Monitoring food habits in the Australian population using short questions

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Abbreviations

ABS	Australian Bureau of Statistics
AFGC	Australian Food and Grocery Council
AFNMU	Australian Institute of Health and Welfare
AGHE	Australian Guide to Healthy Eating
AIHW	Australian Institute of Health and Welfare
ANZFA	Australia New Zealand Food Authority
CATI	Computer assisted telephone interviewing
CDHAC	Commonwealth Department of Health and Aged Care
CVD	Cardiovascular disease
DGA	Dietary Guidelines for Australians
NATSINSAP	National Aboriginal & Torres Strait Islander Nutrition Strategy & National Action Plan
NCHS	National Centres for Health Statistics
NHMRC	National Health and Medical Research Council
NHS	National Health Survey, 1995 (Australia)
NNS	National Nutrition Survey, 1995 (Australia)
NSW	New South Wales
NZMOH	New Zealand Ministry of Health
RDA	Recommended dietary allowances
SIGNAL	Strategic Inter-governmental Nutrition Alliance
UQ	University of Queensland
WHO	World Health Organization

Executive Summary

There is a growing interest in assessing food habits and population nutrition by Commonwealth, state and territory health departments and by non-government and commercial organisations. This usually takes the form of special purpose surveys, or monitoring, where surveys using a similar design and dietary assessment methods are repeated over time. These have a broad range of objectives but frequently include short questions to assess food habits and breastfeeding practices.

Until recently, there has been little systematic assessment of the performance of short questions in common usage in Australia. This report draws on recent work of the Australian Food and Nutrition Monitoring Unit (AFNMU) to make recommendations about the selection and interpretation of short dietary questions for use in population surveys to monitor aspects of food and nutrition that are of current public health interest. It is intended to be a guide to health planners, epidemiologists, nutritionists and others involved in nutrition monitoring and surveys.

Context for selection of short dietary questions

A significant challenge in selecting and using dietary assessment methods is that diet is multidimensional – different aspects of diet are important for different health outcomes. As a result, dietary assessment methods should be selected according to the specific purpose and objectives of the survey or monitoring system. Short dietary questions can provide specific, potentially valuable but limited information related to food and nutrition in the population. A comprehensive assessment and description of the nutrition condition of the population or particular subgroups would usually involve collating several types of data.

Underpinning a monitoring system is a national program of nutrition surveys such as the one conducted in Australia in 1995. They occur at periodic and predictable intervals and supply information about food and nutrient intakes, how these compare with goals and identify food habits that need to be modified on a population basis in order to improve nutrient intakes and nutritional status in accordance with recommendations. Between comprehensive nutrition surveys, the focus of food and nutrition monitoring should include trends in the food supply and in those aspects of food habits that are indicative of diet quality (eg fruit and vegetable intake, fat intake) as identified from comprehensive nutrition surveys. Short questions about food habits can be included in population health surveys to provide this information at minimal cost.

Sections 1.4 to 1.7 of the report discuss the role of short questions in surveys and monitoring, and what constitutes a 'good question'.

Issues in monitoring food habits

Effective development and use of short questions involves considering a range of issues that are frequently specific to the topic or 'content' of the question. Section 3 discusses issues in monitoring food habits as they relate to (i) foods, nutrients and supplements; (ii) breastfeeding practices and (iii) food diversity, diet quality and food security. Sections 3 and 4 of the report provide a framework for developing, selecting and interpreting short dietary questions and indicators.

Policy relevance

The recent endorsement of *Eat Well Australia* and the *National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan* provides a clear and strong policy agenda for food and nutrition initiatives over the next decade (SIGNAL 2001). This includes identifying specific initiatives for the Australian population generally as well as initiatives for selected priority population groups. The policy review in section 2 shows that short dietary questions can provide information for monitoring some but not all of the issues specifically identified as the focus for interventions in current Commonwealth government policies and/or included in current Australian dietary guidance for the population. Table i below summarises the coverage of food and nutrition policy issues by the short questions assessed and recommended for use in this report.

Table i: Coverage of food and nutrition policy issues by short questions assessed in this project and recommended for use

	Assessable with short questions?	Short questions assessed and recommended for use
Intake of foods, nutrients & supplements		
Vegetable, fruit, cereals, breads, legumes	Yes, direct	Yes, various covering some but not all
Consumption of five food groups	Yes, direct	No, combination of questions needed to cover all groups
Fat, saturated fat, folate, iron, calcium	Indirect only	Yes, various covering some but not all
Folate, iron, calcium – supplement intake	Yes, direct	No
Energy	No	No
Salt, Added sugars	Indirect only	No
Alcohol, water	Yes, direct	No
Snack consumption, No. of meals each day	Yes, direct	No
Child feeding practices		
Breastfeeding practices	Yes, direct	Indicators recommended; questions to be assessed
Introduction of solids	Yes, direct	Indicator recommended; questions to be assessed
Food diversity, food security		
Diversity	Yes, but only some indicators	No
Food security	Yes	Yes, covering some aspects only

Recommendations

Specific recommendations are given for food habits questions and breastfeeding indicators for use until such time as improved sets of questions are available. These take account of the broad governmental effort to improve the comparability, consistency and relevance of national information on the health and well-being of Australians. Each of the food habits questions and/or data definitions and standards recommended for use are described in the appendices in a format consistent with that used in the National Health Data Dictionary and in the Knowledgebase maintained by the Australian Institute of Health and Welfare.

These are applicable to based surveys such as those conducted by the Australian Bureau of Statistics and state and territory health departments, including CATI surveys. They should also be used in other surveys where comparison with national data is beneficial. The detailed specifications include comments on use and interpretation, including a summary of performance from the recent work of AFNMU (where available).

A set of general recommendations is also given to broadly strengthen the basis for using short dietary questions in population surveys. The recommendations aim to provide mechanisms for improving the comparability, consistency and relevance of food and nutrition data collected using short questions. They are described as short and long term and can be regarded as the next steps that need to be taken to progress work in this area. They are followed by a specific checklist for the process for development of individual questions.

1 INTRODUCTION

1.1 Background

There is a growing interest in assessing food habits and population nutrition by Commonwealth, state and territory health departments and by non-government and commercial organisations. This usually takes the form of special purpose surveys, or monitoring, where surveys using a similar design and dietary assessment methods are repeated over time. These have a broad range of objectives but frequently include short questions to assess food habits and breastfeeding practices. Until recently, there has been little systematic assessment of the performance of short questions in common usage in Australia. This report draws on recent work of the Australian Food and Nutrition Monitoring Unit (AFNMU) to make recommendations about the selection and interpretation of short dietary questions for use in population surveys to monitor aspects of food and nutrition that are of current public health interest. It is intended to be a guide to health planners, epidemiologists, nutritionists and others involved in nutrition monitoring and surveys.

In the absence of a national consensus regarding which dietary habits should be a priority to monitor, the report also summarises key aspects of current government policy to identify the food habits and population groups that are specifically identified as the focus for interventions. The recent endorsement of *Eat Well Australia* and the *National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan* (NATSINSAP) provides a clear and strong policy agenda for food and nutrition initiatives over the next decade (SIGNAL 2001). This includes identifying specific initiatives for the Australian population generally as well as initiatives for selected priority population groups. These policies and current national food consumption guidelines are reviewed in section 2 in relation to priorities for monitoring food habits in Australia. Information about population dietary habits and how these are changing underpins rational planning and provides a basis for evaluating the effects of these initiatives. Indeed one of the action areas included in *Eat Well Australia* is development and maintenance of a national food and nutrition monitoring system.

A food and nutrition monitoring system can assist policy and service planners to obtain population-based dietary information. Underpinning a monitoring system is a national program of nutrition surveys such as the one conducted in Australia in 1995. They occur at periodic and predictable intervals and supply information about food and nutrient intakes, how these compare with goals and identify food habits that need to be modified on a population basis in order to improve nutrient intakes and nutritional status in accordance with recommendations. The interval between comprehensive surveys of this nature is necessarily medium to long term, ie 5-10 years. In part the time between surveys is determined by the resources required to conduct them and in part also by the fact that in the population as a whole changes in dietary intake occur relatively slowly and can only be ascertained reliably after a period of several years.

Between comprehensive nutrition surveys, the focus of food and nutrition monitoring needs to be on those aspects of food habits that are indicative of diet quality (eg fruit and vegetable intake, fat intake) as identified from comprehensive nutrition surveys. Measurement of single or selected aspects of food habits is more straightforward than measuring whole diets and the nutrients contained in them. Short questions about food habits can be included in population health surveys at minimal cost and can supply valuable information provided they are 'good questions'. What constitutes a 'good question' is discussed in a later section.

Users of short dietary questions are increasing in number, reflecting a growing interest in monitoring food habits and population nutrition by health surveyors. The Australian Bureau of Statistics (ABS) conducts the largest periodic health survey program in Australia and some of its surveys include short dietary questions. In recent years, many state and territory health departments have instituted a regular telephone health survey program conducted by Computer Assisted Telephone Interview (CATI). Most of these surveys include dietary questions, though the questions vary between states.

The Australian Institute of Health and Welfare (AIHW) was funded in 1992 to develop a plan for a National Food and Nutrition Monitoring Program, which included a review of instruments and short dietary questions in use in various health surveys around Australia at the time (Coles-Rutishauser 1996). This document summarised what was known about the performance of dietary questions and highlighted the need for considerable further evaluation of them if they are to be used as the basis of interim monitoring of the food and nutrition situation in Australia. In 1998, the NSW Health Department compiled a set of interim recommendations for nutrition modules (clusters of questions to be administered simultaneously eg intake of fruit and vegetables) while recognising the need for extensive evaluation of these questions (Hewitt et al 1998).

The AFNMU has evaluated a range of short questions currently used and made recommendations regarding indicators for monitoring of breastfeeding habits as part of a program of work funded by the Commonwealth Department of Health and Aged Care. (An indicator is a measurable statistical construct for monitoring progress towards a goal; for example, an indicator may be defined in terms of a proportion or as a mean or median.)

The first part of this work focused on short dietary questions used in the 1995 Australian National Nutrition Survey (NNS). The survey included several short dietary questions as well as a full 24-hour recall of foods and beverages consumed by over 13,000 people, randomly selected from the Australian population. The data from this survey provided an excellent opportunity to evaluate the performance of short dietary questions in relation to a longer and more detailed dietary assessment method on a representative sample of the population. The detailed results of this evaluation can be found in:

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

The second part evaluated the performance of 16 short dietary questions in relation to weighed dietary records collected in a sample of Tasmanian adults. The sample comprised adult residents of Tasmania aged 20 to 65 years and selected from the electoral roll. The analysis was restricted to the 790 adults who had completed three or more days of records in order to better reflect usual intake. The detailed results of this evaluation can be found in:

> Riley M, Rutishauser IHE & Webb K 2001, *Comparison of short questions with weighed food records,* Commonwealth Department of Health and Aged Care, Canberra.

Finally, the following report provides a detailed assessment of options for monitoring breastfeeding practices in Australia and makes recommendations regarding indicators to be used to monitor key aspects of breastfeeding practices as identified from Australian breastfeeding policies and guidelines.

Webb K, Marks GC, Lund-Adams M & Abraham B 2001, *Towards a national system for monitoring breastfeeding in Australia,* Commonwealth Department of Health and Aged Care, Canberra.

Sections 3 and 4 of the present report and the appendices draw on the reports listed above to provide a framework for selecting and interpreting short dietary questions and indicators. Section 3 discusses general issues in using short dietary questions and indicators. Specific recommendations are given in section 4 and in the appendices. The appendices provide detailed specifications and a summary of performance (where available) for a range of dietary habits questions/indicators.

Selection and development of short dietary questions also need to be considered in the context of a broad governmental effort to improve the comparability, consistency and relevance of national information on the health and well-being of Australians. The National Health Information Management Group and the National Public Health Information Group, in collaboration with the AIHW, have made significant advances in development and maintenance of standards, models, definitions and structures for health information. Similarly, the CATI Technical Reference Group is coordinating developments towards using this methodology as part of a national surveillance system (Wilson et al 2001).

Nationally agreed and approved data definitions and standards are readily available electronically in the National Health Data Dictionary and in the Knowledgebase. This can be found on the world wide web at http://www.aihw.gov.au/inet/knowledgebase/ . These are agreed standards for use in governmental reporting and recommended for use by others involved in collection, analysis and reporting of health information.

The short dietary questions and indicators described in the appendices have been presented in a format consistent with the requirements for National Health Data Dictionary and the Knowledgebase.

1.2 Objectives

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 that are of current public health interest. Information from Rutishauser et al 2001, Riley et al 2001 and Webb et al 2001 provides the basis for these recommendations. 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.

1.3 Potential users of this report

This evaluation is intended to provide supporting information to current users of short dietary questions regarding factors that influence the selection of questions and the interpretation of information obtained. Groups who have indicated interest in the results of this work include:

- data suppliers, eg ABS, involved in the collection and dissemination of data on food habits;

- state and territory health departments, eg epidemiology branches responsible for conducting population-based nutrition surveys which include short nutrition questions/modules;

- those involved in conducting CATI surveys;

- users of the 1995 NNS data, particularly those interested in the results from the short questions; and

- other agencies interested in population food habits and trends in these as well as community dietitians, public health nutritionists and epidemiologists.

1.4 Context for selection and development of short dietary questions

Figure 1 describes a conceptual framework that identifies the types of public health nutrition data that could be used for monitoring aspects of the nutrition condition of the population. These range from measures of food supply and other determinants of dietary behaviour through to those reflecting disease outcome in the population.

It is evident from the figure that short dietary questions can provide specific, potentially valuable but limited information related to food and nutrition in the population. A comprehensive assessment and description of the nutrition condition of the population, or particular subgroups, would usually involve collating data from several levels of the pyramid.

However, diet is multidimensional in that different aspects of diet are important for different health outcomes. A significant consideration is that the details of the pyramid will generally be different for each health outcome. For example, breastfeeding is associated with child growth and development while fruit and vegetable consumption is associated with the risk of cancers of specific sites, and total energy intake is associated with risk of overweight and obesity. That is, diet cannot be considered as a single 'exposure' variable, and no single food habits indicator will be adequate for the range of health outcomes related to diet.

The most relevant food and nutrition data will frequently be different for different policies and initiatives and depend on their specific objectives and the population groups covered.

Comprehensive dietary assessment methods such as 24-hour recall and food frequency questionnaires are usually used to provide information on a broad range of food habits and nutrient intakes. Short dietary questions can provide information on specific food and supplement consumption habits. They can also sometimes be used to provide indirect information on intakes of specific nutrients (eg fat intake).

Figure 1: A conceptual framework for monitoring public health nutrition indicators in Australia

Diet-
related
diseases/
conditions

Biomedical indicators

Nutrient intakes

Food and supplement
consumption habits

Food purchasing/acquisition

F&N–related 'literacy'
(knowledge,attitudes,beliefs)

Food supply &
community access

Food/nutrition policy and action
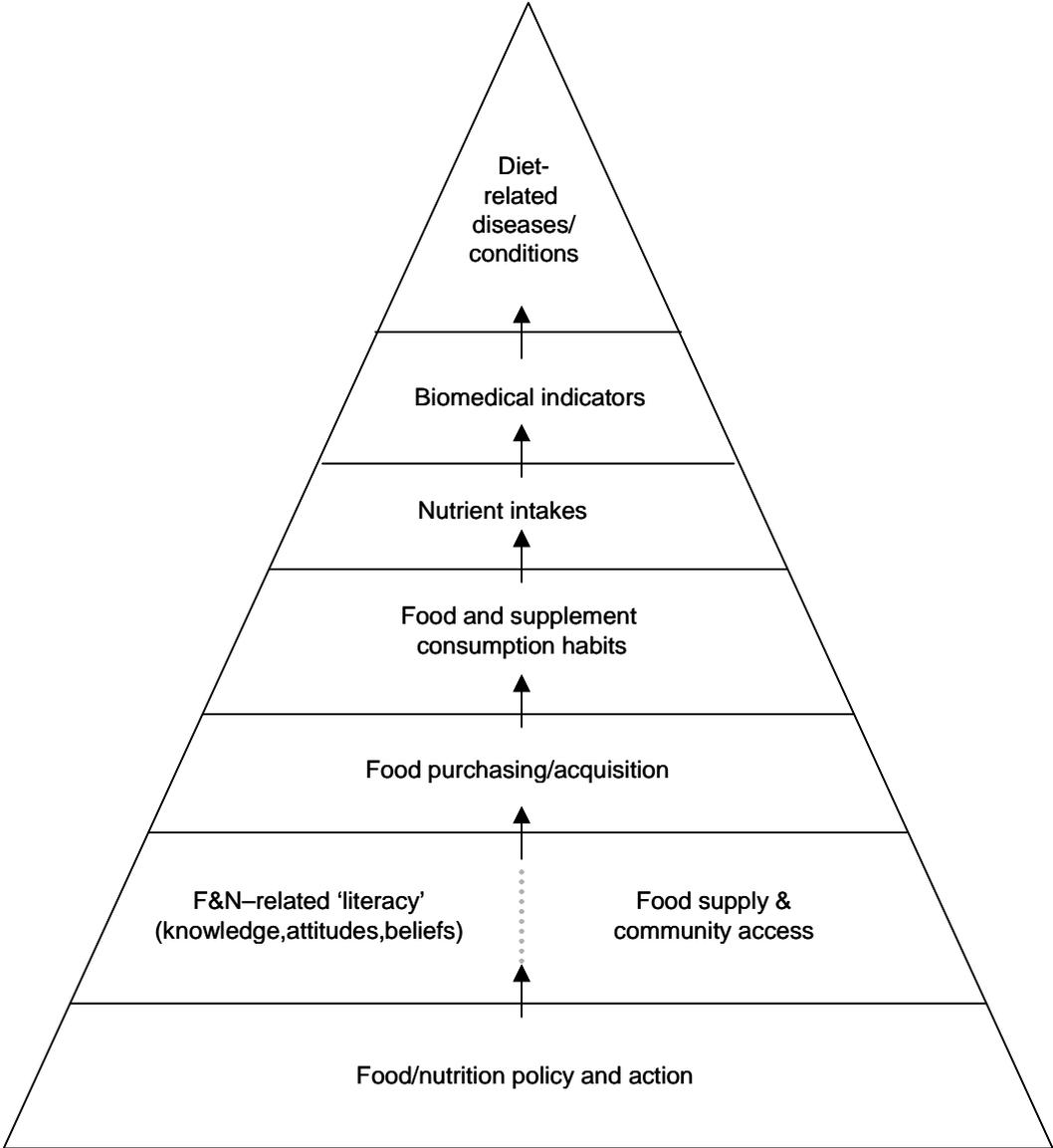
Webb K 2001

1.5 Benefits of using short dietary questions

There are several commonly used methods for assessing the overall food intake among a sample of the population including: the 24-hour recall (used in the 1995 NNS), weighed food records for one or more days and food frequency questionnaires of usual intake for periods of weeks or months. Each of these methods has particular strengths and weaknesses in the context of population-based surveys (Rutishauser 2000).

In the absence of information on overall food intake short dietary questions can be used to assess more limited aspects of food intake and can provide both qualitative and quantitative information on intake over varying periods of time. They can be used to provide interim data on key indicators of food intake, food habits, food security, food access, barriers to dietary change and breastfeeding. They can be used at the local as well as the national level and can be administered via the telephone, via mail surveys or using face-to-face interviews.

Short dietary questions have several advantages over more comprehensive methods of assessing food and nutrient intake:

- they make fewer demands on respondents, potentially increasing response rates;

- the data are relatively inexpensive to collect, potentially enabling large sample sizes;

- they can provide summary information rapidly; and

- because the data collected are less detailed, short questions are likely to be less influenced by an increasingly complex food supply and an increasing tendency to eat food prepared outside the home; both of which make it more difficult for individuals to accurately report what they eat.

1.6 Limitations of short dietary questions

Despite the benefits of short dietary questions listed above they have several limitations in relation to dietary assessment:

- they can provide information on only limited aspects of food intake and food habits;

- in general, they are more likely to be useful for describing the food intake and food habits of groups than of individuals; and

- the information they provide may not be sensitive enough to detect change at the level necessary for regular monitoring purposes.

1.7 Attributes of 'good' dietary instruments

Attributes of 'good' dietary measurement methods have been summarised by a number of authors experienced in dietary assessment (Cameron et al 1988; Gibson 1990; Willett 1990 and Margetts et al 1991). When these are applied to short dietary questions, at least six characteristics of 'good' questions can be identified. These are described briefly below.

1. Indicative of important aspects of dietary quality

To inform public health nutrition policy and planning, a short dietary question should reflect an aspect of nutrition that is of public health relevance for the population of interest.

2. Valid

A valid short question is one in which the results accurately reflect the information it is designed to obtain. It is hardly ever possible to assess the *absolute validity* of dietary questions in population-based surveys since the 'truth' is not usually known (Block 1982). Comparison with another, usually more detailed, method of dietary assessment can provide a measure of *relative validity*.

3. Reproducible

A reproducible question gives the same results when repeated under the same conditions.

4. Consistent

A consistent question is one that performs in the same way in different sub-groups of the population.

5. Responsive

A responsive short question is capable of measuring change in the outcome/variable/factor of interest.

6. Independent of the method of administration

A good short question needs to be suitable for administration in a variety of ways (eg face-to-face, self-administered, CATI). For this to occur, the questions should require minimal accompanying information (such as pictures of serve sizes).

2. POLICY CONTEXT FOR MONITORING FOOD HABITS IN AUSTRALIA

2.1 Introduction

Food habits are associated with the risk of a range of health problems and influence health and wellbeing at all stages of life. Some risks are particularly high in specific population groups as a result of age and associated physiological stresses, current high risk eating habits or genetic predisposition towards particular diseases. For several decades Australian governments and the National Health and Medical Research Council have offered specific dietary advice to Australians to decrease this risk and to promote optimal health. Governments and other organisation have also undertaken a range of initiatives to improve the dietary intake and health of the population.

In spite of this history of interventions and dietary advice there has been little systematic development of an agenda for monitoring food habits. Workshops held in the late 1980s and publications in the early 1990s specified national nutrition goals and targets and the set of indicators needed to measure and monitor progress towards achieving these, but there was no broad consensus regarding what was included nor government endorsement of these.

The recent endorsement of *Eat Well Australia* and the *National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan* (SIGNAL 2001) provides a basis for identifying the population groups and food habits that are most relevant to current national policy priorities. The specific dietary advice contained in the dietary guidelines from the NHMRC (1992, 1995, 1999) and the *Australian Guide to Healthy Eating* (Smith et al 1998) provide a further basis for identifying key food habits to be considered for monitoring. These are reviewed below.

2.2 National Public Health Nutrition Strategy – Eat Well Australia

Australian governments have recently endorsed *Eat Well Australia*, a public health nutrition strategy developed in consultation with a broad range of organisations to provide guidance to government agencies and other organisations for activities to further improve the nutritional health of the population (SIGNAL 2001).

The strategy comprises four initiatives. They include: prevention of overweight and obesity; increasing the consumption of vegetables, legumes and fruit; promotion of optimal nutrition for women, infants and children; and improving nutrition for vulnerable groups including Indigenous Australians. Selection of short dietary questions for planning and evaluation related to *Eat Well Australia* should align with these initiatives.

The main nutrition issues and the population groups identified in these initiatives are summarised in table 1. This is the national agenda for the next decade. Most states and territories are developing initiatives that are consistent with this broad agenda. In terms of monitoring, the table identifies a set of 12 reasonably discrete issues, and no single food habits question and indicator will cover all of these. The population groups identified signal the groups where the performance of the questions and indicators need to be established.

Table 1: *Eat Well Australia* – Food and nutrition issues and priority groups[#]

	Food security	Food supply/ access	Overweight & obesity	Vegetable & fruit intake	Folate intake	Iron intake	Calcium intake	Energy intake	Breast-feeding	Introduction of solids	Snack consumption	Healthy birthweight
General population			✓	✓								
Indigenous Australians	✓	✓	✓	✓								
Children (1-16 yrs)			✓	✓							✓	
Infants												✓
Young people				✓								
Remote & rural communities	✓	✓		✓								
Women of child bearing age					✓	✓	✓	✓				
Indigenous women & teenagers					✓	✓	✓	✓	✓	✓		
Nursing mothers									✓	✓		
Teenage mothers									✓	✓		
Low income women									✓	✓		
Women of non-English speaking backgrounds									✓	✓		
People on low incomes	✓	✓		✓								
People with disabilities (physical, intellectual & developmental)	✓	✓		✓								
Chronically ill people (including people with mental health problems)	✓	✓		✓								
People with dementia	✓	✓		✓								
Frail older people	✓	✓		✓								
Refugees	✓	✓		✓								
Alcohol or drug abusers	✓	✓		✓								
Homeless people	✓	✓		✓								
People on pensions	✓	✓										
Older people	✓	✓										

identified in Part 3 'Health Gain Initiatives

The text of Eat Well Australia specifies indicators for each action area. These are generally related to the process of implementing the activities rather than food habits and so are not listed here.

2.3 National Aboriginal & Torres Strait Islander Nutrition Strategy & Action Plan

The *National Aboriginal & Torres Strait Islander Nutrition Strategy & Action Plan (NATSINSAP)* was developed concurrently with *Eat Well Australia*, and incorporated in the same document (SIGNAL 2001).

The strategy comprises eight initiatives. They include: managing implementation of the strategy; food supply and access; building and sustaining an Aboriginal and Torres Strait Islander nutrition workforce; 'good practice' for public health nutrition activities in Aboriginal and Torres Strait Islander communities; family focused initiatives in food and nutrition for Aboriginal and Torres Strait Islander communities; nutrition issues of Aboriginal and Torres Strait Islander people living in urban environments; national nutrition information systems which can be accessed, updated and used by Aboriginal and Torres Strait Islander workforce and community; and establishing links between household and community infrastructure and improved nutrition outcomes. Selection of short dietary questions for planning and evaluation related to *NATSINSAP* should align with these initiatives.

The main nutrition issues and the population groups identified in these initiatives are summarised in table 2.

2.4 Dietary guidelines

The National Health and Medical Research Council (NHMRC) has been an important source of authoritative dietary advice through development and periodic updating of dietary guidelines. Current publications provide guidelines for the general population in Australia as well as specific guidelines for children and adolescents, and older Australians (respectively NHMRC 1992, 1995 and 1999). These three sets of dietary guidelines are presented in text box 1. The first two of these are currently being reviewed by the NHMRC.

An effective food and nutrition monitoring system would include short dietary questions to monitor the extent to which the general population and the specified population subgroups comply with these recommendations and the way in which this changes over time.

2.5 Australian Guide to Healthy Eating

The *Australian Guide to Healthy Eating* (Smith et al 1998) was developed to provide practical guidance regarding the relative quantities of the five main food groups that individuals should eat each day to meet their daily nutrient requirements as well as comply with the dietary guidelines. The general recommendations are shown in text box 2. The guide also provides more specific advice on quantities and types of foods that are recommended.

Table 2: *NATSINSAP* – Food and nutrition issues and priority groups#

	Food security	Food supply	Overweight & obesity	Low birth weight	Under-weight	Breast-feeding	Diabetes	CVD##	Renal disease	Dental health
Rural communities	✓	✓								
Remote communities	✓	✓								
Urban communities		✓								
Adults			✓				✓	✓	✓	✓
Women						✓				
Urban Women						✓				
Low income women						✓				
Adolescents							✓			
Children			✓		✓		✓			✓
Infants				✓	✓					

identified in Part B 'Action Areas'

Cardiovascular disease

Text box 1: Dietary guidelines for Australians

Children & adolescents population (NHMRC 1995)	The general Australian (NHMRC 1992)	Older Australians (NHMRC 1999)
1. Encourage and support breastfeeding.	1. Enjoy a wide variety of nutritious foods.	1. Enjoy a wide variety of nutritious foods.
2. Children need appropriate food and physical activity for normal growth and development, Growth should be checked regularly.	2. Eat plenty of breads, cereals, vegetables (including legumes) and fruit.	2. Keep active to maintain muscle strength and a healthy body weight.
3. Enjoy a wide variety of nutritious foods.	3. Eat a diet low in fat and, in particular, low in saturated fats.	3. Eat at least three meals every day.
4. Eat plenty of breads, cereals, vegetables (including legumes) and fruit.	4. Maintain a healthy body weight by balancing physical activity and food intake.	4. Care for your food: prepare and store it correctly.
5. Low fat diets are not suitable for young children. For older children, a diet low in fat and in particular, low in saturated fat, is appropriate.	5. If you drink alcohol, limit your intake.	5. Eat plenty of vegetables (including legumes) and fruit.
6. Encourage water as a drink. Alcohol is not recommended for children.	6. Eat only a moderate amount of sugars and foods containing added sugars.	6. Eat plenty of cereals, breads and pastas.
7. Eat only moderate amounts of sugars and foods containing added sugars.	7. Choose low salt foods and use salt sparingly.	7. Eat a diet low in saturated fats.
8. Choose low salt foods.	8. Encourage and support breastfeeding.	8. Drink adequate amounts of water and/or other fluids.
Guidelines on specific nutrients	Guidelines on specific nutrients	
9. Eat foods containing calcium.	9. Eat foods containing calcium. This is particularly important for girls and women.	9. If you drink alcohol, limit your intake.
10. Eat foods containing iron.	10. Eat foods containing iron. This applies particularly to girls, women, vegetarians and athletes.	10. Choose foods low in salt and use salt sparingly.
		11. Include foods high in calcium.
		12. Use added sugars in moderation.

Text box 2: General recommendations from the *Australian Guide to Healthy Eating*

To eat a healthy diet:

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

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.

2.6 The potential for assessing food habits related to policy issues using short questions

There is a high level of consistency amongst the policy statements and guidelines in terms of the food and nutrition issues that are identified. However, diet is multidimensional in that different aspects of diet are important for different health outcomes and, as foreshadowed in section 1.4, short dietary questions can provide information for monitoring some but not all of the issues. Table 3 lists the food and nutrition policy issues that relate specifically to dietary habits and identifies those that could be assessed using short questions.

The table shows that only a subset of the issues related to dietary habits can be directly assessed using short questions. For example, short questions can be used to ask directly about vegetable intake, resulting in an estimate of their intakes. However, the intake of nutrients such as fat, and some other dietary factors, can only be indirectly assessed using a short question. In the case of dietary fat, it is usually consumed in a range of foods and a comprehensive dietary assessment is required to estimate actual levels of dietary fat intake. Nevertheless, fat intake can be indirectly assessed using questions about consumption of foods or food preparation habits that usually contribute a significant amount to fat intake, or that distinguish between high and low fat consumers. Indirect measures can sometimes be strengthened by combining the responses to several related questions.

Total dietary energy intake cannot be estimated using short questions, neither directly nor indirectly.

Similarly, there are a range of policy issues that are not focused on dietary habits and are not further considered in this report: food preparation and storage methods; food supply; healthy birth-weight; underweight, overweight & obesity; diabetes, CVD, renal disease; dental health; physical activity. There are already standard definitions and methods of assessment described in the National Health Data Dictionary and in the Knowledgebase for several of these.

Table 3: Food and nutrition policy issues with potential for assessment using short questions

	Assessable with short questions?	Comments
Intake of foods, nutrients & supplements		
Vegetable, fruit, cereals, breads, legumes	Yes, direct	Can use a single question or set of questions for each
Consumption of five food groups	Yes, direct	Requires a set of questions
Fat, saturated fat, folate, iron, calcium	Indirect only	Indirect assessment based on questions regarding consumption of foods that contribute to nutrient intake and/or food preparation habits; an indicator could be calculated using a set of questions.
Folate, iron, calcium – supplement intake	Yes, direct	Single question or set of questions for each
Energy	No	Requires comprehensive dietary assessment.
Salt, Added sugars	Indirect only	Indirect assessment based on questions regarding consumption of foods that contribute to salt/sugar intake and/or food preparation habits; an indicator could be calculated using a set of questions.
Alcohol, water	Yes, direct	Can use a single question or set of questions for each
Snack consumption, No of meals each day	Yes, direct	Can use a single question or set of questions for each
Child feeding practices		
Breastfeeding practices	Yes, direct	Requires a set of indicators to adequately monitor; requires a set of questions
Introduction of solids	Yes, direct	Can use a single question to indicate age of introduction or set of questions to describe more completely.
Food diversity, food security		
Diversity	Yes, but only some indicators	This is usually reflected by an indicator based on a set of questions or comprehensive dietary assessment
Food security	Yes	Can be assessed with a single question or the calculation of an indicator based on a set of questions

Section 3 discusses the issues related to using short questions to monitor the intake of foods, nutrients and supplements, child feeding practices, and food diversity and food security, respectively.

As well as the particular food and nutrition issues, the policies also identify a range of priority population groups. While it may be possible to assess habits related to an issue using short questions, the performance of a particular question may well be quite variable across population groups and short questions may not be the best method for assessing the habits in every population group. These and other issues are considered in section 3.

3. ISSUES IN MONITORING FOOD HABITS

3.1 Intake of foods and supplements

Purpose

Short questions about specific aspects of food intake and food habits that are of direct relevance to current policy and dietary recommendations (*Eat Well Australia*, *Dietary guidelines for Australians* and the *Australian Guide to Healthy Eating*) are frequently included in population-based surveys that have a focus on nutrition and/or health.

In the context of population-based surveys questions may be used to describe the distribution of specific food habits at a particular point in time or to assess change over time, for example before and after an intervention program. One of the main reasons for using short questions in preference to more detailed dietary data is that they cost less both in terms of staff and time.

The widespread use of short questions about food intake in population-based surveys in effect 'assumes' that short questions work ie that they provide the information that the investigator seeks. To date however there has been little evaluation of the performance of such questions.

It is generally recognised that the type of information that can be obtained from one or more short questions is less specific and more limited in scope than the data obtained from more detailed dietary surveys. This section describes the nature of these limitations and the key issues that need to be considered in the development and/or selection, evaluation and interpretation of short questions related to food habits.

Definition of concepts related to food habits

Short questions about food intake or food habits usually set out to assess the intake or pattern of intake, for an individual food or supplement or for a group of related foods or supplements, over a specified period of time. It follows that all components encompassed by the concept relevant to the question (intake, food/food group and timeframe) must be defined in an unambiguous and operationally practical way. Examples of operational definitions of key concepts relating to specific questions about food intake are given in appendices 1-5.

The data required depend on the concept being measured (intake, food/supplement, time) and the indicator to be used to describe the measurement in relation to policy guidelines, goals or targets. Intake can be described in terms of mass, volume, frequency or in terms of a typical amount or 'serve'. The food or supplement of interest may be a single food or supplement or a group of related foods or supplements. In either case the item(s) of interest needs to be clearly defined. The timeframe of interest can be specific, eg yesterday or over the last seven days, or it may be a longer period of time. In the latter case the question is generally framed in terms of the intake that was 'typical' or 'usual' over the period in question. It is obvious but not always appreciated that if the timeframe of interest is 'typical' or 'usual' intake then it is not possible to derive relevant information from a survey that assesses intake for only one day.

In order to be able to monitor effectively the impact of policy initiatives it is important that due consideration is given to how the data needed to assess a given policy will be obtained at the time that the policy is developed. A food habits indicator may be defined in terms of a proportion or as a mean or median and it may relate to a specific time period such as yesterday or to 'usual' intake. To date indicators have tended to be governed by the way in which policy was framed and not by measurement considerations. However, it is important that both the type of data needed and the position of the goal or target within the data distribution are given due consideration. When the distribution of the data is essentially normal, both mean or median are appropriate descriptors of location whereas if the distribution is markedly skewed, the median and the proportion consuming or the proportion above or below the 'target' value are more informative descriptors.

Considerations in developing/using questions/instruments

Relevance

Because short questions can only address a limited number of quite specific aspects of food intake it is important that short questions about food habits designed for use in population surveys are of direct relevance to issues of public health importance and/or policy. This means that short questions should focus only on key habits, ie habits known to influence the issue of interest and that these habits are ones that can effectively be described by a limited range of responses.

Responsiveness

In order to be useful for the purpose of assessing the impact of policy initiatives short questions must be responsive to detecting the level of change likely to be achieved through policies and programs to promote change. For example if a significant benefit is associated with an increase in the usual intake of a given food from one to two serves per day then the short question must be able to detect a change of this magnitude if it occurs.

Comparability

In order to assess the impact of nutrition interventions over time it is important that the questions/ instruments that are used remain the same in order to obtain comparable information (see figure 2). This is not necessarily the case when changes are made to questions between surveys or modified versions of questions are used, as in the second example in figure 2.

Figure 2: Conditions for maintaining comparability of data over time

Conditions for determining a trend			
Method A	Method A	Method A	✔
Time 1	Time 2	Time 3	
Method A	Method B	Method C	✘
Time 1	Time 2	Time 3	
Method A	Method A, B	Method B	✔
Time 1	Time 2	Time 3	
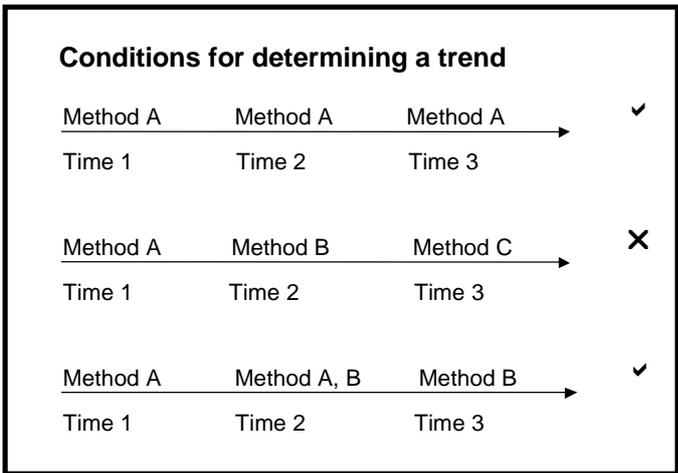
Because foods and food habits change over time it is important that questions about food habits are regularly evaluated and modified as necessary. The figure illustrates that when changes are made it is important to assess the effect of the changes by comparing the data obtained with both the 'old' and the 'new' version of the question.

Mode of administration

Short questions can be self-completed or interviewer administered either in a face-to-face situation or using CATI. Self-completed questions require that all relevant information is provided as part of the questionnaire whereas for interviewer administered questions additional explanatory information can be provided by the interviewer either as part of the standard interview routine or if requested by the respondent.

Target population

Age, ethnic, social and/or cultural background may require questions to be modified in order to obtain the same information. The modification may involve more than simple translation in order to ensure as far as possible that the question(s) are understood and interpreted in the same way by different sub-groups of the population.

Response categories

Questions can be formulated either as open or closed questions. Closed questions are often preferred for large surveys because predetermined response categories are easier to process. However, unless data on the range and distribution of responses to be expected are already available open questions are preferred since they will not inadvertently compress the range or omit 'unexpected' responses. Open-ended responses also provide greater flexibility for analysis and are recommended for this reason whenever possible.

Evaluation of short questions/instruments

Ideally evaluation requires access to an independent source of information on the 'food habit' addressed by the short question/instrument. The preferred approach is to compare the results obtained from the short question with information about the same 'food habit' from another source known to give valid information. In practice, in the case of food intake and food habits, information is usually only available or obtainable from another source of self-reported information eg a 24-hour recall or food record.

Limitations

While these alternative sources of information may provide more detailed information on the 'food habit' of interest they are not necessarily more accurate. Because the information is collected in a different way it may also be difficult to make a direct comparison with the data obtained from the short questions/instrument and the comparison method without the need to introduce one or more assumptions.

For example, in order to compare the data from a short question about the usual frequency of breakfast with data on breakfast consumption obtained from 24-hour recalls it will be necessary to define what constitutes 'breakfast' in the 24-hour recall context. This could be any food or drink consumed in a given time period, or intake of a defined minimum number of foods/beverages in a given time period or any food/beverages consumed that were described as 'breakfast' by the respondent to the 24-hour recall.

Relative validity

Because of these limitations most evaluations of short questions provide only a measure of *relative validity*. When the evaluation consists of a comparison with essentially the same information from another source it is referred to in this report as a *direct* assessment of *relative validity*. For example, a comparison of the proportion reporting that they usually use whole milk based on a short question with the proportion of respondents who used whole milk when assessed by 24-hour recall is a *direct* assessment of *relative validity*.

When the evaluation consists of a comparison of the short question response or response category with an aspect of nutrient intake affected in a known way, if the short question provides a valid response to the 'food habit' of interest, then it is referred to in this report as an *indirect* assessment of *relative validity*. For example, a comparison of the response categories for a short question about the usual frequency of intake of fruit with the mean intake of vitamin C by response category as obtained from food records is an *indirect* assessment of *relative validity*.

Consistency

A further consideration in the evaluation of short questions is whether the performance of the short questions/instruments varies for different population sub-groups and with different modes of administration. This aspect of performance is referred to in this report as *consistency*. Population sub-groups that need to be considered in the context of evaluation include groups based on age, sex, body mass index, socio-economic status and country of birth. Other groups may also be relevant depending on the nature of the study in which the questions/instruments are being used, eg urban/rural.

3.2 Breastfeeding practices

Purpose

Infant feeding policies in Australia and internationally recommend breastfeeding as optimal. The NHMRC Dietary guidelines for children and adolescents and the Infant feeding guidelines outline key aspects of breastfeeding including exclusive breastfeeding for the first 4 - 6 months of life followed by timely complementary feeding and continued breastfeeding to at least 12 months (NHMRC 1995, 1996). These policies and their supporting evidence-base are currently being updated, and the key changes forecast are: an extension of the time exclusive breastfeeding is recommended, to 6 months of age, with an accompanying recommendation that complementary feeding commence at 6 rather than 4 months. These follow recent changes adopted by the World Health Organization (WHO 2001).

These key breastfeeding practices, as outlined in the policies, provide the basis for identifying aspects of most interest to monitor over time. Information about these aspects of infant feeding are required to assess the effectiveness of current national and state efforts, both government and non-government, to improve infant feeding practices consistent with policy recommendations.

Concepts and definitions of breastfeeding

The term 'breastfeeding' is used to describe a wide variety of infant feeding behaviours. These may include: whether the infant was ever breastfed; and if so, whether early breastfeeding was exclusive, predominant or partial; and the length of time that children were breastfed at various intensities. Even the term 'ever breastfed' can mean many things, ranging from: 'ever put to the breast, even just once', 'ever given breastmilk, including expressed breastmilk from a bottle', or 'regularly breastfed during the early weeks of infancy'. There is considerable variation also in the meaning of various terms to describe breastfeeding intensity. For example, exclusive breastfeeding has been used to describe breastfeeding that does not include regularly giving other milks or solid foods whereas in the international literature and most breastfeeding policies, exclusive means no other fluids (such as fruit juice, water, tea etc) or solids are given to the infant.

Consistent definitions of key breastfeeding practices are essential for meaningful reporting of indicators, comparisons between population groups and the documentation of trends.

In 1991, WHO adopted standardised definitions of key breastfeeding terms and proposed these for international use (WHO 1991). These definitions underpin the NHMRC infant feeding policies and are proposed for use in Australia as the basis for defining and measuring the data elements of breastfeeding indicators (see appendix 4).

Data requirements

Data elements are the key aspects of information that need to be collected in order to monitor breastfeeding practices.

The key data requirements are sufficiently detailed information on how an infant is fed to allow breastfeeding practice to be categorised in terms of the different intensities described above and accurate information about the age of the infant at the time to which the infant feeding practice relates. In order to calculate the breastfeeding rates of specific interest (indicators) the total number of infants and children within the reference age included in the survey sample and the total number with particular practices are also needed.

Issues in selecting breastfeeding indicators

An 'indicator' is used in the field of public health monitoring and surveillance to describe a "specific and measurable statistical construct for monitoring progress toward a goal" (a broad statement of a desired improvement) (d'Espaignet et al 1994). Indicators are usually derived from policy goals and program objectives.

WHO has proposed a set of key indicators for global monitoring of breastfeeding practices (WHO 1991) and these indicators serve as a basis for the proposed breastfeeding indicators for Australia. Operational definitions for each of the proposed indicators and the particular data requirements needed to calculate them are described in appendix 4.

In addition to the data requirements as outlined in the section above, the following criteria are useful in the selection/development of indicators for use in Australia:

- relevant to key Australian policy recommendations;

- consistent with WHO wherever possible to meet international reporting obligations;

- consistent with previous indicators/data collected in Australia so that trends may be documented;

- feasible/simple to collect the required information on a nationally representative sample; and

- measurable and valid for detecting the direction and magnitude of changes over time, and differences between population sub-groups.

The main purpose in developing a nationally agreed set of breastfeeding indicators is to define the basic data requirements that are needed in order to ensure comparability over time in national collections and between data for different population sub-groups.

Measurement issues

Survey 'vehicle'/data sources

The data required for monitoring breastfeeding are most likely to be collected in large-scale cross-sectional health surveys of representative samples of the population conducted nationally and at state and territory level, and repeated at predictable intervals. Surveys of representative samples of key population sub-groups are also appropriate such as national Indigenous surveys.

The main limitation of using population-based surveys to monitor breastfeeding practices is the limited sample size of children in the age group of interest typically recruited in such surveys. In Australia, the ABS National Health Survey has been the main survey vehicle for collection of breastfeeding data during the last decade. In the last survey, while the total sample of infants/children included in the breastfeeding assessment was over 3,000, the number of infants aged 6 months or under was less than 400. The same sample size limitations apply to state and territory health surveys, including the current CATI survey system.

Other possible alternatives are to conduct surveys of representative samples of infants and children, eg repeated birth cohort studies, or to utilise routinely collected data from institutions (eg from child health clinics). The main limitation of cohort studies or other purpose-specific surveys is their expense and the difficulty in ensuring repeatability within a program of health surveys. Routinely collected clinic data have limitations because of the variable utilisation of such clinics by mothers, and hence the lack of representativeness of the information collected. Standardising the collection and monitoring the quality of routinely collected clinic data would add considerable expense to this method.

Given these considerations the most likely data sources for monitoring breastfeeding are large-scale cross-sectional health surveys, including the ABS health survey program, the National Nutrition Survey, if repeated, and the state CATI surveys. The recommendations are designed for implementation in this context.

It is also proposed that consideration be given to establishing a regular purpose-specific infant and child health and social survey program in Australia, which could provide a more appropriate survey vehicle for collection of more detailed data about breastfeeding, and other infant feeding practices.

Age of children in the sample frame

In large population surveys the age range of children to be included in the sub-group whose infant feeding practice is to be assessed needs to be defined.

Considerations in deciding on the age range include: the data requirements for each of the breastfeeding indicators, the sample size required and likely to be obtained, and the validity of information about infant feeding practices vis a vis the length of time mothers must recall and report their practices.

WHO recommends the inclusion of all children under two years in measurement of key household breastfeeding indicators (WHO 1991). The rationale for this recommendation is that at least one of the WHO indicators requires measurement of continued breastfeeding up to 2 years of age, and all indicators are based on assessment of current practice, versus retrospective reports (see below).

In Australia, the age range has varied in previous national surveys, however, both the 1995 and the 2001 National Health Surveys included all children up to 4 years of age. A sample frame which includes all infants/children up to 4 years of age at the time of the survey meets the needs of all the indicators in appendix 4; ie measurement of continued breastfeeding to 12 months, the collection of data based on both recall (for some indicators) and current practice (for others), and a relatively short recall period.

All children within the defined age range should be included in the survey, rather than selecting the first or last born, because breastfeeding is known to vary by birth order and parity and thus biased data will be obtained by selection of children on these characteristics.

Recalled versus current breastfeeding practice

Measurement error from inaccurate reporting by mothers can arise from poor recall of infant feeding practices and/or the desire to give socially 'acceptable' responses. To minimise error from recall, WHO recommends the collection of current breastfeeding practice (feeding in the last 24 hours) rather than retrospective or recalled practices. This is based on evidence that suggests mothers' recall of duration of exclusive and predominant breastfeeding, and commencement of complementary feeding may be inaccurate, particularly over relatively long periods of time. It also reflects the successful use and the validity of 24-hour recall methods to document the dietary intakes of groups.

Results of the investigations of the accuracy of mothers' recall of feeding practices, and the timing of these, have shown generally that reports of 'ever breastfeeding'/initiation of breastfeeding and the total duration of breastfeeding are relatively accurate when recalled for up to 3 years, but recall is less accurate over longer periods.

By contrast, studies have found that mothers' recall of the timing of introduction of other fluids and solid foods to the diets of breastfeeding infants is less accurate. Thus, it is preferable to measure indicators relating to exclusive or predominant breastfeeding by the assessment of current practice among infants up to 6 months of age (the upper age limit for exclusive breastfeeding, as specified in current Australian policies).

As noted in the previous section, the sample size available of infants less than 6 months of age obtained in most population surveys is likely to be very small and thus limits the power to detect significant differences between population sub-groups and change over time.

The implication from these studies and sample size considerations is that indicators of 'ever breastfed', and duration of breastfeeding can be measured relatively accurately from mothers' retrospective reports of feeding practices recalled over short periods (eg up to 3 years). However for indicators about the timing of introduction of solid foods, or the intensity of breastfeeding (exclusive, predominant or full) and the duration of these, recalled information is unlikely to be sufficiently accurate to detect differences smaller than two to three months.

Survey questions

Survey questions should supply the information required by each of the breastfeeding indicators and should meet the criteria for short questions about food habits as outlined in section 3.1.

Questions used to derive the data needed for breastfeeding indicators in population surveys (state or national) should be standardised and remain consistent over time so that trends can be documented.

WHO has developed sample questions for use in breastfeeding surveys, from which all WHO breastfeeding indicators can be calculated. The WHO survey questions ask about any substances fed to infants in the previous 24 hours. Standardised questions asking about recalled practice have not been developed/evaluated.

In Australia, the questions used in national surveys have varied and do not provide all the data needed to derive the indicators now proposed for Australia. The limitations of these questions in relation to the proposed indicators, are identified in appendix 4.

The following steps need to be undertaken before a standardised set of survey questions for routine use can be recommended.

1. Development/adaptation of questions to supply the necessary data elements and requirements as outlined in the recommended indicators.

2. Cognitive testing of questions to ensure that they are clearly understood.

3. Evaluation of question performance, particularly in relation to relative validity and consistency among population sub-groups.

Steps 2 and 3 will need to be undertaken before finalising a set of breastfeeding questions for routine use in Australian surveys and studies, but are beyond the scope of this report. The ABS usually undertakes cognitive testing of questions during the pilot phase of its surveys, and so its processes would ensure that the questions "work" in the Australian population (in the sense that the respondents understand the questions and can respond appropriately). Assessment of the relative validity needs to be conducted in the context of a survey or special validation study.

3.3 Food diversity, diet quality and food security

Food diversity and diet quality are both overall measures of the diet while food security is a measure of the access that an individual or family has to an adequate diet. These are separate policy issues and present different measurement challenges. They are considered separately.

3.3.1 Food diversity and diet quality

Purpose

The dietary guidelines encourage the population to 'Enjoy a wide variety of nutritious foods' and the *Australian Guide to Healthy Eating* recommends that everyone chooses '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'. There are several aspects to the rationale for these. Firstly, consuming a varied diet increases the likelihood of eating essential nutrients in adequate amounts. Secondly, consuming a wide variety in the diet provides some protection from non-communicable chronic diseases through reducing excessive amounts of fat, salt and alcohol, and maximising the intake of protective factors from foods such as vegetables, fruits and cereals. Finally, a varied diet minimises the risk of exposure to potentially toxic compounds. These different attributes of a healthy diet can be considered to be different aspects of 'diet quality'.

Thus dietary recommendations, dietary intakes and diet quality are multidimensional. A range of authors have sought to summarise aspects of these into a single indicator, variously referred to as a food diversity score, dietary diversity score, healthy diet index, diet quality index etc.

Concepts and definitions

The concept of food diversity has evolved as new nutrients and other factors in foods with health benefits have been identified, and according to the specific purpose at the time. The concept has been used in relation to:

1. a simple count of the numbers of foods consumed (eg Horwath 1987; Fitzgerald et al 1992);

2. consumption of foods from each of the major food groups each day (eg Kant et al 1991); and

3. consumption of a range of foods with consideration of the types of foods eaten and their relationships with health and disease (Patterson et al 1994; Kennedy et al 1995).

The first of these corresponds to a direct measure of variety in dietary intake. The second and third indicators use food diversity as an indirect measure of diet quality. Diet quality in this context refers to its adequacy for meeting certain criteria, for example, consumption of adequate amounts of the essential nutrients, consumption of amounts of fat/vegetables/cereals etc consistent with dietary recommendations, dietary patterns with the lowest effect on chronic disease markers. Currently there is no general acceptance of one of these over the others as they have each been developed for different purposes.

Considerations in formulating questions/instruments

There are a range of considerations involved with formulating questions and instruments for measuring food diversity in Australian populations. Foremost amongst these is the issue of their primary purpose. The section above described three ways in which food diversity indicators have been used. In general, an instrument developed for one of these uses will have poor to moderate validity for the other two purposes. A large number of food diversity indicators are described in the literature, though none are in common usage in Australia, and each has its own strengths and weaknesses. The marked differences in approach are illustrated below with examples from the literature.

Simple food diversity indicators are based on the number of different food items consumed by a person or household during a period of time. Examples of simple scores are given in table 4. They do not consider the amounts of foods eaten and generally do not include foods eaten infrequently or by few people. As a result, these indicators are inconsistent in the extent to which they also measure selected aspects of diet quality (eg intakes of the most marginal nutrients in the population, or risk of exposure to potentially toxic compounds).

Table 4: Examples of simple food diversity indicators

Source	Food data	Indicator range	Operational definition
Horwath 1987	Food frequency questionnaire	To 75	The number of foods consumed at least once per month
Krebs-Smith et al 1987	3 day food record	12-45	The number of foods consumed during the 3 days
Suitor et al 1990	24-hour recall & food frequency questionnaire	2-66	The number of foods consumed at least once per week
Fitzgerald et al 1992	14 day food record	35-80	The number of foods consumed during the 14 days

Table 5 presents examples of food diversity indicators that were developed as indirect measures of diet quality. These are more complex than the simple indicators, and vary in the way that they weight the types and quantities of foods eaten and/or measure adherence to some overall aspect of diet (eg % energy from total fat & saturated fat).

Diet quality is defined according to different criteria for each of the examples given, and an indicator developed according to one set of criteria does not necessarily have good validity according to the criteria used for the others.

Food diversity indicators of the type described by Patterson et al (1994; the Diet Quality Index) and Kennedy et al (1995; the Healthy Eating Index) are likely to be the most applicable to the Australian policy context because the objectives of the Australian dietary guidelines and other Australian guides have similar broad objectives as those in the US. However, they would need to be modified to reflect the specific food consumption guidelines used in Australia. The need for adaptation to the specific details of the guidelines is reflected by the recent revision of the Diet Quality Index to reflect changes in dietary guidance to the public in the US in recent years (Haines et al 1999).

Table 5: Examples of food diversity indicators developed as indirect measures of diet quality

Source	Comments on indicators & aspects of diet quality considered
Dewey 1981	Considers 46 food groups; diet quality was assessed as the mean adequacy of intake of 9 nutrients in relation to RDAs
Kant et al 1991	Considers 5 food groups (dairy, meats, cereals, fruit, vegetables); diet quality was assessed as the adequacy of intake of each of 9 individual nutrients in relation to RDAs
Wahlqvist et al 1989	Uses a biological taxonomy of foods used to classify 53 food groups; the score was assessed in terms of its relationship with several metabolic risk factors of vascular diseases.
Patterson et al 1994	Diet Quality Index: score based on adherence to 8 US dietary recommendations (% energy from total fat & saturated fat, mg of dietary cholesterol and sodium …), combined into a single score.
Kennedy et al 1995	Healthy Eating Index: score based on a combination of compliance with consumption of 5 food groups and adherence with the US dietary guidelines; diet quality was assessed in relation to intakes of individual nutrients.

In the context of this report, a major shortcoming of both the Diet Quality Index and the Healthy Eating Index is that they require a detailed assessment of dietary intake to calculate the indices. Some simple food diversity indicators can potentially be calculated from a set of short questions that ask about consumption of the major food groups. But their interpretation and usefulness is likely to be quite limited.

No food diversity instrument is recommended at this time. However, such an instrument is potentially very useful for providing a single measure of diet quality, for describing the distribution in the population at a particular point in time and to assess change over time. Selection/development of a food diversity instrument for monitoring in Australia will need consideration of the specific purpose and validity in the Australian policy context.

3.3.2 Food security

Purpose

Food insecurity is identified as an issue for some population groups in both *Eat Well Australia* and *NATSINSAP*. While health and welfare groups have long been concerned about the adequacy of diets in low socio-economic and other at-risk groups, the term 'food insecurity' has only come into common usage in Australia in the last decade (McComb, Webb & Marks 2000). There has been a greater level of debate about food insecurity and related concerns in the USA, where a distinction is made between food insufficiency, food insecurity, and hunger (NCHS 1994). The process of development of food security indicators for a national survey in New Zealand led to identification of five key themes: food insecurity, food inadequacy, coping strategies, alternative sources, and cultural issues (Quigley et al 1997). In both the United States and New Zealand several aspects of dietary circumstances are identified as part of food security. The appropriate questions/instruments will generally be different for each aspect.

Concepts and definitions

Quigley et al (1997) states that "Food security encompasses the ready availability of nutritionally adequate and safe foods, and the assured ability to acquire personally acceptable foods in a socially acceptable way".

The US National Center for Health Statistics (NCHS 1994) gives the following definitions:

> *Food insufficiency – an inadequate amount of food intake due to a lack of money or resources.*

> *Food insecurity – limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.*

> *Hunger – the uneasy or painful sensation caused by a lack of food. It includes the recurrent and involuntary lack of access to food.*

Food insecurity is the broadest of these three in that it encompasses a broader array of issues. However, specification of the differences between these and the key themes reported for New Zealand by Quigley et al demonstrate that there are several ways of viewing food security that potentially have different policy and program implications, and that that these may vary across cultures/ populations.

Considerations in formulating questions/instruments

The following question was included in the 1995 NNS:

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

This covers some limited aspects of food insecurity as it is described above. When its performance was assessed (Rutishauser et al 2001) the responses were associated with all measures of socio-economic disadvantage evaluated in the report. Intake of foods and most nutrients that would be expected to be lower among those who were food insecure, were in fact statistically significantly lower. However, the consistency of these results across sub-groups was poor.

When the question was assessed in the smaller Tasmanian Dietary Indicator Study, the pattern of responses and performance of the question was similar to those for the NNS, but the assessment was limited by the smaller sample size (Riley et al 2001).

As with questions regarding other nutrition issues, it is recognised that the type of information that can be obtained from one short question is less specific and more limited in scope than the information that could be obtained from a more detailed set of questions. It is likely that the NNS question will underestimate the extent of food security problems because it is only covering some aspects of food security. The adequacy of this question needs to be considered in relation to its potential use and interpretation.

Unlike other food habit questions considered in this report, using a more comprehensive dietary assessment method such as 24-hour recall or food frequency questionnaire will not give a more detailed and complete assessment. For this reason it would be highly desirable to have methods developed with the capacity for a more complete and detailed assessment to complement the short question that has been used so far.

In the United States different instruments are used for each aspect of food security, with some differences over time/between surveys. Assessment of food insufficiency has generally relied on a single question with four possible responses; whereas assessment of food security and hunger has generally relied on sets of questions. These have been validated in different ways, with important differences between the qualitative conceptualisation and evaluation of the hunger instrument by Radimer on the one hand, and the more traditional quantitative comparison of food insufficiency/ insecurity responses with income levels and dietary intakes on the other hand (NCHS 1994). The main point from this is that the instruments are based on different premises and provide a different perspective on this cluster of related issues.

Development of the food security indicators in New Zealand included the following steps (Quigley et al 1997):

- *a review of the food security indicators currently being used in developed countries and the international experience in the use of food security indicators;*

- *identification of the key issues surrounding access to food for New Zealanders on a low income;*

- *development of food security indicator questions based on identified key themes; and*

- *pretesting the food security indicators.*

Based on this work, eight food security indicators/questions were used in the New Zealand national nutrition survey to assess food security.

The United States and New Zealand experience suggests that it is useful to make a distinction between the different concepts/aspects of food security as described above, and that these have different policy and program implications. While the New Zealand themes were generally consistent with most of the international experience in food security, there were differences related to the specific social and cultural circumstances of New Zealand, as would be expected. The process used in New Zealand is a simple one that builds on experience elsewhere but directly assesses the implications of differences across countries.

The NNS food security question should continue to be used until such time as a better performing alternative is available, but with recognition of its limitations. The results using this question so far, and the experiences of the United States and New Zealand, suggest that food security is a problem in Australia. But we do not currently have the survey methods to adequately assess its nature, extent or distribution. A process similar to that undertaken in New Zealand should be followed to develop a set of questions that provides a more complete assessment of food security that is appropriate for the Australian context. Validation of the questions will need to encompass assessing their validity against each of the key themes identified.

Survey sampling strategies need to take account of the low prevalence of food insecurity as measured in the NNS and the fact that the prevalence of food insecurity is likely to be highest in the 'hard to reach' segments of the population.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 Overview

A significant challenge in selecting and using dietary assessment methods is that diet is multidimensional - different aspects of diet are important for different health outcomes. As a result, dietary assessment methods should be selected according to the specific purpose and objectives of the survey or monitoring system. The policy review in section 2 explained that short dietary questions can provide information for monitoring some but not all of the issues specifically identified in current Commonwealth government policies and/or included in current Australian dietary guidance for the population. Section 3 reviewed the range of issues and considerations in selecting short dietary questions for monitoring food habits. This section draws on these and the recent work of AFNMU to make recommendations about the selection and interpretation of short dietary questions for use in population surveys to monitor aspects of food and nutrition that are of current public health interest.

The first part of the Unit's work on short dietary questions focused on those used in the 1995 NNS in relation to a full 24-hour recall of foods and beverages consumed. The second part evaluated the performance of 16 short dietary questions in relation to weighed dietary records collected in a sample of Tasmanian adults (Rutishauser et al 2001 and Riley et al 2001 respectively). Having systematically evaluated the performance of these commonly used short dietary questions, we are now in a much stronger position to select and interpret questions appropriately. However, there are gaps and limitations. These relate mostly to policy coverage and suitability for use across population sub-groups.

Table 6 summarises the policy coverage of these questions. In general the questions have not been developed specifically to address this set of policy issues and so there are important gaps in coverage. This was also apparent in the limited context of reporting on the dietary habits of Australians in relation to the dietary guidelines and selected issues from *Eat Well Australia* (Marks et al 2001). Nothing could be reported against one of the guidelines, and only limited aspects of several others could be described. Some of the questions that were assessed in the reports cited above had poor to moderate performance according to the criteria used and these are not recommended for ongoing use. Future work should include development of indicators and assessment of questions for use to address these gaps.

An important area where this has been progressed is in relation to monitoring breastfeeding practices in Australia. The report by Webb et al (2001) makes recommendations regarding indicators to be used to monitor key aspects of breastfeeding practices, as identified from Australian breastfeeding policies and guidelines.

The second major gap/limitation is in terms of using short dietary questions in specific population sub-groups. The policies reviewed in section 2 identified a range of priority sub-groups. While it will generally be possible to assess food habits in these sub-groups using short questions, the performance of questions is not well described for specific sub-groups, with the exception of broad age/sex groupings. The performance of a particular question may well be quite different in specific sub-groups than it is in a broader sample. This is most likely to be the case for the very young, the elderly, and specific ethnic groups. Future developments should include development of indicators and assessment of questions for use in priority population sub-groups. Short questions may not be the best method for assessing the habits in every population group.

Table 6: Coverage of food and nutrition policy issues by short questions assessed and recommended for use

	Assessable with short questions?	Comments
Intake of foods, nutrients & supplements		
Vegetable, fruit, cereals, breads, legumes	Yes, direct	Yes, various covering some but not all
Consumption of five food groups	Yes, direct cover all groups	No; combination of questions needed to
Fat, saturated fat, folate, iron, calcium	Indirect only	Yes, various covering some but not all.
Folate, iron, calcium – supplement intake	Yes, direct	No
Energy	No	No
Salt, Added sugars	Indirect only	No
Alcohol, water	Yes, direct	No
Snack consumption, No of meals each day	Yes, direct	No
Child feeding practices		
Breastfeeding practices	Yes, direct	Indicators recommended; questions to be assessed
Introduction of solids	Yes, direct	Indicators recommended; questions to be assessed
Food diversity, food security		
Diversity	Yes, but only some indicators	No
Food security	Yes	Yes, covering some aspects only

Finally, the questions have been assessed for performance in a single cross-sectional survey. None have been assessed for their usefulness in measuring changes in food habits over time.

These gaps and limitations are addressed in the recommendations below. A set of general recommendations is given to broadly strengthen the basis for using short dietary questions in population surveys. The way in which this might be progressed is outlined in section 4.2 in terms of short and long term recommendations.

Specific recommendations are also given for food habits questions and breastfeeding indicators for use until such time as improved sets of questions are available. These take account of the broad governmental effort to improve the comparability, consistency and relevance of national information on the health and well-being of Australians. Each of the food habits questions and/or data definitions and standards recommended for use are described in the appendices in a format consistent with that used in the National Health Data Dictionary and in the Knowledgebase.

4.2 General recommendations

The following recommendations aim to provide mechanisms for improving the comparability, consistency and relevance of food and nutrition data collected using short questions. These are described as short and long term, and can be regarded as the next steps that need to be taken to progress work in this area. These are followed by a specific checklist for the process for development of individual questions. These draw on the details presented in the previous sections.

Longer-term recommendations

- Establish a process to determine priority areas for food habits questions

- Establish a process to develop and 'accredit' questions

- When developing policy related to food habits consider how policy impact will be monitored

There are a range of government, professional and other groups with a stake in these monitoring developments, each with their own interests and priorities. At present there is no process for determining the priority areas for future developments. This should include establishing criteria for deciding on a 'core' set of questions and indicators for Australia and the priority for subgroups in the population. The process should involve key stakeholders including data collectors, policy makers, question developers and data users.

The process should include liaison with the committees responsible for the National Health Data Dictionary and the Knowledgebase to ensure that 'accredited' questions are included in these.

Future policies (including dietary guidelines) should be stated in terms that are measurable so that their implementation and impact can be monitored.

Short-term recommendations

- Regular liaison between data collectors, policy makers, question developers and data users

- Use only questions which have been evaluated

- If no evaluation is available, use the same questions as previously used in national/state surveys

- Review and evaluate questions currently in use which address key policy areas (eg fruit and vegetable consumption, foods contributing saturated fat)

- Calibrate new/modified versions of existing questions against previous version

These recommendations aim to improve the comparability, consistency and relevance of food and nutrition data collected. For national monitoring purposes, the establishment of trends is a priority, and should take precedence over improving and changing the short diet questions that have been used in population health surveys. When new/modified questions are introduced they should be used together with the existing question in at least one survey so that they can be calibrated and the ability to assess trends maintained.

Recommendations on the process for development of questions

Each of the following points should be addressed in the process of developing new food habits questions.

- Consider policy relevance

- Provide clear operational definitions of all relevant concepts

- Use open-ended responses whenever possible

- Include cognitive testing

- Consider comparability of interviewer/CATI and self-completed data

- Evaluate relative validity and consistency

4.3 Specific interim recommendations

Implementing the recommendations above will provide the mechanisms for systematically strengthening the basis for using short questions to monitor food habits in the Australian population. This section provides specific recommendations on selection and interpretation of food habits questions and/or data definitions and standards for the three major areas covered in section 3: child feeding practices; intake of foods, nutrients and supplements; and food diversity, diet quality and food security. These are interim recommendations in that the performance of many questions in current use is adequate for many purposes, but not optimal. It is expected that the processes described above will, over time, provide a selection of questions with better performance for designated purposes.

Intakes of foods and nutrients, and food diversity

Table 7 at the end of this section summarises key information about the performance of some short dietary questions that have been evaluated and are likely to be useful in measuring some aspects of population food habits. Details of the evaluation of these questions are described in other reports (Rutishauser et al 2001, Riley et al 2001). Detailed specifications for the questions and their use are given in appendices 1-3 and 5.

The table identifies the current Australian nutrition policies to which each short question relates, the question and its source, the key results for the assessment of relative validity (direct and indirect) and the purposes for which each question might be used.

Policy relevance: Eight of the questions relate to the Australian dietary guidelines and other policies concerning vegetables and fruit. Three questions form a set about bread and cereal intake, a food group with quantitative recommendations in the *Australian Guide to Healthy Eating*, two questions relate to the dietary guidelines about meat intake, and one question about type of milk relates to a dietary guideline about limiting saturated fat through use of reduced fat dairy products. The question on food security relates to the national priorities identified in *Eat Well Australia* and *NATSINSAP*, which recommend action to improve food access for Indigenous groups, and the nutritionally vulnerable.

Relative validity, direct: The term 'relative validity' is used because the short questions have been assessed in relation to more detailed quantitative dietary intake assessment methods rather than to an absolute 'gold standard'. This column in table 7 shows for each short question response category the increase in mean intake (dose response) of the relevant food, on the 24-hour recall or weighed food record, expressed as a ratio relative to the lowest response category for the short question. For all questions there is a clear dose-response, showing that those who claim more frequent intakes consume more of the food/food group than those claiming less frequent intakes. For some questions the increases in the ratio are greater than expected and for others less.

Relative validity, indirect: This column provides similar information to the previous column for selected nutrients. This is referred to as indirect validity, because the short questions are not intended to assess nutrient intake but may be indicators of higher or lower intakes of key nutrients contained in the foods to which they relate. The nutrients listed in this column are those that showed statistically significant associations with increasing response category (p<0.001). Those in bold type showed the greatest association with short question response categories and for these nutrients the dose-response ratio is given. As shown, most questions but not all, showed some association with the nutrients that might be expected to differ. The 'dose-response' ratios however do not increase as sharply for nutrients as they do for foods. This is not surprising, as nutrients are contributed by many different foods and so a single short question is unlikely to have a close relationship with nutrient intake except when the relevant food/s are the primary source of the nutrient in question.

Purpose: This column indicates whether the question response categories identify levels of food and/or nutrient intake that are sufficiently different to make the question useful for this purpose. For most questions the criteria to identify 'useful' questions were at least a twofold increase between the highest and the lowest response categories for direct validity (food intake) and a 50% increase for indirect validity (nutrient intake).

Breastfeeding indicators and survey questions

Indicators: Seven new breastfeeding indicators for use in Australia are proposed (appendix 4). Some of these indicators are directly relevant to Australian policies and others enable Australia to meet international reporting obligations for information about breastfeeding prevalence and duration.

Definitions: Standard definitions of breastfeeding terms/practices, adopted directly from WHO, are proposed. These definitions and terms are used internationally. Standard definitions of age of infants/children are also proposed (appendix 4).

Survey design/vehicle: A nationally representative cross sectional survey repeated at regular intervals is recommended for the collection of data about breastfeeding. The ABS National Health Survey, and state/territory CATI and other population-based health surveys meet these requirements, though the sample size of infants typically included in these surveys is small. Thus, consideration of a periodic survey of infant/child health and nutrition is recommended.

Survey questions: Survey questions used in the previous NHS surveys should be reviewed in light of the outcome of national consensus on breastfeeding indicators and definitions. The NHS breastfeeding questions require some modifications and cognitive testing, to enable measurement and reporting of the indicators of exclusive and predominant breastfeeding (appendix 4 and Webb et al 2001). Modified NHS questions will not be suitable for measuring the indicators of mothers' current breastfeeding practices among infants less than six months of age. Consideration should be given to adapting and testing the WHO questions on current practice for use in Australia for use in measuring these proposed indicators (appendix 4, WHO 1991, Webb et al 2001).

Because breastfeeding practices are age-related, it is desirable to ensure accurate calculation of the ages of infants and children, from the collection of information about birth dates. All surveys incorporating breastfeeding questions should ask children's birth dates and calculate age at the time of the survey from this information.

All questions about breastfeeding practices to derive the proposed indicators should be tested to ensure that respondents understand and interpret them correctly. The questions should then be evaluated and tested for validity and consistency in responses for key population sub-groups of interest.

Table 7: Summary of information about short dietary questions recommended for use in population surveys#

Policy Relevance	Question	Relative validity (direct)		Relative validity (indirect)		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? *Source: 1995 NNS[1]*	1serve or less 2-3 serves 4+ serves p<0.001	1 (204g/d) 1 .25 1.65	**Vit A**, Folate & Vit C ↑ All p<0.001 eg Provitamin A: 1serve or less 2-3 serves 4+ serves	 1 (2.6mg/d) 1.4 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? *Source: 1995 NNS[1]*	1 serve or less 2-3 serves 4+ serves p<0.001	1 (70g/d) 2.7 5.3	**Vit A, Folate** & Vit C ↑ All p<0.001 eg Vit C: 1serve or less 2-3 serves 4+ serves	 1 (110mg/d) 1.25 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) *Source: 1996 Dietary Key Indicators Study[2]*	<1/wk 1/wk-2/wk 3/wk-<7/wk 7+/wk p<0.001	1 (10.7g/d) 2.6 5.2 8.15	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? *Source: 1996 Dietary Key Indicators Study[2]*	<1/wk 1/wk-2/wk 3/wk-<7/wk 7+/wk p<0.001	1 (12.8g) 3.9 5.75 8.0	Only Provitamin A: p<0.001 <1/wk 1/wk-2/wk 3/wk-<7/wk 7+/wk	 1 (1.0 mg/d) 2.4 2.8 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 7 (continued): Summary of information about short dietary questions recommended for use in population surveys[#]

Policy Relevance	Question	Relative validity (direct)		Relative validity (indirect)		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) *Source: 1996 Dietary Key Indicators Study*[2]	<1/wk 1/wk-<3/wk 3/wk-<7/wk 7+/wk p<0.001	1 (26g/d) 1.25 2.4 3.35	Only Provitamin A: p<0.001 eg Provitamin A: <1/wk 1/wk-2/wk 3/wk-<7/wk 7+/wk	1 (2.7 mg/d) 0.95 1.15 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? *Source: 1996 Dietary Key Indicators Study*[2]	Rarely or never <1/wk 1/wk-2wk 3/wk-<7/wk 7+/wk p<0.001	1 (25g/d) 1.7 3.0 4.1 6.65	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? *Source: 1996 Dietary Key Indicators Study*[2]	<1/wk 1/wk-2/wk 3/wk-<7/wk 7+/wk p<0.001	1 (19.3g/d) 2.8 4.2 8.1	Vit A and **Vit C**: p<0.001 Rarely/Never <1/wk 1/wk-2/wk 3/wk -<7/wk 7+/wk	1 (85mg/d) 0.95 1.05 1.35 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) *Source: 1996 Dietary Key Indicators Study*[2]	Rarely/Never <2/wk 2/wk-<7/wk 7+/wk p<0.001	1 (11.9g/d) 4.15 8.5 14.1	Vit A, **Vit C**, Folate: p<0.001 Rarely/Never <2/wk 2/wk-<7/wk 7+/wk	1 (63mg/d) 1.65 1.65 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) *Source: 1996 Dietary Key Indicators Study*[2]	< 1/day 1<2/day 2<4/day 4+/day p<0.001	1 (69g/d) 1.6 1.95 2.35	Fibre & **Thiamin** ↑ p<0.001 CHO, energy ↑ P<0.01 eg Thiamin: <1/day 1-<2/day 2-<3/day 3+/day	1 (1.3 mg/d) 1.25 1.3 mg 1.45 mg	Useful as: - an indicator of bread intake - a component of total breads and cereals - an indicator of thiamin intake

Table 7 (continued): Summary of information about short dietary questions recommended for use in population surveys[#]

Policy Relevance	Question	Relative validity (direct)	Relative validity (indirect)	Comments
Dietary Guideline Number 2 (1.2)[5] AGTHE[4]	How often do you eat breakfast cereal? (ready-made, home-made or cooked) *Source: 1996 Dietary Key Indicators*	<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) *Source: 1996 Dietary Key Indicators Study[2]*	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? *Source: 1996 Dietary Key Indicators Study[2]*	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) *Source: 1996 Dietary Key Indicators Study[2]*	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 7 (continued): Summary of information about short dietary questions recommended for use in population surveys[#]

Policy Relevance	Question	Relative validity (direct)	Relative validity (indirect)	Comments
Dietary Guideline Number 1 (1.4,2.1)[5] AGTHE[4]	What type of milk do you usually have? *Source: 1995 NNS*[1]	Wm and RF/SK and 212gWM* 22gRF/SK* 183gRF/SK 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? *Source: 1996 Dietary Key Indicators Study*[2]	<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 1.25 Protein and Energy not Significant	Useful as: - an indicator of volume of milk intake - an indicator of calcium intake
Eat Well Aust[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? *Source: 1996 Dietary Key Indicators Study*[2] *Souce: 1995 NNS*[1]	% responding yes: 5.2% All (20 to 65 yrs) % responding yes: 5.2% (19 yrs 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 & poultry, Fruit ↓ all $p<.001$ Milk and dairy ↑ $p<.01$ For 'yes' responders eg, Fruit Dishes (g/day) Ran out of food 91.8g Did not run out 146.1g	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'.

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Appendices: Contents

Appendix 1: Questions about fruit and vegetable intake

Question: How many serves of vegetables do you usually eat each day?

Question: How many serves of fruit do you usually eat each day?

Question: How often do you drink fruit juices such as orange, grapefruit or tomato?

Question: Not counting juice, how often do you eat fruit? (fruit includes fresh, canned, frozen, dried)

Question: How often do you eat chips, French fries, wedges, fried potatoes or crisps?

Question: How often do you eat potatoes? (not including chips, French fries, wedges, fried potatoes or crisps)

Question: How often do you eat salad? (salad includes mixed green salad and other mixtures of raw vegetables)

Question: Not counting potatoes and salad, how often do you eat cooked vegetables?

Appendix 2: Questions about foods that contribute to fat intake

Question: What type of milk do you usually consume?

Question: About how much milk (in total) do you usually have in a day?

Question: 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)

Question: How often do you eat meat products such as sausages, frankfurter, Belgium, devon, salami, meat pies, bacon or ham?

Appendix 3: Questions about cereals and cereal foods

Question: How often do you eat bread? (include bread rolls, flat breads, crumpets, bagels, English or bread type muffins)

Question: How often do you eat pasta, rice, noodles or other cooked cereals? (not including cooked breakfast cereals)

Appendix 4: Proposed indicators and operational definitions for monitoring key aspects of breastfeeding in Australia

Indicators based on mothers' recalled child feeding practices among children aged less than 4 years

1. Percent ever breastfed

2. Percent breastfeeding at each completed month of age to 12 months (Prevalence of breastfeeding during the first 12 months)

3. Median duration of breastfeeding among 'ever breastfed' children

Indicators based on mothers' reported current child feeding practices (previous 24 hours) among infants at age less than 6 months

4. Percent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

5. Percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

6. Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months

7. Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months

WHO sample questions for use in surveys on breastfeeding indicators

Breastfeeding questions from the 1995 NHS

Breastfeeding questions to be included in the 2001 NHS

Appendix 5: Questions about food security

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

Appendix 1: Questions about fruit and vegetable intake

Question: How many serves of vegetables do you usually eat each day?

(a 'serve' = ½ cup cooked vegetables or 1 cup of salad vegetables)

Purpose: To monitor goals and recommendations relevant to EWA, NATSINSAP, AGHE, DGA.

Mode of administration: Self-completed as part of a questionnaire about usual frequency of food intake.

Response type: Closed.

Response options: 1 serve or less, 2-3 serves, 4-5 serves, 6 serves or more and don't eat vegetables.

Concept: Usual intake of vegetables expressed in terms of 'serves'.

Definitions:

Serve: Defined as part of the question in terms of cup measures of cooked and salad vegetables.

Usually: Defined as *on average over a period of time*. Not specifically defined by the question as used in the 1995 NNS but normally a question of this type would specify the period to which the usual intake applies. In the 1995 NNS this question followed a series of questions that related to food intake in the past 12 months.

Vegetables: Not specifically defined by the question as used in the 1995 NNS but would normally be defined in terms of the major types to be included or excluded eg potatoes, tomatoes, leafy vegetables, root, tuber and stem vegetables, peas and beans, pumpkin type. In the 1995 NNS this question followed a list of 25 foods specifically identified as vegetables. A question of this type should also indicate whether vegetables that are part of a mixed dish should be included or excluded and specify the forms of vegetables (fresh, cooked, dried, frozen and tinned) that should be included or excluded

Indicators:

- Proportion usually consuming at least four serves of vegetables per day

- Proportion usually consuming less than two serves of vegetables per day

Measurement: Number of respondents in a specified response category (X).

Data requirements: Total number of respondents (Y) and the number in specified 'serve' categories (X).

Calculation of indicator: X *100/Y.

Evaluation:

Pattern of response: Ninety-nine percent of the sample provided a useable response to the question. The majority of these respondents (55%) usually consumed between 2 and 3 serves of vegetables per day. A higher proportion of women than men (22% v 15%) usually ate four or more serves per day.

Relative validity (direct): The mean intake of vegetables from a 24-hour recall assessment in the same sample confirmed that those who reported usually eating a greater number of serves of vegetables per day, on average also had a higher 24-hour intake of vegetables. While the differences in mean 24-hour intake were statistically significant between all question categories the amounts did not necessarily equate with estimates based on the weights given for half a cup of cooked vegetables (60-90g) in Australian food composition tables that include household measures (English & Lewis 1991) or in policy documents such as AGHE (75g). For example the mean 24-hour intake for those reporting one serve or less of vegetables per day was 200g and 265g for those reporting two to three serves per day.

Relative validity (indirect): Three nutrients related to vegetable intake (vitamin A, vitamin C and folate) were evaluated. All three nutrients showed statistically significant increases with increasing category of usual vegetable intake. Those in the highest category of vegetable intake had a mean intake of pro-vitamin A that was almost twice the intake of those in the lowest category of intake. The equivalent increases for vitamin C and folate were 50% and 25% respectively. Of the nutrients evaluated vitamin A was most strongly associated with vegetable intake.

Consistency: A statistically significant increase in intake of pro-vitamin A with increasing category of usual intake was observed also for gender specific sub-groups classified by age (19-44 v ³45 years), socio-economic status (Q1/1 v Q4/5), country of birth (Australia v Not Australia) and body mass index (25 v ³25) but not by region (metro v rural).

Conclusion: The question was able to discriminate between groups with significantly different intakes of vegetables based on the 24-hour recall data. However the mean vegetable intake from the 24-hour recall was not proportional to the number of serves reported from the short question and the average quantity of vegetables associated with a 'serve' clearly differed for men and women and for other population sub-groups included in the evaluation. The strongest nutrient correlate of vegetable intake was pro-vitamin A. For analytical purposes it would be desirable for the response categories to be less restrictive ie from 1 to 6 or more with the option of indicating two adjacent response categories when appropriate ie 1-2.

National data sources: The question was included in a self-completed questionnaire in the 1995 National Nutrition Survey and administered by interviewer in the 2001 National Health Survey.

Additional information: Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Rutishauser et al 2001).

Question: How many serves of fruit do you usually eat each day?

(a 'serve' =1 medium piece or two small pieces of fruit or 1 cup of diced pieces)

Purpose: To monitor goals and recommendations relevant to EWA, NATSINSAP, AGHE, DGA.

Mode of administration: Self-completed as part of a questionnaire about usual frequency of food intake in the 1995 National Nutrition Survey.

Response type: Closed.

Response options: 1 serve or less, 2-3 serves, 4-5 serves, 6 serves or more and don't eat fruit.

Concept: Usual intake of fruit expressed in terms of 'serves'.

Definitions:

Serve: Defined as part of the question in terms of medium or small pieces of whole fruit and cups of diced fruit.

Usually: Defined as *on average over a specified period of time*. The time period of relevance was not specifically defined by the question as used in the 1995 NNS. However, in the 1995 NNS this question followed a series of questions that related to food intake in the past 12 months.

Fruit: Not specifically defined by the question as used in the 1995 NNS but would normally be defined in terms of the major types to be included or excluded eg apples and pears, bananas and other tropical fruit, citrus, stone fruit, berries and other such as melons. In the 1995 NNS this question followed a list of 8 foods specifically identified as fruit. A question of this type would also indicate whether fruit that is part of a mixed dish should be included or excluded and specify the forms of fruit (juice, fresh, cooked, dried, frozen and tinned) that should be included or excluded.

Indicators:

- Proportion usually consuming at least two serves of fruit per day

- Proportion who don't eat fruit

Measurement: Number of respondents in a specified response category (X).

Data requirement: Total number of respondents (Y) and the number in specified 'serve' categories (X).

Calculation of indicator: X *100/Y.

Evaluation:

Pattern of response: Ninety-nine percent of the sample provided a useable response to the question. Only just over 50% of these respondents usually consumed at least two serves of fruit per day. The proportion of men who consumed one serve or less was higher for men than for women (54% v 45%).

Relative validity (direct): The mean intake of fruit from a 24-hour recall assessment in the same sample confirmed that those who reported usually eating a greater number of serves of fruit per day, on average also had a higher 24-hour intake of fruit. While the differences in mean 24-hour intake were statistically significant between all question categories the amounts did not necessarily equate with estimates based on the weight generally used for one medium or two small pieces of fruit (100-150g) in Australian food composition tables that include household measures (English & Lewis 1991). For example the mean 24-hour intake for those reporting one serve or less of fruit per day was 70g and 191g for those reporting two to three serves per day.

Relative validity (indirect): Three nutrients derived from fruit (vitamin A, vitamin C and folate) were evaluated. All three nutrients showed statistically significant increases with increasing category of usual fruit intake. Those in the highest category of fruit intake had a mean intake of vitamin C that was almost twice the intake of those in the lowest category of intake. The equivalent increases for pro-vitamin A and folate were 50% and 25% respectively. Of the nutrients evaluated vitamin C was most strongly associated with fruit intake.

Consistency: A statistically significant increase in intake of vitamin C with increasing category of usual fruit intake was observed also for gender specific sub-groups classified by age (19-44 v ³45 years), socio-economic status (Q1/1 v Q4/5), region (metro v rural) and body mass index (25 v ³25) but not by country of birth (Australia v Not Australia).

Conclusion: The question was able to discriminate between groups with significantly different intakes of fruit. In addition the average quantity associated with a serve of fruit differed little between men and women and was proportional to the number of serves of fruit reported. The strongest nutrient correlate of fruit intake was vitamin C. For analytical purposes it would be desirable for the response categories to be less restrictive ie from 1 to 6 or more with the option of indicating two adjacent response categories when appropriate ie 1-2.

National data sources: The question was included in a self-completed questionnaire in the 1995 National Nutrition Survey and administered by interviewer in the 2001 National Health Survey.

Additional information: Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Rutishauser et al 2001).

Question: How often do you drink fruit juices such as orange, grapefruit or tomato?

Purpose: To measure frequency of intake of fruit juice.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual frequency of fruit juice intake.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Fruit juice: Examples are given of types of juices that should be included in the response. Only pure juices are given as examples, although it is assumed that people would include blended juices.

Composition: The question does not give guidance in relation to fruit juice composition. In particular, the maximum amount of dilution that distinguishes fruit juice from flavoured water is not indicated.

Indicators:

- Percentage who rarely or never consume fruit juice

- Percentage who usually consume fruit juice once a day or more

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Twenty-five percent of the adult sample stated they consumed fruit juice once a day or more. Thirty-eight percent stated that they consumed fruit juice rarely or never.

Relative validity (direct): Subjects who stated they consumed fruit juice once a day or more consumed an average of 157g of fruit juice a day as measured by three day weighed dietary record. Subjects who reported they consumed fruit juice rarely or never consumed an average of 18g of fruit juice a day (84% had no intake in three days). The mean observed frequency of intake for those who reported drinking fruit juice at least once a day was 0.75 times a day, while the mean observed frequency for those reporting that they drank fruit juice rarely or never was 0.07 times a day.

Relative validity (indirect): After categorisation, the frequency of fruit juice intake measured by the short question was significantly associated with vitamin C intake and provitamin A intake. There was a suggestion of increasing folate intake with increasing frequency of fruit juice intake as measured by short dietary question, however the association with energy intake was unclear.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by sex, age, region of residence within Tasmania, and by season of administration. Performance of the question differed by body mass index (BMI more than 30 did not over-report fruit juice intake), by region of socioeconomic status (subjects in the more disadvantaged regions did not over-report fruit juice intake) and by season of administration (over-reporting of fruit juice intake was less likely to occur during autumn). Overall, there was a small but significant over-reporting of frequency of fruit juice intake by short question compared to three day weighed dietary record. The magnitude of the difference was 0.12 times per day.

Conclusion:

The question provided a valid measurement of the frequency of intake of fruit juice, which was over-reported by a small amount on average across the adult population. People with high body mass index and people in the most disadvantaged suburbs did not over-report their intake. The nutrient intake of frequent consumers of fruit juice was higher in provitamin A, vitamin C and folate than that of infrequent consumers.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: Not counting juice, how often do you eat fruit? (Fruit includes fresh, canned, frozen, dried).

Purpose: To measure the overall frequency of intake of fruit (excluding fruit juice).

Mode of administration: Interviewer administered questionnaire. Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual frequency of intake of all fruit excluding fruit juice.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Fruit: Types of fruit included are not explicitly defined. Juice of any kind is explicitly excluded from the subject of the question.

Quantity: The question does not indicate a serve size or quantity to distinguish occasions of eating fruit that might be considered trivial.

Form: Clarification that all forms of fruit are to be included is communicated by naming the forms of fruit.

Indicators:

- Percentage who rarely or never eat fruit

- Percentage who usually consume fruit once a day or more

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Fifty-three percent of the adult sample stated they consumed fruit once a day or more. Ten percent stated that they consumed fruit rarely or never.

Relative validity (direct): Subjects who stated they ate fruit once a day or more consumed an average of 168g of fruit a day as measured by three day weighed dietary record. Subjects who reported they ate fruit rarely or never consumed an average of 12g of fruit a day (73% had no intake in three days). The mean observed frequency of intake for those who reported eating fruit at least once a day was 1.3 times a day, while the mean observed frequency for those reporting that they ate fruit rarely or never was 0.14 times a day.

Relative validity (indirect): After categorisation, the frequency of fruit intake measured by the short question was significantly associated with provitamin A intake, total vitamin C intake and folate intake. It was not significantly associated with energy intake.

Consistency: The performance of the short question in relation to three day weighed dietary records significantly differed by sex (females likely to over-report intake), age (younger people likely to over-report intake), region of residence within Tasmania (people living outside the capital city likely to over-report intake) and body mass index (BMI greater than 30 over-report fruit intake). The performance of the question was similar by region of socioeconomic status and by season of administration. Overall, there was no significant difference in report of frequency of fruit intake by short question compared to three day weighed dietary record.

Conclusion:

The question provided a valid measurement of the frequency of fruit intake, however the performance of the question varied significantly by a number of factors. The largest magnitude of difference in performance was for people with a body mass index of greater than 30 who over-reported their frequency of fruit intake by about one third of an occasion per day compared to weighed records. The nutrient intake of frequent consumers of fruit was higher in provitamin A, vitamin C and folate than that of infrequent consumers, but the energy intake is no higher.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: How often do you eat chips, French fries, wedges, fried potatoes or crisps?

Purpose: To measure frequency of intake of fried potatoes. This food category differs from other vegetables by being generally higher in fat.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual frequency of intake of hot or cold fried potato.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Fried potato: Defined by naming 5 types and forms of potato that should be included in the response. Potato is mentioned in only one name, raising the possibility of inclusion of foods derived from other foods (eg corn chips).

Quantity: The question does not indicate a serve size or quantity.

Form: Although not directly stated, one of the target foods is most often eaten cold, while the others are eaten hot. The food eaten cold may be consumed over an extended period of time.

Indicators:

- Percentage who rarely or never eat fried potato

- Percentage who usually consume fried potato more than 5 times a week

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Twenty-eight percent of the adult sample stated they consumed fried potato three times a week or more. Fourteen percent stated that they consumed fried potato rarely or never, and three percent said they consumed fried potato once a day or more.

Relative validity (direct): Subjects who stated they ate fried potato once a day or more consumed an average of 166.5g of fried potato a day as measured by three day weighed dietary record. Subjects who reported they ate fried potato rarely or never consumed an average of 25g of fried potato a day (80% had no intake in three days). The mean observed frequency of intake for those who reported eating fried potato at least once a day was 0.4 times a day, while the mean observed frequency for those reporting that they ate fried potato rarely or never was 0.04 times a day.

Relative validity (indirect): After categorisation, the frequency of fried potato intake measured by the short question was significantly associated with energy intake, fat and saturated intake, and (negatively) with provitamin A intake. It was not significantly negatively associated with total vitamin C or folate intake ($0.05 < p < 0.10$).

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by age, region of residence within Tasmania, region of socioeconomic status and by season of administration. Performance of the question differed by sex (females under-reported fried potato intake on average) and by body mass index (BMI greater than 30 under-reported fried potato intake). Overall, there was no significant difference in report of frequency of fried potato intake by short question compared to three day weighed dietary record.

Conclusion:

The question provided a valid measurement of the frequency of intake of fried potato. However, the performance of the question differed by a small but significant amount by sex and by body mass index. The nutrient intake of frequent consumers of fried potato was higher in energy, fat and saturated fat, and lower in provitamin A than that of infrequent consumers.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: How often do you eat potatoes? (not including chips, French fries, wedges, fried potatoes or crisps)

Purpose: To measure frequency of intake of potatoes that are not fried. This food category is a commonly eaten vegetable.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual frequency of intake of potato that has not been fried. The question may be used as a companion to the question asking about frequency of fried potato intake.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Potatoes (not fried): Defined by naming the food category and excluding 5 forms of the food.

Form: The question does not stipulate the form of potato eaten (other than excluding fried potato) and could include potato eaten as a component of another dish (eg stew, shepherds pie).

Indicators:

- Percentage who rarely or never eat potato

- Percentage who usually consume potato once a day or more

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: $X*100/Y$.

Evaluation:

Pattern of response: Twenty-three percent of the adult sample stated they consumed potato (not fried) once a day or more. Five percent stated that they consumed potato (not fried) rarely or never and fifty-two percent said they consumed potato (not fried) three times a week or more.

Relative validity (direct): Subjects who stated they ate potato (not fried) once a day or more consumed an average of 88g of potato (not fried) a day as measured by three day weighed dietary record. Subjects who reported they ate potato (not fried) rarely or never consumed an average of 26g of potato (not fried) a day (64% had no intake in three days). The mean observed frequency of intake for those who reported eating potato (not fried) at least once a day was 0.6 times a day, while the mean observed frequency for those reporting that they ate potato (not fried) rarely or never was 0.17 times a day.

Relative validity (indirect): After categorisation, the frequency of potato (not fried) intake measured by the short question was significantly associated with provitamin A intake, and (negatively) with energy intake and vitamin C intake. It was not significantly associated with folate intake.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by sex, age, body mass index, region of socioeconomic status and by season of administration. Performance of the question differed significantly by region of residence within Tasmania (people in the capital city over-reported intake less on average than people living outside the capital city). Overall, there was significant (but small) over-reporting of the frequency of potato (not fried) intake by short question compared to three day weighed dietary record. The magnitude of the over-reporting by short question was 0.16 times per day, or more than one occasion per week.

Conclusion:

The question provided a valid measurement of the frequency of intake of potato (not fried), however the question over-reported intake by a small amount. The nutrient intake of frequent consumers of potato (not fried) was higher in provitamin A, and lower in vitamin C and energy than that of infrequent consumers.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: How often do you eat salad? (salad includes mixed green salad and other mixtures of raw vegetables)

Purpose: To measure frequency of intake of salad.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual frequency of intake of salad.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Salad: Definition clarified by describing two food categories that would be included in the definition. By implication does not include potato salad or pasta salad. An operational definition for weighed food records was any mixture of two or more raw vegetables.

Accompanying food: the question does not give guidance about whether to include salad eaten as part of another food (eg salad sandwich).

Indicators:

- Percentage who rarely or never eat salad

- Percentage who usually consume salad once a day or more

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: $X*100/Y$.

Evaluation:

Pattern of response: Twelve percent of the adult sample stated they consumed salad once a day or more. Eighteen percent stated that they consumed salad rarely or never.

Relative validity (direct): Subjects who stated they ate salad once a day or more consumed an average of 76g of salad a day as measured by three day weighed dietary record. Subjects who reported they ate salad rarely or never consumed an average of 9g of salad a day (79% had no intake in three days). The mean observed frequency of intake for those who reported eating salad at least once a day was 0.6 times a day, while the mean observed frequency for those reporting that they ate salad rarely or never was 0.09 times a day.

Relative validity (indirect): After categorisation, the frequency of salad intake measured by the short question was not significantly associated with provitamin A intake, vitamin C intake, folate intake or energy intake.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by age, region of residence within Tasmania, body mass index, region of socioeconomic status and by season of administration. Performance of the question differed significantly by sex (men did not over-report their intake). Overall, there was significant (but small) over-reporting of the frequency of salad intake by short question compared to three day weighed dietary record. The magnitude of the over-reporting by short question was 0.03 times per day, or less than one occasion per month.

Conclusion:

The question provided a valid measurement of the frequency of intake of salad, with the overall accuracy of intake over-reported by a trivial but significant amount. The nutrient intake of frequent consumers of salad was not different to that of infrequent consumers in provitamin A, vitamin C, folate or energy intake.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: Not counting potatoes and salad, how often do you eat cooked vegetables?

Purpose: To measure frequency of intake of cooked vegetables.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual frequency of intake of cooked vegetables. This question is designed to be a companion to the preceding questions about frequency of vegetable intake.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Cooked vegetables: This term is not defined, however two types of vegetable are excluded. The preceding questions further clarify the foods that are excluded from this question.

Form: The question does not stipulate the form of vegetable eaten (other than cooked) and should include vegetables eaten as a mixture or as a component of another dish (eg stew, casserole).

Indicators:

- Percentage who rarely or never eat cooked vegetable

- Percentage who usually consume cooked vegetable once a day or more

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Thirty-four percent of the adult sample stated they consumed cooked vegetables once a day or more. Two percent stated that they consumed cooked vegetables rarely or never.

Relative validity (direct): Subjects who stated they ate vegetables once a day or more consumed an average of 103g of cooked vegetable a day as measured by three day weighed dietary record. Subjects who reported they ate cooked vegetable rarely or never consumed an average of 13g of cooked vegetable a day (67% had no intake in three days). The mean observed frequency of intake for those who reported eating cooked vegetable at least once a day was 0.6 times a day, while the mean observed frequency for those reporting that they ate cooked vegetable rarely or never was 0.13 times a day.

Relative validity (indirect): After categorisation, the frequency of cooked vegetable intake measured by the short question was significantly associated with provitamin A intake. It was not significantly associated with energy intake, vitamin C intake or folate intake.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by sex, body mass index, region of socioeconomic status and by season of administration. Performance of the question differed significantly by age (greater over-reporting by younger subjects) and region of residence within Tasmania (people in the capital city over-reported intake less on average than people living outside the capital city). Overall, there was significant (but small) over-reporting of the frequency of cooked vegetable intake by short question compared to three day weighed dietary record. The magnitude of the over-reporting by short question was 0.14 times per day, or about one occasion per week.

Conclusion:

The question provided a valid measurement of the frequency of intake of cooked vegetable, however the question over-reported intake by a small amount. The nutrient intake of frequent consumers of cooked vegetable was higher in provitamin A intake, but not different in vitamin C intake, folate intake and energy intake than that of infrequent consumers.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Appendix 2: Questions about foods that contribute to fat intake

Question: What type of milk do you usually consume?

Purpose: To monitor goals and recommendations relevant to EWA, NATSINSAP, AGHE, DGA.

Mode of administration: Self-completed as part of a questionnaire about usual frequency of food intake.

Response type: Closed.

Response options: Whole, low/reduced fat, skim, evaporated/sweetened condensed, none of the above and don't know.

Concept: The type of milk most commonly used.

Definitions:

Usually: Defined as *on average over a period of time*. Not specifically defined by the question as used in the 1995 NNS but normally a question of this type would specify the period to which usual consumption applies. In the 1995 NNS this question followed a series of questions that related to food intake in the past 12 months.

Milk: The type of milk was defined by the response categories to the question but the source of the milk was not defined eg cow, other animal milk or a vegetable based milk such as soya milk. For some population sub-groups it could be important to define the source as well as the type and for this reason it would generally be appropriate to define both source and type of milk. It would also be appropriate to indicate whether only one or one or more response categories constitute a useable response to the question.

Indicators:

- Proportion who usually use whole milk

- Proportion who usually use a fat-reduced milk (low/reduced fat or skim)

- Proportion who usually don't use milk

Measurement: Number of respondents in a specified response category (X).

Data requirements: Total number of respondents (Y) and the number in specified 'serve' categories (X).

Calculation of indicator: X *100/Y.

Evaluation:

Pattern of response: Ninety-eight percent of the sample provided a useable response to the question. Two percent of respondents gave more than one response to the question and four percent responded to the effect that they did not use any of the milks listed in the question.

Relative validity (direct): The 24-hour recall data for the same sample indicated that those who reported usually using whole milk had a mean intake of 212g of whole milk and mean intake of 22g of reduced fat/skim milk per day, while those who reported usually using reduced fat/skim milk had a mean intake of 183g of this type of milk and a mean intake of <10g of whole milk per day. These differences were statistically highly significant. On the day of the 24-hour recall survey 8% of respondents used both whole and reduced fat/skim milk.

Relative validity (indirect): Intake of total and saturated fat were evaluated. Both the proportion of total energy from fat and that from saturated fat were significantly higher for those who usually used whole milk.

Consistency: Statistically significant differences in mean percent energy from total fat and from saturated fat were found for all gender specific sub-groups evaluated. The subgroups evaluated were age (19-44 v +45 years), socio-economic status (Q1/1 v Q4/5), country of birth (Australia v Not Australia), body mass index (25 v +25) and region (metro v rural).

Conclusion: The question provided a valid indicator of the main type of milk consumed as assessed by 24-hour recall. The intake of those who usually used whole milk was also consistently higher in terms of the percentage of energy obtained from total fat and from saturated fat. The fact that 8% of respondents to the 24-hour recall used more than one type of milk on the day of the survey suggests that it may be desirable for the question to provide for respondents who usually use more than one type of milk.

National data sources: The question was included in a self-completed questionnaire in the 1995 National Nutrition Survey and administered by interviewer in the 2001 National Health Survey.

Additional information: Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Rutishauser et al 2001).

Question: About how much milk (in total) do you usually have in a day?

Purpose: To measure total amount of usual milk intake. Intake of this food may have important implications in relation to calcium intake, protein intake and saturated fat intake.

Mode of administration: Interviewer administered questionnaire.

Response type: Closed.

Response options: Less than 150ml (or 5ozs), 150-300ml (300ml is a small carton – 10ozs), 301 to 600ml (600ml is approximately an old 'pint' – 20ozs), more than 600ml.

Concept: The usual total milk intake in all forms. This includes milk as a drink, in beverages, in breakfast cereals and used in cooking.

Definitions:

Reference time period: In the 1996 Tasmanian Adults Dietary Survey, the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Milk: The subject of this question (milk) is not defined. Common understanding of milk can differ significantly in nutrient content (particularly fat content) and in source (soy and goat milk are less commonly used than cows milk). This question could be combined with a question regarding the usual type of milk used (see previous indicator).

Response categories: The response categories are chosen to be broadly consistent with the size of commonly purchased cartons of cow's milk, both plain and flavoured.

Indicators:

- Proportion who consume less than 150ml milk per day

Measurement: The number of respondents who consume less than 150ml per day (response category 1).

Data requirements: Total number of respondents (Y) who have unambiguously indicated a single response category. Number of respondents who select only response category 1 (X).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Thirty-nine percent of the adult sample stated they consumed 150 to 300ml of milk a day. Thirty-six percent stated that they consumed less than 150ml a day, and seven percent said they consumed more than 600ml a day.

Relative validity (direct): Subjects who stated they consumed more than 600ml of milk a day consumed an average of 419g of milk a day as measured by three day weighed dietary record. Subjects who reported they consumed less than 150ml of milk a day consumed an average of 115g of milk a day. For response categories two and three, the average daily milk intake measured by three day weighed dietary record was within the range of the response category.

Relative validity (indirect): The response to the short question was significantly associated with mean energy intake, protein intake and calcium intake.

Consistency: (No information).

Conclusion:

The question on quantity of milk consumed provided a valid measurement of the intake of fluid milk.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: 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)

Purpose: To measure frequency of intake of a food category dominated by beef and lamb.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept:

The usual frequency of intake of specified types of meat.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Red meat: Defined by a statement of which common meats to include and those to exclude. Examples are also given of the forms of these meats that might be relevant to the response for this question. Not all meat types are mentioned in the question. People who eat significant quantities of unusual meats (eg goat, kangaroo) may not know how to answer.

Indicators:

- Percentage who rarely or never eat red meat

- Percentage who usually consume red meat less than 3 times a week

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Seventy-two percent of the adult sample stated they consumed red meat less than once a day, but twice a week or more. Four percent stated that they rarely or never ate red meat, and fourteen percent said they consumed red meat at least daily.

Relative validity (direct): Subjects who stated they ate red meat at least daily consumed an average of 121g of red meat a day as measured by three day weighed dietary record. Subjects who reported they rarely or never ate red meat consumed an average of 8g of red meat a day. The mean observed frequency of intake for those who reported eating red meat at least daily was 0.66 times a day, while the mean observed frequency for those reporting that they rarely or never ate red meat was 0.07 times a day.

Relative validity (indirect): After categorisation, the frequency of red meat intake measured by the short question was significantly associated with energy, protein, fat, saturated fat, iron and zinc intake. It was also significantly associated with fat and saturated fat as a percentage of dietary energy and zinc density of the diet. It was not significantly associated with the iron density of the diet.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by age, sex, region of residence within Tasmania, body mass index, region of socioeconomic status and season of administration. There was a small (but statistically significant) over-reporting of frequency of red meat intake by short question compared to three day weighed dietary record.

Conclusion:

The question provided a valid measurement of the frequency of intake of red meat. The nutrient intake of frequent consumers of red meat was higher in energy, fat, saturated fat, iron and zinc than infrequent consumers. The diet of frequent consumers of red meat compared to non-frequent consumers had a higher zinc but not iron density.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: How often do you eat meat products such as sausages, frankfurter, Belgium, devon, salami, meat pies, bacon or ham?

Purpose: To measure frequency of intake of meat products, a food category which is often relatively high in saturated fat content.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual total frequency of intake of specified meat products.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Meat products: Defined by giving examples of the types and forms of food considered as 'meat products' for the purpose of this question. Not all eligible food products are included as examples in the question. Food products similar to the examples given (eg battered saveloys, sausage rolls) are assumed to be included by subjects responding to the question.

Indicators:

- Percentage who rarely or never eat meat products

- Percentage who usually consume meat products less than 3 times a week

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Forty-six percent of the adult sample stated they consumed meat products less than once a day, but twice a week or more. Eleven percent stated that they rarely or never ate meat products, and eight percent said they consumed meat products at least daily.

Relative validity (direct): Subjects who stated they ate meat products at least daily consumed an average of 72g of meat products a day as measured by three day weighed dietary record. Subjects who reported they rarely or never ate meat products consumed an average of 13g of meat products a day. The mean observed frequency of intake for those who reported eating meat products at least daily was 0.66 times a day, while the mean observed frequency for those reporting that they rarely or never ate meat products was 0.17 times a day.

Relative validity (indirect): After categorisation, the frequency of meat product intake measured by the short question was significantly associated with energy, protein, fat, saturated fat and zinc intake. It was also significantly associated with fat and saturated fat as a percentage of dietary energy and negatively associated with iron density of the diet. It was not significantly associated with the total iron content or zinc density of the diet.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by age, sex, region of residence within Tasmania, body mass index, region of socioeconomic status and season of administration. There was a small (but statistically significant) under-reporting of frequency of meat product intake by short question compared to three day weighed dietary record.

Conclusion:

The question provided a valid measurement of the frequency of intake of meat products. The nutrient intake of frequent consumers of meat products was higher in energy, protein, fat, saturated fat and zinc than infrequent consumers. The diets of frequent consumers of meat products compared to non-frequent consumers had a lower iron but not zinc density.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Appendix 3: Questions about cereals and cereal foods

Question: How often do you eat bread? (include bread rolls, flat breads, crumpets, bagels, English or bread type muffins).

Purpose: To measure frequency of intake of all types of bread. This food category is often relatively high in dietary fibre, thiamin and iron content.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual total frequency of intake of all types of bread.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Bread: Defined by giving examples of the types of food that should be included in the response. The question does not specify the type of grain used in the manufacture of the bread.

Indicators:

- Percentage who rarely or never eat bread

- Percentage who usually consume bread less than daily

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Thirty-nine percent of the adult sample stated they consumed bread less than twice a day, but once a day or more. Fifteen percent stated that they consumed bread less than once a day, and eight percent said they consumed bread three times a day or more.

Relative validity (direct): Subjects who stated they ate bread at least three times a day consumed an average of 161g of bread a day as measured by three day weighed dietary record. Subjects who reported they ate bread less than once a day consumed an average of 69g of bread a day. The mean observed frequency of intake for those who reported eating bread at least three times a day was 1.9 times a day, while the mean observed frequency for those reporting that they ate bread less than once a day was 0.8 times a day.

Relative validity (indirect): After categorisation, the frequency of bread intake measured by the short question was significantly associated with energy, carbohydrate, thiamin and fibre. It was also significantly associated with thiamin density, but not carbohydrate as a percentage of dietary energy or fibre density.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by age, sex, region of residence within Tasmania, body mass index, region of socioeconomic status and season of administration. There was a small (but statistically significant) over-reporting of frequency of bread intake by short question compared to three day weighed dietary record.

Conclusion:

The question provided a valid measurement of the frequency of intake of bread. The nutrient intake of frequent consumers of bread was higher in energy, carbohydrate, thiamin and fibre and higher in thiamin density than infrequent consumers.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Question: How often do you eat pasta, rice, noodles or other cooked cereals? (not including cooked breakfast cereals)

Purpose: To measure frequency of intake of a food category relating to cereal food intake. This food category is often relatively high in dietary fibre, thiamin and iron content.

Mode of administration: Interviewer administered questionnaire.

Response type: Open-ended frequency using choice of reference time period.

Response options: frequency per day, frequency per week, frequency per month, rarely or never, I don't know/can't say.

Concept: The usual total frequency of intake of specified cereal foods.

Definitions:

Reference time period: In the 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998), the reference time period was stated to be the previous three months in a preamble to all the frequency questions.

Cooked cereals: Defined by giving examples of the types and forms of cereal foods that should be included/excluded in the response. The question does not specify the type of grain used in the manufacture of the specified foods.

Indicators:

- Percentage who rarely or never eat cooked cereals

- Percentage who usually consume cooked cereals less than daily

Measurement: Questionnaire response converted to a monthly frequency ie per day is multiplied by 30 and per week by 4. An answer of rarely or never is interpreted as less than once per month.

Data requirements: Number in specified response category (X) and the total number of respondents (Y).

Calculation of indicator: X*100/Y.

Evaluation:

Pattern of response: Fifty-three percent of the adult sample stated they consumed cooked cereals less than once a day, but twice a week or more. Eight percent stated that they consumed cooked cereals rarely or never and six percent said they consumed cooked cereals once a day or more.

Relative validity (direct): Subjects who stated they ate cooked cereals once a day or more consumed an average of 98g of cooked cereals a day as measured by three day weighed dietary record. Subjects who reported they ate cooked cereals rarely or never consumed an average of 22g of cooked cereals a day. The mean observed frequency of intake for those who reported eating cooked cereals at least once a day was 0.5 times a day, while the mean observed frequency for those reporting that they ate cooked cereals rarely or never was 0.1 times a day.

Relative validity (indirect): After categorisation, the frequency of cooked cereal intake measured by the short question was significantly associated with carbohydrate intake, thiamin intake and fibre intake. It was also significantly associated with carbohydrate as a percentage of dietary energy and fibre density. It was not associated with total energy intake or thiamin density.

Consistency: The performance of the short question in relation to three day weighed dietary records was similar by age, sex, region of residence within Tasmania, body mass index, and region of socioeconomic status. Performance of the question differed by season of administration with summer being associated with more over-reporting of intake frequency. Overall, there was no significant difference in the reporting of frequency of cooked cereal intake by short question compared to three day weighed dietary record.

Conclusion:

The question provided a valid measurement of the frequency of intake of cooked cereals. The nutrient intake of frequent consumers of cooked cereals was higher in carbohydrate, thiamin and fibre, and higher in carbohydrate contribution to energy intake and thiamin density than infrequent consumers.

Data Source: 1996 NHMRC Dietary Key Indicators Study (Riley & Rutishauser 1998).

Additional information:

Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Riley et al 2001).

Appendix 4: Proposed indicators and operational definitions for monitoring key aspects of breastfeeding in Australia

Introduction

Key data requirements

The key data requirements from which all of the proposed breastfeeding indicators for Australia can be calculated are:

> detailed information about infant feeding practices, to allow breastfeeding practice to be categorised in terms of the different intensities described in the 'Definitions' section below, (that is exclusive breastfeeding, predominant breastfeeding, full breastfeeding, or any breastfeeding, and time of introduction of other foods;

> accurate information about the age of the infant at the time to which the infant feeding practice relates; and

> the total number of infants and children within the reference age included in the survey sample and the total number with particular practices.

These data requirements can be met through a few survey questions. WHO has developed sample questions for use in breastfeeding surveys, from which most WHO breastfeeding indicators can be calculated. The WHO survey questions ask about any substances fed to infants in the previous 24 hours. Standardised questions asking about recalled practice have not been developed/evaluated as part of this project.

In Australia, the questions used in national surveys have varied and do not provide all the data needed to derive the indicators now proposed for Australia. The limitations of these questions in relation to the proposed indicators are identified in sections below.

The WHO breastfeeding questions relating to current practice, and survey questions used in the 1995 NHS are shown at the end of this appendix. These could be the basis for questions used in Australia, but need to be modified to reflect the slightly different data needs for Australia and will required testing (cognitive testing and assessment of validity).

Proposed indicators

Indicators based on mothers' recalled child feeding practices among children aged less than 4 years

1. Percent ever breastfed

2. Percent breastfeeding at each completed month of age to 12 months (Prevalence of breastfeeding during the first 12 months)

3. Median duration of breastfeeding among 'ever breastfed' children

Indicators based on mothers' reported current child feeding practices (previous 24 hours) among infants at age less than 6 months

4. Percent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

5. Percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

6. Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months

7. Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months

Definitions – breastfeeding (adopted from WHO 1991)

Ever breastfed/ever given breastmilk: includes infants put to the breast if only once, and includes infants who have received expressed breastmilk but have never been put to the breast.

Exclusively breastfed: An infant is considered to have been exclusively breastfed if he/she has received only breastmilk/human milk with no other liquids or solids, with the exception of drops or syrups consisting of vitamins, mineral supplements or medicines.

Predominantly breastfed: An infant is considered to be predominantly breastfed if he/she receives breastmilk as the main source of nourishment, that is, with or without water, water-based drinks (sweetened and flavoured water, teas, infusions, etc), fruit juice, Oral Rehydration Solution (ORS) and does not receive any other liquids (including breastmilk substitutes) or solids. Feeding of food-based fluids (except fruit juice and sugar-water) is not consistent with this definition of predominant breastfeeding.

Fully breastfed: An infant is fully breastfed if he/she receives breastmilk as the main source of nourishment. This includes infants who are either a) exclusively breastfed or b) predominantly breastfed. That is, infants can be classified as fully breastfed if a) they receive only breastmilk with no other liquids or solids (except vitamins, mineral supplements, or medicines) OR b) they receive breastmilk and water, water-based drinks, fruit juice, ORS, but do not receive breastmilk substitutes or solids. The *fully breastfed* rate is the combined rate of *exclusively breastfed* and *predominantly breastfed.*

Solid foods: any nutrient containing foods (semi solid or solid), excluding fruit and vegetable juices, sugar water and breastmilk substitutes, but including dilute infant cereals.

Breastmilk substitutes: Any milk (other than breastmilk), or food based fluid used in infant feeding as a replacement for breast milk, whether or not it is suitable for that purpose (commonly includes infant formulae, cows milk, and other milks fed to infants).

Complementary foods/feeding: any nutrient containing foods (solids or liquids other than breastmilk) given to infants who are breastfeeding.

Definitions- age

Age: calculated in completed months, preferably from birth dates.

Reference age range/period: the age range of the infants/children for whom data is obtained.

Aged at least 4 months: infants who are 4.0 or more completed months of age.

Aged at least 6 months: infants who are 6.0 or more completed months of age.

Aged at least 12 months: infants who are 12.0 or more completed months of age

Aged less than 4 months: <120 days, 0-17 weeks, 0-<4 months.

Aged less than 6 months: <180 days, 0-25 weeks, 0-<6 months.

Definitions – duration of breastfeeding

Still breastfeeding: the child is currently receiving breastmilk (direct from the breast or expressed).

Number of months the infant/child was breastfed: The total length of time in completed months, including weaning time, that a child who has completed breastfeeding was breastfed.

Duration fully breastfed: the age in completed months at which an infant began receiving solids or food-based fluids other than breastmilk.

Duration exclusively breastfed: the age in completed months at which an infant began receiving water, juice, other food based fluids other than breastmilk, or solids or semisolids.

Weaning completed: child no longer receives any breastmilk.

Criteria used in the selection of the proposed indicators:

- relevant to key Australian policy recommendations;

- likely to lead to policy and program action;

- consistent, where possible, with previous indicators/data collected in Australia so that trends may be documented;

- feasible/simple to collect the required information on a nationally representative sample via an ongoing health survey program;

- measurable and valid for detecting the direction and magnitude of changes over time, and differences between population sub-groups; and

- consistent with WHO wherever possible to meet international reporting obligations.

Reporting of indicators for population sub-groups

All proposed indicators are recommended for reporting in the general population. In addition, indicators should be reported on vulnerable population sub-groups (who are at risk of low breastfeeding rates) where sufficiently representative samples of these groups can be surveyed over time:

- mothers less than age 25;

- single mothers;

- mothers with no post-school qualifications;

- mothers residing in lower socio-economic areas, that is of SEIFA quintile 1;

- mothers born in countries/regions other than Australia, Oceania, Europe or America; and

- indigenous mothers.

1. Percent ever breastfed

Purpose

This indicator is used to determine the percentage of infants during a reference period (all aged less than 4 years of age is recommended) who ever consumed breastmilk, whether it was once only, and irrespective of whether it was exclusive, predominant or partial. The indicator provides a measure of 'success' of current breastfeeding policies in so far as mothers have attempted to follow current advice.

Indicator

The percent of infants *ever breastfed.*

Calculation: (The number of infants/children *ever breastfed* divided by the total number of infants/children in the reference age range (ie <4 years or 48 months) X 100.

Measurement issues

Evidence suggests that mothers can recall relatively accurately over several years, ever breastfeeding. Thus, a reference period of 4 years enables the indicator to be calculated on a larger sample than if it were restricted to 12 months (as per the WHO indicator).

Questions should include definitions of 'ever' to include 'even once, even for a short time' and of 'breastfed' to include 'ever putting the child to breast, or ever giving expressed breastmilk'.

Data requirements

The number of infants/children in the *reference age range*, (ie all aged <4 years or 48 months) at the time of the survey.

Current age of survey children in completed months, preferably calculated from birth dates.

The number of children who based on the mother's report were ever given breastmilk, or put to the breast, if only once, even for a short time.

Data sources

Cross sectional surveys of representative samples of infants and children within the sample reference age range of 0-4 years. This would include the ABS NHS, State and Territory CATI surveys, National Nutrition Surveys, and other population health surveys, including maternal and child health surveys.

There are no previous national data sources that meet the exact definition of this indicator in Australia. However, the **1995 ABS NHS** and the **1994 NATSI Survey (NATSIS)** included questions which sought this information without defining it precisely for respondents.

2. Percent breastfeeding at each completed month of age to 12 months (Prevalence of breastfeeding during the first 12 months)

Purpose

This indicator gives a measure of the degree to which women have adopted the Australian policy recommendations to "breastfeed" and to continue "for at least the first 12 months" It also identifies the ages at which the greatest decline in breastfeeding rates occur during the first 12 months. Such information can be useful in planning interventions to increase the initiation and duration of breastfeeding.

Indicator

The percentage of infants in the reference age group who have been breastfed to each completed month of age to 12 months.

- **Calculation:** Infants and children who are still breastfeeding at the time of the survey are included in the calculation of the age-specific prevalence rates to avoid the bias that would occur by exclusion of this group. The calculations use a survival analysis approach such as Kaplan-Meier to estimate the percent breastfeeding at each month of age to include both those currently breastfeeding and those that have ceased, and to increase the sample size for age specific estimates by taking account of the overall breastfeeding history for each child (Mackerras, personal communication). For this, it is assumed that someone who stopped breastfeeding at a particular age was breastfeeding for all months up until the age of cessation (eg a child who stopped breastfeeding at 4 months is assumed to have been breastfed at ages 1, 2, and 3 months).

- Include all children meeting the age criterion (<48 months) for whom data on breastfeeding practices are available and arrange by age (in completed months) at the time of the survey. For each age count the total number, number never breastfed, total who had stopped breastfeeding at each age and calculate the number still breastfeeding at each age;
    a. Commencing with calculation for age = 1 month
        i.   count the total number of children aged 1 month or older at the time of the survey
        ii. count the number who had stopped breastfeeding by 1 completed month (those that were never breastfed plus those who had stopped breastfeeding by 1 completed month)
        iii. calculate the number who were still breastfeeding at 1 completed month = (total from step i) minus (total from step ii)
        iv. the prevalence of breastfeeding for 1 completed month of age is: (the number still breastfeeding at this age divided by the total number of children aged 1 month or older at the time of the survey) x 100.
    b. Repeat this for ages 2 to 12 months of age to estimate the prevalence of breastfeeding at each of these ages.

Data heaping may occur if mothers round their recalled reports of duration of breastfeeding. If this has occurred, use a method for data smoothing such as calculating a 3 month moving average, estimating a line of best fit or trendline to adjust the prevalence rates to obtain a more accurate prevalence rate at each month of age (Mackerras, personal communication, WHO 1991b).

Report the percent "ever breastfed" and the prevalence rates at each completed month of age as part of the indicator, as well as the method of smoothing, if applicable.

Measurement issues

All infants and children in the reference age group, regardless of whether they are still breastfeeding at the time of the survey, are included in the calculation of each of the point prevalence rates (<1-12 months) for this indicator eg infants in their sixth month of age at the time of the survey contribute to the point prevalence rates at <1, 1, 2, 3, 4, and 5 months Infants who are younger at the time of the survey than the age cut offs for each of the point prevalence rates are excluded from the calculations for those months.

Note that survey participants will not be asked directly whether the infant was still breastfeeding at each month of age under 12 months; rather, the indicator will be calculated using data collected from questions about total time breastfed or age at which breastfeeding stopped.

Data requirements

The age in completed months at which breastfeeding stopped for each child (no longer received any breastmilk).

The number of infants/children less than age 4 years at the time of the survey who were breastfed at the age 1,2,3,4,5, 6, 7, 8, 9, 10, 11 and 12 completed months of age.

The number of survey infants/children who reached each completed month of age to 12 months

Age of all survey infants/children in completed months, preferably calculated from birth date.

Data sources

Cross sectional surveys of representative samples of infants and children within the reference age range of 0-4 years. This would include the ABS NHS, State and Territory CATI surveys, National Nutrition Surveys, and other population health surveys, including maternal and child health surveys.

The 1995 NHS and 1994 NATSIS collected information that would allow the calculation of prevalence rates of breastfeeding at each month of age to 12 months, although the recall period of up to 12 years for NATSIS raises doubts about the accuracy of the data for this indicator. Published rates are available from both sources for particular age ranges defined in weeks, only some of which coincide with months of age specified in this indicator.

3. Median duration of breastfeeding among 'ever breastfed' children

Purpose

This is useful for monitoring the effects of interventions specifically aimed at extending duration, rather than those to increase initiation AND duration of breastfeeding.

Indicator

The age in completed months, when 50% of children aged less than 4 years (48 months) who were ***ever breastfed***, no longer received any breastmilk.

Calculation

- Exclude those never breastfed from the calculation

- Infants and children who are still breastfeeding at the time of the survey are included in the calculation of the age-specific prevalence rates to avoid the bias that would occur by exclusion of this group. The calculations use a survival analysis approach such as Kaplan-Meier to estimate the percent breastfeeding at each month of age to include both those currently breastfeeding and those that have ceased, and to increase the sample size for age specific estimates by taking account of the overall breastfeeding history for each child (Mackerras, personal communication). For this, it is assumed that someone who stopped breastfeeding at a particular age was breastfeeding for all months up until the age of cessation (eg a child who stopped breastfeeding at 4 months is assumed to have been breastfed at ages 1, 2, and 3 months).

- Include all children meeting the age criterion (<48 months) for whom data on breastfeeding practices are available and arrange by age (in completed months) at the time of the survey. For each age count the total number, number ever-breastfed, and number still breastfeeding at each age;

  a. commencing with calculation for age = 1 month:

    i. count the total number of children aged 1 month or older at the time of the survey who were ever breastfed

    ii count the number who had stopped breastfeeding by 1 completed month (those that had stopped breastfeeding by 1 completed month, but excluding those who were never breastfed

    iii. calculate the number who were still breastfeeding at 1 month = (total from step I) – (total from step ii)

    iv. the prevalence of breastfeeding among 'ever breastfed' children at 1 month of age is: (the number still breastfeeding at 1 month divided by the total number of children aged 1 month or older at the time of the survey) x 100.

c. Repeat this for ages 2 to 12 months of age to estimate the prevalence of breastfeeding among 'ever breastfed' children at each of these ages.

- The **median duration of breastfeeding among 'ever breastfed' children** is the month of age at which exactly 50% of the 'ever breastfed' children are no longer receiving breastmilk (ie 50% of i. above).

- Report the percent of 'ever breastfed' children still breastfeeding at each completed month of age as part of the indicator.

Data heaping may occur if mothers round their recalled reports of duration of breastfeeding. If this has occurred, use a method for data smoothing such as calculating a 3 month moving average, estimating a line of best fit, or trendline to adjust the prevalence rates to obtain a more accurate prevalence rate at each month of age (Mackerras, personal communication, WHO 1991b). Report the method of smoothing, if applicable.

Measurement issues

Children who are still breastfeeding at the time of the survey should be included in the calculation to avoid introducing selection bias.

Smoothing of rates at each month of age is likely to improve the accuracy of the median, and monthly percentages.

Data requirements

The number of infants/children less than age 4 years who were *ever breastfed.*

The number of completed months that each 'ever breastfed' infant/child less than 4 years was breastfed.

Current age of all survey infants/children in completed months, preferably calculated from birth date.

Data sources

Cross sectional surveys of representative samples of infants and children within the sample reference age range of 0-4 years. This would include the ABS NHS, State and Territory CATI surveys, National Nutrition Surveys, and other population health surveys, including maternal and child health surveys.

There are no previous national data sources that meet the exact definition of this indicator in Australia, and information about median duration has not been calculated or reported. However, the 1995 NHS and the 1994 NATSIS included questions which sought information relevant to the calculation of this indicator, though the information is not complete for calculation of the indicator as described. Data from NATSIS may not be accurate, as the recall period for duration of breastfeeding was up to 12 years.

4. Percent exclusively breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

This indicator gives an overall measure of the degree to which women have adopted breastfeeding behaviour consistent with the current Australian policies with regard to breastfeeding 'intensity' or 'exclusivity' for the current and proposed recommended duration.

Previous policies of WHO recommended "exclusive breastfeeding for the first 4-6 months", and the change to "about six months" by WHO has only been very recent. The Australian policy, currently under review is expected to change for a recommendation of 6 months also. Thus, monitoring exclusive breastfeeding rates to six months provides an opportunity to gauge the success in disseminating the new policy recommendation, and to identify age(s) at which greatest declines in exclusive breastfeeding occur

Indicator

Proportion/percent of infants at each completed month of age to 6 months who were *exclusively breastfeeding* in the previous 24 hours.

Calculation: The exclusive breastfeeding rate is calculated as:

(the number of infants aged 1 month, [2 months, 3 months, 4 months, 5 months, 6 months] who were *exclusively breastfeeding* during the previous 24 hours divided by the total number of infants in the relevant age group [ie at each month of age to 6 months]) X 100.

Measurement issues

Published evidence suggests that mothers can recall relatively accurately, even over a long period of time, whether they ever breastfed, and the duration of breastfeeding, but recall is not as accurate for the timing of introduction of other fluids and solid foods. This implies that the rates of exclusive, predominant or full breastfeeding are best measured from an assessment of current practice. WHO and other countries recommend the use of the previous 24 hours as the most accurate and readily measured time period reflecting "current practice".

Questions must probe for sufficiently accurate and detailed information about fluids/solids to distinguish between exclusive v predominant breastfeeding including water, juice, milk, formula, and other liquids.

WHO recommends use of a standard survey question. Survey questions for use in reporting Australian indicators require further development and testing before a standardised set of questions can be recommended.

Breastfeeding practices in early infancy may vary, with periods of exclusive breastfeeding interspersed with predominant, and partial breastfeeding. Thus, measurement of practices in the previous 24 hours, while minimising measurement error due to recall, may misclassify some individuals. A survey question to determine whether yesterday's practice was the usual practice since birth should help to identify those with variable feeding practices.

Note that the sample size from most population-based health surveys of infants less than age 6 months will be small. This limits power to detect differences in exclusive breastfeeding rates between population sub-groups and over time. The use of purpose-designed surveys with the potential to include larger samples of infants than that 'captured' in the ABS household surveys has been recommended (see Data Sources section).

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey.

Current age (at the time of the survey) of infants in completed months (preferably calculated from birth date).

For each infant in the reference age range, 24-hour recall data of all liquids and solids consumed, as the basis for classifying infants as exclusively or predominantly breastfed

Respondents should be probed about the different kinds of liquids the infant may have received, including water, juice, milk, formula, and other liquids, and asked about solid foods

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys such as the ABS NHS, and State/Territory CATI surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition. The latter would allow for more detailed questions about feeding practices/regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based. Information about practices of giving water, juice, or other liquids has not previously been collected in national and state surveys so that rates of exclusive breastfeeding as defined in this indicator cannot be calculated.

5. Percent fully breastfeeding in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

Although it is recommended that young infants be exclusively breastfed for the first 4-6 months, scientific evidence suggests that the health benefits of predominant breastfeeding approach those of exclusive breastfeeding, and that predominant breastfeeding is preferable to only partial breastfeeding. Full breastfeeding encompasses both infants who are exclusively breastfed, and those who are predominantly breastfed. In other words, those whose main source of nourishment is breastmilk. Thus, the indicator, percent fully breastfeeding at each month of age to 6 months enables assessment of the extent to which mothers are approximating current policy recommendations in Australia regarding breastfeeding intensity, and the age(s) at which greatest declines in full breastfeeding occur. The rate of predominant breastfeeding can be derived by subtracting indicator 4 (exclusive breastfeeding) from this indicator (full breastfeeding).

Indicator

Proportion/percent of infants at each completed month of age to six months who were fully ***breastfed*** in the previous 24 hours.

Calculation: The ***fully breastfeeding*** rate is calculated as:

(the number of infants aged <1month [1 month, 2 months, 3 months, 4 months, 5 months and 6 months] who were ***fully breastfed*** during the previous 24 hours divided by the total number of infants in the relevant age group[ie at each month of age to 6 months] X 100.

Measurement issues

Measurement issues are similar to those for the indicator for exclusive breastfeeding, eg obtaining sufficient information about consumption of all types of fluids and solids to be able to distinguish between exclusive, predominant and partial breastfeeding; inaccuracy of recalled information, and small sample sizes when basing the estimate on current practices of infants less than age 6 months at the time of the survey.

Data requirements

The number of infants aged 6 months or less (less than 180 days) in the survey.

Current age (at the time of the survey) of infants (preferably calculated from birth date).

For each infant in the reference age range, 24 hour recall data of all liquids and solids consumed, as the basis for classifying infants as exclusively or predominantly breastfeeding Fully breastfeeding includes both of these groups.

Respondents should be probed about the different kinds of liquids the infant may have received, including water, juice, milk, formula, and other liquids.

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition, which allow for more detailed questions about feeding practices/ regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based.

A fully breastfeeding rate comparable with the proposed rate among infants less than 6 months, cannot be calculated from previous national surveys because information has not been collected: a) about practices of giving water, juice, or other liquids, and b) about current feeding practices (in the previous 24 hours).

6. Percent receiving solid foods in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

This indicator gives a minimum measure of the degree to which women are introducing solid foods earlier than the policy recommendations of 4-6 months. It does not contain information about whether the types of foods or the quantities given are appropriate to meet nutritional needs.

Indicator

Percentage of infants aged 6 months or less who have received solid foods in the previous 24 hours.

The indicator is calculated as:

(the number of infants aged <1 month [1 month, 2 months, 3 months, 4 months, 5 months, and 6 months]who have received *solid or semi solid foods* in the past 24 hours divided by the total number of infants in the relevant age group, [ie At each completed month of age to 6 months]) X 100.

Measurement issues

Are those discussed above for exclusive and full breastfeeding rates.

In addition, a definition of solid and semi-solid food is required to prompt accurate responses to the 24 hour recall of feeding practices.

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey.

Current age (at the time of the survey) of infants in completed months, (preferably calculated from birthdate).

For each infant in the reference age range, 24-hour recall data of all liquids and solids consumed, as the basis for classifying infants as consuming or not consuming solid or semi solid foods

Respondents should be probed about the different kinds of liquids the infant may have received including water, juice, milk, formula, and other liquids, and asked about solid foods.

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition, which allow for more detailed questions about feeding practices/ regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based.

No information is available from previous Australian national surveys to report on this indicator based on current practice. Information was collected in the 1995 and 2001 National Health Surveys about the age mothers recalled first giving breastmilk substitutes and/or solid foods to their infants regularly. This information could be calculated and reported as percentages receiving solid foods at each month of age to 6 months although it would not be directly comparable with the proposed indicator, based on current practice.

7. Percent receiving breastmilk substitutes in the previous 24 hours among infants at each completed month of age to 6 months

Purpose

Young infants may not be exclusively or predominantly breastfed because they receive either breastmilk substitutes or solid foods. This indicator gives a picture of the extent and timing of use of breastmilk substitutes, as distinct from solid foods, among young infants.

Indicator

Percentage of infants at each completed month of age to 6 months who have received breastmilk substitutes in the previous 24 hours.

Calculation

The indicator is calculated as:

(the number of infants at each month of age <1 month [1 month, 2 months, 3 months, 4 months, 5 months and 6 months]to 6 months who have received breastmilk substitutes in the past 24 hours divided by the total number of infants in the relevant age group [ie at each completed month of age to 6 months]) X 100.

Measurement issues

Are similar to those outlined for exclusive and full breastfeeding and solid foods indicators

Data about feeding breastmilk substitutes in the past 24 hours can be collected by a question similar to that of the WHO standard question to identify exclusive and predominant breastfeeding (end of appendix 4).

Data requirements

The number of infants aged 6 months or less (<180 days) in the survey

For each infant in the reference age range, 24-hour recall data of all liquids and solids consumed, as the basis for classifying infants as consuming or not consuming breastmilk substitutes

Respondents should be probed about the different kinds of liquids the infant may have received including water, juice, milk, formula, and other liquids, and asked about solid foods. Current age of infants (at the time of the survey) in completed months, calculated from birthdate.

Data sources

Ideally, data for this indicator would be collected from both cross sectional surveys (as proposed for the other indicators) and from special purpose surveys such as the National Nutrition Survey and surveys of maternal and child health and nutrition, which allow for more detailed questions about feeding practices/regimens. An important consideration is obtaining an adequate sample size of infants less than 6 months of age on which the calculation of this indicator is based.

No information is available from previous Australian national surveys to report on this indicator based on current practice. Information was collected in the 1995 and 2001 National Health Surveys about the age mothers recalled first giving breastmilk substitutes and/or solid foods to their infants regularly. This information could be reported as percentages receiving breastmilk substitutes at each completed month of age to 6 months, although it would not be comparable with the proposed indicator, based on current practice.

WHO sample questions for use in surveys on breastfeeding indicators[1]

For each child less than 24 months old ask the respondent

1. Can you tell me how old the child is today?

   If possible, the exact date of birth is…..

2. Since this time yesterday, has (name) been breastfed?   Yes No

   If yes, was this (name)'s main source of food?   Yes No

3. Since this time yesterday, did (name) receive any of the following:

   Vitamins, mineral supplements, medicine   Yes No

   Plain water   Yes No

   Sweetened or flavoured water   Yes No

   Fruit juice   Yes No

   Tea or infusion   Yes No

   Infant formula   Yes No

   Tinned, powdered or fresh milk   Yes No

   Solid or semi-solid food   Yes No

   Oral Rehydration salts   Yes No

   Other (specify….)   Yes No

[1] Source: WHO 1991

Breastfeeding questions from the 1995 NHS

There were 14 breastfeeding questions included in the 1995 NHS. Information was collected for all children aged <4 years (n=3,252) at the time of the survey. For most children, questions were answered on their behalf by a parent, usually the mother (approximately 80%). The aim of the module on breastfeeding was to assess the length of time an infant was breastfed and when substances other than breastmilk were introduced. 'Introduced' was defined as when an infant first started taking food or breastmilk substitutes on a regular basis, not when first offered or one-off occasions when the food was taken (ABS 1998).

Q301.   **Has …..ever been breastfed?**

Yes

No   —> Q304

Q302.   **Is …. currently being breastfed?**

Yes

No

Q303.   **Was …..breastfed when …..first came home from hospital?**

Yes

No

No hospital

Q304.   **Has …..ever been given infant formula regularly?**

Yes

No   —> Q306

Q305.   **At what age was …. first given infant formula regularly?**

Weeks

Months

Less than one week

Don't know

Q306. **Has …..ever been given cows milk regularly?**

Yes

No —> Q308

Q307. **At what age was …..first given cow's milk regularly?**

Weeks

Months

Less than one week

Don't know

Q308. **Apart from breastmilk/infant formula/cow's milk has …. ever been given any (other) type of milk substitute on a regular basis?**

Yes

No —> Q311

Q309. **What type of milk substitutes did …. have?**

Soya bean milk

Goat's milk

Evaporated milk

Other

Q310. **At what age was …. first given (this/any of these) milk substitute(s) milk regularly?**

Weeks

Months

Less than one week

Don't know

Q311. **Sequence guide**

If aged less than 6 months —> Q312

Otherwise —> Q313

Q312. **Has …. ever been given solid food?**

Yes

No ⎯> Q314

Q313. **At what age was …. first given solid food regularly?**

Weeks

Months

Never/not

Don't know

Q314. **Sequence guide**

If code '2' (No) in Q302 ⎯> Q315

Otherwise ⎯> No further questions about breastfeeding

Q315. **Including times of weaning, what is the total time …. was breastfed?**

Weeks

Months

Less than one week

Don't know

Q316. **What is the main reason you stopped breastfeeding ….?**

Teething

Child bored

Felt it was time to stop

Resumed work

Pregnant

Not producing any/adequate milk

Other

Breastfeeding questions included in the 2001 NHS

Q150.   **Sequence guide**

If child aged 0–3 years   —>   Q151

Otherwise   —>   do not ask breastfeeding questions

Q151.   **Has .....ever been breastfed?**

Yes

No   —>   Q154

Don't know   —>   Q154

Q152.   **Is .... currently being breastfed?**

Yes

No

Don't know

Q153.   **Was .....breastfed when (he/she) first came home from hospital?**

Yes

No

No hospital

Q154.   **Has .....ever been given infant formula regularly?**

Yes

No   —>   Q156

Don't know   —>   Q156

Q155. **At what age was …..first given infant formula regularly?**

Weeks

Months

Less than one week

Don't know

Q156. **Has …. ever been given cows milk regularly?**

Yes

No —> Q158

Don't know —> Q158

Q157. **At what age was …. first given cow's milk regularly?**

Weeks

Months

Less than one week

Don't know

Q158. **(Apart from breastmilk/infant formula/cow's milk)**
Has …. ever been given any (other) type of milk substitute on a regular basis?

Yes

No —> Q161

Don't know —> Q161

Q159. **What type of milk substitutes did …. have?**

Soya bean milk/soy milk

Goat's milk

Evaporated milk

Other

Q160. **At what age was …. first given (this/any of these) milk substitute(s) regularly?**

Weeks

Months

Less than one week

Don't know

Q161. **Sequence guide**

If aged less than 6 months   —>   Q162

Otherwise   —>   Q163

Q162. **Has …. ever been given solid food?**

Yes

No   —>   Q164

Q163. **At what age was …. first given solid food regularly?**

Weeks

Months

Less than 1 week

Don't know

Q164. **Sequence guide**

If breastfed but not currently (code '2') in Q152   —>   Q165

Otherwise   —>   No further questions about breastfeeding

Q165. **Including times of weaning, what is the total time …. was breastfed?**

Weeks

Months

Less than one week

Don't know

Q166. **What is the main reason (you/……mother) stopped breastfeeding ….?**

Teething

Child bored

Felt it was time to stop

Resumed work

Pregnant

Not producing any/adequate milk

Other problems with breastfeeding eg cracked nipples

Other

Appendix 5: Questions about food security

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

Purpose: To monitor goals and recommendations relevant to EWA, NATSINSAP.

Mode of administration: Self-completed as part of a questionnaire about usual frequency of food intake.

Response type: Closed.

Response options: Yes / No.

Concept: Food security encompasses the ready availability of nutritionally adequate and safe foods, and the assured ability to acquire personally acceptable foods in a socially acceptable way.

Definitions:

The US National Center for Health Statistics (NCHS 1994) gives the following definitions:

> *Food insufficiency – an inadequate amount of food intake due to a lack of money or resources.*

> *Food insecurity – limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.*

> *Hunger – the uneasy or painful sensation caused by a lack of food. It includes the recurrent and involuntary lack of access to food.*

This question covers some limited aspects of food insecurity as it is described above.

Indicators:

- Proportion that ran out of food and couldn't afford to buy more at some time over the previous 12 months.

Measurement: Number of respondents who reported "yes" (X).

Data requirements: Total number of respondents (Y) and the number who reported "yes" (X).

Calculation of indicator: X *100/Y.

Evaluation:

Pattern of response: Over 99% of the 1995 NNS sample provided a useable response to the question but less than 5% gave a positive response. Females reported a slightly higher rate of positive responses than males but the greatest difference in the proportion of positive responses was observed between

younger and older age groups, with the younger group reporting about three times the rate reported by the older group.

Relative validity (direct): The proportion of positive responses (with 95% confidence intervals) for selected categories of the socioeconomic measures used to assess this question. For all indices analysed the proportion of positive responses was highest in those categories associated with greater socioeconomic disadvantage. Of the indices selected for analysis the nature of house occupancy showed the greatest differential. On average almost 16% of those paying rent or board gave a positive response to the food security question.

Relative validity (indirect): With the two exceptions discussed below non-parametric tests identified the same food and nutrient intake variables as significantly different between the food security response groups.

Foods: Mean intake of meat and meat products and fruit and fruit products was significantly lower in those who had run out of food at some time. In contrast mean but not median intake of milk and milk products was significantly higher for those who had run out of food at some time.

Energy: Neither total energy intake nor the ratio of energy intake to basal metabolic rate (EI:BMR) differed significantly between food security groups.

Nutrient density: Despite the similar level of energy intake the nutrient density of the diet (nutrient intake/MJ) for iron, vitamin C and folate was significantly lower for those who had run out of food. Consistent with the results for milk and milk products the mean but not the median nutrient density for calcium was significantly higher for those who had run out of food.

Consistency: None of the variables that differed significantly for the sample as a whole differed significantly for all 22 of the population sub-groups tested. The most consistent nutrient (expressed as mg/kJ) was vitamin C, which differed significantly for 18 of the 22 sub-groups. The exceptions were older men and women, men in the upper quintiles of SEIFA and women not born in Australia. In general consistency was better in females than males probably due to a higher rate of positive responses in females as compared with males.

When the question was assessed in the smaller Tasmanian Dietary Indicator Study, the pattern of responses and performance of the question was similar to those for the NNS, but the assessment was limited by the smaller sample size (Riley et al 2001).

Conclusion: In the NNS sample as a whole a positive response to the food security question was associated both with a significantly greater likelihood of socio-economic disadvantage and a lower intake of some food groups (meat and fruit), but not other food groups (milk and milk products) that are important sources of nutrients in the Australian diet. Although evaluation of this question was limited, at sub-group level, by the low prevalence of positive responses (~5%) the density of vitamin C was significantly lower in all but four of the sub-groups tested.

National data sources: The question was included in a self-completed questionnaire in the 1995 National Nutrition Survey.

Additional information: Further details about the evaluation of this question can be found in another publication from the Australian Food and Nutrition Monitoring Unit (Rutishauser et al 2001).