3.3 Food acquisition and household expenditure*

The pattern of household expenditure

The Australian Bureau of Statistics' Household Expenditure Surveys provide information on food expenditure patterns for four periods: 1974–75, 1975–76, 1984 and 1988–89. The main objective of the surveys is to ascertain how expenditures by private households on different categories of goods and services vary according to household characteristics, including income level, household size and composition, geographic location, and principal source of income. Information is collected on expenditures only, and the surveys do not include quantities of food purchased. It is therefore not possible to determine food and nutrient intakes from the surveys. In addition, data are collected on expenditure 'per household' and so do not give information about within-household distribution of the goods or services.

Comparisons between the four Household Expenditure Surveys are limited by differences between the surveys. The 1974–75 survey was restricted to the six State capitals and Canberra, and is not considered further here; the subsequent surveys included a representative sample of the wider Australian population. Some aspects of the broad commodity and service categories changed between the two earlier surveys and the two surveys undertaken in the 1980s, and some items moved from one category to another. For example, communication services (postal and telephone) were grouped with transport in the 1970s and with household services and operations in the 1980s. Education was linked to recreation in the 1970s but was listed in the miscellaneous category in the 1980s (although it is possible to align most if not all items at the broad level). Table 3.8 summarises the trend in expenditure between the 1975–76, 1984 and 1988–89 surveys for the broad expenditure groups.

In real terms, more money was spent on total commodities and services in 1975–76 than in 1988–89. There was a progressive decrease in money spent (in real terms) on food, alcoholic beverages, tobacco, transport, clothing and footwear, and a progressive increase in medical and health care expenditures. Between 1975–76 and 1984, current housing costs rose, but fell by 1988–89.

In 1988–89 Australian households spent on average $502.71 per week on commodities and service. Of this, 42 per cent was devoted to what might be termed the shelter, food and clothing, and footwear category—the contributing items being current housing costs (14.3 per cent), fuel and power (2.6 per cent), clothing and footwear (6.1 per cent) and, the largest expenditure group, food (19.1 per cent). Almost half of expenditure was spent on the three categories of housing, food and transport.

* The major contribution of Steve Crowley to the preparation and drafting of this section is gratefully acknowledged.

Table 3.8: ***Average weekly expenditure on broad expenditure groups, 1975–76, 1984 and 1988–89 Household Expenditure Surveys, all households***

	1975–76	Expend.	1988–89[(a)]	1984	Expend.	1988–89 [(a)]	1988–89	Expend.
Expenditure group	**$**	**%**	**$**	**$**	**%**	**$**	**$**	**%**
Current housing costs	23.65	13.7	72.13	46.46	12.8	65.14	71.80	14.3
Fuel and power	4.02	2.3	12.26	10.56	2.9	14.81	12.87	2.6
Food and non-alcoholic beverages	33.64	19.5	102.60	71.22	19.7	99.85	95.83	19.1
Alcoholic beverages	6.54	3.8	19.95	12.30	3.4	17.24	16.90	3.4
Tobacco	3.70	2.1	11.29	5.73	1.6	8.03	6.89	1.4
Clothing, footwear	14.35	8.3	43.77	23.46	6.5	32.89	30.73	6.1
Household furnish, equipment	na	na	na	27.69	7.7	38.82	37.37	7.4
Household services	na	na	na	15.70	4.3	22.01	24.11	4.8
Medical, health care	5.30	3.1	16.17	14.07	3.9	19.73	21.68	4.3
Transport	31.17	18.1	95.07	59.00	16.3	82.72	76.13	15.1
Recreation	14.59	8.5	44.5	43.13	11.9	60.47	59.37	11.8
Personal care	na	na	na	6.60	1.8	9.25	9.95	2.0
Miscellaneous	na	na	na	25.93	7.2	36.35	39.08	7.8
Total expenditure	**172.35**	**(b)**	**525.67**	**361.85**	**100.0**	**507.31**	**502.71**	**100.0**

na Not available

(a) Values expressed in the 1988–89 terms were derived by calculation from CPI data. The factor for 1975–76 was 3.05 and for 1984 was 1.402

(b) Only categories that correspond to the 1984 and 1988–89 Household Expenditure Surveys are included

Source: Australian Bureau of Statistics, 1975–76, 1984 and 1988–89 Household Expenditure Surveys

Food expenditure

In 1988–89 Australian households spent on average $95.83 per week on food and non-alcoholic beverages and $16.90 on alcoholic beverages. Table 3.9 shows the distribution of food expenditure for the 1975–76, 1984 and 1988–89 surveys.

The two main expenditure items were meals out and take-aways, and the meat, seafood and eggs group, although the former is increasing over time and the latter decreasing. In 1988–89 just under 44 per cent of total food and alcohol expenditure was spent on cereals, fruit and vegetables, the meat and seafood group, and dairy products, but this excludes those components purchased as take-aways and meals away from home because the Household Expenditure Survey does not provide this level of detail for foods eaten away from home. The relative contributions of dairy products, fats and oils, and alcohol to expenditure also declined in this time, although it can be inferred that by 1988–89 a proportion of this expenditure resided within the take-away and meals away from home group.

It must be remembered that these trends do not necessarily represent changes in what is eaten: relative price movements between the various food categories will also influence the pattern of expenditure. The level and compatibility of information about elasticities of food demand, substitutability and relative prices changes are insufficient to determine change in consumption.

One method of reflecting change in intake over time is to combine information relating to nominal expenditures on food items in each of the Household Expenditure Surveys with data on price movements for the same items between the surveys. This analysis could be undertaken, but only for capital cities because CPI data relate only to the capital cities.

Table 3.9: ***Average weekly expenditure on selected food items, 1975–76, 1984 and 1988–89 Household Expenditure Surveys, all households***

	1975–76 Survey		1984 Survey		1988–89 Survey	
Food item	**$**	**%**	**$**	**%**	**$**	**%**
Bread, flour, other cereals	2.42	6.0	4.96	5.9	7.06	6.3
Fruit and vegetables, juices	4.82	12.0	10.98	13.1	15.24	13.5
Meat, seafood, eggs	8.79	21.9	16.61	19.9	19.53	17.3
Milk, cheese, other dairy	3.18	7.9	6.13	7.3	7.23	6.4
Subtotal	**19.21**	**47.8**	**38.68**	**46.1**	**49.06**	**43.5**
Snack foods	4.99	12.4	10.46	12.5	14.44	12.8
Margarine, butter, oils, fats	1.21	3.0	1.76	2.1	1.75	1.6
Meals out and take-aways	6.10	15.2	15.40	18.4	23.48	20.8
Other food	2.12	5.3	5.03	6.0	7.08	6.3
Total food	**33.63**	**83.7**	**71.24**	**85.3**	**95.81**	**85.0**
Alcoholic beverages	6.54	16.3	12.30	14.7	16.90	15.0
Total food and alcohol	**40.17**	**100.0**	**83.54**	**100.0**	**112.71**	**100.0**

Note: per cent totals may differ from 100 due to rounding
Source: Australian Bureau of Statistics, 1975–76, 1984 and 1988–89 ABS Household Expenditure Surveys

Effect of location on prices

The limited information on price differences across Australia does show that urban–rural price differences are significant.[24] The Australian Bureau of Statistics collected data on the relative prices of food in selected cities and towns from 1984 to 1990 (catalogue number 6404.0 [25]—see Table 3.10), but this survey is no longer conducted.

Remoteness results in higher prices. On mainland Australia, the greatest price differences from the nearest capital city were found in remote Aboriginal communities in the Northern Territory (Nhulunbuy and Yulara), in north Queensland (Cooktown), and in the Kimberley region of Western Australia. Sullivan et al.[26] also found high relative food costs in the Kimberley region in 1986, using a locally relevant 'market basket' (the range of items available was also smaller than in Perth). The results for the two towns covered in both surveys—Broome and Halls Creek—were similar. Food was about 40 per cent dearer in Halls Creek than in Perth, and 15 per cent dearer in Broome than in Perth.

Table 3.10: ***Indexes of relative prices of food, Australian cities and towns, 1984 to 1990(a)***

	Index numbers as at 15 May						
City or town	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**
New South Wales							
Sydney	100	100	99	100	101	100	101
Bourke	112	112	112	112	111	112	112
Broken Hill	107	110	113	113	110	110	107
Dubbo	102	103	104	106	103	103	101
Lord Howe Island	na	155	143	157	149	143	147
Parkes	107	109	106	109	107	106	103
Victoria							
Melbourne	100	100	101	101	100	102	102
Queensland							
Brisbane	99	97	98	98	97	98	96
Blackall	113	114	113	115	111	110	105
Cooktown	126	122	118	120	123	122	122
Cunnamulla	118	116	118	115	113	111	109
Hughenden	119	118	117	115	114	112	107
Mount Isa	113	114	111	114	114	111	105
Thursday Island	155	164	157	154	147	141	137
Weipa	126	120	126	131	127	124	119
Western Australia							
Perth	99	100	102	100	100	100	100
Broome	113	115	115	112	116	115	116
Carnarvon	111	106	110	105	103	103	107
Fitzroy Crossing	na	na	na	na	na	121	124
Halls Creek	139	140	137	136	130	124	130
Kalgoorlie–Boulder	106	107	112	109	110	109	109
Marble Bar–Nullagine	na	134	140	133	130	129	133
Meekatharra	na	109	110	111	109	109	110
Wyndham	121	na	na	na	na	115	119
South Australia							
Adelaide	99	99	98	97	96	97	93
Ceduna	108	106	106	104	103	104	101
Coober Pedy	na	112	114	114	113	112	110
Port Augusta	102	102	104	105	98	100	99
Tasmania							
Hobart	107	106	108	108	107	105	104
Australian Capital Territory and Northern Territory							
Canberra	105	104	103	100	99	99	99
Darwin	112	112	112	112	111	108	109
Alice Springs	114	114	117	115	109	112	110
Katherine	118	122	122	124	118	117	115
Nhulunbuy	122	127	121	122	136	132	136
Tennant Creek	116	118	119	118	118	113	110
Yulara	na	na	na	na	na	136	132

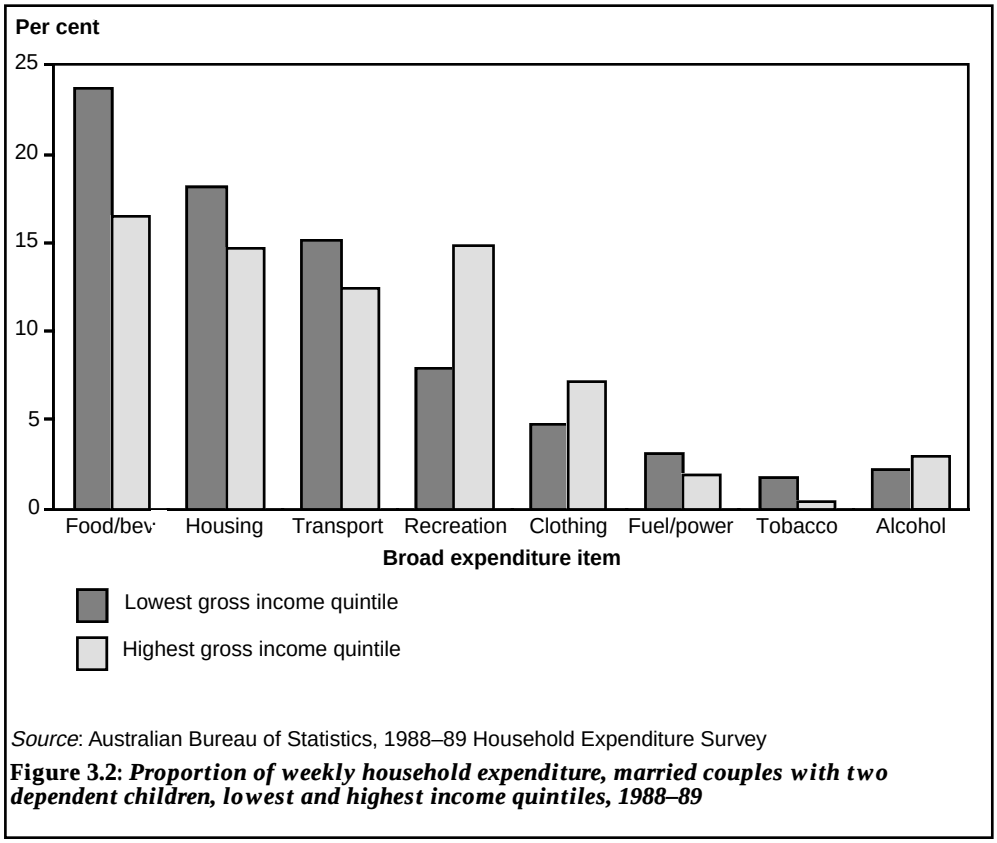
na Not available

(a) Base: weighted average of eight capital cities at each particular time = 100

Source: Australian Bureau of Statistics[25]

Food expenditure and income

Low-income households (and individuals) spend considerably less on food compared with the more affluent, but the proportion of total expenditure that this represents is significantly greater. For example, in the 1988–89 Household Expenditure Survey, the lowest income quintile for a household consisting of a married couple and two dependent children spent $109.63 a week on food and beverages, this representing almost 24 per cent of total commodity expenditure (see Figure 3.2). The highest income quintile for this household type spent $178.30 a week on food and beverages but this represented only 16.5 per cent of the household budget. For both income groups the proportion of expenditure devoted to food has declined significantly since the 1984 survey. This propensity to spend a high proportion of household expenditure on food has been shown for other low-income household structures.[27]



Source: Australian Bureau of Statistics, 1988–89 Household Expenditure Survey

Figure 3.2: ***Proportion of weekly household expenditure, married couples with two dependent children, lowest and highest income quintiles, 1988–89***

The pattern of food purchases differs between households of different structures, and particularly with varying income levels. Table 3.11 categorises the detailed food items of the Household Expenditure Survey (for the top and bottom income quintile for a family of two parents with two dependent children) into broad food groups to compare the purchasing patterns of the different household groups. Low-income

groups are more likely to spend a larger proportion of their scarce resources on breads and cereals, fruit and vegetables, meat and meat products, and dairy products. This again is consistent with the finding that the purchase of foods considered to be staples tends to be price-inelastic.

The lowest income group was spending 59.3 per cent of its scarce resources on food within these four groups in 1984, and this decreased to 53.2 per cent in the 1988–89 Household Expenditure Survey. The corresponding figures for the highest income quintile were 48.1 per cent (1984) and 40.4 per cent (1988–89). This must be qualified by the fact that high-income groups spend more money on take-aways and food eaten away from home. Other differences of note are that the lowest income quintile spent a higher proportion (but slightly less in dollar terms) of its food budget on meat and seafood, the same proportion on high-fat and high-sugar snack foods (and so less in dollar terms), and a much lower proportion on take-away foods and meals eaten away from home. For both low- and high-income groups, the amount spent on this last category increased between 1984 and 1988–89.

Table 3.11: ***Average weekly expenditure on selected food items, married couples with two dependent children, lowest and highest income quintiles, 1984 and 1988–89***

	Lowest income quintile				Highest income quintile			
	1984		1988–89		1984		1988–89	
Food item	**$**	**%**	**$**	**%**	**$**	**%**	**$**	**%**
Bread, flour, other cereals	6.15	7.6	8.25	7.5	6.8	5.7	10.38	5.8
Fruit and vegetables, juices	11.52	14.3	16.67	15.2	16.38	13.8	23.52	13.2
Meat, seafood, eggs	21.68	26.9	24.07	22.0	24.41	20.6	27.55	15.4
Milk, cheese, other dairy	8.48	10.5	9.28	7.5	9.53	8.0	10.60	5.9
Subtotal	**47.83**	**59.3**	**58.27**	**53.2**	**57.12**	**48.1**	**72.05**	**40.4**
Snack foods	11.38	14.1	17.47	14.4	16.97	13.6	24.06	13.5
Margarine, butter, oils, fats	2.03	2.5	1.95	1.8	2.36	1.9	2.04	1.1
Meals out	2.87	3.6	6.06	5.5	11.66	9.8	21.27	11.9
Take-aways	5.58	6.9	8.82	8.0	11.22	9.4	21.92	12.3
Other food	4.94	6.1	7.46	6.8	6.49	5.5	9.25	5.2
Total food	**74.63**	**92.5**	**100.03**	**91.2**	**105.82**	**89.1**	**150.59**	**84.5**
Alcoholic beverages	6.07	7.5	9.60	8.8	12.95	10.9	27.71	15.5
Total food and alcohol	**80.70**	**100.0**	**109.63**	**100.0**	**118.77**	**100.0**	**178.30**	**100.0**

Note: per cent totals may differ from 100 due to rounding

Source: Australian Bureau of Statistics, 1984 and 1988–89 Household Expenditure Surveys

3.4 Sources and extent of consumers' nutrition information*

The principal sources of nutrition information are the mass media (particularly the print media); family, friends and school; the environment (for example, billboards, point-of-sale information, and food labels); health professionals and health organisations; 'alternative' health practitioners; and, for women but not men, health shop staff.[28–32]

The extent to which information is sought from each of these sources depends on sex, age, socioeconomic status and cultural tradition. Radio appears to have a minor role. Nutrition information (and misinformation) may also be unconsciously absorbed through exposure to both overt and indirect messages in the media and the environment. A significant proportion of the population appears not to actively seek nutrition information.

Surveys indicate that, although the mass media predominate among sources of nutrition information (see Table 3.12), these most frequently used sources of information tend to have the least credibility, while less frequently used sources, such as the National Heart Foundation and dietitians, are accorded the most trust.[30,33] Nevertheless, it should be remembered that much of the information carried by the media (magazines, newspapers, television and radio) originates from a 'reputable' source within the health sector; public opinion may reflect a distrust of the media in general.[30] One-quarter of the population surveyed by Crawford and Baghurst believed the media 'should be doing a better job' in promoting nutrition education and research.[32]

The print media

The pre-eminence of the print media as a source of nutrition information is confirmed in many surveys.[34] A 1974 survey reported that only 10 per cent of female respondents, and 40 per cent of males, did *not* read, regularly or occasionally, nutrition articles in popular magazines; 72 per cent of women reported reading articles in the *Australian Women's Weekly*.[35] Nutrition information need not be confined to articles devoted to food and nutrition; both medical advice columns and cooking features may touch on nutrition, and advertisements may also convey nutrition messages.

Women's magazines are a constant source of information on food and nutrition, albeit of varying accuracy.[36–38] In 1985 Reilly reviewed the nutrition information in Queensland newspapers over 18 months, concluding that the press did not generally promote ideas in conflict with the Dietary Guidelines for Australians.[39] According to a study of women's magazines in 1984, 12 articles giving nutrition information were published in 12 issues of the *Australian Women's Weekly*, 34 articles in 50 issues of *Woman's Day*, 46 articles in 52 issues of *New Idea*, and 15 articles in 14 issues of *Family Circle*.[36] Approximately half of these articles were considered to contain misinformation.[37] A later study of a similar group of women's magazines concluded

* The major contribution of Barbara Santich to the preparation and drafting of this section is gratefully acknowledged.

that about one-third had some inaccuracies.[38] On the other hand, analysis of one year's issues of a popular magazine aimed at teenage girls showed that six out of the seven articles conveying nutrition information carried a positive message, although their effect may have been undermined by the predominantly negative messages in advertisements, incidental nutrition references, and a heavy emphasis throughout on body image.[40]

The print media obviously have the potential to influence a large proportion of the population, which means that it is important that their information is appropriate and accurate.

Table 3.12: ***Sources of nutrition information referred to during past 12 months (per cent)***

	Survey				
	1984				
Source	With supplements[(a)]	Without supplements[(b)]	1985	1988	1991
Magazines, newspapers, product information	37	17	–	27	58[(c)]
Nutrition and diet books	–	–	–	21	23
Other media	–	–	–	18	51[(d)]
Family, friends	24	15	–	20	18
Medical doctor	21	12	14	19	26[(e)]
Chemist/pharmacist	4	2	–	3	7
Dietitian/nutritionist	6	5	6	8	7
Nurse	3	1	–	–	–
Naturopath/herbalist	12	3	4	–	–
Community health centre	–	–	–	3	–
National Heart Foundation	–	–	–	11	–
Anti-Cancer Council	–	–	–	3	–
Department of Health	–	–	–	3	–
Supermarket	–	–	–	–	6
Health food shop	15	3	10	6	13
Fitness/gym staff	9	4	–	–	–
Slimming club	–	–	–	–	5
Other	5	3	7	–	–
No referrals	32	58	–	43	–

– Not surveyed

(a) Respondents who used dietary supplements (vitamins, bran, wheat germ)

(b) Respondents who did not use dietary supplements

(c) Magazines 37%, newspapers 21%

(d) Television 33%, radio 18%

(e) Doctor and/or health centre

Sources: 1984—Worsley & Crawford;[29] 1984—Crawford et al.;[31] 1985—Crawford & Baghurst;[32] 1991 Worsley[30]

Television

Advertisements

Food advertisements form a substantial component of all television advertising; according to a 1989 survey, in the period between 5 pm and 6 pm food advertisements constituted 46 per cent of all advertisements, and 37 per cent between 7 pm and 8 pm; in the 'children's hour', from 4 pm to 5 pm, they constituted 76 per cent of all advertisements.[41] Morton and Smith noted that food and nutrition messages occurred frequently on Australian television but were generally more positive than those shown overseas.[42]A similar survey showed that in the 3.30 pm to 6.00 pm period, in one week on three commercial channels, 30 per cent of advertisements were promoting food products and 81 per cent of the products were high in fat, energy, sugar or salt (for example, chocolate, confectionery, biscuits, sweetened breakfast cereals, sugared drinks, savoury snacks, packaged meals and convenience foods).[43] Woodward et al. reported that high school students who watch commercial television for more than three hours a day differ from their peers in both their dietary behaviour and their perceptions of foods and food norms.[44]

Approximately half of a sample of women living in an area of low socioeconomic status referred to television commercials when asked if they had recently seen, read or heard anything about 'healthy eating'.[45] More importantly, there was no indication that the women interviewed exercised any discrimination between the various advertisements. Although a proportion of the advertisements originate from sources disposed to provide information consistent with the Dietary Guidelines (the Australian Meat and Livestock Corporation, the Australian Dairy Corporation, and Foundation South Australia, for example), some are likely to be giving less appropriate messages (commercial weight-reduction treatments, high-fat, high-sugar snack food promotion, and so on).

Young teenagers appear to discriminate no better than older people. Morton has shown that young teenagers claim to like (food) advertisements as much as, or better than, the programs and have a high recall of the characters, slogans and jingles in these advertisements; high school students had excellent recall of nutrition messages in breakfast cereal advertisements.[46]

Television commercials have the potential to reach a very high proportion of the population and to promote 'healthy' eating practices. Two commercials run in Perth in a four-week period were seen by 70 per cent and 60 per cent respectively of shoppers sampled and, of these, 85 to 92 per cent recognised the main message about the desirability of reducing consumption of fatty foods and about the need to be aware of the fat content of foods.[47]

Programs

'Healthy' eating habits can also be promoted through television programs. *Everybody*, a 'health and lifestyle' program, is reported to have a weekly viewing audience of more than one million.[48]

Television is also a passive conveyor of nutrition information; for example, in 'soaps', where eating and drinking activities are frequently used as dramatic devices to facilitate communication between the characters.[49] An analysis of three Australian

'soaps' showed the nutrition messages to be predominantly positive, with meals generally following the Dietary Guidelines, although snacks were more likely to contravene the guidelines. Because these programs offer powerful role models, it may be that for children the positive messages counteract some of the other negative messages in television advertising.[49]

Family, friends and upbringing

By their very design, surveys such as those summarised in Table 3.12 neglect the importance of school education and the family environment. It is likely that the fundamental knowledge of and beliefs relating to food and nutrition are absorbed at a relatively early age, passed on from school and parents. Among Italian-born adults, one-quarter relied on parents or tradition for nutrition information.[35] In a low-income area, Australian-born women's beliefs about 'good foods' were often directly derived from their mothers and reflected the nutrition emphases of an earlier generation.[50] Very few of the study women remembered anything about nutrition from high school, where nutrition education was often a topic in cooking or home economics courses.[45] Some of them, however, claimed to have benefited from the nutrition education given their children, who brought home 'healthy eating' messages from primary school programs (see also Section 3.6).[45] The recent paper by Jamrozik et al., reporting nine oral histories given by women aged 55 to 60 years in Perth, also illustrates the long-lasting influence of upbringing on attitudes and habits.[51]

Dietitians and nutritionists

The Better Health Commission noted in 1986 that there was in Australia only a handful of medical nutritionists (medical specialists in clinical nutrition) and supported the increased availability of dietitian–nutritionists and medical nutritionists, but this is yet to occur.[52] The few medical nutritionists working in Australia are largely occupied with research and the education of health professionals, particularly dietetic and medical students. There is also an unknown but small number of nutritionists with scientific qualifications who are not dietitians

The estimated number of dietitians practising in Australia is below 2000, and more than 80 per cent of them work in clinical settings.[53] Dietitians are perceived as relatively inaccessible;[55] Legge et al. estimated their availability at one per 100 000 people, compared with one GP per 770 people.[54] It has been advocated that, because there are so few dietitians, the best use of this resource would be to provide authoritative dietetic support to other professional groups (indeed, their training equips them for this role) through improved communication of dietitians' cross-disciplinary skills, particularly those that extend beyond clinical nutrition.[54,56]

Possibly as a consequence of their rarity outside the hospital setting , and despite their specialist expertise and high credibility, dietitians are infrequently used as a source of nutrition information. They are probably seen as providing specialised advice rather than 'nutrition information'. In comparison with GPs, who rate highly in terms of both access and credibility, dietitians do not have the same decision-making responsibilities and are relatively expensive—consultations with dietitians in private practice do not attract a Medicare rebate (private health schemes do, however, provide some cover)—and this may discourage their use for general 'information' purposes.[54]

There is also a role for dietitians within the food industry, and it appears that industry is increasingly taking advantage of their skills in the preparation of informative materials and the presentation of information. In this way, dietitians can indirectly enhance the credibility of the food industry as a reliable source of nutrition information.

Community nutritionists, working from community health centres, provide a wide range of services, from individual dietetic counselling to practical group sessions aimed at improving skills and knowledge. Although provision of these services has increased, of those dietitians who were members of the professional organisation (Dietitians Association of Australia) only 15 per cent of those employed in Australia in 1993 were in community health programs (compared with 8 per cent in 1985).[53]

Other health professionals

The pervasive influence of nutrition in health means that many health professionals deal with health problems that have a nutrition component and may be the only available information provider. Among these professionals are medical practitioners, nurses, community health workers, health educators, physiotherapists, podiatrists, social workers and pharmacists. Medical practitioners (especially GPs), pharmacists and community health personnel have been identified as recognised sources of nutrition information.[28–31] There is certainly a case for providing support through access to dietitians and nutritionally appropriate resource materials from reputable sources. There is also a case for the inclusion of basic nutrition knowledge in graduate courses (see Section 3.6). Some courses already have a nutrition component but this may not yet be sufficient. Pharmacists, for example, have a nutrition component in their training, with the emphasis on appropriate diets and dietary practices for various diseases (diabetes and hypertension, for instance) and for pregnancy and lactation. They may also be asked by the public for advice on the appropriateness of dietary supplementation with vitamins, minerals and other products.[57] Product information displayed and available in retail pharmacies, however, generally relates to products sold on the premises. These rarely include food.

The ‘alternative’ health industry

Table 3.12 shows that naturopaths, herbalists, health food shop proprietors, slimming clubs and commercial physical fitness establishments are information sources for some people. A survey of practising chiropractors revealed that 75 per cent of the respondents provided patients with dietary advice (food selection and eating habits) as one of their clinical interventions; for 28 per cent of respondents it was their first intervention.[58] Respondents endorsed the Australian Dietary Guidelines and approximately two-thirds implemented nutritional strategies to reduce consumption of fat, salt and alcohol. On the other hand, a significant proportion also recommended dietary supplements.

There are good reasons for seeking to influence the nutrition knowledge base of such groups through training courses, provision of resource materials, and provision of access to reputable information sources. The boundary between ‘orthodox’ and ‘alternative’ health practitioner disciplines is neither clear nor relevant: all are possible providers of information about nutrition, and that information could influence eating behaviours.

Private and public health organisations

A wide range of nutrition information materials and nutrition information is provided by organisations such as the National Heart Foundation, the Anti-Cancer Councils, State health promotion bodies (for example, in Victoria and South Australia), relevant State and federal government departments and statutory authorities, the Australian Nutrition Foundation, the Australian Food Foundation, the Dietitians Association of Australia, the Australian Consumers Association and other consumer groups, and local government and community organisations. The National Heart Foundation commissioned a qualitative study of community attitudes in 1989; the results suggested that people did not differentiate greatly between government and non-government organisations—there was a perception, for example, that the National Heart Foundation was funded by government.[33]

Food product information

The provision of information about food products is an essential part of the functions of the National Food Authority. It provides printed nutrition information directly to the public and administers the analysis and reporting of food composition for professional use. It is also involved through the review of the Food Standards Code, the basis for food laws that regulate the amount and type of information appearing on food labels.

Food labels typically give details of selected aspects of the nutrient composition of a particular food and thus can be considered to provide a specialised form of nutrition information. A small but significant proportion of shoppers refer to the nutrition panel on food labels: 29 per cent of one sample claimed to have read such information.[30] In another survey only about one-third of a sample of women shoppers, and about half the men shoppers, claimed *not* to read this information.[59] About 50 per cent of shoppers claimed that they sometimes used this information to compare foods and about 33 per cent used it often; women were more likely than men to make such comparisons.[60] People aged over 30 years read the labels on foods more often than people under 30 years.[61]

The importance of the food industry

Providing nutrition information

There is no legal requirement to provide nutrition information on food product labels if no claim related to nutrient content is made.[62] Thus the food industry is the arbiter: generating the legal necessity for nutrition information is at the discretion of the industry source. Otherwise, nutrition information may or may not be provided at the discretion of the manufacturer.[62] Many food manufacturers and marketers do provide nutrition information, either voluntarily or by opting to include a nutrition claim in their advertising. Furthermore, many industry organisations sponsor, underwrite or generate nutrition education and information resource materials. This is usually with very restrained advertising, often confined to identification of the originating company. It must be recognised that commercial profitability is a legitimate and desirable objective of the private sector and should be taken into account (the nutrition and health consequences of inequalities in wealth distribution are a separate issue and are discussed in Chapter 6). Whatever the motive, the food industry is a major source of accurate nutrition information.

Point-of-sale

Although few people appear to rely on supermarkets as a source of nutrition information, the supermarket can be an important site for the provision of such information through a variety of avenues (pamphlets, cooking demonstrations and tastings, 'shelf talkers', video demonstrations, and so on). The advantages of providing nutrition information at the point of purchase (that is, in the supermarket) are increasingly recognised, and the participation of major chains is growing. Further, the supermarket can be seen as a community resource and integrated into nutrition education and promotion campaigns along with other sources of information (the print media, radio and television), either in specific local communities or nationwide.[47,63,64] Evaluations of several such integrated programs suggest that the provision of information (about fat and sources of fat in the diet, about bread and its benefits, about a 'healthy diet') can result in changes in food purchase patterns and a greater awareness of nutritionally desirable dietary practices.[47,63,65]

Similarly, the supermarket is viewed as an appropriate site for enhancing consumers' nutrition knowledge, in particular their understanding of the nutrition information on food labels. Participants' responses to supermarket tours indicate that such tours can improve nutrition knowledge and lead to changes in dietary practices.[66] Workplace canteens offer similar opportunities for point-of-purchase nutrition information.

McDonalds Australia Limited is a significant food supplier, selling, for example, 200 million buns in 1992.[20] It provides explicit nutrition composition information on its product range (energy, carbohydrate, fat, protein and sodium) together with dietary information based on the Dietary Guidelines.[67]

Within-population differences in use of information sources

Women seek and use nutrition information more than men. A five-State Australian survey in 1988 showed that women use nutrition or diet books and magazine and newspaper articles more than men and are also more likely to refer to a family member, close friend or community health centre.[68] In a survey of shoppers, more women than men had sought nutrition information, had read the nutrition information panel on a food product in the preceding shopping trip (31 per cent of women, compared with 16 per cent of men), were more interested in nutrition and talked more about nutrition.[30]

Younger age groups tend to use nutrition information more than older age groups. More younger women than older women report seeking information from family, friends and various media sources; more younger men than older men refer to magazines, newspapers and other media, and more older men seek advice from doctors.[68]

High School students are more likely than their parents to view the media as the most important source of nutrition information, and younger people are more likely than older people to have changed their diets in response to a newspaper advertisement or advice from a friend or relative.[30,69] Older people, however, are more likely than younger to use nutritional information on food labels as a basis for comparison.[59]

The higher the socioeconomic status, the more likely are both men and women to look for information in newspaper and magazine articles.[68] In contrast, tertiary-educated individuals appear to be less interested in label information on foods.[59]

It has been noted that rural populations have some characteristics that differ from those of urban dwellers. A recent study by Humphries et al. of populations in western New South Wales confirms that patterns of use and the credibility of preventive health sources resemble the national pattern but that accessibility is a powerful influence. The importance of the pharmacist was significantly greater in the town of Gilgandra, which had a chemist shop, compared with the smaller township of Gulargambone, which did not.[70] The study asked only a general question about sources of information to prevent ill-health, so no specific inference can be drawn about nutrition per se.

Finally, the preferred source of information may vary according to ethnic origin. In a Perth survey of 166 Italian-born people and 173 Australian-born people of English-speaking background, only 19 per cent of those of Italian origin referred to the media, health professionals or other 'outside' sources, compared with 46 per cent of the English-speaking group.[34] Access to and the appropriateness of nutrition information sources, particularly for those of non-English-speaking background, may limit the usefulness of the information in this respect.

Role of nutrition knowledge

Nutrition knowledge, skills (application of knowledge) and attitudes (for example, towards health, nutrition, and the relevance of nutrition to health) are the principal psychosocial variables thought to influence food choice and eating habits. In this context, 'nutrition knowledge' encompasses nutrition awareness—for example, being aware of the Australian Dietary Guidelines or of messages to eat less fat. Often, however, the term is given a more narrow interpretation (factual or theoretical knowledge) and separated from awareness; in the example cited the corresponding nutrition 'knowledge' would relate to the role of fat in the body and sources of fat in the diet.

These psychosocial variables are not independent in the various models that have been proposed to illustrate the processes involved in food choice or in achieving changes in eating habits. The process of successful behavioural change can involve a sequence of steps from awareness to knowledge, motivation, skills, action and maintenance.[71] Nutrition knowledge can influence attitudes and indirectly affect behaviour; it can also be the basis of attitude and commitment.[72,73] On the other hand, awareness and attitude may assist in the translation of knowledge into practice and skills.[74] Several studies have shown that the level of nutrition knowledge is not necessarily related to diet and eating habits, nor is the provision of nutrition information necessarily related to a change in eating habits.[72,75–77] One report of an attitudinal survey noted 'widespread awareness' of appropriate dietary habits but commented, '… there were repeated signs that *knowledge* of particular virtues was often quite unrelated to *behaviour*'.[33]

Factual knowledge

There are difficulties associated with the assessment and interpretation of 'nutrition knowledge'. In most studies, 'nutrition knowledge' is implicitly understood as beliefs that conform to the current nutritional orthodoxy (in one study, doctors, medical students and nurses who did not give the 'right' answers were described as having 'irrational opinions on certain nutritional matters').[75] This interpretation tends to ignore the fact that nutritional orthodoxy does change over time, as knowledge is continually

modified by the results of research, and that these changes might take some time to filter through the population.

The usual method of assessing nutrition knowledge is by means of a questionnaire in which the range of responses is limited to right/wrong/don't know; allowance is rarely made for qualification of responses (for example, right in a particular set of circumstances). In a population, the level of nutrition knowledge is usually expressed as the proportion of correct answers to a series of specific questions relating to the nutrient composition of foods, the role of particular nutrients in the body, and beliefs about food and health. In British studies in the 1960s and 1970s, for example, nutrition knowledge was interpreted variously as familiarity with nutritional terms (such as vitamins, protein and calories), an understanding of the sources of nutrients ('What foods provide protein?'), and an understanding of the function of particular nutrients ('What is the function of protein in the body?').[74] Such assessments represent nutrition knowledge in terms of nutrients and reinforce a separation of nutrition from food choice and eating habits. Both the choice of questions and the way in which the questions are expressed may reflect a particular nutritional bias.

The several studies done in Australia show nutrition knowledge (assessed in this way) to be relatively poor. Heywood used a modified American questionnaire to estimate nutrition knowledge in a sample of 823 Sydney women.[78–80] Questions were asked about the availability of certain nutrients from the regular diet, the nutritional qualities and functions of particular foods, and the nutritional composition of various foods. The results showed 'a lack of knowledge and confusion about nutrients' and 'confusion about foods and nutrients as sources of energy'. Similarly, residents of Western Sydney had little knowledge of which foods actually contained large amounts of fat (most respondents did not know that fried chicken and meat were sources of fat), although they were aware of the association between animal fat intake and heart disease.[71] Other studies report specific knowledge, such as an awareness of the cancer risk associated with the consumption of certain foods, to be low.[81]

Baghurst and McMichael report a low level of nutrition knowledge in a group of undergraduate students (average age 18 years) and male, non-officer, service recruits (average age 22 years).[75] Their questionnaire asked about the energy and nutrient contents of various foods and the physiological roles of various nutrients, and presented a number of misconceptions about dietary practices and food values with which the respondents were asked to agree or disagree. The proportion of correct answers overall was 44 per cent for recruits, 53 per cent for male students and 58 per cent for female students. In the section where respondents were asked to match nutrients and functions, the proportion of correct answers ranged from 28 to 86 per cent; in matching foods and calorie contents, 9 to 45 per cent of answers given were correct; and in the final section on nutritional misconceptions, the proportion of respondents giving the wrong answer (that is, agreeing with the 'myth') ranged from 23 to 82 per cent. In a sample of New Zealand athletes of comparable age, the proportion giving 'incorrect' answers to a set of 18 true–false statements, generally related to nutrition and sporting performance, ranged from 2 to 54 per cent.[82]

Similarly, among a group of older (average age 43.4 years) and predominantly female clients of a weight-control clinic, one-third of the answers in a 20-question, multiple-choice questionnaire were wrong. Scores averaged 62 per cent, compared

with averages of 90 per cent for nutritionists, 81 per cent for diabetic program staff, 80 per cent for physiotherapists, 77 per cent for medical staff, 68 per cent for nursing staff and 67 per cent for laboratory staff.[83]

Studies in various countries suggest that nutrition knowledge is associated with sex, age, social class and level of education. Women are typically more knowledgeable than men, and younger individuals more knowledgeable than older. Nutrition knowledge tends to increase with social class and level of education.[74,82] In a United States study, the South Carolina Nutrition Survey of 1982, the mean score in a 'nutrition knowledge test'—representing the number of correct responses to a set of 23 true–false statements about food composition, current food facts and fallacies, and food and heart disease—was 58 per cent. According to the authors, 'most people failed the knowledge test'.[84] Results might vary, however, according to the test administered: given a simplified and more elementary nutrition knowledge test, visitors to an International Food Fair in London in 1985 scored an average of 78 per cent correct answers.[77]

Nutrition awareness

It has been suggested that awareness of nutrition issues has increased in the past decade, as has interest in nutrition.[73] At the same time, there is an increase in confusion, which can probably be associated with a low level of detailed and factual knowledge. A study in Western Sydney showed that over 85 per cent of the sample was aware of the association between the risk of heart disease and overweight, high blood pressure, high cholesterol levels, and high intake of animal fat.[85] An earlier study in the same area found that 86 per cent of the sample believed a lower fat intake to be important in reducing heart attacks; 69 per cent and 68 per cent respectively believed salt and sugar intakes to be important.[85] Other studies have shown a similarly high awareness of dietary 'risk factors', although some factors (fat) were apparently of greater concern than others (fibre).[86] Groups with low occupational status were less aware of the relationships between specific nutrients and disease.[86] In the United States a review of literature concluded that 'the public is highly concerned about diet and health but is lacking the detailed knowledge needed to act effectively on these concerns'.[87]

3.5 Consumer attitudes and beliefs and their effects on behaviour*

A large amount of attitudinal data is collected through market research in the private sector. The primary limitations on access are the cost of purchase and commercial confidentiality. Nevertheless, the potential exists to tap this large fund of information: the Australian Supermarket Institute, for example, has already carried out a survey funded partly by the National Better Health Program.[5] In the United States, a program of monitoring knowledge, attitudes and related behaviours has been in progress for some years. The 1989 Diet and Health Knowledge Survey examined people's awareness of diet–disease relationships, and a need for better information on knowledge, attitudes and the link with dietary behaviour has been signalled as

* The major contribution of Fiona Cumming and David Woodward to the preparation and drafting of this section is gratefully acknowledged.

important for the Ten-Year Comprehensive Plan for the National Nutrition Monitoring and Related Research Program.[88] In Australia, publicly available information is similarly limited.

Motivation for personal dietary change

Studies of Australian adults found that events considered most likely to persuade them to make a dietary change were being seriously ill and believing a diet change would aid recovery, if change was recommended by a doctor, if someone close developed a serious illness, or noticing a change in weight.[89] The National Heart Foundation's qualitative study of community attitudes in 1989, showed that 'feeling crook' and vanity were also triggers and concluded that 'information, by itself, rarely triggers compliant behaviour'.[33]

Factors most likely to influence people to continue with a dietary change were seeing the change produce a positive effect on their own health and well-being, liking the taste or texture of the new foods, strong support from a spouse or partner, and having a strong wish to change their diet. For most of these, women rated the factors as more important than did men.[89] Nevertheless, a 1991 survey of people aged 18 years and over suggested that most Australians believe they eat a healthy diet (that is, not too much fat, varied, and plenty of fruits, vegetables and breads); 74 per cent of 18–24-year-olds and 98 per cent of those aged 65 years and over had this view.[18] In the same survey, however, almost half the respondents believed themselves to be overweight.

Weight reduction diets are more common among women than men. Cultural pressures to slimness in Australian women are the same as in other similar societies and dissatisfaction with their current body shape and size is widespread among women.[90] Some hazardous weight-loss strategies are common among women[91] and adolescents.[92]

The food supply

In five Australian random population studies of food beliefs and behaviours and in two surveys of supermarket shoppers the two major concerns expressed were about poor food quality and harmful chemicals.[5,60,61] It is also frequently noted that public concern about chemicals in food is in direct contrast to the low levels of chemical contaminants actually detectable in the Australian food supply.[93–95] Worsley notes that 'additives and irradiation are predominant concerns for consumers which have re-appeared in survey after survey [in Australia] and overseas for the past twenty years'.[60]

In contrast to an apparent high level of public concern about food safety and nutritional quality, a survey of chief executives of supermarket retail and wholesale companies around the world noted the declining importance of nutrition as an industry issue.[90] This was evident worldwide except for Japan (although Japan was the only Asian country for which there were data).[96]

Concerns about the food supply

From a survey of Sydney, Adelaide and Melbourne supermarket shoppers Worsley found in 1991 that concerns about food encompass far more than food safety and nutritional quality issues and 'relate to personal well-being, concern for others, the environment, and the activities of the food industry and government'.[60] Examples of

such external issues and the proportion of respondents that rated them 'very important' are driftnet fishing (60 per cent), poverty in Australia (57 per cent), importing of foreign food products (52 per cent), animal cruelty in food production (49 per cent), starvation in other countries (48 per cent), transport of food over long distances (34 per cent) and ownership of retail food companies (23 per cent).[59] It is relevant to the consideration of these responses that they were issues raised in the questionnaire rather than issues volunteered by the respondent.

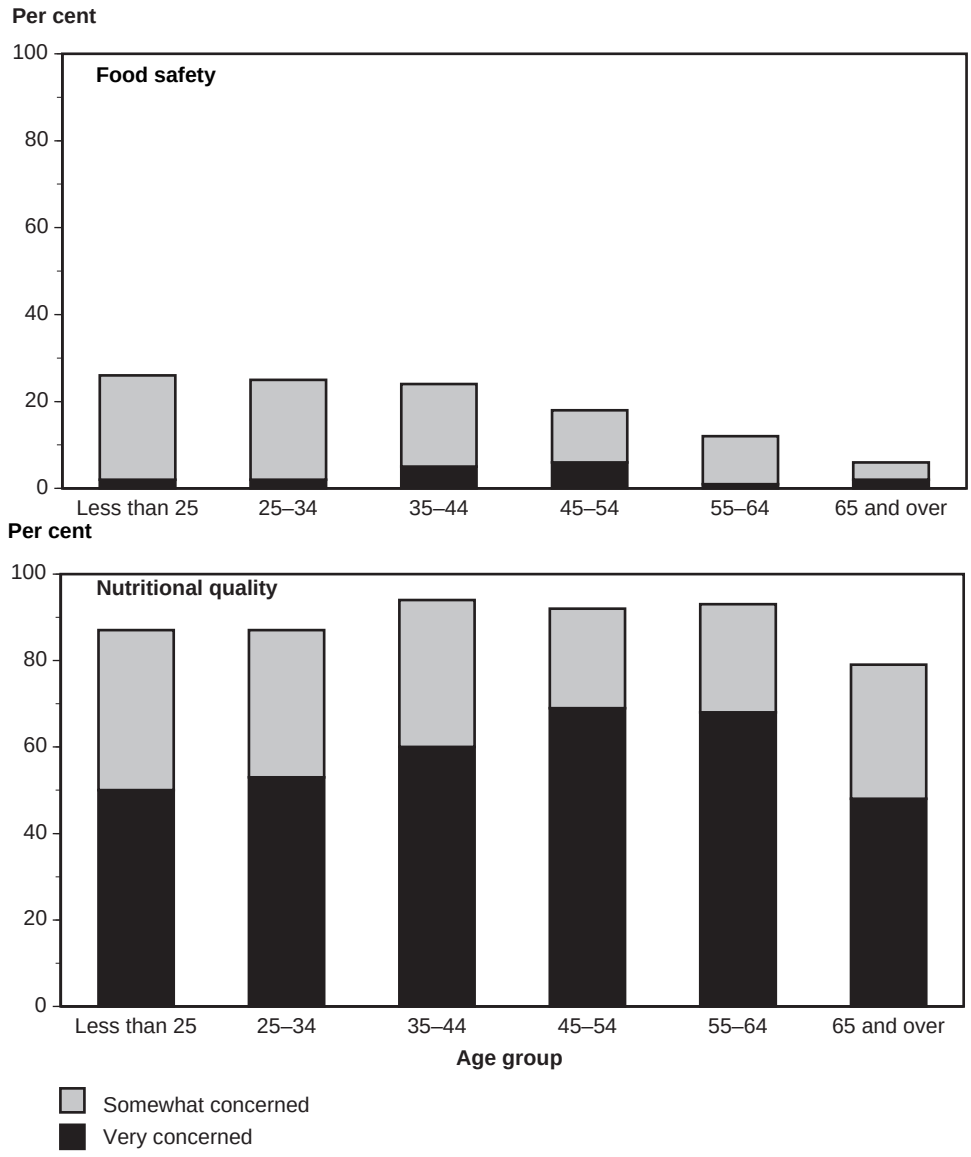
The 1991 survey of shoppers found that those aged over 70 years were more concerned about poor food quality than about chemicals, while those aged 31–70 years were more concerned about the presence of harmful chemicals. Multi-dimensional analysis revealed that men and women considered food and health concerns differently, women being possibly more attuned to the energy content of food and men to the 'good vs poor nutrition dichotomy', although the overall levels of concern were not significantly different between sexes.[60]

A 1992 study of 'consumer attitudes and the supermarket' found, in a sample of 1004 supermarket shoppers, that those aged 65 years or over were more confident about the safety of the food supply than were younger shoppers, but that at all ages more people were concerned about the nutritional quality of food than about food safety (see Figure 3.3).[5] There were no significant differences in attitude by sex or employment status, giving a pattern of concerns similar to that described by Worsley from several surveys.[5,60,61] The differences that do emerge in the results of the surveys may arise in part from differences in method. The Worsley survey asked for opinions about a range of listed characteristics of food.[60] In the 1992 supermarket survey, on the other hand, questions were open and multiple responses were accepted; questions were of the form 'What is it about the nutritional content of what you eat that concerns you and your family the most?' What else concerns you and your family?' (asked of those who had already said they were concerned) and 'What if anything, do you feel are the greatest threats to the safety of the food you eat?'[5] Figure 3.4 shows perceived threats to food safety, based on the last question.

It can be seen that, in all, residues, 'chemicals', additives and preservatives constitute a large part of consumer concern about food safety. Other studies have shown that those aged 18–30 years were the age group least concerned about safety and quality,[61] although data on 16–22-year-olds from the 1992 Australian Youth Survey show that, among those who said they were concerned about food, the presence of chemicals in food is the issue most frequently cited.[97]

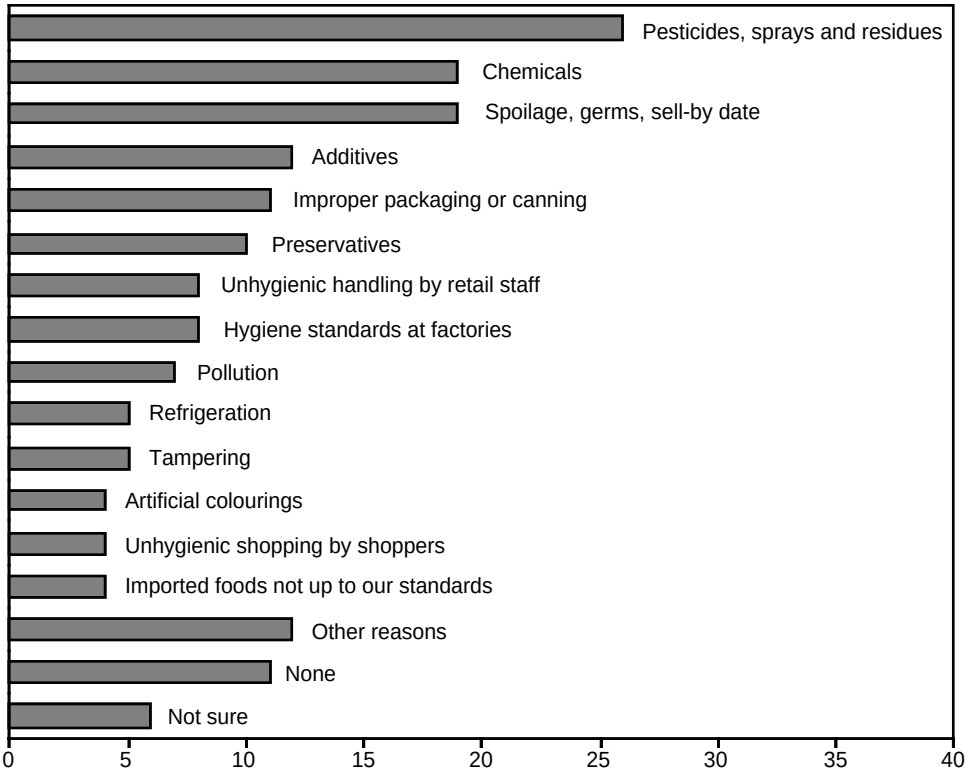
In the supermarket survey sample, most people said they relied on themselves to ensure that what they bought was safe, although the proportion fell between 1990 and 1992 (see Table 3.13). Relatively few relied on governments and industry. Multiple responses were recorded. The 'new player' between 1990 and 1992 was the National Food Authority, which attracted 15 per cent of respondents' preferences in 1992.

The decline in self-reliance and in reliance on food manufacturers was matched by increasing reliance on consumer organisations and the National Food Authority, with a small move in favour of the Australian Government.[5]



Source: Adapted by permission from Australian Supermarket Institute *Trends in Australia*[5]

Figure 3.3: ***Shoppers doubtful about food safety or concerned about nutritional quality, by age group, 1992***



Source: Adapted (with permission of the Australian Supermarket Institute) from *Trends in Australia*[5] and unpublished data

Figure 3.4: ***Perceived greatest threats to food safety, national sample of 1004 shoppers, June 1992***

Table 3.13: ***Most common source of information on product safety, 1990 and 1992 (per cent)***

Source	1990	1992[(a)]
Number of respondents	*1020*	*1004*
Self	50	43
Customer organisations	10	17
National Food Authority	na	15
Manufacturers	19	13
Retailers	9	9
Government		
Federal	5	6
State	2	5
Other	2	2
None	1	–
Can't say	2	4

na Not applicable
– Zero
(a) Includes multiple responses
Source: Australian Supermarket Institute[5]

Food quality

Young people (18–30 years) believed that their diets tended to be artificial rather than natural, and too processed, unhealthy and deficient in vitamins and minerals.[61] People in this age group were also more likely to eat non-traditional foods, their diets being more strongly based around snack foods. The greatest barriers to dietary change seen by young people were non-volitional factors such as inconvenience, unavailability or liking the wrong foods.[61]

Middle-aged people had more positive attitudes to the Dietary Guidelines, and their main concern was weight. Older people (over 60 or over 70, depending on the individual study) tended to describe their diets as natural and unprocessed, healthy and traditional, and high in vitamins and minerals and low in fats, energy, carbohydrate and starch. Their diets appeared to be based on traditional foods rather than snacks, take-aways and other novel foods, and their attitudes to their diets were considered conservative.[61]

A majority of supermarket shoppers surveyed in 1990 (62 per cent) and 1992 (59 per cent) were very concerned about the nutritional quality of food.[4,11] More women than men were concerned, and families with children were more concerned than those without. The proportion of those concerned increased with age. Of those who were concerned about nutritional quality, the major issues were fat content, freshness, purity and absence of spoilage, and chemicals and artificial additives, so there is a cross-over with food safety that underscores the high level of public anxiety about what is in food.[5]

Food labelling

Of those Australians interested in reading the labels on food products, men were most interested in information on benefits or threats to health; women were mostly looking for details of quantities of additives and preservatives.[98] The majority of men and women attempted to avoid preservatives, additives and chemicals in their foods. Women checked the labels first for natural or pure ingredients; men looked for the fibre and vitamin content of the product. Although almost three-quarters of a sample of 920 shoppers believed food labels should always include a nutrition information panel, nutrition information was ranked eighth in importance in a list of 10 items, behind such details as use-by date, list of additives, and a list of ingredients.[59] This information confirms retail market surveys of the relative (although possibly decreasing) importance of nutrition as a motivating factor in food selling and buying.[6]

The National Food Authority has recently developed a set of proposed guidelines for food endorsement programs in response to interest generated by the National Heart Foundation Pick-the-tick program. Such programs can provide nutrition information to consumers and incentives to industry to produce more foods consistent with the application of the Dietary Guidelines, but they have attracted criticism because they target nutrients rather than foods and a complete diet. Many shoppers would apparently prefer a 'healthiness' symbol to numerical, quantitative information.[60] This suggests that shoppers and nutritionists have different perceptions about the way in which information should be supplied; the details sought and valued by consumers are at variance with those favoured by nutrition professionals. Support for this position was found by Worsley, who surveyed 900 shoppers from 15 Sydney supermarkets in 1991. The respondents indicated as 'very important' information about cholesterol, pesticides, preservatives, irradiation and added sugars, for example, but not energy content, dietary fibre or complex carbohydrates, which are considered important by nutrition professionals.[59] In this survey, sex, age and education 'had quite extensive influences' on perceptions of usefulness. For example, female respondents found nutrition labelling more useful than did males, and the perceived usefulness of information about cholesterol, fatty acids and total fat increased with age.[59]

Ratings of some health messages on food labels by a sample of Sydney shoppers also differed significantly according to sex, age, education and employment.[59] Shoppers were asked to rate the helpfulness of seven health messages; overall, 'healthy' and 'natural' were considered least helpful and 'no additives' and 'low cholesterol' most helpful. Of intermediate helpfulness were 'reduced fat', polyunsaturated', and 'sugar free'.[59]

More women than men found the messages 'natural', 'sugar free' and 'no additives' helpful; the utility of 'low cholesterol', 'reduced fat', 'polyunsaturated' and 'natural' increased with age; 'low cholesterol', 'polyunsaturated', 'healthy' and 'natural' were less helpful to those with more education; and those without paid employment found 'healthy' and 'natural' more helpful than did wage earners. The survey results indicated that shoppers do look at label information, although the nutrition information panel is read by fewer people than is the ingredients list. Current ingredient labelling and additive codes were poorly understood.[59]

Worsley highlights an important difficulty in providing appropriate information in the condensed form necessary for food labels: there is 'a great divide between consumers

and health scientists. Many of these messages are vague at best and probably misleading… [but] results show that shoppers… find them helpful. This does not imply that they fully accept or believe the messages—they are merely helpful'.[59]

Attitudes to specific foods

> Parent: 'It's broccoli, dear.'
> Child: 'I say it's spinach, and I say the hell with it.'[99]
> *(from* New Yorker *magazine, December 1928)*

Among high school students the best liked of 22 foods was orange juice and the least liked were tomatoes, low-fat milk, butter, polyunsaturated margarine and other margarines. Girls liked apples more, and sausages, hot chips and ice-cream less, than did boys.[100] The same study showed that students perceived as healthiest (from a list of 22 items) low-fat milk, apples, orange juice and tomatoes; the least healthy were cakes, biscuits, ice-cream, meat pies, hot chips and soft drinks. Girls rated biscuits, non-polyunsaturated margarine and hot chips as less healthy than did boys.[100] The 10 best liked foods (from a list of over 200) among adult hospital in-patients in Sydney were mostly fruits (strawberries, peaches, fruit salad, cherries, bananas, grapes and apples), plus baked potato, ice-cream and fried chicken. The 10 least liked foods were mostly offal (brains, tripe, tongue, fried liver and kidneys), blue-vein cheese, olives, artichokes, soybeans and plain yoghurt.[101]

Most senior secondary students see fruits and vegetables as being 'rich in vitamins'; only a small minority see meats, milk or eggs thus.[102] Many adults believe that commercial fruit and vegetables, whether fresh or frozen, have lost much of their nutrition value.[103]

Fruits, vegetables and cereals (especially wholemeal) are generally seen as protective against cancer; coffee, alcohol and meat (especially processed meats) are seen as increasing cancer risk.[81,104] Adults see (in descending order) reductions in fried foods, full-cream dairy products and fatty meats as needed for a reduction in cardiovascular risk. Awareness of these changes was greater among women and among those who reached a higher level of formal education.[105]

Attitudes to specific nutrients

Australians have concerns about nutrients and disease, although these concerns are a mixture of fact and misinformation. Crawford and Baghurst found that most people link fat with heart disease and sodium with hypertension, but that there is confusion about the roles of simple carbohydrate and fibre in disease causation.[106] The one nutrient that most concerned people in their own diets was fat, followed by food additives or chemicals and fibre. Few mentioned salt or sugar as cause for concern.

Nutrition education messages to reduce fat intake appear to have been heard and understood by the public, with a significant proportion claiming to be making such a change.[89] About one in three Australian adults consider eating too much fat to be a risk factor for cancer.[81]

Many Australians appear to have a poor understanding of the role and importance of complex carbohydrate, sugars and dietary fibre in the diet. Only a minority could identify a disease associated with intakes of fibre or sugars: the most common response (and misapprehension) was that diabetes is caused by sugars.[106] There is some

confusion in the terminology for carbohydrates. The term 'carbohydrate' may be used by nutrition professionals to mean 'available carbohydrate' (digested and absorbed in the small intestine), with 'dietary fibre' used interchangeably with 'unavailable carbohydrate'.[107] 'Complex carbohydrate' may or may not include dietary fibre, and there is further confusion about resistant starch and non-starch polysaccharides, or naturally occurring and added sugars.

A number of studies of Australian populations in the 1980s showed that, despite the Dietary Guidelines for Australians, the majority of the population who have any opinion about their carbohydrate intake believed that they should be reducing their intake of complex carbohydrate.[28,106,108] In a national survey Crawford and Baghurst also found that few Australians were concerned about their sugar intake (5 per cent); 10 per cent believed that their intake of dietary fibre was of concern.[106]

Primary school students see alcohol as 'bad for you', causing drunkenness, damage to vision and memory, and impaired driving skills.[109] Lynch et al. in 1981 found that among high school students the beliefs that alcohol is 'bad for your health' and 'bad for your heart' were strong in year 7 but much less so by year 10; that alcohol causes cancer was not widely accepted at any level. Most agreed that drinking is enjoyable, but also that it is a waste of money.[110]

Most adults saw moderate drinking as 'normal'.[111] Most also saw alcohol as causing health problems (mainly liver and brain damage) and social problems (mainly domestic, family and marital problems), but 28 per cent of adults saw it as having some health benefits.[112] Most believed that alcohol is likely to increase the risk of cancer but few believed limiting their alcohol intake would lower cancer risk.[81,104]

McConaghy found that 41 per cent of men and 59 per cent of women in South Australia considered it very important to reduce their salt intake and that 51 per cent of men and 66 per cent of women were actually reducing, or attempting to reduce, their intake.[89] The belief that salt increases cancer risk is fairly widespread, being affirmed by 55 per cent of respondents to a survey of South Australian adults[81] and 27 per cent of respondents to a national survey of adults.[104] Crawford and Baghurst reported that 69 per cent of Australian men and 78 per cent of Australian women were aware of at least one major health problem or disease related to sodium consumption: hypertension, heart disease and arteriosclerosis were the disorders most commonly quoted.[106] Worsley and Crawford concluded that, of the people who read labels on food products, only around 15 per cent are interested in the salt content. Women were more interested than men, and women of high occupational status were more interested than other women.[113]

Primary and secondary students see vitamins as good for health, particularly for colds.[102,109] Adults are more specific, seeing vitamin C as curing or preventing colds, iron as preventing anaemia, and vitamin A as good for skin and hair.[114] Vitamin C and iron are thought to be protective against cancer, but there is less certainty about vitamin A, retinol, β-carotene and selenium.[81]

About 36 per cent of adults consider it very important to adjust their diet so as to obtain the right amount of vitamins and minerals, although only about half that number have made, or attempted, such changes.[89] Use of supplements is, however, fairly widespread.

Within-population differences in behaviours and attitudes

Various authors have noted socioeconomic differences (based variously on income, education and occupation) in food and nutrient behaviours and attitudes in Australia.[115–119] In general, higher status groups tend to have healthier diets, with, for example, higher intakes of fruit, vegetables, whole-grain cereals, fish and low-fat milk. One notable aberration is their higher alcohol consumption. A review by Truswell and Darnton-Hill found a number of differences between the food habits of adolescents and adults.[120] Adolescents miss meals more frequently, snack more, and consume more soft drinks; it was concluded that 'the food habits of adolescents reflect the weakening influence of the parental family at this age' and the increasing influence of peers.[120]

There is some evidence of interstate differences in diet. Woodward has examined the food differences found in the 1983 National Dietary Survey in detail, identifying Hobart as the most atypical capital city.[121] Use of vitamin supplements varies between States, being most prevalent in Queensland and least prevalent in the Northern Territory.[122] Intakes of various foods and nutrients are different in urban and rural areas; for example, rural residents choose fewer low-fat options.[123,124]

The dietary attitudes and beliefs of Aboriginal and Torres Strait Islander people are not as well studied as their social, nutritional or health status. Traditional Aboriginal and Islander cultures have a different philosophical base from that of Western cultures,[125] and nutrition education programs for Aboriginal and Islander people based on assumptions derived from Western views about the relationship between food and health may be inappropriate.[126]

Many overseas-born Australians also come from culturally distinct regions, often with specific traditions, religious and language differences, and a range of beliefs and values about which there is limited awareness in Australia. Even among migrants from other Western-style cultures, the differences are extensive. It will be of some importance to determine the attitudes and beliefs that sustain dietary practices in migrant populations whose health profile on arrival is better than the Australian average, in order to maintain that health profile. Webb and Manderson have thoroughly reviewed the dietary changes that migrants from different countries experience on establishing their lives in Australia.[127] Trends in food consumption and morbidity and mortality from nutrition-related causes have been explored. Most migrants acquire the food habits of Australian society, to a greater or lesser extent and over varying periods.

Integration of factors

Few Australian studies have looked simultaneously at more than a couple of factors. Three studies serve as examples of the possibilities of more extensive analysis. McAllister et al. note that the quantity of alcohol consumed by adults tends to be higher outside the capital cities, among the more educated, among the employed, among those with higher self-esteem and among those whose peers also drink.[119] Adolescents show a more complex, sex-dependent pattern. Girls drink more if they live in a capital city, are Australian-born or have low self-esteem. Boys drink more if they live outside a capital city and their peers also drink alcoholic beverages.

Woodward[118] explored among high school students associations between intakes of various food categories and a variety of personal characteristics: body size; use of vitamin supplements, alcohol and cigarettes; urban versus rural residence; school type;

parental educational level and social status; and family size. Among other things, girls consumed less milk, potatoes, cakes and desserts with increasing body mass index; boys consumed more red meats and confectionery with increasing alcohol use; and use of vitamin supplements was associated with higher milk intakes among girls and higher green vegetable intakes among boys.

A 1990 study of Perth adults aged 18–30 years found a correlation between nutrient densities and other dietary factors, food behaviour, personality measures and demographic variables.[128] Some of the findings are correlations in men between neuroticism and fibre density (negative) and cholesterol density (positive), and a positive correlation in women between extroversion and sodium density. The authors concluded that personality factors were stronger than demographic variables as predictors of nutrient intake.[128] The prospects of monitoring such factors, however, are much poorer than for the well-established demographic collections.

Multi-dimensional scaling was applied to responses in three surveys undertaken by Worsley in 1991 in which information was collected about nutrition information sources, views on food label information, and concerns about the food–health relationship. Multi-dimensional scaling maps covering food and health concerns, utility of terms appearing on food labels and in other sources of nutrition information, and trust in sources of information can be found in the published reports from these surveys.[30,59,60]

3.6 Nutrition education

'Nutrition education' is a broad term used to describe any and all activities from dispensing therapeutic advice to patients, clients or customers, to mass media public health campaigns, to part of normal, formal schooling, and to recreational learning for interest's sake (aroused perhaps by public health awareness-raising campaigns). It includes the education of those in whose professions a knowledge of nutrition may be helpful for a general understanding of their professional context or as an adjunct to their own specialist area and those whose primary professional concern will be to impart 'nutrition education'—either to those who will pass it on to the general public in some way or directly, perhaps (to complete the cycle) as therapeutic advice.

This concept of nutrition education, however, encompasses so much and has become so diffuse that it loses utility. An overriding need in monitoring nutrition policy implementation is to define aspects of the system sufficiently well for them to be assessed. Some specific aspects of nutrition education are defined and discussed in this section.

Consumer nutrition education

Consumer nutrition education is designed to give individual consumers of food an understanding of how to make nutritionally sound decisions about food and the reasons for doing so.

The dissemination of nutrition information and advice has been documented since 1918, when infant welfare organisations began providing information to mothers. Some States also provided food and nutrition information at free kindergartens during the 1920s and 1930s.[129] The Commonwealth Advisory Council on Nutrition

recommended in 1938 that the States establish committees for 'the education of the public, concerning the proper dietetic and nutritional practice'.[130] This recommendation was taken up by State governments and 50 years later those committees are still primary sources of nutrition education and information programs.[129]

NHMRC Subcommittee on Nutrition Education

The current broad social approach to nutrition education in Australia is consistent with that enunciated in the Ottawa Charter in 1986.[131] The rationale, discussion and recommendations for Australia's implementation of the Ottawa Charter in terms of nutrition are contained in the report of the NHMRC Subcommittee on Nutrition Education and call for 'an environment to support healthier food choices, and which addresses the social and economic factors restricting the access of some Australians to nutritious food'.[129]

The report of the NHMRC Subcommittee on Nutrition Education was instrumental in widening the scope of nutrition education, and several of its recommendations have been implemented. A number of the recommendations fell outside the scope of the health sector and so required cooperation from other areas. Examples are promoting the quality of institutional food in non-health institutions, workplaces and school canteens; advancing nutrition education programs in schools and relevant professional courses in tertiary institutions; investigating the effects of television advertising of foods directed at children; and pre-service and in-service training in food and nutrition for all health practitioners, schoolteachers and food service workers.[129] These areas are to be dealt with as part of the implementation of the National Food and Nutrition Policy.[132]

In a review of reported nutrition education interventions in Australia, Egger found it difficult to evaluate their impact on nutrition behaviour.[73] Over two-thirds of the interventions studied had no clear target audience; over one-half were knowledge-based; half relied solely on written material or videos, with no accompanying education. Egger considered none of the reviewed interventions to have had an adequate theoretical base and most to have been poorly evaluated.[73] The review, however, did not include some of the more recent programs, notably those funded under the National Better Health Program, which have been based on the social health model and focus on influencing food supply and food policy and mobilising community action.

Many nutrition education projects are not reported and many that are do not have an adequate evaluation component. There is, therefore, little opportunity to further refine and develop intervention strategies and evaluation tools. This situation is exacerbated by the general lack of resources available for health promotion and illness prevention activities.

The Victorian Review of Nutrition Education and Promotion Activities is an example of the collection for data about nutrition education activities and raises the prospect of monitoring and evaluation as identified projects mature.[133] The published report reviews results and summarises activities in community health centres and by local governments, listing details of 91 community health centre projects and 52 local

government projects. Further reports have been foreshadowed and the project may be a workable prototype for a national review.

The NHMRC noted in 1986 the importance of countering 'the large amount of misinformation, circulating in the community' and recomended that 'nutrition educators should work together with the food industry and media journalists to improve the reliability of nutrition information'.[134] Although no formal action was taken in response to this statement, there has been ad hoc improvement in consultation and cooperation between the various groups since 1986.

Nutrition education in schools

In 1938 the Commonwealth Advisory Council on Nutrition recommended that State departments responsible for health and education establish 'schemes of education in diet and food hygiene as an essential part of school curricula'.[130] Education about nutrition has appeared within the formal primary and secondary education structure, often as a topic in one or several subject lines rather than integrated into curricula. An example of this treatment is the New South Wales Department of Education's food technology syllabus, in which nutrition is an important component (see Box 3.2).

The development of comprehensive, sequential and integrated nutrition education curricula in schools has been a priority recommendation for over a decade,[129] and the development of national nutrition education curriculum resource materials (supported by professional development activities) is a priority implementation strategy of the National Food and Nutrition Policy.[132] This strategy is complemented by the development of a national curriculum within the context of the Goals for Schooling of the Department of Employment, Education and Training.[137,138] The preparation of a national State–Commonwealth collaborative statement and profiles for health and physical education has been in progress since 1992.[139] These articulate a framework for nutrition education (in schools) within the health and physical education field.

Environmental support for school programs

> Too often the school environment contradicts rather than supports classroom nutrition education messages.[129]

Many papers and reports in the last half-century have noted the crucial importance of school canteens and tuckshops in reinforcing or devaluing classroom education. Although, for example, New South Wales has had a school canteen policy since 1985 and other States have supported appropriate changes, implementation falls down at the level of the individual school. The NHMRC Subcommittee on Nutrition Education recommended that State education authorities help schools to find alternatives to using the canteen as a fund-raising resource for the school. Almost certainly, fund-raising has meant the sale of high-profit food lines, most of which are inappropriate both nutritionally and as exemplars for nutrition education.[129]

Canteens are important, but they are not the only influence (see Figure 3.5). The NHMRC Subcommittee on Nutrition Education considered nutrition education in schools to be a high priority, and several of its recommendations are being taken into account in the implementation of the National Food and Nutrition Policy.

Box 3.2: New South Wales food technology syllabus for secondary schools

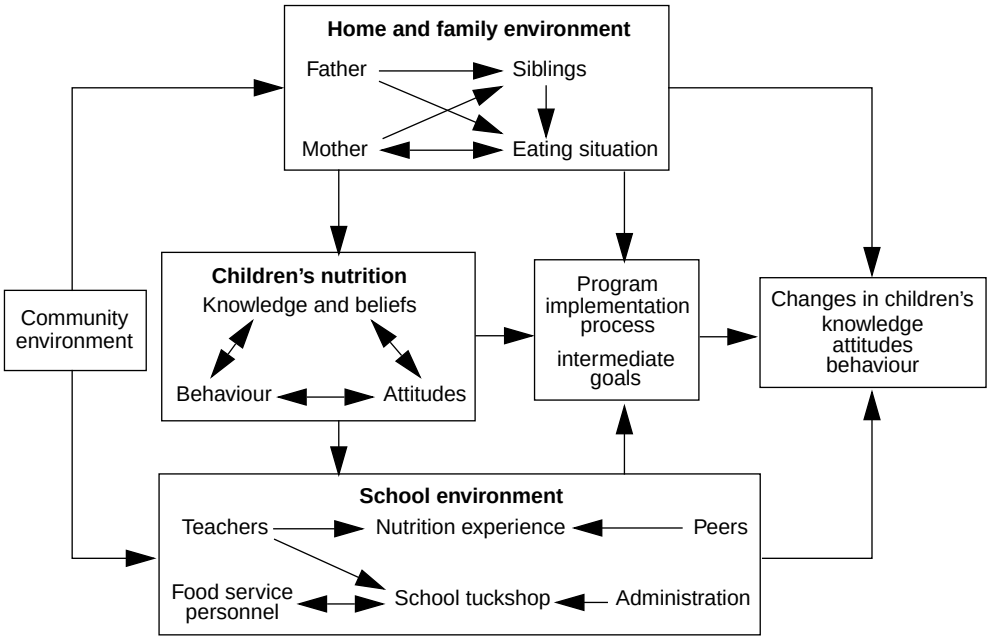
Food technology is a part of the Technological and Applied Studies Key Learning Area. The course content in years 7–12 is intended to follow from prior learning in design and technology in years K–6. The aims for the years 7–10 syllabus and the years 11–12 syllabus, apart from the natural emphasis on food technology, cover a wide range of food and nutrition topics:

Years 7–10[135]	**Years 11–12**[136]
Gain an understanding of the diverse range of activities involved in food technology.	Investigate a diverse range of food technologies in domestic, commercial, industrial and global settings.
Evaluate relationships between food technology, nutritional status and quality of life.	Become informed and responsible in making decisions about food.
Design solutions in response to specific food needs.	Design solutions to food technology issues.
Develop environmental and social responsibility in the design and use of food and food technologies.	Become involved in a range of food technology experiences.
	Appreciate the inter-relationships between the food system, society and the environment.

The Nutrition in Schools project

The Nutrition in Schools project was started by a consortium of the Curriculum Corporation, the Queensland University of Technology and the University of Queensland in December 1992. The first phase—an audit and evaluation of nutrition education materials available for use in Australian schools—was completed in July 1993.[139] The audit was to identify where there were deficiencies in the materials available and where there were quality resources; the priority was for Australian resources. The audit covered materials referred to in the syllabus documents of all States, plus teacher support materials, relevant new publications, and material from the food industry and health promotion organisations.

The criteria for evaluation of books, videos and kits were based on consistency with the first draft of the National Statement and Profiles on Health and Physical Education. Criteria were included for inclusivity, currency, usability and quality. The audit found that, of 379 resources evaluated, few took account of the processes and outcomes envisaged in the draft National Statement and Profiles. A particular deficiency was the failure to consider the required emphasis on promoting individual decision making and action. It was also found that there were few resources suitable for primary students.[139]



Source: NHMRC[129]

Figure 3.5: ***Influences on children's nutrition knowledge, attitudes and practices***

Vocational training in nutrition

Nutrition education at the vocational training level goes beyond what is needed for personal decision-making about food and nutriton matters. Training encompasses nutrition units within courses related to non-health disciplines as well as nutrition education within health disciplines and specialist nutrition and dietetic training. The NHMRC Subcommittee on Nutrition Education alluded to the need for nutrition education for non-health professions such as teaching and also recommended adequate nutrition training 'for those whose main responsibility may not be health care or health education, but who, nonetheless, have the opportunity to influence food knowledge or eating habits'.[129] Examples of 'non-health' occupations are food service and catering personnel, non-specialist schoolteachers (particularly at primary level), police, physical fitness instructors, social security and welfare workers, community workers, youth leaders, social workers, agricultural scientists, food technologists and food scientists.

In 1989 the Social Issues Committee of the Royal Australasian College of Physicians also noted the importance of some non-health professional areas, recommending a better level of nutrition knowledge for 'those responsible for government policy, executives of national organizations … food producers, manufacturers and retailers, parents and teachers, those who run weight control groups or health food shops, physical educators, journalists and social scientists' and practitioners of alternative medicine.[140]

The importance of training in nutrition for those in relevant occupations has been recognised in the National Food and Nutrition Policy,[132] although there is not yet any monitoring in this area.

Nutrition education in non-health disciplines

Apart from food science and technology and some consumer science courses, few non-health vocational courses have nutrition as a component. It is probably more realistic to look to in-service or continuing education units to provide basic nutrition knowledge. The NHMRC Subcommittee on Nutrition Education recommended the inclusion of nutrition in relevant vocational courses but implementation has not been a priority.[129] An example of an in-service approach is the Victorian Food and Nutrition Program's Catering Improvement Program, which targets commercial catering outlets; an evaluation is in progress and may serve as a useful model for monitoring the effectiveness of similar in-service education programs.[141]

The current initiatives to integrate nutrition into school curricula will require teacher competence in teaching nutrition. There are as yet no specific initiatives but, as with other professions, the nutrition education needs of current practitioners as well as students must be considered. An example of a course of this nature is the Graduate Diploma in Nutrition Education at Deakin University, which is directed primarily at those in teaching occupations, and which can be taken off-campus and so is suited to continuing education needs.

Medical practitioners

The NHMRC urged the teaching of an adequate nutrition knowledge base for medical students in 1979 and for medical students and practitioners in 1986.[134] The Dietitians Association of Australia also supports the inclusion of nutrition as a 'well-defined entity within medical education and introduced into medical schools and postgraduate training programs …' as well a part of 'any formal general practitioner course or continuing education program'.[142] The Royal Australasian College of Physicians report *Responsibility for nutrition diagnosis* set guidelines for nutrition assessment and diagnosis that recognised the need for clinical and community nutrition expertise, particularly for general practitioners (GPs).[140] A specific recommendation was that 'nutrition assessment should be an integral part of undergraduate and postgraduate training for medical practice'.[140]

In the last decade the medical profession has moved towards the inclusion of clinical nutrition as a compulsory subject in medical education. Medical nutritionists have provided the impetus and it is now accepted that clinical nutrition is an important component of medical practice.[143–145]

An example of existing in-service educational material for GPs is a booklet on nutrition sponsored by a major food company and covering the essentials of nutritional diagnosis and management.[146] For currently practising GPs and other medical practitioners, many of whom had little or no nutrition education as students, this and other options are available; among the other options are the use of medical journals and newsletters or audio and video education, as with the existing Doctors Medical Network.[56] Graduate diploma courses in nutrition are available through several Australian universities—for example, Deakin University, the University of Canberra and the University of Queensland—and are suitable for medical and other health practitioners. A further option is through a Master of Public Health degree, where a nutrition speciality can be taken.

Although the Royal Australasian College of Physicians report notes that detailed dietary assessment is the task of the specialist dietitian–nutritionist,[140] the scarcity of dietitians outside hospitals means that possibly the most effective option for many (particularly rural practitioners) is to become familiar with the existing nutrition resource network.[56]

Other health professionals

The NHMRC Subcommittee on Nutrition Education recommended nutrition training for most health professionals: nurses, pharmacists, dentists and dental therapists, and health educators, for example.[129] Both pre-service and in-service education are required to cover existing practitioners and new graduates. Nutrition is a component of nursing, pharmacy, and health educator curricula, although the depth of knowledge required is variable.

Nutrition education for nutrition specialists

The scarcity of specialist nutritionists, and particularly their accessibility to the community, is discussed in Section 3.4. The most effective use of such specialists will be in training other professionals to provide nutrition education. Consequently, the education of specialists must include teaching, management and negotiation skills as well the highest level of knowledge; to maintain effectiveness and currency, a level of proficiency and familiarity with new information should be required. There are two aspects of nutrition knowledge required: the biomedical or clinical aspects of nutrition, and the practice of dietetics. In Australia each year about 120 new dietitian–nutritionists graduate, which represents a 10 per cent increase in numbers. The less-than-2000 dietitians represent a repository of nutritional science expertise; unfortunately, most of them are employed in clinical dietetics, either wholly or partly. Of a sample of 38 dietitians working in rural Queensland, Harris et al. found only nine (25 per cent) to be fully community-based; 15 (42 per cent) were fully hospital-based.[147] Similar proportions have been reported by members of the Dietitians Association of Australia in recent years.[53,148]

Medical specialists in nutrition are very few, and their education function is almost exclusively sequestered by the needs of dietetic and medical students. There are also relatively few dietitian–nutritionists with expertise in education available to teach graduate-level nutrition and dietetics. There is a need for a high level of expertise not only in dietetics and nutrition but also in the teaching of these subjects at graduate level. In order to meet the need, however, an extra commitment of resources is necessary.

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