

Diet and general health

Mark L. Wahlqvist

Abstract

Dental health was one of the first focal points for those concerned about the dietary patterns of affluent society. The recognition that carbohydrate was an essential substrate for cariogenic bacteria contributed to the view that the kind of carbohydrates eaten, notably sucrose and starch, may not be desirable for general health. The dental education message was more effectively delivered than was, for example, the developing message about diet and heart disease. With time, a more general relationship between the affluent diet and the disease characteristics of affluent society was discerned. The diet in developed countries includes many energy-dense food items, provides a plentiful intake of animal and dairy products, and makes alcoholic beverages readily available whilst whole-grain cereals and vegetables and, to some extent, fruits, are eaten with reluctance. The disease pattern that is found in association with this kind of dietary pattern is one of obesity, atherosclerotic vascular disease, lung, breast and colorectal cancers, non-insulin-dependent diabetes mellitus, and alcohol abuse syndromes. To a lesser or greater extent, it appears that the food intake pattern plays a part in the development of these conditions. Dentists are now working with nutritionists, dietitians, medical practitioners, health educators and others to develop a common nutrition education policy.

The food intake pattern in Australia

As in most other developed nations, Australians have a relatively low contribution to energy intake from carbohydrate; this being about 40–45 per cent, as judged from apparent food consumption data and from various population studies. This contrasts with a contribution of carbohydrate to energy in the region of 60–70 per cent among Australia's Asian neighbours, and of some 90 per cent in Papua New Guinea. The carbohydrate is derived from grain products (41 per cent), sucrose (36 per cent), fruit and vegetables (14 per cent), milk and milk products (6 per cent) and beverages (3 per cent). Although there has been little change in the apparent per capita consumption of sucrose over the last 40 years, the relative contribution from manufactured goods has risen. In the past decade there has been a marked fall in the consumption of bread and an increase in the consumption of fruit juice. It is likely that these trends in bread and fruit juice consumption have contributed to the maintenance of a low dietary-fibre intake at around 15–20 grams per day on current estimates. These dietary fibre intakes contrast with those in, say, Africa of 60 grams per day or more. Conversely, there is a relatively high contribution to energy intake from fat, about 40 per cent, and an important contribution from ethanol of about 2 per cent, although individual variation will be large with the latter.

These macronutrient characteristics of the Australian diet reflect a relatively high intake of ruminant meats (beef and lamb), of milk and dairy products, of low-dietary fibre grain and sugar products, and of alcoholic beverages, together with a relatively low intake of whole-grain cereal products, vegetables and fruits.

Another important characteristic of the Australian diet is that it is high in sodium, being about 12–20 grams of sodium chloride per day, and relatively low in potassium. On a molar basis, the ratio of sodium intake to potassium intake in Australia is about 2:1. By contrast, in developing countries the ratio is more like 1:5. Unfortunately, only about one-quarter to one-third of this sodium intake is contributed by the consumer in cooking or at the table, the rest coming as a result of food processing.

Disease patterns in Australia

Dental caries is undoubtedly an important nutritionally related health problem in Australia. However, it is worth remembering that it is not a cause of premature death or of reduced life expectancy. And although life expectancy at birth in Australia has progressively improved in the 20th century, it is not as good as in Sweden, Greece, the Netherlands and Japan, for example. Thus, there is more to gain in Australia, and it seems likely that some of this gain will be made by nutritional means.

Most deaths in Australia are due to macro-vascular or atherosclerotic vascular diseases, affecting the coronary arteries supplying the heart, the cerebro-vascular arteries supplying the brain, and other arteries. The nutritionally related risk factors for atherosclerotic vascular disease include hypertension (by way of obesity, excess sodium and too little potassium intake, excess ethanol intake and possibly too low polyunsaturated to saturated fat ratio), hypercholesterolaemia and hypertriglyceridaemia, and enhanced platelet aggregation (influenced by the kind of essential fatty acid in the diet). Diabetes mellitus, with its own nutritional determinants, also contributes to the excess of atherosclerotic vascular disease. In both men and women, the second most common cause of death from neoplastic disease is large bowel cancer. Although the precise way in which diet influences the development of colo-rectal cancer remains to be worked out, it is clear that the food intake pattern in Australia predisposes to this kind of cancer. In the case of lung cancer, the leading cause of death from neoplastic disease in men, the greater the intake of green leafy and yellow vegetables, perhaps because of their carotenoid content, the less the likelihood of this condition. Even with breast and other gynaecological cancers, it seems that diet plays a modulating role in their development. For prostate, pancreas and other tumours, the same may also be true.

Alcohol abuse, with regular intakes of 40 grams or more by at least 15 per cent of the Australian male population, constitutes a major nutritional problem in Australia. The related diseases are cirrhosis of the liver, disease of heart muscle, brain damage, nerve damage, pancreas damage and various vitamin and mineral deficiencies.

The relative excess of energy intake over need, reflecting to a large extent the relative physical inactivity of Australians, leads to obesity, which leads not only to reduced life expectancy, but also to considerable morbidity.

Dietary guidelines for Australia

In 1978, a working party was set up by the Australian Association of Dietitians to formulate a national nutrition policy and to develop dietary guidelines. The working party included members of the health professions, academic nutritionists, home economists, a food industry representative, consumer interests and government. Its dietary guidelines were released in August 1979 and presented to the Nutrition Society of Australia. They are:

- Eat a variety of foods each day.
- Prevent and control obesity.
- Limit the fat in your diet.
- Decrease sugar consumption.
- Limit alcohol consumption.
- Increase your intake of fruit, vegetables, bread and cereals.
- Reduce sodium intake.
- Enjoy water.
- Encourage breast feeding.

It will be clear from the description of food intake and disease patterns in Australia why these dietary guidelines were developed.

Diet for dental and general health

To some extent, the dietary guidelines recommended for Australians have cut across specific advice given by dental educators. This has arisen because of a desire by such educators to

replace foods and beverages high in sugar and starch with little or no dietary fibre, with foods and beverages of almost any other kind. For example, salty and fatty potato crisps have been encouraged as a snack food. The nutritional characteristics are clearly not those sought by the generalist interested in a wider range of health problems. Nevertheless, it does seem that as the anti-cariogenic properties of foods are better defined there is more coincidence in the thinking of the dental and general health educator. For example, foods characterized by a high dietary fibre concentration appear for various reasons, not just their dietary fibre intake, to improve not only dental health but also general health.

Dialogue between dental practitioners, medical practitioners and nutrition counsellors has been lacking. Mechanisms for a common approach are now developing. One good example is the advent of the Australian Nutrition Foundation, with divisions in the States and Territories, and involvement by a wide range of health workers with special expertise in nutrition. Professor Elsdon Storey of Melbourne University's Dental School has been a pioneering member of the Australian Nutrition Foundation. The links are very likely to lead to joint dental and generalist nutrition research projects. In this way, it should be possible to avoid the risk of dying prematurely with perfectly good teeth.

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Discussion

K. Adkins: I was interested in reading some literature recently, put out by the National Heart Foundation, where there was relatively little comment about sodium intake. There seems to be a little bit of a lack of conviction about the role of sodium these days. I don't think the medical profession is lacking conviction that it is undesirable for us, but there seems to be a lack of proof. Would that be a fair comment?

M. Wahlqvist: I think there's a good deal of agreement about sodium. Perhaps the emphasis in recent National Heart Foundation statements reflects more a wish to emphasize certain aspects of diet for a particular promotional exercise rather than a lack of conviction about sodium. On the contrary, I think that almost all national bodies have taken a fairly consistent line on sodium. That's true in the United States, and, even where there appears to have been dissention between the Academy of Science and the American Heart Association on other issues, there is coincidence with regard to sodium. I think it is generally recognized that about 20 per cent of the population are sensitive, as far as their blood pressure is concerned, to sodium intake, and that sodium is not just sodium chloride, of course, it's sodium coming from other sources such as monosodium glutamate, and, more importantly, I think that it's now becoming appreciated that the ratio between sodium and potassium in the diet is important in regard to hypertension, and it's that pattern of high sodium, low potassium intake that seems to be particularly important, perhaps even for a greater proportion of people than that 20 per cent that we originally talked about. The problem is common in Australia and some 20 per cent of Australians do actually have hypertension.

J. Thonard: What are dietitians doing to promote non-fat meats, such as venison?

M. Wahlqvist: Most of us feel that nutrition education should assist people in making preferred choices and, the wider the range of products available, the better the choice that one can make provided one has the information. Our first task is to generate a concept in people's minds that an excess of fat from ruminant sources, with its high saturated fat content, is the important consideration. It is probably less important from monogastric animals. Venison is nice for an elite group but it doesn't help the general problem. However, many nutritional changes do actually take place from an elite group. I would recognize that there is a kind of trickle phenomenon with nutrition information and change through the community and if venison helps, fair enough.

Questioner: Should we take note of primitive diet in formulating dietary guidelines, since we evolved as hunters and gatherers.

M. Wahlqvist: Obviously it's somewhat unrealistic, living in an urban society, to think of returning entirely to all aspects of hunter/gatherer life. Inevitably we do depend on having a safe and secure food supply appropriate to urban needs. Nevertheless, having said that, we do live in an urban society, which has a lot of garden, so there's a good deal of food production close to the point of eating. We're uniquely privileged in this regard and we can continue to derive benefit from the experience of our hunter/gatherer forebears. I think that one needs to take different lines of evidence in working out guidelines. Only one of them is the hunter/gatherer experience.

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EDITED BY
Elsdon Storey



Department of Conservative Dentistry
The University of Melbourne

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