daily
- c. Lunch Never/rarely Once/week Twice/week Daily

11. What kind of drink do you usually buy from the canteen? (Please shade one circle only) (if you buy more than one type of drink, choose the one you buy most often)

- I don't buy drinks from the canteen
- Water
- 100% fruit juice
- Soft drink
- Sport drink
- Milk (plain or flavoured)

12. What kind of drink do you usually buy from the school vending machine? (Please shade one circle only) (If you buy more than one type of drink, choose the one you buy most often)

- Our school doesn't have a vending machine
- I don't buy drinks from the vending machine
- Water
- 100% fruit juice
- Soft drink
- Sport drink
- Milk (plain or flavoured)

13. How many days each week do you usually buy something to eat on the way home from school? (Please shade one circle only)

- Never or rarely
- Less than once/week
- 1-2 times/week
- 3-4 times/week
- Every day

14. How many days each week do you usually do the following? (Please shade one circle on each row)

	<i>Never or rarely</i>	<i>Less than once/week</i>	<i>About 1-3 times/week</i>	<i>About 4-6 times/week</i>	<i>Every day</i>
a. Have something to eat for dinner (tea or the evening meal)					
b. Prepare or help prepare your dinner?					
c. Eat dinner with most of your family?					
d. Eat dinner in front of the television?					
e. Eat food from a fast food outlet (like McDonalds, KFC, Burger King)?					

15. Thinking about yesterday, how many times did you have a snack between your main meals? (Please shade one circle only)

- Not at all
- Once or twice
- 3-4 times
- 5-6 times
- 7-8 times
- More than 8 times

The survey also includes some other questions about attitudes to food.

A4.3. Queensland DIAT Survey of Older Primary and Adolescents

This survey questions older primary and adolescents about food habits, and has been developed by researchers at the University of Queensland (Coyne et al 2004). It uses questions derived from a number of sources around Australia, and these are shown on the right hand side of the questions (listed below); on the left of the questions is a summary of the rationale for the questions.

Early testing of the questions amongst children and their health worker parents indicated that there was generally one category or less difference between children's responses and their parent's responses (personal communication: T. Coyne 2004). The repeatability and validity of the questionnaire are currently being conducted amongst a wider cohort.

Foods I Usually Eat –Background Information about Questions

- 1 What is your FIRST and LAST NAME?

- 2 Are you a BOY or a GIRL? Boy Girl
- 3 What YEAR were you born? _____
What MONTH were you born? _____

We are interested to learn about your recent eating habits, for instance over the past month. For the following questions please answer how many times a DAY do you USUALLY eat these foods? Tick only one answer for each question.

SOURCE	QUESTION	RATIONALE
<p>4 AF&NM</p>	<p>How often do you eat bread? (This includes bread rolls, flat breads, bagels, English muffins or bread-type muffins.)</p> <p><input type="checkbox"/> Never or rarely <input type="checkbox"/> About 1-3 times a day <input type="checkbox"/> About 4-5 times a day <input type="checkbox"/> 6 or more times a day</p>	<p>BREAD & CEREAL 1/3 DIVERSITY-B&C 1/3</p>
<p>5 8th grade post survey</p>	<p>How often do you have butter or margarine on your bread or rolls?</p> <p><input type="checkbox"/> Never <input type="checkbox"/> Not very often <input type="checkbox"/> Sometimes <input type="checkbox"/> Almost always <input type="checkbox"/> Always</p>	<p>MODERATION-FAT 1/2</p> <p><i>*this question has not been evaluated.</i></p>
<p>6 AF&NM AAHMS</p>	<p>How much milk (in total) do you <u>USUALLY</u> drink each day? (include all types of milk including flavoured milk and milk on cereal.)</p> <p><input type="checkbox"/> I don't drink milk <input type="checkbox"/> Less than one cup <input type="checkbox"/> About 1 to 2 cups <input type="checkbox"/> About 2 to 3 cups <input type="checkbox"/> 3 cups or more</p>	<p>DAIRY 1/1</p> <p>DIVERSITY-DAIRY 1/2</p>
<p>7 AF&NM NNS95 CATI core AAHMS AusDiab Lighten UP Healthy Weight QH Child Health QH Infant Nutr</p>	<p>What type of milk do you <u>USUALLY</u> drink? (Choose one type of milk only)</p> <p><input type="checkbox"/> I don't drink milk <input type="checkbox"/> Whole milk (full cream) <input type="checkbox"/> Low or reduced fat milk (1 or 2% fat) <input type="checkbox"/> Skim (non fat) milk <input type="checkbox"/> Flavoured Milk (such as chocolate, strawberry) <input type="checkbox"/> Other type milk (such as soy, rice, goat) <input type="checkbox"/> Not Sure</p>	<p>FAT 1/3</p>
<p>8 AF&NM ESU bio NNS95 CATI core AAHMS AusDiab Lighten</p>	<p>How many serves of vegetables do you <u>USUALLY</u> eat each day? (A 'serve' is a half-cup of cooked vegetables or 1 cup of salad vegetables). This includes all fresh, dried, frozen and tinned vegetables.</p> <p><input type="checkbox"/> I don't eat vegetables <input type="checkbox"/> 1 serve or less <input type="checkbox"/> 2 serves <input type="checkbox"/> 3 serves</p>	<p>VEGETABLE 1/1</p>

Up QH Child Health
QH Infant Nutr
Bowen Base, 16

- 4 serves
 5 serves or more

9
AF&NM, NNS95,
ESU bio,CATI
core
AAHMS,
AusDiab
LightenUP,
Bowen Baseline,
QH Child health,
QH Infant Nutr,
16

How many serves of fruit do you USUALLY eat each day? (A 'serve' is 1 medium piece or 2 small pieces of fruit, or a cup of diced pieces). This includes all fresh, dried, frozen, and tinned fruit.

- I don't eat fruit
 1 serve or less
 2 serves
 3 serves
 4 serves or more

FRUIT 1/2

**DIVERSITY-
FRUIT 1/2**

10
created this

How much water do you USUALLY drink each day? This can be plain tap water, mineral water or bottled water.

- I don't drink water
 Less than one cup
 About 1 to 2 cups
 About 2 to 3 cups
 3 cups or more

**For the next questions, think about what you USUALLY eat each WEEK. Remember to think back to what you usually ate over the past month.
Tick only one answer for each question.**

11
AF&NM
AAHMS

How often do you drink 100% fruit juices such as orange juice or apple juice?

- Never or rarely
 Less than once a week
 About 1-3 times a week
 About 4-6 times a week
 Everyday

FRUIT 2/2

**DIVERSITY-
FRUIT 2/2**

12
created this

How often do you eat cheese or yoghurt?

- Never or rarely
 Less than once a week
 About 1-3 times a week
 About 4-6 times a week
 Everyday

**DIVERSITY-
DAIRY 2/2**

***this question
has not been
evaluated.**

13 AF&NM

How often do you eat breakfast cereal? (ready-made, home-made or cooked)

- Never or rarely
 About 1-3 times a week
 About 4-6 times a week
 Once a day
 2 or more times a day

**BREAD &
CEREAL 2/3**

**DIVERSITY-
B&C 2/3**

14 AF&NM

How often do you eat pasta, rice, or noodles?

- Never or rarely
 About 1-3 times a week
 About 4-6 times a week
 Once a day
 2 or more times a day

**BREAD &
CEREAL 3/3**

**DIVERSITY-
B&C 3/3**

15
AF&NMAAH
MS

How often do you eat red meat such as beef, mince, lamb, pork, or ham?

- Never or rarely
 Less than once a week

MEAT 1/3

DIVERSITY-

	<input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Everyday	MEAT 1/3
16 AAHMS	<p>How often do you eat chicken or fish?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> Less than once a week <input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Everyday	MEAT 2/3 DIVERSITY- MEAT 2/3 * this question has not been evaluated.
17 Healthy Weight	<p>How often do you eat baked beans, three bean mix, lentils, split peas, or dried beans?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> Less than once a week <input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Everyday	MEAT 3/3 DIVERSITY- MEAT 3/3 * this question has not been evaluated.
18 AF&NMAAH MS	<p>How often do you eat meat products such as sausage rolls, hot dogs, devon, salami, meat pies, or bacon?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> Less than once a week <input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Everyday	SAT FAT 1/1
19 HE, EFNEP	<p>How often do you eat eggs?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Once a day <input type="checkbox"/> 2 or more times a day	CHOLESTERO L 1/1 * this question has not been evaluated
20 AF&NM AAHMS	<p>How often do you eat chips, wedges, or French fried potatoes?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> Less than once a week <input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Once a day <input type="checkbox"/> 2 or more times a day	FAT 2/3 * this question has not been evaluated
21 QH Child health QH Infant Nutr WAAS	<p>How often do you have meals or snacks such as burgers, pizza, chicken, or chips from places like McDonalds, Hungry Jacks, Pizza Hut, Red Rooster or local take-away food places?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> Less than once a week <input type="checkbox"/> About 1-3 times a week <input type="checkbox"/> About 4-6 times a week <input type="checkbox"/> Once a day <input type="checkbox"/> 2 or more times a day	FAT 3/3 MODERATION -FAT 2/2 * this question has not been evaluated
22 AAHMS	<p>How often do you eat potato crisps or other salty snacks (such as Twisties, Corn chips)?</p> <input type="checkbox"/> Never or rarely <input type="checkbox"/> Less than once a week <input type="checkbox"/> About 1-3 times a week	MOD-SALT 1/1 * this question has not been evaluated

- About 4-6 times a week
- Once a day
- 2 or more times a day

23
AAHMS

How often do you eat sweets (such as sweet biscuits, cakes, pies, lollies or chocolates)?

- Never or rarely
- Less than once a week
- About 1-3 times a week
- About 4-6 times a week
- Once a day
- 2 or more times a day

**MOD-SUGAR
1/2**
***this question
has not been
evaluated**

24
Similar to
QH Child
Health 2001,
AAHMS

How often do you drink soft drinks, fizzy drinks or sports drinks like soda, cordial, Coke, Lemonade, Gatorade?

- Never or rarely
- Less than once a week
- About 1-3 times a week
- About 4-6 times a week
- Once a day
- 2 or more times a day

**MOD-SUGAR
2/2**
***this question
has not been
evaluated.**

25
created this

Are there any other foods that you usually eat that are not listed here?
If yes, what are those foods:

- 1 –AF&NMU – short questions recommended for use in population dietary surveys 2001
- 2 – ESU Bio – QH Epidemiology Services Unit evaluated using biomarkers-carotenoid and red cell folate
- 3 - NNS - 1995 National Nutrition Survey – ‘short questions’
- 4 - CATI TRG core – (Source: 1995 national Nutrition Survey)
- 5 -CATI TRG – optional – highly recommended (Source: Dietary Key indicators Study, 1996, NHMRC)
- 6 - QH Child Health 2001
- 7 - QH Infant Nutrition
- 8 - AAHMS 2004-01-09
- 9 – AusDiab – Qld extra questions
- 10 - Well Person Health Check
- 11 - Lighten Up –“in the last few weeks”
- 12 - Healthy Weight – Indigenous Weight loss program
- 13 - Western Australia Adolescent Survey – short questions
- 14 - Bowen Baseline Survey
- 15 – Healthy Eating Index (HEI)- Kennedy (1995)
- 16-Expanded Food and Nutrition Education Program (EFNEP) and Food Stamp Nutrition Education Program (FSNEP)
- 17- post 8th Grade Survey- M. Buzzard (2001)

A4.4 South Australian Food Security questions

South Australia Health Department asks four food security questions using CATI. The questions are similar to that used by NSW Health, but include some added dimensions and indicators of periodicity and psychological aspects of food insecurity, e.g. stress or anxiety.

The food security questions are:

1. In the last 12 months were there any times that the food you had bought just didn't last and you didn't have any money to buy more?
2. How often did this happen?
3. How do you cope with feeding your child/children when this happens? (asked only if answered yes to question 1).
4. In the last 12 months have you felt stressed because of not having enough money for food?

A4.5 US Youth Risk Behaviour Survey (YRBS)

The Youth Risk Behaviour Survey (YRBS) collects data on health related behaviours of American schoolchildren including selected dietary behaviours. It is based on self-reported data from schoolchildren in 9th to 12th grade (approximately 14-18 years old). The YRBS currently uses seven short questions to measure food choices; six of the questions address fruit and vegetable consumption, and one addresses milk consumption. The fruit and vegetable questions are similar to questions asked of adults on CDC 's Behavioral Risk Factor Survey (BRFSS). In addition, there are nine questions about body weight, including the recent addition of two questions to assess self-reported weight and height, in order to address increasing concerns about obesity. This has occurred, despite concerns about under-reporting obesity from the self-reported data, as it is believed this information will be useful to track trends over time (CDC rationale, 2005). A study to assess the validity of all self-reported behaviours of the YRBS has not been conducted (CDC 2004).

A study to assess the validity of all self-reported behaviours of the YRBS has not been conducted (CDC 2004), although issues associated with the validity of self-reported dietary questions have been discussed by Brener et al (2003). These include cognitive factors (such as recall difficulties) and situational factors (such as interviewing conditions).

In addition, the validity of similar short questions on fruit and vegetable intake used in the YRBS and BRFSS have been assessed by Field et al (1998). The 4-item YRBS asked about past day intake whereas the two 6-item questionnaires from the BRFSS asked about past day and past year intake. All questionnaires were found to significantly underestimate the proportion of subjects consuming at least 5 serves of fruits and vegetables. Questionnaires asking subjects to recall their diet over the previous year were more effective in ranking subjects ($r > 0.42$) than those assessing the previous day's intake ($r > 0.30$). Underestimation was primarily due to underreporting of vegetable intake, in particular vegetables consumed in mixed dishes. The authors concluded that brief assessments of fruit and vegetable intake are more useful for ranking subjects than for estimating the prevalence of consumption of 5 or more serves per day.

Dietary questions currently used in the YRBS:

The next 7 questions ask about food you ate or drank during the past 7 days. Think about all the meals and snacks you had from the time you got up until you went to bed. Be sure to include food you ate at home, at school, at restaurants, or anywhere else.

1. During the past 7 days, how many times did you drink 100%fruit juices such as orange juice, apple juice, or grape juice? (Do not count punch, Kool-Aid, sports drinks, or other fruit-flavored drinks.)
2. During the past 7 days, how many times did you eat fruit? (Do not count fruit juice.)
3. During the past 7 days, how many times did you eat green salad?
4. During the past 7 days, how many times did you eat potatoes? (Do not count french fries, fried potatoes, or potato chips.)
5. During the past 7 days, how many times did you eat carrots?
6. During the past 7 days, how many times did you eat other vegetables? (Do not count green salad, potatoes, or carrots.)
7. During the past 7 days, how many glasses of milk did you drink? (Include the milk you drank in a glass or cup, from a carton, or with cereal. Count the half pint of milk served at school as equal to one glass.)

The response options for fruit and vegetable items are:

- A.I did not eat this food during the past 7 days
- B.1 to 3 times during the past 7 days
- C.4 to 6 times during the past 7 days
- D.1 time per day
- E.2 times per day
- F.3 times per day
- G.4 or more times per day

The response options for milk intake are:

- A.I did not drink milk during the past 7 days
- B.1 to 3 glasses during the past 7 days
- C.4 to 6 glasses during the past 7 days
- D.1 glass per day
- E.2 glasses per day
- F.3 glasses per day
- G.4 or more glasses per day

A4.6 Short questions about fruit and vegetables, reported in the literature:

Relatively few validation studies have been undertaken on short questions. Prochaska and Sallis (2004) developed a brief, 2-item self-administered measure to assess adolescents' fruit and vegetable consumption on a typical day, using the following questions:

In a typical day, how many servings of fruit do you eat?

A serving is equal to:

- *1 medium piece of fruit*
- *½ cup of fruit salad*
- *¼ cup of raisins, apricots or other dried fruit*
- *6 oz of 100% orange, apple or grapefruit juice*

(Do not count fruit punch, lemonade, Gatorade, Sunny Delight or fruit drink)

Answer from 0, 1, 2, 3, 4 or more

In a typical day, how many servings of vegetables do you eat?

A serving is equal to:

- *1 medium carrot or other fresh vegetable*
- *1 small bowl of green salad*
- *1/2 cup of fresh or cooked vegetables*
- *¾ cup of vegetable soup*

(Do not count French fries, onion rings, potato chips, or fried okra)

Answer from 0, 1, 2, 3, 4 or more

This measure was found to be reliable and significantly correlated with 3-day food record data (not weighed). Correct classification and specificity were good (both 63%), indicating the measure's ability to correctly classify adolescents not meeting the 5-a-day guideline. Sensitivity, however, was low at 33%, indicating that some participants said to be achieving the guideline, were actually misclassified (Prochaska and Sallis, 2004).

Other validation studies of brief adolescent fruit and vegetable measures include studies by Cullen et al. (1999), Domel et al. (1994), and Baranowski et al. (1997). A 24-item FFQ compared with a 24-hour recall among middle-school youth found a mean discrepancy in reported consumption of 2.8 servings per day with a Spearman $r=0.34$ to 0.51 (Cullen et al., 1999). A 15-item FFQ evaluated against a 7-day food record with fourth to fifth graders produced correlations below 0.10 (Domel et al., 1994). A 7-item FFQ with third grade students' (≈ 9 year olds) provided much higher estimates of serves of fruit and vegetables,

compared to food records; 50.9 serves per week (FFQ) vs 15.9 per week (food record) (Spearman $r=0.22$) (Baranowski et al, 1997).

Appendix 5:

Meat intake among Australian children

Background

Young children tend to have low intakes of meat and low intakes are associated with low intakes of iron and zinc and with poor iron status.

CAPS Study (Webb et al 2005):

- n=429 children aged 16-24 months
- 3-day WFR, used NUTTAB95 (version 3) database
- meat was consumed, on average, just over once a day.
- 97% of children ate some meat during the study period
- The 30 most commonly eaten meats (and foods containing meats) are listed below and accounted for 66% of all meats consumed
 - beef mince, regular
 - chicken McNuggets
 - beef sausage, grilled
 - leg ham (lean only)
 - devon/fritz
 - chicken breast, baked (lean and skin)
 - Frankfurt, simmered
 - Hamburger/cheeseburger McDonalds
 - Chicken breast, baked (lean only)
 - Bacon breakfast rasher, fried
 - Chicken breast quarter rotisserie (l&s)
 - Chicken unspecified, baked (l&s)
 - Leg ham (l&f)
 - Chicken drumstick baked (lean only)
 - Sausage roll (individual)
 - Shoulder ham (l&f)
 - Chicken roll
 - Infant dinner (pasta, beef and tomato)
 - Beef, unspec, lean
 - Pizza supreme
 - Meat pie (individual)
 - Chicken unspec rotisserie (l&s)
 - Infant dinner (chicken and vegetable)
 - Pizza thick crust commercial
 - Infant dinner (steak and vegetable)
 - Ham, unspec (l&f)
 - Lamb, unspec (l&f)
- Foods classified as red meats (beef, lamb and organ meats) were consumed less than either white meats (pork, chicken) or processed meats (sausages, bacon, ham, deli meats).
- 58% of children had consumed red meat during the study period, compared to 62% who had consumed white meat and 54% processed meat.

- An average portion of red meat (29 g) contributed significantly less total and saturated fat, cholesterol and sodium and significantly more iron and zinc than a portion of white (38 g) or processed meat (28 g)

Baghurst et al, 2000:

- Red meat refers to beef, veal and lamb (not offal)
- White meat refers to pork, cured pork products, poultry, fish and seafood
- Meat cuts refer to steak, chops, roasts, chicken breast or thigh, fish fillet or minced or chopped without additions, eg meat patties
- Meat dishes and products refer to sausages, pies, casseroles, hamburgers, curries, stir fries, pasta, rice dishes and frozen dinners, tortilla, dim sim, meatloaf, spreads and pastes, gravy, stock and soup
- The NNS reported over 60% of young children (2-15 y) ate some red meat on the day of the survey
- Children aged 2-3 y consumed a mean of 25g red meat per day. This intake increased with age until adolescence. Boys continued to increase their intake until early adulthood (88g), whereas intake in girls peaked at 12-15 y (45g). This is a reflection of smaller portion sizes rather than fewer women consuming red meat.
- In early childhood (2-7 y), meat cuts (as opposed to meat products and mixed dishes) made up approx one third of red meat consumption but by adolescence (12-15 y) and into adulthood, cuts provided over half the red meat.
- The most popular red meats for children aged 2-11 y were sausages and processed meat (21-39%), stews, casseroles and curries (12-23%) and steak (6-14%) (see Table 8)
- In children aged 2-15 y, red meat contributed to 50% of total MFP (see Table 9)
- Schoolchildren under 8y consume 9-13% of meat outside the home, and preschool children consume 4% of their red meat at childcare centres.
- 85-95% of 2-15 y children consumed MFP on NNS day
- 61-74% of 2-15 y children consumed red meat on NNS day (see Table 10)
- 50-60% of red meat was consumed at dinner time by 2-15 yo and 30-40% was consumed at lunch
- the contribution of red meat to nutrient intake across age groups mirrored the consumption patterns with its contribution rising in early childhood and peaking in early adolescence for females but in early adulthood for males.
- In 2-15 yo, red meat contributes 10-14% of iron (51-58% of haem iron), 20-28% of zinc, 3-5% of energy, 5-7% of fat, and 4-6% of saturated fat.

Nutritional values of Australian meats

	Energy	Fat	Na	Fe	Zn
Beef					
Boneless, unspec, ck	827	8.3	59	3.1	6.4
Chuck steak, si	911	8.1	48	3.7	11.3
Fillet steak, gr	863	9.6	59	4.0	4.4
Rump steak, gr	804	6.7	54	3.9	5.2
Skirt steak, si	790	4.9	66	2.8	10.05
Topside roast, bkd	678	6.3	56	2.4	3.9
Mince, regular	764	9.8	57	2.3	5.2
Mince, lean, dry frd*	731	7.9		3.0	5.2
Sausage, regular, gr	1070	18.2	930	2.4	3.7
Sausage, lean, gr	556	8.0		1.6	Na
Lamb					
Boneless, unspec,ck	906	10.9	79	2.4	4.8
Chump chop, gr	941	10.8	75	3.4	4.6
Midloin chop, gr	1000	15.2	94	2.4	3.1
Leg, bkd	795	7.3	66	2.5	4.7
Shank, si	850	7.7	81	3.4	9.4
TrimLamb topside steak, gr*	745	5.7		3.7	4.8
TrimLamb round roast, mw*	639	5.2		2.8	6.2
Veal					
Boneless, unspec, ck	668	3.9	80	2.0	3.7
Shank, si	684	4.7	96	2.0	5.8
Leg steak, fr	647	3.1	81	2.1	3.3
Offal					
Liver, beef, si	923	11.7	70	6.5	5.3
Liver, lamb, fr	1010	13.7	100	11.1	5.0
Kidney, beef, si	566	2.7	110	7.6	2.7
Kidney, lamb, si	611	4.3	200	11.4	3.9
Kangaroo, stk, gr					
	556	1.2		4.2	3.2
Rabbit, stw					
	712	5.7		1.3	2.1
Pork					
Boneless, unspec, ck	872	10.3	61	1.3	2.9
Butterfly steak, gr	797	8.4	48	1.2	1.8
Forequarter chop, gr	976	14.4	77	1.5	4.1
Leg steak, gr	654	3.7	62	1.3	2.8
Leg, bkd	948	11.4	49	1.5	3.0
Medallion steak, gr	936	11.2	74	1.3	2.8
Sausage, gr	1190	21.7	950	1.6	2.4

Chicken					
Boneless, unspec, bkd	783	8.1	82	0.9	1.7
Breast, bkd	660	4.8	63	0.6	0.8
Drumstick, bkd	873	10.6	96	1.2	2.4
Unspec, rotiss, l&s	1010	15.4	185	0.9	1.0
KFC, unspec	1300	22.3	525	1.2	1.3
Chicken McNuggets	1180	18.2	370	0.9	1.0
Processed foods					
Bacon, middle, gr	1090	14.4	2300	1.2	3.4
Ham, non-canned, unspec	524	6.8	1390	1.3	2.1
Ham, leg, ln	453	3.6	1580	1.3	2.2
Salami, unspec	1800	37.6	1460	2.4	4.1
Devon/fritz	981	18.2	780	2.3	2.1
Chicken roll	665	9.3	745	0.8	0.5
Frankfurt, si	1040	19.9	770	2.3	2.4
Meat pie, ind	947	13.8	600	1.3	0.7
Sausage roll, ind	1200	17.7	630	1.4	1.0
Hamburger, plain	936	10.2	660	1.7	2.0
Hamburger, Jrnburger	1120	11.1	190	3.0	Na
Hamburger, Big Mac	1150	14.8	530	3.1	Na
Liverwurst	1380	28.8	770	4.4	2.9
Meat paste	861	13.9	870	2.6	1.9
Pate de foie	1240	24.7	970	9.3	3.6
Infant dinners					
Steak and veg, jn	323	2.5		0.8	1.2
Chicken and veg, cn	263	1.2		0.7	0.8
Pasta, beef and tomato, jn	341	2.5		1.1	1.7
Chicken noodle, jn	276	1.4		0.7	1.2

All values are from Nutritional Values of Australian Foods, ANZFA, 2001 unless otherwise indicated

Meat cuts chosen are 75% trimmed or lean (no fat or skin), unless otherwise indicated

*MLA data

Nutritional values of Australian meats based on portion sizes consumed by 18 months (Webb et al 2005)

	Portion (g)	Energy	Fat	Na	Fe	Zn
Beef						
Boneless, unspec, ck	21	174	1.7	12	0.7	1.3
Mince, regular	27	206	2.6	15	0.6	1.4
Sausage, regular, gr	42	449	7.6	391	1.0	1.6
Lamb						
Boneless, unspec,ck	15	136	1.6	12	0.4	0.7
Chicken						
Boneless, unspec, bkd	26	204	2.1	21	0.2	0.4
Drumstick, bkd	39	340	4.1	37	0.5	0.9
Unspec, rotiss, l&s	33	333	5.1	61	0.3	0.3
Chicken McNuggets	48	566	8.7	177	0.4	0.5
Processed foods						
Bacon, middle, gr	12	131	1.7	276	0.1	0.4
Ham, leg, ln	15	68	0.6	237	0.2	0.3
Devon/fritz	24	235	4.4	187	0.6	0.5
Chicken roll	18	120	1.7	134	0.1	0.1
Frankfurt, si	39	4.6	7.8	300	0.9	0.9
Meat pie, ind	45	426	6.2	270	0.6	0.3
Sausage roll, ind	57	684	10.1	359	0.8	0.6
Hamburger, Jnrburger	57	638	6.3	108	1.7	na

All values are from Nutritional Values of Australian Foods, ANZFA, 2001 unless otherwise indicated

Meat cuts chosen are 75% trimmed or lean (no fat or skin), unless otherwise indicated

*MLA data

Original questions:

1. How often do you eat red meat? (beef, lamb, liver and kidney but not pork or ham). (In this category include all minimally processed forms of red meat such as chops, steaks, roasts, rissoles, hamburgers, mince, stir fries and casseroles).

- This question (validity tested using DKIS) showed an association between the frequency of red meat consumed and energy, protein, fat, sat fat, iron, zinc and zinc density in adults.

2. How often do you eat meat products such as sausages, frankfurters, devon, salami, meat pies, bacon or ham?

Suggestions for updated meat questions:

1. How often does <child> eat red meat such as beef, or lamb? Include all steaks, chops, roasts, mince, stir fries, and casseroles. Do not include pork or chicken.

Longer list: Veal, Offal (liver, kidney), Mutton, Game (buffalo, crocodile, frog, goanna, goat, hare, kangaroo, possum, rabbit, snake, venison, wild boar, witchetty grubs)

- This question includes all minimally processed red meats.
- Fat content of these meats is generally below 10g/100g (assuming 75% trimmed or lean cuts)
- The iron content of beef, veal and lamb range from 2.0-4.0 mg/100g with a haem iron content of approx 55-60%.
- The zinc content for beef, veal and lamb range from 3.0-11.3 mg/100g
- The fat content per median serve size is below 3g/ serve
- The sodium content is less than 50mg per serve
- The iron content is about 0.5mg and the zinc content about 1mg per serve.

2. How often does <child> eat meat products such as sausages, frankfurters, devon, ham, hamburgers or chicken nuggets?

Longer list: frankfurters, salami, bacon, chicken roll, luncheon meats, delicatessen meats, meat paste, liver paste, pate, meat pies, sausage rolls, hamburger, saveloys, cheerios, hotdogs, rissoles, chorizo, canned meats, smoked chicken, other smoked meats

- This question asks about processed meats high in fat and saturated fat and/or sodium. Fat contents range from 10g/100g for plain hamburgers to 38g/100g for salami;
- The fat content per median serve size is generally above 5g/serve (except ham);
- The sodium content is generally above 200mg/serve;

- The iron content is generally <0.5g/serve and the zinc content is generally <1.0mg/serve;
- Chicken nuggets, sausage rolls and hamburgers have been added to the main list;
- The fat content of ham is quite low (approx 4-7%), however it has a high sodium content and has been included in the list of processed foods.
- Sausages have been retained in processed meat category as they are high in fat and sodium content, however, they also contain higher quantities of iron and zinc, unlike most of the other processed meats.

Appendix 6:

Table 6.1: Soy milks available in New South Wales

Brand name	Manufacturer	KJ/ 100 g	Fat/ 100 g	Ca/ 100 g
Full fat				
So Good*	Sanitarium	270	3.4	120
So Good Chocolate flavour		310	3.2	115
So Good Vanilla flavour		320	3.2	115
Organics Simply Soy		210	3.1	120
So Natural Original	So Natural Foods Aust	250	2.9	nf
So Natural Calci Forte		287	2.9	120
Smooth White		264	3.4	120
Smooth White, White choc		408	5.6	120
Soy Life Original*	Parmalat Aust	291	3.4	120
Vitasoy Creamy Original	Vitasoy Austr Products	271	3.0	nf
Vitasoy Calci-plus*		269	3.0	120
Vitasoy So Milky Regular*		220	3.0	120
Sungold Soy drink	Dairy Farmers	266	3.4	120
Nature's Soy Certified Organic	Pure Harvest	280	2.9	120
Soy Goodness	Hillcrest, ALDI	265	3.3	96
Homebrand Soy drink	Woolworths	293	4.7	120
Coles Regular Soy drink	Coles	200	3.1	96
Modified fat				
So Good Lite*	Sanitarium	170	0.9	120
So Good Fat Free		150	0	120
So Good Essential*		220	1.5	150
So Good Soyachino		240	1.5	115
So Natural Light	So Natural Foods Aust	230	1.5	120
Vitalife Low fat		213	1.5	120
Soy Life Low fat*	Parmalat Aust	194	0.9	120
Vitasoy Light Original	Vitasoy Austr Products	118	0.7	nf
Vitasoy Calci-plus high fibre		202	1.5	120
Vitasoy So Milky Lite*		159	1.5	120
Vitasoy Lush Chocolate		306	1.5	120
Vitasoy Vanilla Delite		257	1.8	nf
Coles Lite Soy drink	Coles	140	1.5	96

* also available as fresh, refrigerated product

nf not fortified