

7 Food and nutrition monitoring and surveillance

7.1 Overview: a practical strategy*

What are monitoring and surveillance and what are they for?

Food and nutrition monitoring and surveillance involves continuous description of the components of the food and nutrition system for the purposes of planning, policy analysis, program evaluation and trend forecasting. It should monitor nutritional status and nutrition-related conditions. A monitoring strategy requires baseline data and regular data collection so that trends can be analysed. It requires appropriate assessment and dissemination of information. It is critical to the efficient and effective development, targeting, evaluation and review of policy, programs and research activities in food, nutrition and related issues, and it must have links with the decision-making process.^{1,2} Box 7.1 explains the terms ‘monitoring’ and ‘surveillance’.

Assessment of the effectiveness of nutrition programs and policy ‘depends upon the identification of quantifiable goals and targets, and the availability of timely, relevant and reliable data... Where targets are not directly or conveniently measurable ... performance indicators of their attainment [are necessary]’.³ Thus the National Food and Nutrition Policy includes the establishment of ‘ongoing monitoring and surveillance’ as one of its four priority objectives⁴ (see Box 1.1)—it is fundamental to assessing the implementation strategies aimed at achieving the other three objectives. In accordance with those objectives, it is important that a national monitoring and surveillance system be developed in such a way as to facilitate the provision of data at the local, State and national levels, and to recognise the role of the States as significant users of and contributors to the national system.

Dissemination of information

Information collected through monitoring and surveillance must be analysed and transmitted to decision-makers in an appropriate format and in a timely fashion if it is to be of real value. It is critical that the information be accessible to those for whom it is intended and that mechanisms exist for evaluation and feedback on the information’s usefulness for planning. Dissemination of information must be an interactive process.

There is an important distinction between ‘data’ and ‘information’, although the terms are often used synonymously. Kelly and Becker⁵ described ‘information’ as data processed into a form that is meaningful for the intended user. The implementation strategies of the National Food and Nutrition Policy include commitments to reporting progress toward the Policy’s objectives and to wide dissemination of information.⁴

* This section is based on background material researched and compiled by Karen Cashel and her important contribution is gratefully acknowledged.

Box 7.1: Defining ‘monitoring’ and ‘surveillance’

There may be uncertainty about the terms ‘monitoring’ and ‘surveillance’ because in everyday use they each take several meanings and are sometimes used interchangeably. Epidemiological usage distinguishes between monitoring and surveillance in that surveillance implies an intention to investigate or control problems detected. The usage in this publication is based on the following definition:

Monitoring

The performance and analysis of routine measurements, aimed at detecting changes in the nutritional or health status of the population, or changes in the performance of the food and nutrition system. Monitoring can include continuous measurement aimed at detecting progress toward a goal or target.⁶

Surveillance

‘Ongoing scrutiny, generally using methods distinguished by their practicality, uniformity and frequently their rapidity, rather than by complete accuracy. Its main purpose is to detect changes in trends or distribution in order to initiate investigative or control measures.’⁶

Background to nutrition monitoring in Australia

One of the influential advocates of nutrition monitoring in Australia has been the NHMRC, which, on the basis of the recommendations of the Nutrition Taskforce of the Better Health Commission, advised that ‘assessment of nutritional status should be one of the most important activities in monitoring the health of Australians.’⁷ The minimum requirements for a national monitoring and surveillance program were to provide information on:

- the nutritional quality of the Australian food supply;
- food consumption patterns at national level and of subgroups in the community;
- public knowledge, beliefs and practices relating to nutrition;
- indices of nutritional status—for example, anthropometric measurements, blood lipids, iron status.⁹

When development of the National Food and Nutrition Policy began in 1991, the NHMRC recommended the establishment of a technical working group to develop a national nutrition monitoring and surveillance strategy. It directed that a priority for the group was to consider the data needs for a national dietary survey. The relevant terms of reference for the working group were as follows:

- To develop a detailed outline (including aims, objectives and target groups) of a nutrition monitoring and surveillance strategy for Australia, having regard to
 - the recommended Dietary Intakes for use in Australia
 - the revised Dietary Guidelines for Australians and their associated nutrition goals and targets
 - policy development activities proposed by the Nutrition Section of the Commonwealth Department Human Services and Health.

- In developing the strategy, to consider existing data collections and recommend modifications suitable for monitoring purposes.
- To consider future surveys undertaken by various interest groups and recommend additions appropriate to nutrition monitoring purposes.⁸

Later, an NHMRC Expert Panel was established to advise on the development of a national food and nutrition monitoring and surveillance strategy.

The conduct of a national dietary survey was identified as a priority of the National Health Information Agreement developed under the auspices of the Australian Health Ministers Advisory Council. Traditional dietary intake surveys—collecting information about foods consumed, from which nutrient intakes can be calculated—provide useful information about consumption but on their own do not provide an assessment of the nutritional and health status of a population. This is widely recognised, and the collection of food intake data should preferably be conducted in concert with the collection of demographic, haematological, biochemical, physiological and anthropometric data. Many, including the NHMRC Expert Panel, would also include psychological, behavioural and sociological data.

Status of the food and nutrition information base

Australia does not as yet have a coordinated food and nutrition monitoring strategy for obtaining data at national and State levels. With monitoring acknowledged as a priority objective of the National Food and Nutrition Policy, National Health Advancement Program funding has already been provided through the Food and Nutrition Program for the development of a monitoring and surveillance strategy.⁹

Some components of a national monitoring strategy already exist, but the available data collections have gaps and limitations. Gaps in existing collections include that between the apparent consumption data and food intake data. In particular, it is important to develop ways of monitoring events at point-of-sale. Available data are not always collected or collated in a form suitable for food and nutrition purposes. They may not be continuous or comparable, thus precluding trend analyses, or they may not be available in a form readily applicable or understandable to those involved in food and nutrition. Additional difficulties arise when the sources of information are not widely disseminated or readily available and when those who are familiar with the data and use them effectively are few.

A practical strategy will seek to enhance existing instruments wherever possible and to cover gaps in data collections by initiating appropriate new collections. In this context, use could be made of existing instruments for collecting attitudinal, mortality and morbidity, and socio-economic information, as well as food supply and purchase data. Policy audits and methods of detecting the effects of advocacy could also be monitored.

Monitoring nutrition-related inequalities

National data collections which include socio-demographic measures of inequality relevant to nutrition monitoring, are the Risk Factor Prevalence Surveys of 1980,¹⁰ 1983¹¹ and 1989,¹² the 1985 Australian Health and Fitness Survey,¹³ and the 1989–90 National Health Survey conducted by the Australian Bureau of Statistics. The 1983 National Dietary Survey of Adults and the 1985 National Dietary Survey of

Schoolchildren were conducted in conjunction with the 1983 Risk Factor Prevalence Survey and the 1985 Australian Health and Fitness Survey and so can be linked to them. Table 7.1 lists survey data items that can be used to assess relevant inequalities. Information on differences in food expenditure can be gained from the Household Expenditure Survey.

Table 7.1: Survey data items used to assess inequalities

Data item	Survey ^(a)				
	RFPS80	RFPS83	RFPS89	AHFS85	NHS89–90
Social	Yes	Yes	Yes	Yes	Yes
Economic	No	No	Yes	No	Yes
Occupation	CCLO ^(b)	CCLO ^(b)	ASCO ^(c)	No	Yes
Aboriginality	No	No	No	No	Yes
Ethnicity	Yes	Yes	Yes	Yes	Yes
Geographical	6 capitals	6 capitals	All capitals	Urban, rural	National
Sex	Yes	Yes	Yes	Yes	Yes
Age	25 to 64	25 to 64	20 to 69	7 to 15	All ages

(a) Surveys listed are the 1980, 1983 and 1989 National Heart Foundation Risk Factor Prevalence Surveys (RFPS), the 1985 Australian Health and Fitness Survey of Schoolchildren (AHF), and the 1989–90 National Health Survey (NHS).

(b) Coded to Australian Bureau of Statistics Classification and Classified List of Occupations

(c) Coded to Australian Bureau of Statistics Australian Standard Classification of Occupations

Source: Australian Institute of Health³

Age groups

No national surveys have collected dietary information for children aged less than 10 years. The 1983 National Dietary Survey of Adults covered the age range 25–64 years, and, with the exception of the 1988 Survey of Elderly People (which surveyed people aged 55–75 years), the CSIRO dietary surveys covered people aged 18 years and over. Very few dietary data are available for people aged less than 10 years, between 18 and 24 years, and over 70 years. The Department of Employment, Education and Training's Longitudinal Youth Survey provides some limited information on people aged 16–22 years.

7.2 Characteristics of a national food and nutrition monitoring and surveillance strategy*

The purpose

The primary goal of a food and nutrition monitoring and surveillance strategy is to provide the basis for a comprehensive food- and nutrition-related action program (including research) through the collection of relevant data that are regular, informative, coordinated, timely, reliable and effectively and efficiently disseminated. An important attribute of such a system is its predictability: decision makers need to be able to anticipate the range and timing of information and plan on that basis.

A national food and nutrition monitoring and surveillance strategy needs to provide, on a regular and comparable basis, a description of the nutritional status and related health outcomes of the population, with particular reference to defined subgroups who may be at risk. Complementing this must be a description of the available food supply of the population with particular reference to trends that may affect nutritional status, and a description of the physical and socio-cultural environment that impinges on the food and nutrition system. The information so provided must be suitable for predicting trends that may influence future nutritional and health status. The information must provide an adequate basis for government decision making and policy formulation, for planning food and nutrition programs, and for decisions on priorities and resource allocation. The strategy must also include a means of monitoring existing initiatives to evaluate their progress towards specific objectives, goals and targets.^{1,14}

Where to start

The first step in developing a food and nutrition monitoring and surveillance strategy is to determine the availability of suitable existing data and vehicles for obtaining data. The NHMRC Expert Panel on a Food and Nutrition Monitoring and Surveillance Strategy identified the following data priorities for such an inventory:

- national data collections that are obtained at regular intervals, preferably where the original data sets are available for further analysis to meet the needs of food and nutrition monitoring;
- national data collections that are obtained at regular intervals and have the potential to provide information on food and nutrition issues;
- national data collections that provide unique information but are available only on an irregular basis;
- regional or local data collections that provide food and nutrition data on priority population subgroups, and that are, or could become available on a regular basis.

Existing data with potential for use in nutrition monitoring are patchy. There are, for example, significant collections of information about foods produced and processed but there are major gaps in data on food distribution and accessibility and dietary

* This section is based on background material researched and compiled by Karen Cashel and her important contribution is gratefully acknowledged.

intake. Where data are available, the primary need is for (further) analysis and interpretation pertinent to the objectives of a national food and nutrition monitoring and surveillance system. In many cases, these data have not been examined from this viewpoint. Where there are no data, it is necessary to find a way of identifying the specific information requirements of users of the system. Ways of data collection also need to be elucidated, provision being made for appropriate analysis of the data and for dissemination of information derived from them.

Approaches to obtaining data

Constituents of a monitoring strategy

The backbone of an ongoing monitoring strategy must be a series of comparable surveys of the core components of the strategy, from which trends can be identified and the progress of policy strategies or assessment against established nutrition goals and targets can be discerned. A practical strategy must build on existing systems wherever possible. The need for a national dietary surveillance program is now well established. The effective approach, in the first instance, will be to develop and implement at regular intervals a national nutrition survey to provide the core data set for monitoring.

Data on food intake and nutritional status for populations defined by other criteria—such as State representative populations and samples relevant to local government responsibilities—could be added through specific enhancements of the core monitoring, to encourage program planners at all levels to use the system. Intersectoral collaboration is vital. Sectors other than health provide other mechanisms for food and nutrition data collection and may be able to target specific population groups that either are difficult to reach by the core surveys or are of particular concern.

To achieve a national food and nutrition monitoring and surveillance system that is continuous, flexible and achievable, a primary goal will be the development of a broad collaborative network across all sectors of the food and nutrition system. This would consist of potential data contributors and data users, from both the public and private sectors. The development and establishment of such a system is not just a government concern, and those who see themselves as users of the system must recognise that they are potential contributors to it.

One approach may be the development of guidelines for a national food and nutrition monitoring and surveillance system, to optimise the potential for intersectoral cooperation and collaboration within and between the public and private sectors. It should be considered, however, that this would be a major undertaking. Such guidelines must deal with data requirements, data collection mechanisms, standardised methods, the adequacy and availability of analysis and reporting approaches, and mechanisms for obtaining feedback. The guidelines would form the basis for assessing the suitability of data for inclusion in the national data base.

The development of data collection methods and tools consistent with the guidelines that are widely available will enhance the effectiveness of the monitoring process. Further, the promotion of compatible approaches in the evaluation of food- and nutrition-related projects would enable the national monitoring system to facilitate such evaluation, and the outcomes may then contribute to the national data base.

Specific data needs

Composition of the food supply

A continuing program of national analysis of foods and food components, as well as a program to update the data base, are needed to provide up-to-date information about food availability and changes in the composition of the food supply. Important considerations include national trends in food technology innovation and the potential introduction and consumption of new foods, food safety and food hygiene, non-nutrient components of foods, and food ingredients.

Food habits, activity patterns and nutrient intakes

Estimates of food and nutrient intakes at national, household, group and individual levels can be used to identify potential nutritional inadequacies and inappropriate food consumption patterns. This includes issues specific to particular population groups, such as breast-feeding, and the nutritional adequacy of workplace, institutional and child-care food practices. It also encompasses related behaviours such as activity patterns.

Socio-cultural information

Socio-cultural information encompasses knowledge (including knowledge of the food system), values (including cultural attitudes determining the edible portions of foods, quality perceptions, meal patterns, and preferred food preparation and combination methods), behaviour, and the psycho-social aspects of food and food consumption (such as understanding the use of nutritional supplements). This information provides the basis for understanding changes in patterns of food selection and consumption and for designing health promotion programs. National data on food-related skills—for example, food handling, storage and preparation in the home, and the availability of various appliances—are useful indicators of changes in, and the ability to change, food practices.

Anthropometric, biochemical and haematological data

Relevant anthropometric data include birthweights, data on the growth of infants, children and adolescents, and on the healthy weight of adults. Such data are clear indicators of potential clinical problems and inappropriate patterns of food consumption. Data such as blood lipids, folic acid and measures of iron status are critical indicators of nutritional status and potential clinical problems. The nutrients of concern need to be determined with respect to other indicators of nutrients at risk of deficiency and the availability of adequate and standardised means of measuring levels. Such data are most useful if they are derived from the people who provided the dietary and anthropometric data.

Demographic data and vital statistics

Demographic data, such as age, sex, occupation and education are already collected and may be adapted for use in food and nutrition monitoring. Vital statistics, such as morbidity and mortality data, are also generally available but need to be further analysed and collated if they are to serve the needs of a food and nutrition monitoring system.

National reference standards

National reference standards relevant to nutrition monitoring would include the recommended dietary intakes for Australians, growth reference values for children, height–weight reference values for adults, dietary goals, guidelines and targets, and selected reference ranges and standard methods of measurement for biochemical indices of nutritional status. These national reference standards are necessary for the assessment of data collected.

7.3 Goals and targets

As part of the [National Food and Nutrition] Policy, diet and nutrition goals and targets will be defined. These will relate to the overall National Health Goals and Targets...⁴

As part of the policy implementation, the monitoring and surveillance strategy must be able to report against defined goals and targets.⁴

Background to nutrition goals and targets

Possibly the crucial event for nutrition monitoring was the establishment of the National Better Health Program. This Program not only supported the nutrition policy process but also established the importance of health goals and targets and the essential role of evaluation in program implementation and review. The Program commissioned the Australian Institute of Health (now Australian Institute of Health and Welfare) to report on progress towards meeting the Program targets.³

Before the National Food and Nutrition Policy was released the NHMRC, after extensive consultation, released the revised Dietary Guidelines for Australians.¹⁵ The guidelines are fundamental to the development of nutrition goals and targets.

The National Better Health Program goals and targets were taken from the Health for all Australians report,¹⁶ and had originated with the Better Health Commission in 1985.^{17,18} A revision of the goals and targets was commissioned as part of the concluding evaluation of the National Better Health Program.¹⁵

A workshop of representatives of the NHMRC, public health nutritionists, and the food industry was held in January 1991 to consider and develop revised nutrition goals and targets.¹⁹ These were also provided to the Health Goals and Targets consultancy team for consideration. Some of the nutrition targets were included in an amended form in the recommendations of the consultancy team presented in its 1993 report.²⁰ Generally, the health goals and targets proposals included goals for which targets could be set. The Workshop to revise nutrition goals and targets took a longer view, identifying goals for which there was not sufficient information to set targets but which recognised areas where monitoring was needed.

A full discussion of the 26 goals identified by the Workshop, the identified targets and the relationship with the national health goals and targets proposals can be found in Appendix D.

7.4 How existing national data collections can be used

Food supply: the apparent consumption data

Sections 2.3 and 2.4 discuss in detail the apparent consumption data. The data are used to monitor the nutritional adequacy of the food supply and trends in foods, food components, and foods as sources of nutrients. For some foods (such as refined sugars, alcoholic beverages, and fat spreads and cooking fats and oils) the data provide the only objective mechanism for monitoring levels and trends in supply. The data have been used in the development of the Dietary Guidelines, in monitoring the National Nutrition Goals and Targets, and in planning the National Food and Nutrition Policy. The usefulness of the data may be enhanced through modifications to the way in which they are collected and presented. Among the major considerations are the following:

- review of the classification of foods into groupings and subgroupings and choosing such groups to be consistent or comparable with data in other kinds of collections;
- the level of specificity of foods and commodities for which data are collected (for example, fat-modified margarines, fat-modified milk and other dairy products, and processed forms of major vegetables such as the potato);
- review of the availability of information on value-added product forms of the basic foods;
- review of data sources for major foods (such as breads) that are provided by many small-scale operators who are excluded from the existing data collection mechanisms;
- review of the frequency of the collection of data on specific foods such as oils and types of beer and extension of such censuses to other food areas;
- review of the range of nutrients estimated consistent with the available food composition data and the Recommended Dietary Intakes for Australia;
- contemporary data on home production of foods, including wastage and non-commercial fishing.

Household supply: the Household Expenditure Survey

The Household Expenditure Survey is a regularly conducted national survey currently aimed at providing information about expenditure patterns on specific broad categories of goods and, to varying degrees, the items within these broad categories. For food, information is collected on the amount of money spent and a description of the food purchased (for example, \$x on biscuits). Money spent away from home (for example, pocket money and money spent at school canteens, take-aways and restaurants) is not reported at this level of detail. Within the limitations of the food descriptions, the Household Expenditure Survey information allows determination of the proportion of income allocated to food in relation to other items; it also enables some monitoring of the trends in foods purchased (that is, in dollar value) by commodity groups.

Household-level food and nutrition surveys are a component of the food and nutrition information systems of many countries. Information at the household level is necessary for providing food data (both quantity and dollar value consumption data)

pertinent to the most important consumer unit for economic decisions. It is at the household level that the core decisions on food purchases and resultant consumption occur. Such decisions affect the food habits and intake of a number of otherwise individual consumers.

The Household Expenditure Survey has the potential to provide vital information about food and nutrition linked to expenditure and related issues and to become a major element of a national food and nutrition monitoring and surveillance system.

Suggested modifications that could be made include:

- extending the range of information obtained from purchase docketts such as recording amounts and adequate descriptions of products. This could include details of food and meals purchased away from home and where they were purchased;
- collecting information about vitamin and mineral supplements purchased (type, quantity, cost and use);
- inclusion of a short questionnaire on aspects related to food purchasing patterns, such as who is primarily responsible for food purchasing and when, where and how food shopping is done;
- possible extension of the questionnaire approach to include food-related appliances purchased and food preparation methods;
- incorporating a dietary subsample of household members or a subsample directed to specific groups (infant feeding practices, the elderly, adolescents, and so on). A self-administered 24-hour diet record at the beginning or end, or both, of the Survey diary period could be an acceptable and compatible approach. The recent change to continuous surveillance offers greater opportunity for collecting dietary data.

The individual: the National Health Survey

The National Health Survey is designed to obtain national benchmark information on a range of health-related issues and to enable trends to be monitored over time. The 1989–90 National Health Survey was the first in a new five-yearly series. Information was obtained from residents of a stratified multi-stage probability sample of 22 202 private and non-private dwellings. Specific groups, including institutionalised persons, were excluded from the Survey. Each person aged 18 years or older was interviewed personally, persons aged 15 to 17 were generally interviewed with the consent of a parent or guardian, and data for persons aged less than 15 years were collected from a 'responsible adult', usually the mother. The Survey's strengths include its large sample, its high participation rate, its coverage of all ages, and its coverage of rural Australians. The importance of diet as a component of health has already been acknowledged within this Survey and some action taken. The 1989–90 Survey incorporated a set of diet-related questions, a separate set of questions about alcohol consumption and a breastfeeding component. The National Health Survey has several prospective uses:

- the regular inclusion in the Survey of questions on key aspects of knowledge, attitudes, beliefs and behaviours related to food and nutrition and associated health issues;
- information related to food security issues;

- information on food preparation facilities, skills and practices, and food knowledge, attitudes, beliefs and behaviours;
- information on infant feeding knowledge, attitudes and practices and barriers to breastfeeding.

As is to be done in 1995, a nutrition survey including dietary, physical and biochemical measures can be conducted as a sub-sample of the National Health Survey.

Population Survey Monitor

The Population Survey Monitor, conducted by the Australian Bureau of Statistics, is a quarterly national survey of persons aged 18 years or over from 2000 households. It can provide information on the general population and on subgroups. Results become available within six weeks of completion of interviews and the data are comparable with other Bureau household survey data and the population census. The following are the core data items:

- personal characteristics—sex, age, marital status, birthplace, highest educational qualification, labour force status, occupation, usual gross income and major activity of those in work;
- household characteristics—dwelling structure, household family type, number of adults in household, age of eldest dependant;
- location—metropolitan, urban or rural.

Questions to elicit other specific information are then added by the commissioning body. The Bureau will assist in the formulation of questions if required. The charge is based on a set rate per question per quarter, although repeated surveys are discounted. Cost may be an important determinant of the utility of this service. The expected sample size and distribution are shown in Table 7.2; there is scope to vary the sample numbers and characteristics where necessary if, for example, information about specific subgroups within the population is sought.

Table 7.2: Expected sample size and distribution for the Population Survey Monitor, 1993

By age group	n	By State	n
18–20	139	NSW	482
21–24	173	Vic	416
25–34	444	Qld	340
35–44	414	WA	254
45–54	294	SA	241
55–64	228	Tas	136
65–74	185	ACT	87
75+	123	NT	44

Source: Population Survey Monitor project information supplied by ABS

Risk factor prevalence surveys

The 1989 Risk Factor Prevalence Survey was the third in a series of cross-sectional surveys conducted during the 1980s by the National Heart Foundation. Although there

were minor differences, the three surveys used basically the same methods. Prospective participants were mailed invitations with a specific appointment time to attend a local survey centre for a free check of heart disease risk factors. One of the surveys' strengths is the physical examination component, which comprises anthropometric measurements, blood pressure testing, and biochemical analysis of a blood sample for lipid status. The survey protocol was approved by the Ethics Committee of the Australian Institute of Health and Welfare.

Food safety and hygiene

'Market basket' surveys are the responsibility of the National Food Authority. These surveys, which are national, sample a range of foods as prepared for consumption across seasons.²¹ Residue and contaminant intakes are calculated from a representative diet approximated from the foods sampled. The main limitation is the small number of foods tested; further, because the prime objective of the surveys is to monitor contaminant levels, some of the foods are marginal in terms of amount consumed (for example, bran). Inclusion of additional foods of dietary significance would make the surveys more useful for nutrition monitoring. Supplementary surveys are conducted from time to time; these may enhance the quality of the information obtained. The National Food Authority also has the responsibility for processing and coordinating information on food toxicological and microbiological data collected at State and local government level.

National residue surveys are conducted to monitor residue levels in raw commodities and to provide direct information about these levels in the food supply. The range of commodities covers meats, grains, fruits and vegetables, eggs, honey, and dairy products; in future it will include fish and seafood. The results are available on a State, individual commodity or individual chemical basis.²² A large range of analytical techniques is used, and there may be potential to report additional data or include additional analyses from the sample.

Consumer attitudes: trends in Australia

The Australian Supermarket Institute, in collaboration with the United States Food Marketing Institute, organised surveys of supermarket shoppers' habits and attitudes in 1990²³ and 1992.²⁴ Many of the questions asked elicited useful information about attitudes and behaviours, and a complete section was devoted to nutrition issues. The range of nutrition questions was increased in the 1992 survey, and the National Better Health Program made a contribution to funding. Additional unpublished data from the survey were made available for this report, and continuing cooperation between the public and private sectors has the potential to further enhance this survey program. A necessary condition is respect for the confidentiality of commercially sensitive information. This may not pose a problem for nutrition monitoring because data regarded as 'aged' by commercial organisations may often be more current than any other data that are accessible.

Other industry sources of data

Data are collected in vast quantities by the food retail industry, by statutory authorities such as the Australian Meat and Livestock Corporation and the Australian Dairy

Corporation, and by many market research organisations. Several issues arise in relation to such data:

- confidentiality—access may be constrained because the material is commercially sensitive or because the survey data have high commercial value;
- physical accessibility—it may be difficult to trace the data custodian or it may be that analyses performed on the data are not useful for nutrition monitoring. Useful information may be obtainable from the original data but access may be difficult because of the volume of the data or the method of storage;
- cost—this applies particularly to market research organisations, whose product is information and who therefore must market their data. The data may be very useful, though, and negotiation should be part of the development of a monitoring strategy.

Some data source prospects are Brand Scan, warehouse withdrawals and compilation reports. The Australian Product Number Association, affiliated with the Australian Supermarket Institute, has Brand Scan information that may be available. Individual supermarket chains have checkout scanning data and have already made some of the data available to researchers. Market research organisations monitor consumers, using product bar codes to record products brought into the home. The primary source of warehouse withdrawal data is the AC Nielsen Sales and Marketing index and there are numerous ad hoc surveys carried out by market researchers that may be useful sources of data.

7.5 What else is needed?

Key indicators of change

Sometimes surveillance is impractical for technical reasons or because resources are limited. In these circumstances it may be feasible to monitor for changes in the system by indirect means. Key indicators can be developed from existing knowledge of associations within the food and nutrition system. Using key indicators as a monitoring tool adds breadth and flexibility. On one hand, they can be used to respond to identified specific problems; on the other hand, they enable researchers to take advantage of short-term opportunities for data collection.

Key indicators of change must be relevant to monitoring priorities, be reliant primarily on existing data collection mechanisms, and be both measurable and able to provide appropriate, timely information. Preferably, tools to monitor changes in key indicators should be adaptable for use in conjunction with existing data collection tools. An example would be a validated set of questions that could be added to questionnaire-based surveys of a sample population that is otherwise inaccessible to nutrition monitoring. Indicators may be clinical, biochemical or dietary. They may indicate structural change, outcome, impact or process, and they may be short, medium or long term; for example, vital statistics (long-term outcome), attitudinal or cognitive changes (process), or the proportional allocation of health funding between curative and preventive modes (structural).

Another instance of the use of key indicators occurs when a sentinel, rather than a national, approach is the most effective monitoring tool. A sentinel approach would

identify a community or sample group or occurrence in the food supply that can be monitored longitudinally; for example, growth rates in infants or incidences of food poisoning. A sentinel group needs to be representative of the population or population subgroup.

Positive indicators of health and well-being

It is now established that public health monitoring and surveillance must incorporate strategies for evaluating health as more than simply a state of disease avoidance. Current indicators, such as morbidity and mortality data, are not sufficient for the purpose.

Measures of food variety are possible candidates for use as key positive health indicators, based on an association between dietary variety and health.²⁵ They can be a flexible tool, not necessarily tied to a specific period or to assumptions about serve size or frequency.

The broader context within which nutritional health and well-being are pursued is also important and research is needed to identify barriers to the achievement of positive health status.

Further, an awareness of the possible health outcomes, both favourable and unfavourable, of using non-nutrients needs to be promoted, such as state of menopause, incidence of breast cancer, inflammatory joint disease, asthma prevalence, diabetes and its complications, and ethnic differences in food–health relationships. Australians may be on the threshold of major changes in health patterns, some of which will be attributable to changes in the use of non-nutrients in foods, both traditional and non-traditional.

Box 7.2: Monitoring biologically active food components

The monitoring of biologically active food components may become increasingly important. In the first place, this means that appropriate food analytical techniques to measure the components themselves must be available, for example:

- *HPLC (high-pressure liquid chromatography) for carotenoids and flavonoids, GLC (gas-liquid chromatography) for trans-fatty acids and GLC mass spectrometry for phytoestrogens;*
- *various advanced lipid chemistry techniques for products of lipid–protein or lipid–carbohydrate interactions that occur with newer cooking techniques such as microwave cooking;*
- *physico-chemical measurements for particle size in extrusion products.*

It also means that new approaches to toxicological methods, allowing assessment of non-classical toxicology must be available; for example, for sampling human colonic microflora, for studies of human colonic mucosa and cell biology, for studying hepatic and splanchnic metabolism, and for tissue measurement of non-nutrient compounds and their derivatives as well as nutrients.

A national dietary surveillance program

A national dietary survey has been included specifically as a National Food and Nutrition Policy strategy.⁴ The survey will be conducted in conjunction with the 1995 National Health Survey.⁹ The likely dietary intake data collection will include a 24 hour recall with a replication in a sub-sample, to obtain a better estimate of the distribution of intakes in the population. A semi-quantitative food frequency questionnaire at the same time will provide additional information about 'usual' intake in individuals.

The inclusion of a short-term method and a usual intake method adds to the potential for comparison with earlier surveys and for examining the comparability of intake data using different methods.

Confidentiality and privacy

Information collected by the Australian Bureau of Statistics, directly through household interviews or indirectly from the National Heart Foundation, State health authorities or other agents, would be subject to the confidentiality provisions of the *Census and Statistics Act 1905*; that is, information could not be released in any manner likely to enable the identification of an individual.

Australian Bureau of Statistics data collection complies directly with the information privacy principles set out in the *Privacy Act 1988*. For the nutrition component, some procedures such as physical measurements and feedback to respondents may need to be subject to clearance by an appropriate ethics committee.

Feedback to respondents

A number of ethical and operational issues are associated with feedback of results to the respondent or to the respondent's doctor, or both. The procedure and letter developed for the 1989 Risk Factor Prevalence Survey and approved by the Ethics Committee of the Australian Institute of Health and Welfare are a useful guide.

Data access

Data would be disseminated by the Australian Bureau of Statistics as published statistics and in the form of unpublished tables available in accordance with normal Bureau practices for special data services. A unit record file of unidentifiable records would be released for public use in accordance with existing policy and practice. Other analytical requirements could be met by arrangement with the Bureau, using the full survey file on the Bureau computer.

Follow-up of health outcomes

There is potential for relating diet to later disease experience by retaining a minimum level of data sufficient to enable linking with future disease outcomes. This would require the full name, date of birth and sex of participants to be retained for matching with mortality outcome through the National Death Index and for matching with cancer incidence through the National Cancer Statistics Clearing House. Both these registers are recent developments; they are kept at the Australian Institute of Health and Welfare for epidemiological purposes.

The inclusion of ongoing dietary surveillance in a national nutrition monitoring program has wide support. Dietary surveillance is a part of nutritional assessment, required to provide data for the assessment and monitoring of the following:

- foods consumed and nutrient intakes;
- nutritional status, related health status and health outcomes;
- social, environmental and economic factors associated with dietary intake and nutritional status;
- food standards, public health and food safety issues.

Data analysis would comprise subpopulation and trend analysis, assessment of over- and under-nutrition, and estimation of the distribution of intakes. Passive follow-up of outcome data using the National Death Index is also an option, as are passive follow-up studies of diet and health.

To be an effective part of the monitoring strategy, national dietary surveys should be repeated regularly. A survey every five years would be a reasonable balance between the need for information and the resources necessary to collect, process and analyse the data if the survey can be associated with the National Health Survey. Consideration could be given to a smaller but continuous data collection activity that could be aggregated over time. To give this a perspective, with the resources then available it took four years to code and analyse the data from the 1983 National Dietary Survey of Adults and to publish the basic nutrient intake data.

Nutrient analyses should be based on data held by the Australian Nutrient Data Bank, which is maintained and administered by the National Food Authority. Use of this data base for nutrient analyses should be promoted as the standard in Australia, thus removing one impediment to comparisons across surveys.

Reporting on monitoring and surveillance

Regular reports from a national food and nutrition monitoring and surveillance system are essential. These would deal with food and nutrition status and trends in Australia and focus on national policy goals and targets. It is critical that the information can be provided at State or regional level as well as at national level.

Such reports should also keep users aware of the development of new data collections, including the availability of survey methods and tools developed and of workers in the various areas of interest. It is important that the reports be positive tools for the food and nutrition sectors. The approach should balance identifiable achievements and further action.

Conclusion

A national food and nutrition monitoring and surveillance system will provide a basis for, and the mechanisms necessary for, monitoring public food and nutrition policy decisions related to programs, research directions and priorities, nutrition education, food production, food product development, food marketing, and aspects of food safety, fortification and labelling (especially regulation).

A national food and nutrition monitoring and surveillance system will both generate and collate information. It will provide a framework and a continuum for workers in food and nutrition—researchers, educators, producers—to place and assess their work.

Intersectoral collaboration will facilitate the development of a national food and nutrition data base and increase effectiveness of the national research effort.

The development of an extensive collaborative network as part of the system would provide the opportunity for a number of individuals and organisations to participate in and influence the further development of the system. An information and education component aimed at encouraging researchers and others to appropriately use and contribute to the national data base may facilitate this level of active participation.

References

1. Mason JB, Habicht J-P, Tabatabai H, Valverde V. Nutritional surveillance. Geneva: WHO, 1984;1-194.
2. McGinnis JM, Harrell JA, Meyers LD. Nutrition monitoring: interface of science and policy. *J Nutr* 1990;120(Suppl 11):1437-1439.
3. Australian Institute of Health. Improved Nutrition. Monitoring targets towards 2000. Statistical report to the Project Planning Team, National Better Health Program. Canberra: AIH, 1989;1-112.
4. Commonwealth Department of Health, Housing and Community Services. Food and nutrition policy. Canberra: AGPS, 1992;1-32.
5. Kelly A, Becker W. Nutrition information systems and data quality requirements. In: Becker W, Helsing E eds. Food and health data: their use in nutrition policy-making. Copenhagen: WHO Regional Office for Europe (WHO Regional Publications, European ser. no. 34), 1991.
6. Last JM ed. A dictionary of epidemiology. 2nd ed. Oxford: Oxford University Press, 1988;125-126.
7. NHMRC. Report of the 102nd session. Canberra: AGPS, 1987;36-37.
8. NHMRC. Report of the 112th session. Canberra: AGPS, 1991;14-15.
9. Department of Health, Housing, Local Government and Community Services. Unpublished information. 1993.
10. Risk Factor Prevalence Study Management Committee. Risk factor prevalence study report no. 1—1980. Canberra: National Heart Foundation of Australia, 1980;1-136.
11. Risk Factor Prevalence Study Management Committee. Risk factor prevalence study report no. 2—1983. Canberra: National Heart Foundation of Australia, 1983;1-119.
12. Risk Factor Prevalence Study Management Committee. Risk factor prevalence study: survey no. 3, 1989. Canberra: National Heart Foundation of Australia, Australian Institute of Health, 1990;1-141.
13. Australian Council for Health, Physical Education and Recreation. Australian Health and Fitness Survey 1985. Adelaide: ACHPER, 1985;1-201.
14. Kohlmeier L, Helsing E, Kelly A, et al. Nutritional surveillance as the backbone of national nutrition policy: recommendations of the IUNS Committee on Nutritional Surveillance and Programme Evaluation in Developed Countries. *European Journal of Clinical Nutrition* 1990;44:771-781.
15. NHMRC. Dietary Guidelines for Australians. Canberra: AGPS, 1992;1-110.
16. Health Targets and Implementation (Health for All) Committee. Health for all Australians. Report to the Australian Health Ministers' Advisory Council and the Australian Health Ministers' Conference. Canberra: AGPS, 1988;77-89.
17. Better Health Commission. Looking forward to better health. Volume 1. Final report. Canberra: AGPS, 1986.
18. Better Health Commission. Looking forward to better health. Volume 2. The taskforces and working groups: report to the Better Health Commission. Canberra: AGPS, 1986.

19. Workshop to revise nutrition goals and targets, Melbourne, 29 January 1991. Unpublished report. 1992.
20. Nutbeam D, Wise M, Bauman A, Harris E, Leeder S. Goals and targets for Australia's health in the year 2000 and beyond. Report prepared for the Commonwealth Department of Health, Housing and Community Services. Canberra: AGPS, 1993;1-269.
21. National Food Authority. Appendix 1. Functions and powers of the National Food Authority. In: Annual report 1991-92. Canberra: National Food Authority, 1992;55-56.
22. Bureau of Rural Resources. Report on the National Residue Survey 1989-1990 results. Canberra: AGPS, 1992;1-69.
23. Trends in Australia. Survey on consumer shopping 1990. Conducted for the Food Marketing Institute, the Australian Supermarket Institute and the Coca-Cola Company by Market Facts Inc. and the Roy Morgan Research Centre Pty Ltd. Washington, DC: Research Department, Food Marketing Institute, 1990;1-46.
24. Australian Supermarket Institute. Trends in Australia. Consumer attitudes and the supermarket. Conducted for the Food Marketing Institute and the Coca-Cola Company in cooperation with the Australian Supermarket Institute and the Australian National Better Health Program by Market Facts Inc. and the Roy Morgan Research Centre Pty Ltd. Washington, DC: Research Department, Food Marketing Institute, 1992;1-56.
25. Hodgson JM, Hage BH, Wahlqvist ML, Kouris-Blazos A, Lo CS. Development of two food variety scores as measures for the prediction of health outcomes. Proc Nutr Soc Aust 1991;16:62-65.