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THE POLITICS OF FOOD

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GUEST EDITORIAL

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It was Australian social nutritionist Patricia Crotty who astutely observed that the act of swallowing neatly separates food and health into two cultures.¹ The post-swallowing culture is interested in the physiological, metabolic, pathological and biochemical outcomes of food once it is eaten. Its prime concern is the fate of nutrients and the consequences on health—the so-called nutrient–disease interface. In contrast, the pre-swallowing culture wants to know how and what food gets onto the plate in the first place, rather than simply what nutrients are consumed. ‘Pre-swallowers’, so to speak, are interested in the political, economic, social and cultural factors that influence the food supply at the macro- and micro-levels. While the post-swallowing culture is currently by far the most dominant of the two, represented by much of the work done in nutrition and health promotion, it would be wrong to think this has always been the case.

It is Crotty again who alerts us to the importance given to sociocultural and economic considerations of food in Australia and overseas in earlier times.² Early 20th century disquiet about health, food and poverty³, and, later, considerations over food rationing at times of world warfare sharpened the minds of those who were responsible for ensuring that food supplies were ample to prevent population malnutrition.⁴ Pre-swallowing interests have developed considerably over the last 20 years. A recognition in public health nutrition of the socioeconomic determinants of health and food choice has fuelled an awareness of the impact of the factors influencing the food supply. This awareness requires engagement with a broad range of areas including anthropology, policy studies, sociology, environmental studies and a raft of other disciplines within the social sciences and humanities.

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It would be fair to say that the papers in this issue of the *Public Health Bulletin* are all pre-swallowing in nature. For example, Grahame Tonkin examines global trends in food, pointing out that food exports to places like China represent a valuable opportunity for food production in Australia, especially South Australia. However, global low-cost producers in South America and Eastern Europe could easily price Australia out of the market. Indeed, Tonkin wonders whether Australia might become a net importer of food as competition in the global export food industry intensifies and local food production becomes too costly.

With food production, distribution and cost in mind, but from another angle, Jacob Wallace's paper discusses the environmental sustainability of the food supply. The 'ecological footprint' is an environmental accounting instrument that weighs up the extent to which a population's demands on renewable resources exceed supply. Wallace's points are: how far can we allow our current methods of food production and distribution to eat into the environment, what are the likely consequences, and what can we do to reduce the impact? Fay Jenkins looks at our food supply system from another angle again, examining the role that governments play through regulation and food standards. Food standards are there to protect public health and safety, and while this traditional and crucial role will continue, Jenkins suggests that it could well be broadened and that the food regulatory system could play a role in chronic disease prevention by addressing preventable risk factors of poor nutrition.

At a more local level, the paper by Karen Webb and Lesley King discusses how the built environment (public buildings, housing estates and transport systems) impacts on nutrition. The design and siting of homes, public facilities, food shops and transport systems can hugely influence access to and availability of healthy foods. Added to this is the effect of erosion of arable land as the built environment encroaches on peri-urban agriculture. Heather Yeatman and Kaye Mehta discuss separately the impact on consumers of the food manufacturing and food advertising industries. In countries like Australia the food manufacturing industries are powerful; they can, as Yeatman points out, even define the kinds of knowledge generated about food and health through funding for research that asks some questions but not others. The power of the food advertising industries, especially in influencing food choice in children, is also formidable. According to Mehta, the complex regulatory environment that governs, or indeed fails to govern, food advertising does not make it easy for consumers to activate the necessary mechanisms that allow easy access to complaints processes.

The appalling state of food supplies in Indigenous communities in rural and remote areas is addressed in an article by Patricia Carter and Paul Foster. Since 1987 study after study has shown that foods available to these communities are generally nutritionally poor, and where healthy foods are available they are costly. An overview of the strategies, including the Outback Stores initiative, now

being implemented to address these inequities, is provided. Patricia Carter and Anne Taylor develop this theme further, looking at food insecurity, that is not having sufficient food, more generally. Analysing national and South Australian data, it is very clear that food insecurity is more prevalent in the most disadvantaged areas, in people on low incomes, in those without secure accommodation, and in other vulnerable groups. My own paper attempts to look broadly at what may be included under the heading 'the politics of food'. Using the photographs presented in a recently published book examining the foodways of families in 24 countries, I discuss how food politics is played out in matters such as culture, gender, warfare and social disadvantage.

In conclusion, it should be said that while Crotty's two cultures are a convenient way of separating different interests in food and health, we should not believe the cultures to be irreconcilable. In nutrition generally, and in public health nutrition in particular, there is currently an international initiative aimed at joining together the cultures under the heading the *New Nutrition Science Project*.^{5,6} The project seeks to incorporate into nutrition a number of perspectives from sociocultural and environmental disciplines. Such perspectives are important if we are to better understand food problems that affect population and planetary health. As the articles in this edition of the *Public Health Bulletin* demonstrate, 'pre-swallowing' Australian researchers and practitioners are already engaging with these broader questions.

I would like to thank the contributing authors to this edition for making it a valuable collection of papers addressing pressing issues in the food supply.

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THE POLITICS OF FOOD

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I recently went on record questioning whether the world needed yet more articles and books with headings like *The politics of food*.¹ My point was that, like *Food for thought* and *You are what you eat*, titles that play on politics and food may have been overdone. So why am I now putting my name to an article titled *The politics of food*? There are two reasons: because I was asked to (!) but also, and more importantly, because I would argue that many attempts under this title have been too narrow in their scope. 'Politics' and 'food' are often packaged together to examine various struggles of control over the food supply involving government, industry and sometimes advocacy groups. Or they are used to discuss regulative and legislative processes that govern or fail to govern food safety. There are a number of examples of these approaches and they are excellent reading.^{2,3} Also excellent are those books addressing similar themes, such as Lang and Heasman's *Food wars*.⁴

But to do justice to the politics of food a broader view is needed. If we consider that the term 'politics' goes beyond lobby and control groups, a number of other possibilities are available under which we can write about the associated topics of food and health.⁵ Thus, taking 'politics' to broadly mean those processes that privilege certain problems, actions and populations, a number of new opportunities open up. Since all cultures exert a variety of prescriptions and proscriptions which privilege some foods and food actions over others, it is difficult to imagine a case where food is never political. What follows therefore is an attempt to unpack the politics of food in a more general way, keeping in mind health generally and public health in particular. The stepping-off point for framing this article is the book *The hungry planet: What the world eats (2005)*, by photographer Peter Menzel and writer Faith D'Aluisio.⁶ In the present article, I first provide an overview of the book, and then go on to discuss macro- and micro-political issues of food using examples of culture, gender, war and social disadvantage.

The hungry planet: What the world eats

As an attempt to understand those processes that determine who eats what and why, *The hungry planet* is an excellent example of the politics of food. Essentially, it examines the eating habits of 30 families from 24 countries around the globe, taking in the first, second and third worlds. Each chapter represents a family. The most striking pages are those in which the total food eaten by each family during the course of a week has been laid out and photographed in full colour. Given that some families are from war-torn Africa and others from affluent America or Australia, nothing could provide a more vivid contrast of who gets to eat what food. The authors add to the visuals by describing the

health profile of each family's country and the significant food customs or foodways. Also included are essays by well-known food commentators plus a foreword by Marion Nestle. The book is less a 'must read' than a 'must have' for anyone with even a remote interest in food. For our purposes the book brings into sharp relief food and politics.

Personal politics and food

We tend to think about the politics of food in terms of the governance of food production, manufacturing, retail, distribution etc. However, the consumption of food is itself a political act. Indeed, choosing what to eat, where that is possible, can be considered as a hallmark of making the personal political. *The hungry planet* is a vivid reminder of the role of culture in dictating our eating habits. As it roams across 24 countries, the book depicts a vast range of foods as evidence of different climates, and of levels of availability and accessibility. However, many other factors play a role in what the families have chosen to eat. One of these is religion, which in many countries is a powerful statement of food choice and identity. Another is ideology, or personal politics. Thus the Melander family in Germany actively support local and organic food over supermarket fodder in their attempt to live according to their principles. They prefer to shop at the town outdoor food market where they know and trust the local stallholders.

In an accompanying essay Corby Kummer⁷ discusses the slow food movement, now active in 50 countries, as an antidote to ubiquitous and popular fast food. As a political statement slow food celebrates everything that fast food is not: seasonality, authenticity and equity. To actively choose to eat against the cultural or social tide is a political act. Sometimes the foodways of minority cultural groups 'hybridise' in the face of dominant cultural food patterns. This is often seen during the post-migration processes of groups that arrive in countries like Australia.⁸ The resulting 'dietary acculturation' can have poor health and economic outcomes unless specific policies are introduced to protect vulnerable groups.

Gender politics and food

The descriptions of food production methods in the pages of *The hungry planet* are clear reminders that these are often male-dominated activities. It is true that in some places both men, women and indeed children take part in growing food, especially in the subsistence agricultures found in many countries. However, almost without exception, women are responsible for food preparation and cooking. This so-called nurturing role is hardly questioned in many cultures. Indeed, it is often regarded as the natural consequence that follows giving birth and breastfeeding.

In countries where many traditional roles for men and women have become blurred, however, the gender politics of food have become academically and practically significant.

For example, research in many countries has shown that while women have the responsibility for food preparation, they don't always have control over the family menu.⁹⁻¹² Thus, decisions about what families eat are often taken with men's, and increasingly children's, food preferences in mind. These decisions often override consideration of what foods might be healthier for families. The responsibility for feeding families according to nutritional priorities is more problematic for women from disadvantaged backgrounds, where taking risks of buying healthier food options, which might meet family rejection, can represent a significant waste of income.^{11,13} Thus, the politics of gender in the family food setting have a number of implications for health promotion, which seeks to change eating habits without necessarily appreciating the family dynamics at play.

Food and war

Military conflict has well-known effects on the physical and mental health of civilian populations caught up in the fighting. The situation is made more desperate when strife involves dispossession of land and triggers massive population movements. The resulting refugees, cut off from their food supplies, rely on food aid and the charity of host countries. *The hungry planet* depicts this aspect of the politics of food in two vivid ways. First, it pictures one family from Darfur, Sudan, and their meagre week's worth of food set out on the ground. The food mostly comprises rations of cereals like sorghum and something called corn-soy blend, donated by the World Food Programme. Fresh food is limited to a handful of limes, onions and garlic. Water and fuel for cooking also have to be rationed. Compared to other pages in the book where families from places like Italy, China, America, Peru and Bhutan display their week's worth of food, the refugees' food plight looks pitiful. The fate of this family represents the state of affairs for all the families in this refugee camp, and also families in other camps in places housing refugees or where military activity affects civilians.

The hungry planet shows that the precarious nature of food in war is not confined to African conflict. Also featured is a Bosnian family (the Dudos family) who are still recovering from the civil war that raged across the region during the 1990s. While there are no longer any food shortages, the Dudos family is ever mindful of the time when they were living close to starvation during the Sarajevo siege. It is well known that the influence of warfare on food supply does not end when the fighting finishes. It can take years for communities to re-establish stable food supplies, while in the meantime depending on food aid from donor organisations or countries. Sometimes donor food becomes incorporated into local food systems, making communities dependent on foreign imports where once they were self-sufficient and food secure.

Food politics, regulation and legislation

In the more familiar territory of the traditional politics of food, governments play a significant role in deciding what populations eat. This can take the form of legislation concerning which crops can be grown (e.g. under current legislation Australian states do not allow commercial production of genetically modified crops); the governing of food processing, manufacturing and additives; or the imposition of subsidies to assist and tariffs to hinder various groups in the food chain. The extent of government intervention into the food supply is highly variable. In *The hungry planet* we read about the food supply in oil-rich Kuwait, where virtually everything is imported and where the government provides hefty subsidies to ensure costs are kept down. Also featured is a family from Cuba, where government food rationing ensures that basics are available for everyone at very low prices (e.g. a half-kilo of rice costs one-sixth of one US cent).

Food politics therefore operates to attempt to ensure good access to food. Of course, many governments decide not to regulate on food issues, leaving consumers to the free market or individual choice. For example, the decision by the Howard Government to not tighten regulations governing food advertising to children represents a policy of non-action. It rests on a belief that industry self-regulation and parental control are sufficient to protect children from exploitative advertising campaigns that promote unhealthy foods. Whether children will benefit from such government non-action is, of course, a matter of current debate.¹⁴

Food politics and socioeconomic disadvantage

The social determinants of health are a vivid reminder that those resources required for health, especially healthy foods, are unevenly distributed across populations. There are many reasons for this including different levels of accessibility, availability and affordability. Some might argue that education about what is good to eat for health is another factor that influences why some people eat a better diet than others. However, UK research demonstrates that disadvantaged groups often have adequate levels of nutritional knowledge, but that access to healthy food is the main barrier.¹⁵

The hungry planet features two Australian families who represent different levels of socioeconomic privilege. The Browns, who have already been visited by diet-related diseases such as diabetes and stroke, are an extended Australian Indigenous family living in suburban Brisbane. The Malloy family, also from Brisbane, are apparently more affluent and are enjoying better health. Why? Could there be clues in the foods eaten? Indeed, the photograph of the Malloy's weekly food tally features significantly more fruit, vegetables and lean meat, and less processed foods. And no doubt the packets of cigarettes featured at the front of the photo of the Indigenous family's weekly shop play a role. But the contrast between the two photos represents far more than individual family preferences or

even cultural differences. The health differences between Indigenous and mainstream Australians are undoubtedly a result of socioeconomic disadvantage and poor access to health-promoting resources in Indigenous communities. Numerous studies have shown that, especially in rural and remote areas, healthy foods are less available and more expensive.^{16,17}

Of course, there is nothing inevitable about this state of affairs. The appalling access and availability problems that limit supplies of healthy foods reaching rural and remote communities are the result of policies that have failed, and are continuing to fail, vulnerable groups. Some might argue that the so-called tyranny of distance is a key factor. However, the fact that many rural or remote South Australian homesteads and stations enjoy foods and diets that are probably city-equivalent suggests that distance per se is not necessarily a barrier to eating well in the bush. What appears to be a barrier is the lack of belief that the supply of healthy food in rural or remote Indigenous communities is a community necessity, like the supply of health care and education. While no-one would consider leaving health or education to market forces and entrepreneurship, it appears to be acceptable to view the supply of healthy foods as a commercial enterprise, in many cases without competition and local accountability.¹⁸ An alternative policy position would see community food stores as essential services, ensure healthy food is affordable, and invest in the training and accreditation of store personnel as a priority.¹⁹

Conclusions

This article has attempted to examine a range of issues covered by the title *The politics of food*. The aim has been to demonstrate that such a view of food can go further than what is conventionally encompassed in terms of power and control of the food supply by vested interests. The 'lens' for this exercise is provided by *The hungry planet: What the world eats*, a book containing a vast richness of ideas about food in pictures and words, where culture, gender, warfare and socioeconomic privilege are all evidence of the politics of food that shape food choice and eating habits.

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POLITICS OF THE FOOD INDUSTRY AND THE IMPACT ON CONSUMERS

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The food industry

The pervasive nature of food industries within society should not be underestimated. Their sheer size and extensive links within our society can be very powerful political influences. The food system encompasses agriculture, food transport, food processing and marketing, food retail and food services. Its net worth for South Australia is calculated as \$10.1 billion (2005–06) and it employs around 136,100 people (2005–06).¹ Thus the food industry sector can exert political influence through direct advocacy with political parties and politicians, or through influence on policies such as agriculture, water management, food regulations, food services and advertising.

There are also several ways in which food industries directly impact on consumers that are less obvious but equally important to understand, as they potentially affect public health. This paper will examine some of these impacts, focusing on industry influence on food–nutrition knowledge, information, communication and education. These can be considered political influences within a definition of politics as guiding and influencing (governmental) rules and procedures or exerting power over policies and, hence, access to resources.

Defining knowledge

Scientific knowledge about food and nutrition has been considered to be ‘objective’ and ‘value neutral’. However, this position does not necessarily reflect the environment within which such knowledge is generated. Government support for research, considered to be the most independent source of funding for scientific endeavour, has policies which encourage, if not require, research to be undertaken in partnership with industry. Thus food and nutrition research focuses on supporting the food industry, such as in the National Food Innovation Strategy², or is conducted with an industry partner, such as within the Australian Research Council’s Linkage Projects.³

This has several impacts on consumers. Certainly, research is undertaken which otherwise may not receive funding and support, and nutrition knowledge is advanced to the benefit of human health. Our understanding in the field of nutritional sciences is advancing rapidly, as witnessed by nutrition and human genomics⁴, nanotechnology⁵ and knowledge regarding specific nutrients in the body, e.g. omega 3 fatty acids⁶, trans fatty acids⁷ and antioxidants.⁸

However, a negative aspect of the strong link between research funding and industry interests is that broader research questions which do not necessarily advance industry interests, or indeed may be critical of the influence of the food industry, may have difficulty receiving funding. This could apply to research that might benefit small groups within the community with particular health needs or concerns, e.g. determining the health impact of limited access to fresh foods in low income areas, or the long-term health impact of new food production technologies prior to their introduction into the Australian market. As a function of industry funding specific research, there may also be a systematic bias in results that are reported in the literature.⁹

Whose advice

A further impact issue to consider is the long-term independence of nutrition advice. A majority of nutrition researchers in Australia have received industry funding for their research, and nutrition trained professionals are increasingly being employed by the food industry.¹⁰ Where can consumers go to seek independent information? Research has shown that consumers value highly information provided by health professionals¹¹ but do they realise that many health professionals undertake their research on behalf of or in conjunction with industry?

Consumers’ access to independent, as opposed to commercially motivated, nutrition information is influenced by the food industry in many ways, in addition to the reporting of research. As health and other government departments have a limited capacity to provide nutrition information due to budget constraints, industry groups have increasingly provided this information. They do this either directly to the public (e.g. gift packs to pregnant women in hospitals—‘Bounty Bags’); via websites about their products¹²; via websites that act as nutrition education services¹³; by sponsoring health professional education conferences and workshops; or through direct mailing of product information via health professional association mailing lists. This range of industry influences over nutrition information is not well known or understood by consumers, making it very difficult for them to access ‘independent, scientific’ opinions on nutrition issues.

Food label information

A further example of changing access to nutrition information is the food label. The changes to the food regulations in 2001 have increased access to information for consumers. Nutrition information panels are compulsory in Australia and New Zealand, as is the percentage of key ingredients in a processed food and declaration of allergenic components, such as nuts or soy. Consumers have certainly benefited from these changes, although some current government initiatives to educate consumers about the food label could also be construed by some to be industry focused. An example is the following excerpt from a government website

directing readers to industry-provided information sources: 'Some Australian food manufacturers have recently taken steps to improve consumer education through healthy eating promotions, using front of pack labelling, educational websites, advertising, supermarket, shopping centre and major event promotions'.¹⁴

The benefit to consumers of broadening the approval for health and nutrition-related claims on food labels is also contested. Changes to product composition in order to carry certain claims can be advantageous¹⁵, but whether an actual health benefit can be linked to greater use of health claims is unclear.¹⁶ There also exists the opportunity for greater consumer confusion from a multiplicity of claims on the foods.¹⁷ An associated issue, which foods should be fortified with certain nutrients, is predominantly driven by industry, with Food Standards Australia New Zealand responding to these applications, rather than being directed via broader food or health policy. Once fortified with the nutrient, the food company will be able to place nutrition-related claims on the label.

In addition, information on nutrition-related issues considered by consumers as important is not readily available or may not be considered necessary. Information on the country of origin of foods has been energetically debated within the food regulation community. There is now labelling of country of origin of primary food products, which is an advantage for Australian farmers, but not of many of the ingredients in processed foods because it is considered by industry to be too difficult. Industry knows that several states will not be enforcing the new requirements¹⁸, and this may undermine the regulation. Animal welfare and production standards are increasingly considered important pieces of information used by consumers in their food choices overseas¹⁹ but are yet to be discussed within the Australian and New Zealand regulatory context.

Some standards are set outside the food regulatory system. For example, glycaemic index labelling of foods is being considered through a non-government agency, Standards Australia. While this process is sound, it may result in limited consumer educational initiatives that do not incorporate other important labelling information (e.g. the wider nutrition profile of the food) promulgated by government agencies.²⁰

Food regulations

Clearly there are different views by industry, consumers and governments of the purpose and role of food regulations. While traditional perspectives primarily focus on food safety and immediate public health concerns, industry believes that such measures should not come at too great a cost, a position shared by governments. This opinion is reflected in current reviews of the food regulatory system in Victoria²¹ and national regulatory issues.¹⁸ The legal intent of the regulations is that they should protect the interests of the public, supporting not only their short and longer term health, but also their capacity to make informed decisions and protect themselves from deceptive behaviours.

These different political agendas play out differently depending on the food regulatory issue under discussion. For example, positive health claims or attributes can be associated with individual foods under the proposed new food standard, which is helpful for food industries wanting to sell individual products. However, negative claims, which would be at least as important for consumers to know about, are not included.²² Thus individual foods can have healthy attributes but only overall diets can be unhealthy. Another example is the growing evidence of low iodine levels in the community. While this is a public health concern, support wavers for mandatory fortification of foods as a public health measure to overcome this deficiency.²³

There would be considerable time and efficiency savings if political/policy discussions on food regulations and related issues were undertaken on a broader level, in a similar way to the treatment of regulatory issues. We need to ask what is the role of the food standards to protect and promote public health (the first objective of the Food Standards Code (FSC)) and how does this fit with other public health initiatives? How can the provision of information to consumers to inform their food choices be more comprehensive, independent and effective—not only as the second objective of the FSC, but more broadly as the education role of government?

Do we need a national food policy?

A single national food policy with clear, overarching public health information and outcome goals would produce gains for industry as well as consumers, through reduced time taken to review individual standards. Discussions relating to 'regulatory burden' and the cost/effectiveness of (regulatory) initiatives would be required to account for the public health or consumer public-good benefits in a standardised but comprehensive manner. This is currently not possible when these terms are not well defined, outcomes are not articulated, and regular systematic monitoring is not undertaken. The current reviews of regulatory burden need to ensure that the public health and consumer perspectives are sought and incorporated; otherwise the discussions may be very one-sided and limited. Reduction in regulatory burden needs to be situated within a food policy framework—not the other way around. A food policy would provide an opportunity for industry groups, consumers and government officials to participate in an open dialogue about these issues.

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FOOD STANDARDS: THEIR ROLE IN PUBLIC HEALTH

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It could be said that all people are stakeholders in the food systems as they all have to eat. But while they may all be stakeholders, they have very different expectations, views and agendas. This paper will look at two major interest groups – consumers and the food industry, and at the role governments, through standards and regulation, play in the food system. Food standards have traditionally protected the safety of the food supply, but is there a broader role for the food regulatory system in chronic disease prevention by addressing preventable risk factors of poor nutrition?

The views of stakeholders regarding the nature of the food supply system is varied. They range from those who advocate a 'traditional' organically grown food supply where substances such as those found in complementary medicines are not added and where health or medicine-like claims cannot be made, to those who advocate for minimal regulation of the food system and where free market forces operate.

Consumers

Consumers want safe, inexpensive food and they want what they purchase to be what they expect it to be; for example, that an 'apple pie' contains a significant amount of apple. Consumers also want choice and many want information to enable them to make informed food choices. This includes information on food labels about genetically modified (GM) food, the country of origin of the product, and whether the product is organically grown.

South Australian research shows that the top three food labelling issues for consumers are date marking, nutritional information panels and country of origin labelling.¹ South Australian consumers also believe that nutritional claims should be truthful and backed up by evidence, and that it should be the responsibility of government to assess claims regarding the health benefit or nutritional content of food.¹

The food industry

While the food industry is very aware of the needs and interests of consumers, the priorities of the two groups are not necessarily the same. The food industry wants to grow and remain profitable, which requires consumers to buy more food and/or spend more on their food products. The contribution of the food industry to the economy is considerable. The average total weekly expenditure of South Australian households on food and non-alcoholic beverages

increased by \$26 to \$137.83 between 1998–99 and 2003–04. This represents an increase in the proportion of total weekly expenditure from 23% to 26%.²

The food industry obviously needs to produce what consumers want, but they need to go further. According to the Australian Bureau of Agriculture and Resource Economics:

*For domestic producers to expand market share they need to differentiate their products and develop new export markets. Product differentiation involves the development or promotion of high valued food products with attributes beyond the provision of sustenance. The types of food likely to be developed include products with specific sensory appeal (colour and flavour); desired nutritional content; relevant health benefits; food safety guarantees; origin of production; processing practices; or greater convenience.*³

Food standards

Meanwhile, governments have a range of responsibilities and agendas which could be seen to be contradictory. First, they need to support the food industry to be strong and viable, promote industry development, facilitate trade and minimise the regulatory burden on industry. Second, they are charged with protecting public health and safety, protecting consumers' rights, and managing and treating ill health and disease.

One of the most traditional, and absolutely crucial, roles of government in protecting the safety of the food supply is through the development and enforcement of food policy and regulations. The joint Australian and New Zealand food regulatory system was established by state and territory food acts: the *Food Standards Australia New Zealand Act 1991*, *Food Regulation Agreement 2002* and *The Agreement between the Government of Australia and the Government of New Zealand establishing a System for the Development of Joint Food Standards 2002*. The objective of the system can be summarised as protecting public health and safety, informing and protecting consumers, facilitating trade and commerce, and reducing the regulatory burden on industry.

Examples of the traditional role that food standards play include the regulation of: food additives; labelling and composition of foods—ingredient lists to inform consumers of what is in their food; batch numbers and manufacturer information for traceback in the event of a food recall; maximum residue limits for chemicals (e.g. pesticides); and, more recently, food hygiene requirements that govern the cleanliness of premises and equipment in food preparation and production and in food handling. These are all crucial in protecting the safety of our food supply.

While this traditional role of food standards in regulating food supply to protect consumers from health hazards associated

with pathogens and chemicals will always continue to be an important public health focus for government, is there an opportunity to broaden this role? Looking at the burden of disease related to the food supply and food consumption, the major risk factor is not an unsafe food supply, but the consumption of an energy-dense nutrient-poor diet inconsistent with Australian dietary guidelines.

In recent decades evidence has shown that diet plays a major role in either reducing or increasing the risks of various diseases.⁴ A number of chronic diseases such as coronary heart disease, stroke, hypertension, particular cancers, type 2 diabetes and osteoporosis are known to be associated with several preventable risk factors including excess weight, poor diet and physical inactivity.⁵ Also, the risk of developing a range of health problems including cardiovascular disease, high blood pressure, particular cancers, type 2 diabetes, sleep apnoea, osteoarthritis, psychological disorders and social problems is increased by excess body fat.⁶

The prevalence of overweight has increased markedly in Australia over the last 2 decades. It is a major health problem estimated to cause more premature death and illness in Australia than tobacco smoking and high blood pressure, with 8.6%, 7.9% and 7.3% of the burden of disease being attributed to overweight, tobacco smoking and high blood pressure respectively.⁷ The WHO has described the worldwide increase in obesity prevalence as a global epidemic.⁶

Data from the Netherlands clearly show that the biggest risk to public health from the food supply is not from factors which the food regulatory system protects against, but from diet-related conditions. The Netherlands National Institute for Public Health and the Environment has identified that each year in the Netherlands inadequate diet composition causes about 13,000 deaths due to diabetes, cardiovascular disease and cancer. Obesity claims 7,000 lives due to cardiovascular disease and cancer. In comparison, food-borne illness claims between 20 and 200 lives a year.⁸

In Australia chronic diseases are also the primary health concern now and in the future, having overtaken infectious disease and injury.⁹ Some chronic diseases are now of epidemic proportions both in Australia and globally.⁵ Chronic diseases are associated with high health care expenditure as many are long-term, and together the top nine account for \$34 billion (nearly 70%) of allocated health expenditure in Australia.¹⁰

Can food standards be used proactively to protect against diet-related conditions?

Health agencies have developed health promotion and social marketing strategies to prevent or reduce excess weight and chronic disease in the population through improving nutrition and increasing physical activity. However, the best public health outcomes are usually achieved by multiple health strategies, including public policy change and the use

of legislation. Examples of this approach include tobacco control legislation supporting social marketing campaigns to reduce smoking prevalence; and road safety legislation supporting driver education to reduce road traffic accidents. There could be a similar potential role for food regulation as a complementary tool with health promotion and social marketing strategies to prevent or reduce excess weight and chronic disease. Currently in Australia, understanding of this approach is lacking and little, if any, work is being undertaken in this direction.

Could the food regulatory system in Australia contribute to the prevention or reduction of excess weight and chronic disease by addressing the preventable risk factors of poor nutrition? Of the objectives of the joint Australian and New Zealand food regulatory system stated above, protecting public health and safety and informing and protecting consumers are complementary to such a health agenda. Food regulation can already control product formulation including prohibiting the presence of unsafe substances in the food supply; provide information to consumers through labelling or other means; and control the claims that can be made about food on labels and in advertising.

Food standards prohibit the presence in the food supply of substances thought to contribute to an increased risk of cancer (e.g. ethylene oxide). Should they also be applied in relation to ingredients that can increase the risk of chronic disease (e.g. trans fatty acids)? Should food standards prohibit energy-dense nutrient-poor foods being portrayed as healthy? Consumers are bombarded with diverse and varied messages about what is healthy and the purported health benefits of foods. Food regulation could assist consumers navigate this complex maze and reduce their confusion. Food labelling could provide them with easily understood and consistent information on the nutrients in food (e.g. front-of-pack 'traffic light' labelling. See next page). Regulation could also ensure that any claims made regarding food (e.g. that it is all natural, low GI and contains real fruit) are honest and accurate so that people know what they are buying, and are not mislead into thinking that they are buying healthy food when in fact they are not.

The WHO Global Strategy on Diet, Physical Activity and Health states that:

Governments have a central role, in co-operation with other stakeholders, to create an environment that empowers and encourages individuals, families and communities to make positive, life-enhancing decisions on healthy diet and physical activity.¹¹

Policy makers face a number of challenges in implementing this statement. Are personal responsibility and a wider community response mutually exclusive? What should be the balance between the greater good, individual choice and industry interests? Where, how and when should governments act in creating this supportive environment? What contribution should the food regulation system make to creating this supportive environment? What are the roles of individuals and industry?

While this paper poses more questions than it answers in relation to an expanded role of food standards in protecting and promoting health, it seems clear that this is a direction that could be pursued. The range of stakeholders, their competing agendas, and the economic and trade environment make the food regulatory system complex and challenging, but serious action to prevent chronic disease needs to use all available avenues. Experience in other major public health challenges point to the essential role that policy, legislation and regulation have played in multifaceted interventions to improve public health.

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TRAFFIC LIGHT LABELLING

In response to research indicating that consumers have difficulty using nutrition information on food labels,¹ and the growing number of different food labelling systems, the United Kingdom Food Standards Agency (UK-FSA) has recommended the introduction of a consistent front-of-pack labelling system.

This system, also known as 'traffic light' labelling, is intended to provide clear, straightforward coding that helps consumers understand at a glance which foods can make a positive contribution to a healthy diet, and which are recommended to be eaten only in moderation or sparingly.

UK-FSA undertook extensive research to determine which system would best achieve this aim, and has concluded that front-of-pack labelling should:

- provide separate information on fat, saturated fat, sugar and salt
- use red, amber and green colour coding to indicate whether levels of these nutrients are high, medium or low
- use criteria set by a food regulatory agency to determine the colour code
- clearly indicate if information relates to food as sold or as consumed
- provide per serving information that is based on a realistic portion size.

UK-FSA has published a technical guide² to provide details of the system. Examples of designs that comply with the guide are provided in Figure 1.

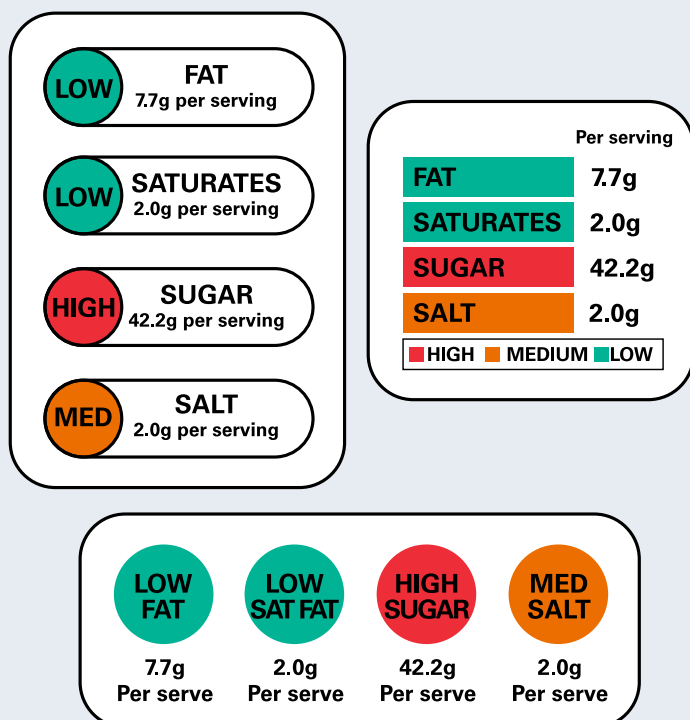


Figure 1: Example of traffic light food labelling design

The guide provides the following table that must be used to determine which traffic light colour appears on the food label for each nutrient.

Table 1: Food (per 100 g whether or not they are sold by volume)

	Green (low)	Amber (medium)	Red (high) >250g ^a	Red (high) if portion
Fat	≤3.0g	>3.0 to ≤ 20.0g	>20.0g	>21.0g/portion
Saturates	≤1.5g	<1.5 to ≤ 5.0g	>5.0g	>6.0g/portion
Total sugars	≤5.0g	>5.0 to ≤ 15.0g	>15.0g	>18.0g/portion
Salt	≤0.30g	>0.30 to ≤ 1.50g	>1.50g	>2.4g/portion

^a By 2008 this will be if portion >100g

Note: different criteria are assigned for drinks.

Initially, it is recommended that the system be used on packaged foods that consumers have informed UK-FSA they find the nutritional content difficult to understand. These foods include prepared packaged meals, burgers, sandwiches, breakfast cereals, pizzas, chicken nuggets and pies.

The UK-FSA labelling system is now being implemented on a voluntary basis in the UK. An independent Project Management Panel has recently been established to oversee an evaluation of the impact of the system on shopping behaviour. More information and updates are available on <http://www.food.gov.uk>.

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FOOD, NUTRITION AND THE BUILT ENVIRONMENT

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*This article is a condensed version of that published by the New South Wales architect Chris Johnson in *Healthy Environments; 11 essays*.¹*

Nutritionists rarely concern themselves with the design of public buildings, transport routes or new housing estates. Similarly, architects and urban planners rarely consider food and nutrition when they design public buildings or Indigenous housing, or plan for a new housing estate. But these professions have more potential overlap than is first apparent. Nutritionists are concerned about 'the food environment', in which food is produced and distributed to people and in which people purchase, store, prepare and consume their daily food. They are also interested in people's resulting health and nutritional status.² Architects and urban planners are concerned about the built community environment and the extent to which it meets the various basic and higher order needs (physical, aesthetic, psychological and social) of the people who live in or use it.

But should these professions extend their concerns beyond current boundaries? This paper argues that these professions could do a better job in meeting basic human needs for food, shelter and health through collaboration, and that their constituents would benefit substantially. This argument is illustrated through selected examples of actions undertaken by urban planners (usually in local government) in partnership with health services and community members. Similar action is needed on a much broader scale, along with fresh, creative approaches to designing environments which are conducive to good nutrition.

Nutrition-related health problems are common in the Australian community. Obesity heads the list, along with various forms of heart disease, the major cause of premature deaths. Many of these problems are preventable by weight loss, reduced saturated fat intake, smoking cessation and increased exercise. Diabetes mellitus is also on the rise, and the age of onset is getting younger. Lower income populations experience higher rates of these conditions and shortened life expectancy. In addition, lower income households can experience food insecurity—the lack of ability to count on obtaining adequate and appropriate food at all times for themselves and their families.³

Food consumption patterns among children and adults tend to be excessive in energy, particularly from energy-dense nutrient-poor foods (high in fat or sugar).⁴ Fruit and vegetable intake is only about half that recommended, and most mothers introduce solid foods too early and cease breastfeeding far earlier than the recommended 12 months.⁵ Lack of physical activity is also a major contributor.

While educating consumers about food and nutrition is important, it is an insufficient solution to changing their eating habits. There are countless examples of influences in our food environment that undermine healthy eating and make the 'healthy choices the difficult choices'. The prices and availability of food often favour the less healthy options, as does television advertising of junk food.

There are many subtle ways in which the built environment also affects food consumption. It affects whether agricultural land is preserved near cities to grow fruits and vegetables. It delimits the type, size, price structure and variety of food retail outlets and particularly whether a supermarket (with a wider range and lower prices than smaller shops) is accessible. The built environment affects the convenience or difficulty that disabled and disadvantaged people have in obtaining their weekly food. It can influence whether they can get to shops, obtain a home-delivery service, or travel to and from social events and meals out. Housing design determines the extent to which those living on low incomes have storage space, kitchen facilities and working equipment to prepare 'budget meals' for the large extended families for whom they often cater. The design of commercial and public buildings and spaces affects how comfortable women feel in breastfeeding their babies for the recommended 12 months, especially when they go out.

There are several local and international examples of collaboration between nutrition, local government, urban planning and design professionals to address such problems. Six issues where collaborative action has occurred are illustrated here:

- food retail zoning and land use planning
- catering for special needs through collaboration with commercial and institutional food businesses
- improving access to food supply through transport planning
- breastfeeding-friendly policies regarding design requirements for public buildings/spaces
- policies, events and research regarding preservation of local agriculture and the promotion of local food production and produce
- housing design and kitchen facilities.

There are excellent examples of collaborative actions on these issues from several New South Wales local councils including Penrith, South Sydney, Hawkesbury and Illawarra. They have each taken positive steps (beyond their usual role in food safety) to improve the local food supply for residents, workers, students and visitors to their communities.⁶⁻¹² The work of these few Australian projects has been modelled largely on Food Policy Councils, now widespread in municipal governments in North America. Some achievements from the Penrith Food Project⁶, including those dealing with the six issues listed above, are shown in Table 1.

Table 1. Selected achievements for the Penrith Project by objective

Improving access to food retail facilities and public transport

A census of food retail shops, transport, and audit of healthy choices within shops (planned for repeat analysis)

Policy guidelines for neighbourhood food access for use in planning new housing estates

Home-delivered fruit and vegetable services established in less well-serviced areas

Establishment of fruit barrows in business districts through collaboration with retailers and the city council

With national supermarket chain, development of pilot home grocery order and delivery service for homebound elderly

Bus route changes for an outlying housing estate to a major food shopping centre, through collaborating with city council's transport forum

Expanding availability of healthy choices

Regular monitoring and publishing prices of healthy choices through collaboration with local price-watch group

Food and nutrition policy for long day care centres (developed and monitored with cooks and centre managers)

Catering improvement in local restaurants and take-away food shops by a 'nutrition advice' service

School canteen menu checklist to standardise means of monitoring food available for sale

Model food services policy regarding specification of healthy choices for the city council and health facility food services

Improving community support for breastfeeding

Parenting facilities policy for public buildings adopted and implemented when reviewing applications for constructing public buildings and facilities (went on to be adopted as a policy by the National Assembly of Local Governments)

Conducted successful pilot workplace policy to improve facilities and incentives for mothers to combine work and breastfeeding, which was subsequently adopted by the trial organisation and used as a model to recommend action in other workplaces

Promoting local agriculture

Annual Open Farm Day and local farm tours developed and now regularly run for more than a thousand visitors each year, with local farmers and the state tourism authority – the city council negotiated with tourism to take over the lead in the planning and implementation of these regular events

Creation of a school garden, a breakfast program, and a healthy canteen in a disadvantaged area, which have been maintained for several years through collaboration with a school principal

Establishment of Sydney's Fresh Food Bowl, a collaborative project between many organisations (which grew directly out of the Penrith Food Project), advocates for the maintenance of local agricultural industries near the urban area, and the promotion of local produce

Improving food safety

Delineation of roles and responsibilities for food inspections and food safety surveillance between health and local government agencies by facilitating better communication

Food retail and land use planning

Food prices are substantially higher, and the range of stock available is considerably narrower, in convenience stores, corner stores and small markets than in supermarkets. People therefore require local access to a supermarket. Yet, it has been recognised for some time that there is often a substantial lag in the provision of essential services, including supermarkets, to new housing estates. As well, there has been a loss of supermarkets in the central business districts of urban areas, leaving many people to travel substantial distances to a supermarket or rely on convenience stores for their primary supplies. The solutions to these problems vary between areas but all rely on commitment, good will and consultation between planners, food retailers and residents. Siting and zoning policies can be modified; councils can negotiate with retailers for intermediate-size markets (with supermarket prices) until the area can sustain a larger supermarket; and mixed land use planning can encourage the co-location of business parks (which could house supermarkets) and housing estates, to avoid concentrating business and industry in separate areas. Public-private partnerships to subsidise the initial establishment of supermarkets in underserved areas have worked well in North American projects, where the problems with supermarket access are similar to those in Australia.

Planning and zoning for a desirable food retail mix in communities are also needed. Many areas are overserved by specialty outlets but lack the basics. For example, in at least one area in Sydney there is a high density of liquor shops but no supermarket.

Catering for special needs through collaboration with food businesses

Every area has residents who are either disabled, elderly, without transport and/or 'nutritionally vulnerable'. For many in these circumstances, home-delivered groceries and fruit and vegetables (which are heavy and perishable) would be an invaluable service. While home-delivered pizza is widely available in most urban areas of the state, home-delivered groceries are expensive and fruit and vegetable home delivery is mostly not available. A select few councils have collaborated with supermarkets and with fruit and vegetable retailers to provide a reduced price home-delivery service to disadvantaged residents.

Improving access to food outlets through transport planning

People tend to drive their cars to shop for the weekly groceries where possible. But those on very low incomes, students, the elderly and those in households with only one car tend to rely on public transportation to do their food shopping. As a consequence, they usually have to buy smaller quantities, at higher prices, and shop more frequently. Often, however, people living on the urban fringe as well as in rural and remote areas are poorly served for both shopping centres and public transport. Selected councils have addressed some of the transport and food

shopping needs of residents by providing shopper shuttles, altering bus routes and timetables, and improving shelters and footpath access.

Policies regarding specific design requirements for public buildings and spaces

It is likely that mothers will breastfeed their babies longer if, when they go out, they have access to rooms or places where they can feed babies in a comfortable, safe and relatively private environment. 'Breastfeeding-friendly' communities provide parenting rooms or areas in public and commercial facilities (e.g. shopping centres, libraries, theatres, parks and workplaces) in accordance with professional specifications, such as those listed on the Australian Breastfeeding Association website. A number of councils have incorporated into their Development Applications the requirement that public buildings include parenting rooms.

Preservation and promotion of local agricultural activity

Peri-urban agricultural land is fast disappearing and being replaced by new housing. Farmers on the urban fringe have small operations and find it difficult to sustain a living wage. Yet, urban centres need to retain agricultural activity for food growing, particularly horticultural produce which is highly perishable and best sold in nearby markets. Familiarity with and/or involvement in food growing appears to improve food habits among those who participate, so community access to farms and agriculture is also desirable. It is therefore a challenge to find ways to preserve agriculture in and around urban centres in Australia. Promoting local farmers and their produce through open farm days, farmers' markets and farmgate stalls has helped to highlight the value of this precious but declining resource. Rural land audits are another means of documenting the economic value of agricultural activity in an area. There are many incentives that local government can use to encourage the continuation of farming and preservation of agricultural activity.

Housing design and kitchen facilities

With the trend away from cooking and towards the use of ready-to-serve meals, newer housing designs tend to eliminate or minimise kitchens, paring back the equipment and storage space. Yet those on low incomes, in particular, can benefit from preparing food at home and buying bulk supplies, which cost less per unit. Designing kitchens in public and private housing is a substantial challenge to anticipate and meet the current and future needs of residents. Food prepared away from home, even in gourmet kitchens, tends to be higher in fat, saturated fat and salt than home-cooked meals, so there are nutritional benefits in cooking at home and teaching cooking skills to young people. It is therefore crucial to include adequate kitchen facilities, in consultation with nutritionists and consumers, in the design of public and private housing. In some settings communal kitchens may be an economical solution, while for some Indigenous communities low-cost outdoor courtyard kitchens (including provisions for storage of food away from animals) may be the most economical and suitable option.¹³

Conclusion

This article has described several examples of how built environments can be designed and modified to help make good nutrition an easier choice for people. The location of supermarkets, local agricultural activities, transport provisions, services for special needs groups, and building and housing design are some key issues for consideration and action.

Although a handful of councils around Australia are working collaboratively on these issues, considerably more action is needed. For example, there are over 100 local government areas in New South Wales without an explicit commitment to considering food and nutrition in planning their communities. State and regional planners and government architects make key decisions about public housing and community plans, but there has not been a forum for discussion about the food supply needs that affect the nutrition of communities. There is no shortage of ideas, models for action or potential collaborators with goodwill. What is needed is political commitment to create a seat at the table for nutrition professionals and the food business sector so that food and nutrition objectives are considered in community planning.

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THE SUSTAINABILITY BENEFITS OF A HEALTHIER DIET

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'The most political act we do on a daily basis is choosing what to eat...'

Professor Jules Pretty, University of Essex, UK.

It can be argued that choice of diet is our most environmentally significant act, given that 36% of the average South Australian's 'ecological footprint' is attributed to the consumption of food, more than any other type of consumption activity.¹

Our food production systems and diets have changed significantly over the course of the past few decades. This has led to intensification of the environmental impact from food production, and facilitated an epidemic of obesity. Clearly, this is socially and environmentally unsustainable.

New ways of thinking about food are needed. Using the ecological footprint as a guide, this paper examines complementary policy links between the human health and environmental sustainability agendas with respect to diet and food systems.

What is the ecological footprint?

The ecological footprint provides an indicator of renewable resource consumption in much the same way that economic indicators such as gross domestic product represent aspects of the financial economy.²

The ecological footprint is a balance sheet for renewable resources for a given year. One side of the sheet (supply) measures the amount of renewable resources available to us. The other side of the sheet (demand) measures the amount of renewable resources required to produce what we consume and to absorb our waste.

If a population's demand on renewable resources exceeds supply, then that population is said to be in ecological overshoot—operating unsustainably. This is possible because, for example, we can fell trees faster than they can regrow, and emit carbon dioxide faster than it can be absorbed.¹

How is it useful?

The most important attribute of the ecological footprint is its ability to make the concept of 'ecological limits' tangible, and define the concepts of 'sustainability' and 'sustainable development'. The ecological footprint aids in understanding the relationship between our consumption behaviours

and the resources required to support them.^{1,2} Defined in hectares, it allows an individual or group to mentally associate the goods and services they consume with an area of productive land.

How does South Australia compare?

Demand

Demand is defined as the amount of renewable resources used in all consumed goods and services, including imports. South Australia's ecological footprint was first calculated in 2005 and the results released in early 2006. Based on 2001 data (the latest available at the time of calculation), the average South Australian requires 7.0 global hectares (gha) of renewable resources to support their annual consumption,¹ an area of productive land roughly four and a half times the size of Adelaide Oval.

The Australian footprint (based on data from the same time period) is roughly 10% higher at 7.7 gha. However, while we may be doing a little better than the Australian average, the world average footprint stands at 2.2 gha.¹

Supply

Supply is defined as the renewable resources available per person worldwide. When all of the world's cropland, pasture, fishing grounds, forest and the fertile land on which we have built most of our cities is combined, there is 1.8 gha of productive land available per person worldwide.¹

Given that the world average footprint stands at 2.2 gha, humanity is therefore in ecological overshoot, with a demand on renewable resources some 20% higher than supply. However, if the whole world lived like South Australians, with a footprint of 7.0 gha, we would require nearly four earths' worth of renewable resources to support ourselves.¹

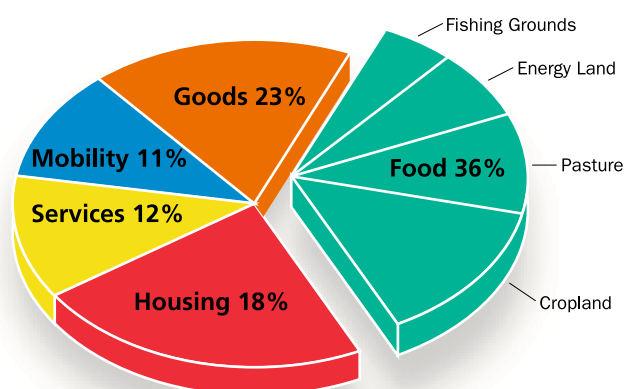
The footprint of food

Globally, food systems have changed considerably in recent decades. The key trends have been in larger farms, declining crop heterogeneity, increasing mechanisation and increasing 'food miles' through international trade. Australian diets have also changed, with more processed calorie-rich food being consumed.⁴

These changes have compromised human nutrition, contributed to an epidemic of obesity in many regions^{5,6} and, as ecological footprint calculations show, contributed greatly to ecological overshoot.⁷

As illustrated in Figure 1, the major contributors to the footprint of the South Australian diet are the use of productive cropland (39%), the use of pasture (28%), greenhouse gas emissions arising from the use of energy (on the farm, in processing and food miles: 19%), the use of fishing grounds (12%) and around 1% for the use of forest (wood used largely in packaging).¹ Combined, the

use of energy, cropland and pasture represents 86% of the ecological footprint of food. Reducing these aspects of the food footprint therefore requires special focus.



*Energy Land refers to the amount of land required to sequester (soak-up) the carbon dioxide emitted as a result of our use of energy.

Figure 1: The SA footprint by consumption type

Source: Department of the Premier and Cabinet¹

The energy component—food miles and processing

‘Before you finish eating breakfast this morning, you’ve depended on more than half the world.’

Martin Luther King.

The distance our food travels and the degree of processing involved are key determinants of the energy footprint of our diet. Ever-increasing energy demands for processing, packaging, storing and transporting food have created some remarkable imbalances. For example, it takes approximately 7 units of (primarily) fossil energy to produce 1 unit of food energy in the US.⁸

Consuming fresh food rather than processed food is a key way to reduce the energy footprint. Processing requires energy input, frequently involves packaging and may lower the nutritional value of some foods. Certainly, the prevalence of processed food makes it easier for us to avoid the fresh fruit and vegetables we need, while eating foods that may be tasty but are of minimal nutritional value.⁹

Much of our food also makes a very long journey from farmgate to plate. The author is not aware of relevant figures for Australia, but it is estimated that the average food item sold in the US travels between 2,500 and 4,000 kilometres.¹⁰ Consuming locally grown food can reduce the ecological footprint of our diet, as food items from far-flung destinations cause the emission of greenhouse gases in their transportation.

As there is no price placed on the environmental impact of transporting food long distances, and therefore little incentive to eliminate the impacts, some counterintuitive

behaviour occurs. This is well illustrated by a summary of trade behaviours in the UK. For example, in 2004 the UK imported as much gingerbread as it exported, and sent almost exactly the same amount of potatoes to Germany as it received from Germany (some 1.5 million kg).¹¹ There are many more puzzling examples.¹²

Some argue that there are also health benefits to consuming locally grown food, as it may retain a greater proportion of its nutrients if there is a shorter time elapsed between harvest and consumption. In addition, reduced handling and the shorter distance from producer to market can reduce food safety risks. The 2001 and 1967 foot and mouth disease outbreaks in the UK are illustrative. Through the use of centralised slaughterhouses the 2001 outbreak spread much further and faster than in 1967, when most slaughtering still took place locally. Furthermore, the 2001 outbreak was traced back to feed imported from China.^{6,10}

Estimates from the UK suggest that total environmental and health costs arising from the current agricultural system exceeded \$1.5 billion for the year 2000, not including such impacts as antibiotic resistance arising from overuse in livestock systems and the chronic health effects of pesticides.¹²

The pasture and cropland component—meat vs veggies

The composition of our diet with respect to animal- and plant-based foods is a key determinant of the ecological footprint of food. In recognition of this, the Department of the Premier and Cabinet and the University of South Australia have conducted a preliminary analysis of the effect on the footprint of shifting to the recommended National Health and Medical Research Council (NHMRC) diet. The NHMRC’s guidelines for a healthy diet recommend lower calorie intake, lower levels of meat consumption and higher levels of plant-based food consumption than current patterns (based on the latest available national survey data).¹³

The results of the analysis indicate a reduction of some 15% in the ecological footprint of the average South Australian’s diet, or around 5% of their total footprint.¹⁴ Other studies conducted internationally have produced similar results.^{15,16} Notably, moving to a fully vegetarian diet has still greater ecological benefits. A Scottish study showed that a balanced vegetarian diet can reduce an individual’s food footprint by a further 23% over a normal healthy diet.¹⁶

In both scenarios the reduction occurs largely due to the lower footprint of plant-based food, which, per calorie, is roughly a quarter that of animal-based food.¹⁷ There is an element of footprint ‘double-dipping’ involved in meat production; by limiting meat consumption to healthy levels, we not only reduce our use of pasture but also of cropland, as grain is often used to feed livestock.

To conclude—opportunities

There are some clear complementary links between the health and environmental sustainability agendas in South Australia with respect to food consumption. Currently the way we eat is unhealthy both for ourselves and our environment.

Improving the diet of South Australians can make an important contribution to the achievement of many targets in South Australia's Strategic Plan, notably reducing our ecological footprint, reducing greenhouse gas emissions, reducing the number of South Australians who are overweight and increasing life expectancy. The nature of our diet and food systems deserves special focus, and there are opportunities for the development of new knowledge and mutually beneficial partnerships.

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DIETARY GUIDELINES FOR SUSTAINABILITY

In 1986 the renowned American nutritionist Joan Gussow advocated that the Dietary Guidelines, which are based almost entirely on the relationship between food and human health, should be broadened to include the relationship between food and environmental health. Gussow urged an environmentally conscious application of the Dietary Guidelines, that is dietary guidelines for sustainability.¹ Gussow's concepts are outlined below.

The Dietary Guidelines for Sustainability

To incorporate sustainability into the framework of the Dietary Guidelines requires that foods be judged not only by their nutrient content but also by their source and method of production.

1. Eat a variety of foods

The so-called 'variety' of foods available to us actually represents a narrowing of the biological basis for our food resources, with so many of the thousands of available, predominantly processed, products made from a combination of the same relatively few raw food materials. By eating a variety of foods we not only achieve our nutritional requirements but also maintain our biological diversity. Variety should also be rational, seasonal and preferably local, as out-of-season produce can be very energy-intensive to provide.

2. Maintain ideal weight

To overconsume calories is to waste food. Food is wasted right through the food chain—in the paddock, the factory, the shop and the home. Avoiding the waste of overconsumption is good for the planet as well as the individual.

3. Choose a diet low in fat, saturated fat and cholesterol

It takes a great deal of plant food energy to feed an animal to produce (high-fat) animal food energy. Farmlands are being degraded, and forests, rainforests and rangelands are being destroyed to create pasture for cattle production.

4. Choose a diet with plenty of grain products, vegetables and fruits

Whole grains are a major source of fibre, but many of the foods we eat to excess are made from refined grains, depleted of fibre as well as many of their nutrients. The refining process benefits neither the grower nor the consumer, so there is no value to them, or to the maintenance of agriculture, or to the biological variety of the diet, when refined grain is converted into hundreds of products high in fat, salt and sugar.

5. Avoid too much sugar

Refined sugar supplies no nutrients besides calories (kilo-joules) and can displace other nutrients in the diet. It requires processing and packaging, the energy costs of which outweigh the nutritional return.

6. Avoid too much sodium

Sodium is primarily added as part of the processing of foods, so choosing minimally processed foods promotes both health and sustainability.

7. Drink alcoholic beverages only in moderation

The energy costs involved in the production, processing and packaging of alcohol provide substances that have little or no food value and can in fact be harmful.

The field of ecological public health nutrition is growing, with increasing recognition of the important links between food supply, human health and the health of the environment. Examples of relevant initiatives are provided on the websites of Sustain, a UK organisation for sustainable food and farming², and the US Center for Science in the Public Interest.³

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GLOBAL FOOD TRENDS

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Why consumers who are living longer are enhancing the returns from food

Food production contributes 33% of exports from South Australia, and one in five people in the workforce are employed in the food/agricultural sector. Although there is a growing contribution from finished food products, most food production is of commodity products such as bulk grains and meat. While this is significant for South Australia, we produce only about 9% of Australia's food produce, and Australia produces only about 3% of world produce.¹ So although the produce is of world class quality, by these measures South Australia is a small producer.

While Australian farmers are among the most cost-efficient in the developed world, South Australia's agricultural resources are limited. More importantly, our ecological footprint, that is the amount of natural resources required to produce our food, is three times the world average.²

Assessment of the following pressures and emerging global influences will determine how we plan for future food production and what returns we anticipate from the food produced:

- increased competition from developing countries
- higher value products growing faster than commodity products
- demand for food products based on environmental attributes.

Competition

The emergence of developing economies adds a new dimension to Australia's ability to export quality food products to the world.

China is becoming the second largest exporter in the world, with economic growth consistently around 8–10% per year. China's purchasing power is correspondingly large and its demand for food is being driven by the need to accommodate its 1.3b population and growing affluence. Yet China's per capita income is less than US\$2,000 per year.³ Imagine the demands from this economic behemoth when this average income doubles to US\$4,000, let alone US\$10,000 per year.

While it looks like Australia should benefit from this demand, we are not price competitive against newly emerging economies in South America, Asia and Eastern Europe.

China is also rapidly growing its agricultural sector to feed its vast population and is becoming a highly competitive exporter of an array of food products. With China's almost limitless access to very low-cost labour, its competitive low-cost position and its capacity for intensive production, Australia has limited ability to compete on price with China and other emerging economies in mainstream food products.

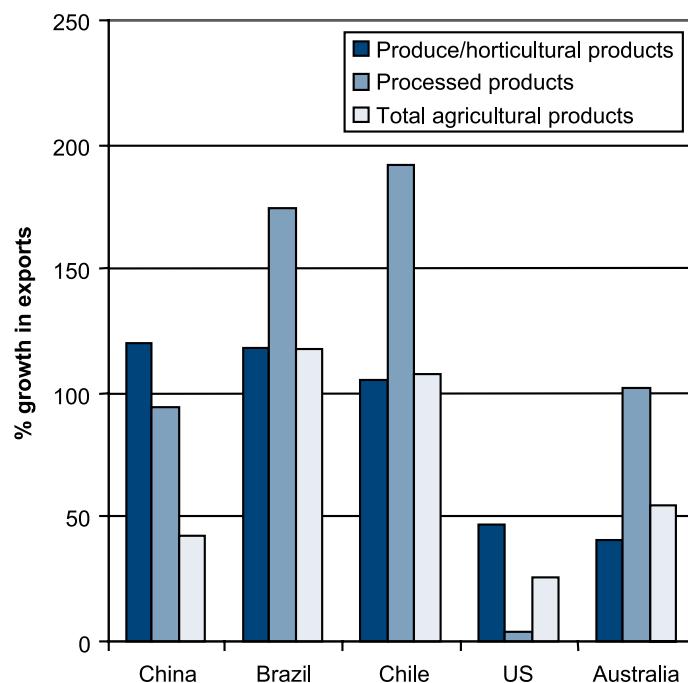


Figure 1: Percentage change in exports of produce, consumer products and total agricultural products from Australia and key competitors 1994–2004

Source: Department of Foreign Affairs and Trade STARS database

Australia is well behind Chile and Brazil in the growth in exports of food products and particularly of processed products (Figure 1). Since the year 2000 Australia's export of processed foods has steadily declined and '...as a result, not only are we becoming less competitive in food exports, but also increasingly we face competition from imports. Increasingly, Australians will be eating imported foods. It is conceivable that Australia could one day become a net importer of food.'⁴

Higher value products and shifting demand

While competition is growing, so is the demand for higher value products. These include convenience foods, organic/natural foods and foods that have environmental attributes. The US Wholefood Market chain, whose mantra is 'our food does not include...' has now topped US\$5b in turnover and is rated number 5 in *Fortune Magazine's* top 100 best companies to work for. The company commenced in 1980 and has now grown to 191 outlets across North America and UK.⁵

Wholefoods core values include:

- selling the highest quality natural and organic products available
- satisfying and delighting their customers
- caring about communities and the environment
- supporting excellence and happiness.

These values, clearly reflecting lifestyle decisions, have come from a careful analysis of the changing perceptions of food, how it is produced and the interaction with sustainable food production. It is also demonstrative of the growing population of consumers prepared to pay extra for food that they believe will perpetuate good health and longevity. '...26% of those purchasing meat and poultry and 21% of natural/organic foods are doing so away from mass market retailers in the US.'⁶ The US giant Walmart has responded by developing major organics offerings and environmental initiatives along the supply chain.

80 is the new 60!

The expected life span of people born in Australia in 2001 was 80 years for all people—the 3rd highest of all OECD countries. In 1970 Australia was 16th in this group.⁷ This is of course based on averages, but a healthy baby born in 2007 has a very good chance of living well beyond the age of 85. In the US the proportion of the population older than 65 years has increased tenfold since 1900, and by 2030 it is predicted that one in five people will be older than 65. The fastest growing age group is older than 85 and is expected to make up just less than 20% of the population by 2050. However, the disturbing increase in obesity, and child obesity in particular, may upset this trend and create the phenomenon of the current generation surviving to a younger age than the previous.

For the moment, however, as First World economies become more affluent, their ageing populations are living longer. They want to continue working and maximise their longevity by maintaining good health and fitness. These influences are driving the demand for perceived higher quality foods, as indicated in the 'wellness' graph in Figure 2. These include foods that contain added natural benefits (so-called functional foods); bioactive foods, particularly yoghurt and fruit drinks with friendly bacteria and natural antioxidants that claim to improve circulation and heart health; and fruits and vegetables that have inherent beneficial health qualities.

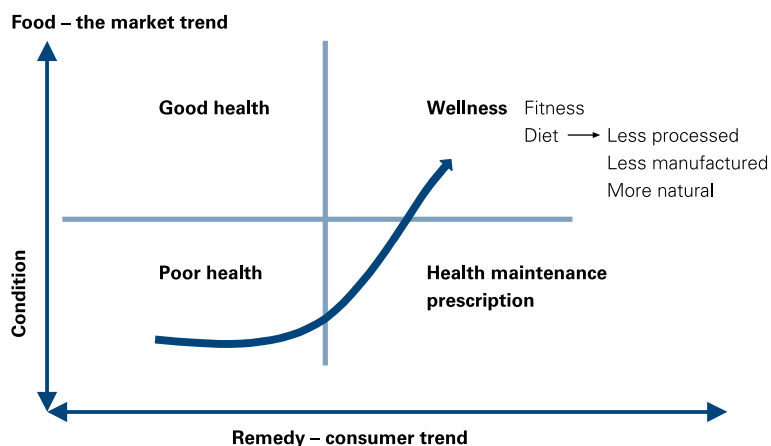


Figure 2: The 'wellness' graph

Source: Food South Australia, Primary Industries and Resources South Australia

Statistics from major UK supermarkets indicate that the 'healthy organic and environmental benefit' food category now accounts for 18% of customer spending and that the customer profile is affluent and peaks at middle age and older. Organics, for example, are bought primarily for health reasons, driven by the perception that these foods contain little or no chemicals. 'In addition, fresh organic produce such as vegetables (84%), fruit (70%) and salads (61%) are perceived to taste better, whereas chocolate and ice cream only score 24% and 20% respectively.'⁸

A further analysis showed that although consumer spending on organics was being driven by a small group, there was huge promotion potential – '3% of customer base accounts for 47% of spend' in the organics category.⁸

This trend has led to major food companies investing heavily in developing products that have a 'natural' and health beneficial profile that promotes lifestyle over cheaper price. The pioneering pro-biotic 'Yakult' was at the forefront of many similar dairy-based products promoting friendly bacteria and improved gut health. The Finnish dairy company Valio is one of the most innovative dairy companies, investing heavily in research into the health benefits of natural foods, and is a world leader in the development of functional foods.

The credence factor underpinning this demand is for foods produced in environmentally sustainable conditions that can be traced to the production source. The growth and popularity of farmers' markets is attributable to consumers' interest in where the food is produced and their ability to relate to who grew or produced the product. In Japan many supermarket vegetables are sold with a picture of the farmer on a specially wrapped package of fresh produce. Of course, this is costly but demand for this credibility is becoming insatiable. In Japanese society it is traditional to buy maybe just one piece of perfectly formed, elaborately wrapped fruit (e.g. one cantaloupe can cost US\$50) and present it as a gift when one is visiting a family member or friend in hospital. It is symbolic of presenting the very best food toward the recovery and wellbeing of the patient.

South Australia's competitive position

Aligning our supply capability with these trends and specialised market demands provides the opportunity to compete against the low-cost producers. While some may assess these higher value food categories to be niche, the category size and scale relative to South Australia's ability to produce is large. Being small in comparison to world production allows this sector to adapt in meeting new consumer demands. 'There are few potential competitors to Australia in developing environmentally based products...'⁶ South Australia's management of its land, ocean and river resources is world class, giving us a reason to invest in and protect an environmentally sustainable image. We also have reason to establish core values in the production of foods targeted to meet the demands of food-conscious consumers. Such consumers are prepared to pay a premium for foods that they believe are produced from ecologically sustainable resources and will contribute to good health, wellbeing and longevity.

The benefits to the state's economy and wellbeing are incremental:

- higher value for our exports
- a more sustainable food and agriculture sector
- the prospect of improving food knowledge, which produces a healthier population and leads to lower health costs.

All these are desirable outcomes on which the future of our quality of life may depend.

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FOOD ADVERTISING TO CHILDREN: THE BATTLE FOR CHILDREN'S DOLLARS OR HEALTH?

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Why the debate about food advertising to children?

Food advertising to children became a discussion issue at the same time that the world realised the significance of the childhood obesity problem. In Australia food advertising to children, as a contributory factor to childhood obesity, was discussed for the first time in 2002, at the New South Wales Childhood Obesity Summit.¹ The issue has remained on the public and political agenda, and was included in the National Obesity Taskforce's consideration of strategies to tackle childhood obesity.²

The focus of debate has been on television food advertising to children because this is the dominant medium used by food companies.³ However, children are exposed to a wide range of food marketing strategies, including internet marketing, movie-toy tie-ins, sports promotions, school-based promotions, children's magazines, and product placement in movies and television programs.⁴

There are many problems associated with television food advertising to children:

- Children are exposed to large volumes of food advertising promoting high-energy low-nutrient foods (30% of advertisements are for food and of these 50–80% are for unhealthy foods).^{5–7}
- Children's food preferences are influenced by advertising.⁸
- Children are getting fatter (up to 30% of Australian children are overweight or obese).^{9,10}
- Childhood obesity is associated with adult obesity and chronic diseases.¹¹
- Children under the age of 8 years do not fully understand the persuasive intent of advertising and are therefore more vulnerable to its effects.¹²

The issue of whether to restrict advertising of unhealthy foods to children during their peak viewing times is currently being debated between public health advocates, consumer groups, industry bodies and politicians across the globe.^{13–17}

What is the current situation?

The current system of regulation in Australia is a co-regulatory one with responsibilities shared between the Australian Communications and Media Authority, Free TV Australia and its members, and the Advertising Standards

Bureau. The relevant pieces of regulation are: the Children's Television Standards,¹⁸ the Commercial Television Industry Code of Practice,¹⁹ the Australian Association of National Advertisers' Code for Advertising to Children²⁰ and the Australian Association of National Advertisers' Food and Beverage Marketing Communications Code.²¹ The co-regulatory system is complaints-based and has no institutional system of monitoring compliance or meting out penalties for breaches. Not surprisingly, there are few complaints registered. One possible reason could be the complexity and unwieldiness of the system, with many pieces of regulation to refer to and no clear pathway to support complainants (mums and dads of Australia).

Since 2002 the pros and cons of increasing the regulation of food advertising to children has been debated through obesity summits,¹ the National Obesity Taskforce,² parliamentary inquiries²² and the media.²³ There have been reviews of the industry codes, and the Australian Communication and Media Authority is preparing for a review of the Children's Television Standards in 2007.

However, over the 5 years of the above activity there has been no significant changes to the regulations and children have continued to be bombarded with advertising promoting unhealthy foods.

Who are the players in this debate?

Public health groups

Public health groups have been critical of the regulatory system and have questioned its ability and indeed intention to protect children from aggressive advertising.¹⁶ In 2002 the Coalition on Food Advertising to Children (CFAC) was formed, comprising peak medical, health and consumer groups.¹⁶ This group led the charge calling for a ban on all food advertising during children's peak viewing times, and for healthy eating messages to be aired through non-commercial social marketing. CFAC has argued that industry self-regulation has not worked to protect children from high levels of junk food advertising, and indeed relying on it is like putting the fox in charge of the henhouse. The prime motivation of industry is to make profits and it is probably unrealistic to expect industry to voluntarily restrict their own marketing practices.

Industry groups

The food and beverage, advertising and television industries have been active players in the debate about food advertising to children. They have been present at all summits, taskforces and parliamentary inquiries, and have lobbied politicians privately to put forward their case against regulatory reform. They have questioned the scientific evidence behind claims that advertising influences children's food choices (notwithstanding the fact that billions of dollars are spent on this activity).²⁴

Some companies have made voluntary changes such as producing healthier options (McDonald's Pasta Zoo Happy Meals²⁵) or reducing their marketing to children (Arnott's²⁶). However, there has been no substantial change to the advertising of unhealthy foods directed at children. The latest content analysis by Chapman et al.⁵ found that 80% of food advertisements were for unhealthy foods, which is consistent with findings from earlier studies.⁷

Politicians

Politicians from different parties have taken a stand on this issue. The Liberal party has stridently opposed restrictions to food advertising, claiming that responsibility lies with parents to control children's eating and that government intervention would be tantamount to a 'nanny state'.²⁷ The federal Labor party, on the other hand, launched a health policy prior to the 1994 federal election promising a ban on junk food advertising to children.²⁸ In February 2006 the Greens tabled an amendment to the Broadcasting Legislation Amendment Bill (No 1) 2006 prohibiting all food advertising during children's viewing hours.²⁹

State Labor governments have supported restrictions on unhealthy food advertising to children and have been in open conflict with their federal Liberal counterparts.³⁰

Parents

The strong exposure of this issue in the media has raised community awareness. Surveys of parents reveal that they are concerned about the detrimental effects of food advertising to children and want to see greater government controls and more advertisements for healthy foods.³¹⁻³³

The media

The media (print and electronic) have shown a high degree of interest in this topic, no doubt fired by the conflicts between opposing parties. In one analysis of print media coverage by Udell and Mehta,²³ there were 166 articles in 32 newspapers between 2002 and 2005, and journalists leaned 2:1 in support of restrictions on food advertising to children.

What does the future hold?

As an issue that has many parallels with tobacco control, a long and hard-fought battle can be expected between public health advocates and industry players for a win in the regulatory stakes.

From the public health advocacy viewpoint, it would be hoped that political leadership would both stand up for children's rights to grow up healthy and free of exploitation, and stand up to business and prohibit it from profiting at the expense of children's health. A society in which all stakeholders, including the business sector, values the rights of the child is worth fighting for.

Like all issues of importance to our future, the community has an important role to play in informing politicians, business and health policy-makers about what their preferences are. The upcoming review of the Children's Television Standards in 2007 provides an opportunity to formally influence the regulatory process. It will be vital for as many people as possible to express their concerns about the inadequacy of the current system and to call for reform.

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FOOD INSECURITY IN SOUTH AUSTRALIA

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Food security and food insecurity

Food security refers to the ability of individuals, households and communities to acquire appropriate and nutritious food on a regular and reliable basis, and to do so using socially acceptable means. Food security is determined by the food supply in a community, and whether people have adequate resources and skills to acquire and use (access) that food.¹

In contrast, food insecurity can refer to not having sufficient food, experiencing hunger as a result of running out of food and being unable to afford more, eating a poor quality diet as a result of limited food options, experiencing anxiety about acquiring food, or having to rely on food relief.¹

Who is food insecure?

While Australia as a whole is food secure, as are other developed countries, some Australians are food insecure. Food insecurity is more prevalent in the most disadvantaged areas, in people on low incomes and in those without secure accommodation. People affected by addictive behaviour and substance abuse, those with an Aboriginal or Torres Strait Islander background, some migrant groups and frail elderly people living in their own homes are particularly vulnerable to food insecurity.

Food insecurity nationally

The 1995 Australian National Nutrition Survey (NNS) measured food insecurity by asking the question 'In the last 12 months, were there any times that you ran out of food and couldn't afford to buy more?' Overall, 5.2% of adults aged 19 years and over answered 'yes' to this question. This included 11% who were not in the workforce or were unemployed compared with 4% who were employed; 8% in the most disadvantaged groups compared with 3% in the least disadvantaged groups; and 9% on a government pension or benefit compared with 2% in their own business or a share in partnership and 4% earning wages or salary. Most significantly, almost 16% of adults paying rent or board gave a positive response compared to less than 2% of adults who own their own dwelling.² Of those who gave a positive response, 51% received government benefits as their main income, 63% were on annual incomes of less than \$30,000

(national mean \$45,000) and 36% were in the lowest level of equivalent income (1st quintile).³

Data collected in Queensland in 1993 showed similar results. Using logistic regression to control for sociodemographic factors, the risk of food insufficiency was highly associated with age and income (threefold risk); unemployment and shared accommodation (twofold risk); and one-adult households and being single versus being separated, widowed or divorced (one-and-a-half-fold risk).⁴

More recent national data from the 2001 National Health Survey showed results similar to the 1995 NNS, with an overall prevalence of food insecurity of 4.7% of males and 5.6% of females aged 19 years or over.⁵ For both males and females aged 15–24 years, in both 1995 and 2001, those from the most disadvantaged areas were significantly more likely to report that they ran out of food some time in the previous 12 months and were unable to afford more. For both males and females aged 25–64 years, those from the most disadvantaged areas were significantly more likely to report food insecurity in both 1995 (males 335%, females 202% higher) and 2001 (males 363%, females 235% higher).⁶

Poverty and food insecurity overlap considerably. In a 1996 study 12% of those in the lowest quintile of annual household income (\$0–\$14,000) reported having run out of food at some time in the last 12 months and had insufficient money to buy more. As well, the percentage of individuals who were food insecure decreased steadily with increasing quintile of annual household income, from 14% (\$14,000–\$25,000) to less than 3% (> \$60,000).⁷

It is generally recognised that measures of food insecurity could be improved and that actual food insecurity rates are likely to be higher than currently reported rates.^{8–10}

Food insecurity in South Australia

The South Australian Monitoring and Surveillance System (SAMSS) monitors key health issues of the population on a regular basis. SAMSS measures food insecurity by asking all respondents 'In the last 12 months, were there any times that the food you have bought just didn't last and you didn't have money to get more?' For the period July 2002 to December 2006 it was found that an average of 5.6% (n = 531; 95% CI 5.2–6.1) of all respondents 16 years of age and over reported having experienced an instance of food insecurity at some time in the 12 months prior to the interview, as displayed in Figure 1.¹¹

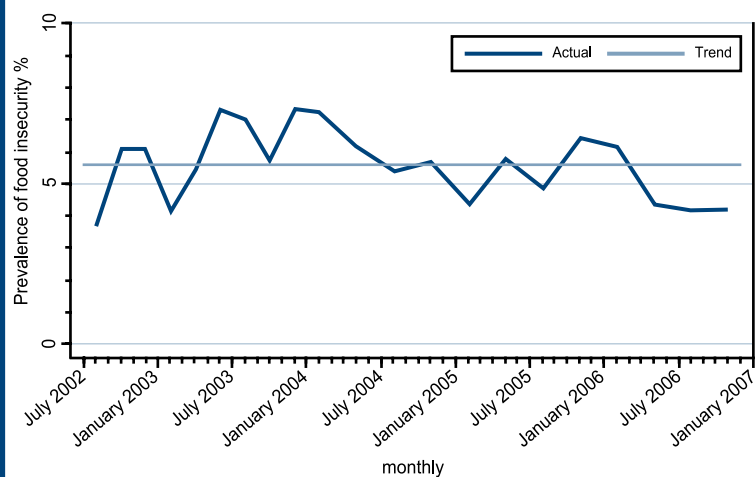


Figure 1: Monthly prevalence of food insecurity, 16 years of age and over, July 2002 – December 2006

Source: South Australian Monitoring and Surveillance System

For the period January 2004 to December 2006 a range of variables were statistically significant ($p < 0.05$) at the univariate level for respondents aged 16 years and over who reported experiencing food insecurity at some time in the 12 months prior to the interview. Those people who reported experiencing food insecurity were more likely to be separated/divorced or had never been married; to have achieved an educational attainment of up to a trade/certificate/diploma; to have an annual household income of up to \$60,000; and to belong to the lowest SEIFA quintile. They were also less likely to be aged 55 years or over. These results are displayed in Table 1.

Variables that were statistically significant ($p < 0.25$) at the univariate level were entered into a multivariate logistic regression analysis to determine the best joint explanatory variables for food-insecure individuals aged 16 years and over ($c_ = 9.22$; $df = 8$; $p = 0.32$). Those people who reported experiencing food insecurity were more likely to have an annual household income of up to \$60,000; to have achieved an educational attainment of a trade/certificate/diploma; and to belong to the lowest SEIFA quintile. They were also less likely to be aged 55 years or over; and to live in rural South Australia. These results are displayed in Table 2.

Relationship between food insecurity and fruit and vegetable consumption

Recommendations for adults are two serves of fruit and five serves of vegetables per day. Analysis of SAMSS data 2002–05 for those aged 19 years and over to explore the relationship between food insecurity and fruit and vegetable consumption showed the following results:

- Fruit—a statistically significantly higher proportion of those who did not eat any fruit or ate up to one serve per day were classified as food insecure, while a statistically significant lower proportion of respondents eating two or more serves of fruit per day were classified as food insecure.
- Vegetables—there were no statistically significant differences in terms of food insecurity among respondents

who ate the recommended serves of vegetables. Of those who did not eat vegetables or ate one or less serve per day, a statistically significantly higher proportion were classified as food insecure. For those who ate two to four serves per day, a statistically significantly lower proportion of respondents were classified as food insecure.¹²

Table 1: Univariate analysis of demographic indicators by respondents aged 16 years and over who reported experiencing food insecurity in the 12 months prior to interview

Demographics	n	%	OR	(95% OR)	p value ^a
Sex					
Male	142/2,817	5.0	1.00		
Female	171/2,941	5.8	1.16	(0.92–1.46)	0.20
Age (years)					
16–24	56/855	6.5	1.00		
25–34	68/947	7.2	1.11	(0.77–1.60)	0.57
35–44	83/1,074	7.7	1.20	(0.85–1.71)	0.30
45–54	51/1,017	5.0	0.76	(0.51–1.13)	0.17
55–64	29/786	3.6	0.54	(0.34–0.86)	0.01
65–74	18/545	3.4	0.50	(0.29–0.86)	0.01
75+	8/535	1.5	0.22	(0.10–0.47)	<0.001
Marital status					
Married/living with partner	165/3,871	4.3	1.00		
Separated/divorced	43/350	12.3	3.16	(2.22–4.50)	<0.001
Widowed	14/341	4.2	0.98	(0.56–1.70)	0.95
Never married	90/1,192	7.5	1.82	(1.40–2.38)	<0.001
Education					
Degree or higher	37/1,171	3.2	1.00		
Trade, certificate, diploma	89/1,423	6.2	2.04	(1.38–3.01)	<0.001
No schooling to secondary	187/3,152	5.9	1.92	(1.34–2.76)	<0.001
Annual income (\$)					
80,000 +	28/1,279	2.2	1.00		
60,001–80,000	25/829	3.0	1.38	(0.80–2.40)	0.25
40,001–60,000	52/894	5.8	2.78	(1.74–4.45)	<0.001
20,001–40,000	62/1,063	5.8	2.80	(1.78–4.42)	<0.001
Up to 20,000	100/811	12.4	6.40	(4.16–9.84)	<0.001
Not stated	46/882	5.3	2.51	(1.56–4.06)	<0.001
SEIFA Index					
Highest quintile	47/1,358	3.5	1.00		
High quintile	66/1,188	5.5	1.62	(1.11–2.37)	0.01
Middle quintile	57/1,171	4.9	1.42	(0.95–2.10)	0.08
Low quintile	63/1,103	5.7	1.67	(1.14–2.46)	0.01
Lowest quintile	78/919	8.5	2.56	(1.77–3.72)	<0.001
Region					
Central northern Adelaide	158/2,870	5.5	1.00		
Southern Adelaide	82/1,335	6.2	1.13	(0.86–1.48)	0.39
SA country	72/1,554	4.6	0.83	(0.62–1.10)	0.20
ARIA region					
Metropolitan	267/4,773	5.6	1.00		
Rural	35/808	4.3	0.75	(0.53–1.08)	0.13
Remote	11/177	6.1	1.09	(0.58–2.04)	0.79

^a Bold p values indicate statistical significance, $p < 0.05$.

Source: South Australian Monitoring and Surveillance System

Table 2: Multivariate logistic regression analysis of demographic indicators by respondents aged 16 years and over who reported experiencing food insecurity in the 12 months prior to interview

Demographics	n	%	OR	(95% OR)	p value ^a
Age (years)					
16–24	56/855	6.5	1.00		
25–34	68/947	7.2	1.16	(0.76–1.75)	0.49
35–44	83/1,074	7.7	1.26	(0.85–1.89)	0.25
45–54	51/1,017	5.0	0.76	(0.49–1.17)	0.22
55–64	29/786	3.6	0.32	(0.19–0.53)	<0.001
65–74	18/545	3.4	0.18	(0.10–0.32)	<0.001
75+	8/535	1.5	0.06	(0.03–0.14)	<0.001
Education					
Degree or higher	37/1,171	3.2	1.00		
Trade, certificate, diploma	89/1,423	6.2	1.75	(1.16–2.64)	0.01
No schooling to secondary	187/3,152	5.9	1.42	(0.96–2.10)	0.08
Annual income (\$)					
80,000 +	28/1,279	2.2	1.00		
60,001–80,000	25/829	3.0	1.23	(0.71–2.15)	0.46
40,001–60,000	52/894	5.8	2.59	(1.60–4.19)	<0.001
20,001–40,000	62/1,063	5.8	4.09	(2.54–6.59)	<0.001
Up to 20,000	100/811	12.4	15.27	(9.52–24.49)	<0.001
Not stated	46/882	5.3	2.73	(1.65–4.53)	<0.001
SEIFA Index					
Highest quintile	47/1,358	3.5	1.00		
High quintile	66/1,188	5.5	1.48	(1.00–2.21)	0.05
Middle quintile	57/1,171	4.9	1.25	(0.83–1.90)	0.28
Low quintile	63/1,103	5.7	1.46	(0.96–2.21)	0.08
Lowest quintile	78/919	8.5	1.67	(1.12–2.48)	0.01
ARIA region					
Metropolitan	267/4,773	5.6	1.00		
Rural	35/808	4.3	0.52	(0.35–0.78)	<0.001
Remote	11/177	6.1	1.01	(0.52–1.97)	0.97

^a Bold p values indicate statistical significance, $p < 0.05$.

Source: South Australian Monitoring and Surveillance System

Relationship of food insecurity to diet and health

Consistent food insecurity results in poor nutritional status, which has the potential for significant long-term negative effects on people's health, lifestyle, activity levels, ability to find work, wellbeing and length of life. The 1995 NNS data showed a significant association between food insecurity and both lower intakes of fruit and meat and higher prevalence of underweight, overweight and obesity. In her literature review on links between poverty, food insecurity and obesity for VicHealth, Cate Burns noted that the risk of obesity is 20–40% higher in women (not men) who are food insecure regardless of income, education or lifestyle behaviours.¹³

Addressing food insecurity

Food insecurity is a complex issue that requires action across a range of policy areas. While this is not the focus of this article, it is of interest to briefly mention some initiatives in this area. One useful introductory resource is a publication produced by the New South Wales government-funded Centre for Public Health Nutrition, *Food security options paper: a planning framework and menu of options for policy and practice interventions*.¹ VicHealth, the Victorian Health Promotion Foundation, has an ongoing food security program Food for All, designed to increase regular access to and consumption of a variety of foods, particularly fruit and vegetables, by people living in disadvantaged communities. Initiatives in a number of local government areas in Victoria are currently being funded and supported over 5 years to implement and evaluate strategies to address food insecurity.¹⁴ In South Australia two health sector initiatives related to food security are the Playford Food Alliance (Central Northern Adelaide Health Service) and the statewide Community Foodies program (managed by Southern Adelaide Health Service).

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IMPROVING THE FOOD SUPPLY IN REMOTE INDIGENOUS AUSTRALIAN COMMUNITIES: A HEALTH PRIORITY

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Introduction

Around 2–3% of Australians live in remote Australia, which covers about 80% of the continent, and 26% of people living in these areas are Indigenous.¹

The inadequate food supply in remote and rural areas where many Aboriginal and Torres Strait Islanders live undermines efforts to address their poor nutrition and health status. The food available in community stores and takeaway outlets is often nutritionally poor.² Table 1 shows the top 10 food and beverage items sold in six community stores in the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands in north-western South Australia.³ The shaded food items are ‘unhealthy’ foods, that is with high energy density and low micronutrient content.

Table 1: Top ten sellers by sales amount (\$) in community stores on the APY Lands, October 2004

Product ranking	Store 1	Store 2	Store 3	Store 4	Store 5	Store 6
1	1.25L Coca Cola	Meat	Buttercup vienna bread 650g	Meat	1.25L Coca Cola	1.25L Coca Cola
2	Sliced vienna bread	Pies	Takeaway pie	Sunbless white bread	Wing ding	Buttercup thick white bread
3	390mL Coca Cola	White bread	Meat	600mL Coca Cola	Roasted chicken wings	Kangaroo tails
4	Pies/pasties/sausages	Kangaroo tails	1.25L Coca Cola	1.25L Coca Cola	Mighty soft thick bread 650g	Grocery item
5	Eggs	1.25L Sprite	600mL Coca Cola	375mL Coca Cola	Kangaroo tails	375mL Coca Cola
6	Hamper corned beef	Cheese burger	Takeaway sandwiches	Full-cream milk powder	600mL Coca Cola	Powerade berry ice
7	Sunbless white bread	Eggs	600g eggs	600g eggs	Hot pie	Hamper corned beef
8	Kangaroo tails	McCain perfection Hawaiian pizza	Takeaway sausage roll	Wholemeal bread	Buttercup white bread 650g	Powerade lemon lime
9	390mL Sprite	Hamper corned beef	390mL Coca Cola	390mL Coca Cola	Lollies	Frey Bentos steak & kidney pie
10	Lipton tea bags	‘Healthy’ bread	390mL Sprite	390mL Sprite	1.25L Sprite	600mL Coca Cola

Note: All cold drinks are regular (not diet) unless otherwise stated.

Source: Nganampa Health Council

Numerous reports provide evidence of the higher rates of morbidity and mortality and poorer diet in Indigenous compared with non-Indigenous Australians.^{4,5} Much of this disease is diet-related low birth weight, childhood malnutrition (including poor infant and childhood growth), anaemia, dental caries, type 2 diabetes, cardiovascular disease, renal disease, hypertension and overweight and obesity. Strategies that address improved supply of and access to nutritious, quality, affordable foods (particularly fresh fruit and vegetables) and beverages are fundamental to the prevention and management of these chronic and other diseases.

While access to adequate, safe and good-quality food and water is a basic requirement for good health for all Australians, the national nutrition strategy has singled out the need to focus on improving the food supply for vulnerable groups, including those living in rural and remote Indigenous communities.² A complex range of factors influences whether or not a good variety of nutritious, quality and affordable food is provided in such places. These factors include store infrastructure, staff knowledge and skills, community location and size, freight, store buying power and in-store marketing.

This paper provides examples of research findings on the food supply in remote communities and of food supply improvement initiatives. It draws significantly on the Food North report, which made recommendations and identified leverage points for action to improve the food supply in remote Indigenous communities.⁶

Variety and price of food in remote Indigenous communities

Data collected in several states over a number of years consistently show that food costs increase and the variety of foods decrease with remoteness. For Indigenous people in remote communities, eating a healthy diet can cost a considerable proportion of their often low incomes, higher than in capital cities and regional centres.

The first research was conducted in Western Australia in the Kimberleys and published in 1987. Follow-up surveys showed the situation was unchanged nearly 10 years later. In this region in 1996 the cost of a basket of basic foods in remote Indigenous communities and towns was 59% and 25% respectively more than the cost of the same basket in Perth.

In Queensland four Healthy Food Access Basket (HFAB) surveys, covering around 80 stores across the state, have been conducted in 2000, 2001, 2004 and 2006.⁷ Key findings of the 2004 survey were:

- The cost of the HFAB (the basket), which feeds a family of six for two weeks, continued to be considerably higher in remote and very remote localities throughout Queensland.

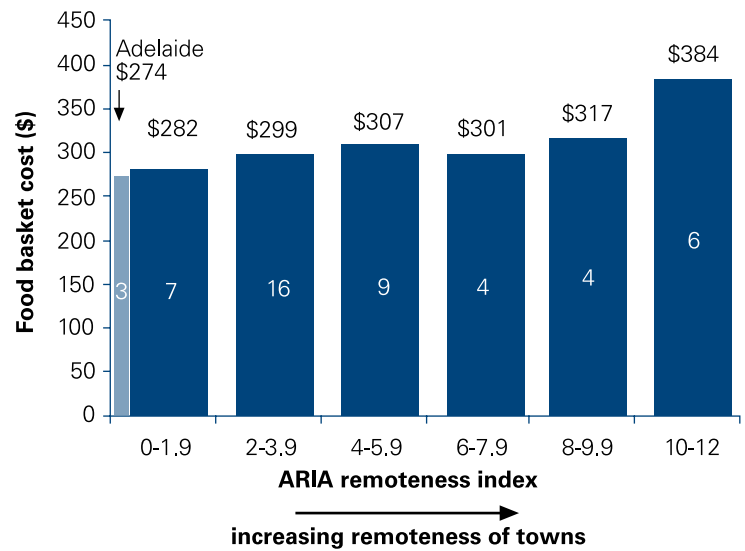
- The average cost of the basket was \$395.28, which was \$113.89 higher in very remote stores compared with the same basket in major city stores.
- From 2001 to 2004 the average cost of the basket increased by almost \$50, with the increase in the very remote localities close to \$77.
- Comparisons of the price change of the basket in the 56 stores surveyed up to 2004, relative to the CPI for food in Brisbane, suggests that the cost of healthier foods had increased more than the less nutritious alternatives since 2000. Despite stabilisation of the CPI in Brisbane in the 12 months between June quarter 2003 and June quarter 2004, the basket cost continued to be higher than the CPI for food across all remoteness categories for the 56 stores surveyed.

In the Northern Territory three Market Basket Surveys have been conducted in 2003, 2004 and 2005 to monitor food cost, availability, variety and quality in remote community stores.⁸ In 2005, across the 66 stores surveyed:

- The average cost of the 'healthy food basket', which feeds a family of six for two weeks, was \$575 in remote community stores, \$567 in district centre 'corner stores' and \$452 in district centre supermarkets.
- The average cost of the food basket in remote stores was 32% more expensive than in the Darwin supermarket and 4% more expensive than in the Darwin corner store.
- Twenty-five percent of a family welfare income was required to purchase the basket of foods in a Darwin supermarket and 34% in the remote stores.
- The average numbers of fresh fruit and fresh vegetable choices available in remote stores were 8 and 15 respectively.

Two surveys of food cost and availability have been conducted in South Australia. The first was the Cost of Living on the APY Lands survey in 1998.⁹ A healthy stores box based on the food required to feed a hypothetical family of six for one week, basic health hardware items (e.g. for personal hygiene) and other household items for cleaning and cooking, was priced in ten communities. The average price was about \$500, more than 80% of the average household income of \$600 per week.

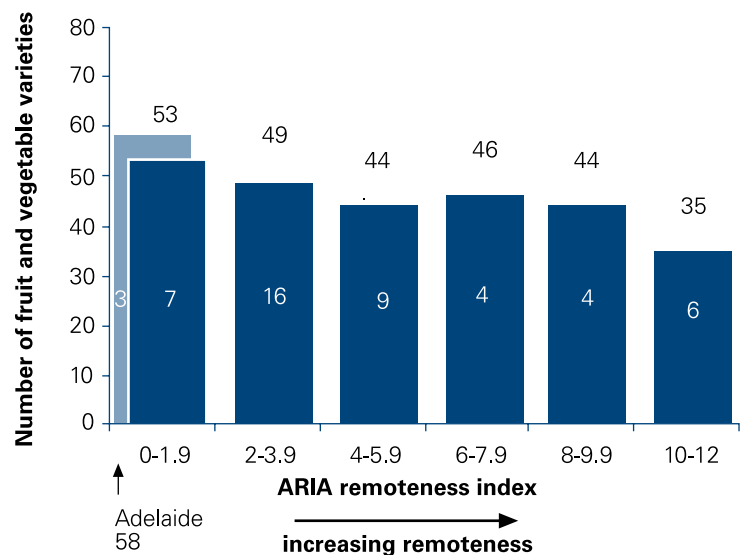
The second survey was conducted in 1999 in 46 shops across rural and remote South Australia.¹⁰ It did not include any stores in remote Aboriginal communities. Results showed that the cost of a food basket varied from 95% to 175% of the cost in Adelaide and between 20% and 38% of an estimated welfare income for a hypothetical family of six. The cost was highest in towns with a population of less than 400 people, in medium and small shops (i.e. not large supermarket chains), and in remote towns. Figure 1 shows the gradient in cost of the food basket in towns of different remoteness, classified by the Accessibility/Remoteness Index of Australia (ARIA). Figure 2 shows the reduction in diversity of fruit and vegetable varieties associated with increasing remoteness.



(The numbers in the bars indicate the number of shops surveyed.)

Figure 1: Food basket costs according to community remoteness in SA 1999

Source: Eat Well South Australia¹⁰



(The numbers in the bars indicate the number of shops surveyed.)

Figure 2: Diversity of fruit and vegetable varieties according to remoteness in SA 1999

Source: Eat Well South Australia¹⁰

In addition to higher cost and decreased variety, it has been suggested that the quality of food in remote communities is more variable than in major centres. This is not surprising given the large distances food travels and the need for adequate facilities to package, transport and store (in particular) perishable food, not just by industry but also by freight companies, local stores and households. More investigation into remoteness, food quality and health consequences is required.

Strategies to improve food supplies in remote Indigenous communities

A number of initiatives have aimed to improve the range, quality and price of food available in individual or groups of stores and takeaway outlets in remote communities. A key element is the development of store/takeaway policies that address issues such as the type of food to be provided; subsidies on the price of fruit and vegetables; restrictions on the availability of soft drinks; store opening hours; banning credit; and employment of Indigenous staff. Examples are the policies developed for stores managed by the Arnhem Lands Progress Association in the Northern Territory, the Department of Aboriginal and Torres Strait Islander Policy Retail Stores Unit in Queensland and the Mai Wiru regional stores policy for the APY Lands in South Australia. A complementary policy is the Store Charter developed by the Australian Competition and Consumer Commission, which helps stores comply with relevant laws, encourages better trading standards and develops understanding and respect between store operators and Indigenous people.^{6,11}

Community involvement is important in both ensuring the success of store improvement programs and creating demand for healthy food within communities. Relevant strategies include setting up store committees; establishing staff positions and training for community members to work in stores and encourage healthy lifestyles; marketing healthy food at point of sale; and developing community gardens and establishing small businesses such as healthy takeaway outlets and bakeries. Examples include the Mai Wiru initiative and the Jawoyn Fred Hollows Foundation Nutrition Program's Nyirrangulung nutrition project in East Katherine¹², where strategies include employment of staff with retail management expertise.

Two national initiatives building on previous work such as that outlined above are the Remote Indigenous Stores and Takeaways (RIST) project and the Outback Stores (OS) initiative.¹³

RIST is a three year project funded by Health Departments in WA, NT, Qld, NSW and SA and the Australian government. Its focus is development of standards for 'healthy' remote stores to enable communities to meet their nutritional needs. A suite of tools is being developed covering the range of foods to be stocked; marketing of healthy food; ordering of fruit and vegetables; menu and food preparation guidelines for takeaways; requirements for display and storage of healthy foods; a freight toolkit; competencies for staff employed in remote stores and takeaways; and recommendations for training. Six trial sites will be part of a research program to identify the key indicators to monitor food turnover, which will help to evaluate the success of food improvement initiatives. A particularly successful freight forum was held in June 2006 and has resulted in the establishment of strategies in several communities to improve freight. This national work has used the tools and expertise of the SA Department of Transport and Energy Infrastructure's Freight Logistics group.¹⁴

The OS initiative was announced in the 2006 Federal budget. Operated by Indigenous Business Australia, its focus is good store governance and provision of healthy food, and this is aided by having a nutritionist on staff. The expectation is that it will use the nutrition and freight-related tools developed by RIST. In its first three years OS expects to work with 40 stores, commencing in the Alice Springs and then the Cape York areas. Key components of OS are to: encourage a partnership approach between itself and communities; negotiate store management agreements with interested communities; pay rent to the community for leasing the store infrastructure; employ a store manager; and set up a store committee to provide advice on local employment, training and other issues. Expected outcomes include: improved health and nutrition of Indigenous Australians living in remote communities; a broader and better range of goods and services including affordable healthy food; consistency in the delivery, supply, quality and range of products in line with established standards including health and hygiene; increased employment and training opportunities for local Indigenous people; business and financial skills training; a more efficient and reliable store; and better product pricing.

This paper has not discussed other dimensions of community food supply or food security such as provision of school breakfast programs; emergency food for those who run out of money; food for babies who are failing to thrive, or for hungry children or elderly people, through home and community care programs; or the facilities needed in houses to store, prepare and cook food. However, if the current initiatives described above are supported in the medium to long term by governments and communities, they have the potential to ensure that Indigenous people have improved and adequate access to nutritious, quality and affordable food. In so doing they will significantly contribute to reducing the gaps in health status between Indigenous and non-Indigenous Australians.

In addition, there are other strategies that are potentially needed to enhance success. These include subsidies to bring prices in line with those in capital cities; local food production and processing; the capacity to respond to climate stresses such as flooding and to transport and communication barriers; recognition programs such as 'Tidy Towns'; and research into the potential for clearer food labelling systems to influence consumer choice (e.g. the proposed front-of-package 'traffic light' labelling system).¹⁵ The challenge will be to deliver the policies and programs needed to develop and sustain long-term robust food systems to improve health outcomes for remote communities in line with the fundamental human right to be free from hunger and have access to nutritious food.¹⁶

In South Australia the Departments of the Premier and Cabinet (Aboriginal Affairs and Reconciliation Division), Transport, Energy and Infrastructure, and Health will continue to work together and with communities to encourage and support improvement to freight and supply of healthy foods in stores in remote South Australian Aboriginal communities.¹⁷

At the 1996 World Food Summit, leaders from 185 countries and the European Community reaffirmed, in the Rome Declaration on World Food Security, 'the right of everyone to have access to safe and nutritious food, consistent with the right to adequate food and the fundamental right of everyone to be free from hunger'. They further pledged to cut the number of the world's hungry people in half by 2015.

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COMMUNICABLE DISEASE CONTROL BRANCH REPORT

1 July to 31 December 2006

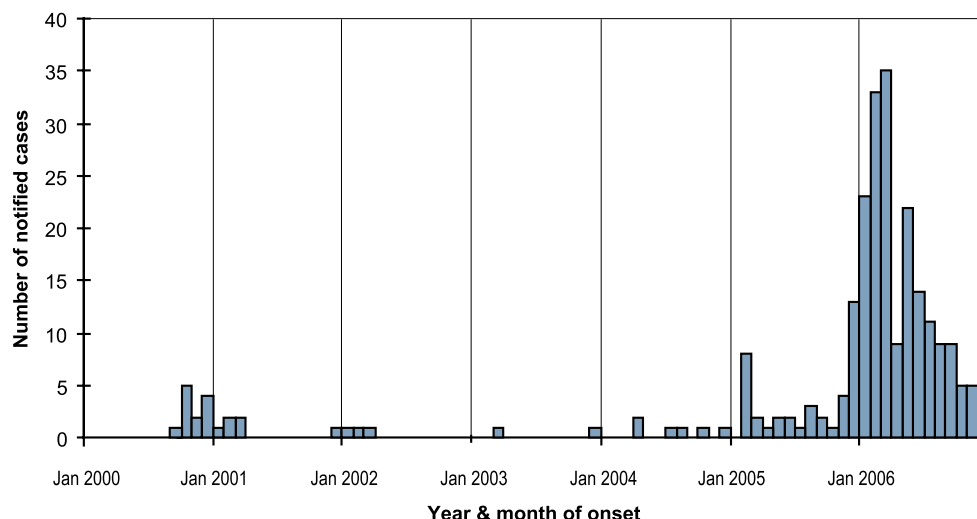


Figure 1: Notified cases of Barmah Forest virus infection, by month of onset, 1 January 2000 to 31 December 2006

VECTORBORNE DISEASE

In South Australia, Arboviral disease caused by Ross River and Barmah Forest viruses shows cyclic patterns, peaking in summer months. Both viruses are spread by mosquito vectors, and, during the summer of 2005–06 very high mosquito numbers were recorded in South Australia. A health alert released from the Communicable Disease Control Branch late in 2005 increased awareness of these infections; this may have also resulted in increased detection of these infections.

Barmah Forest virus

In the latter half of 2006, 49 cases (12 males, 37 females, age range: 8 to 81 years) of Barmah Forest virus infection were reported, compared to 130 in the first half of 2006 and 15 in the same period of 2005. The majority of reported cases acquired the infection in rural South Australia, with only 10 becoming infected in metropolitan Adelaide. Figure 1 illustrates a large number of cases of Barmah Forest virus infection early in 2006, followed by a gradual decline during the remainder of the year.

Ross River virus infection

Between July and December 2006, 75 cases of Ross River virus infection were reported (27 males, 48 females, age range: 10 to 81 years), a decrease from 287 cases notified in the first half of the year. Fifty four percent of cases resided in rural South Australia, and a further 10% reported recent travel to areas prone to Ross River virus infections, such as the Riverland and South-East; in seven instances, cases were exposed to the virus elsewhere in Australia. The summer of 2005–06 recorded the biggest outbreak of Ross River virus infection in South Australia since the summer of 2000–01. (See Figure 2).

Ross River virus activity in South Australia can be viewed on our web site: www.health.sa.gov.au/pehs, as well as information about prevention of vector borne diseases and the Fight the Bite campaign.

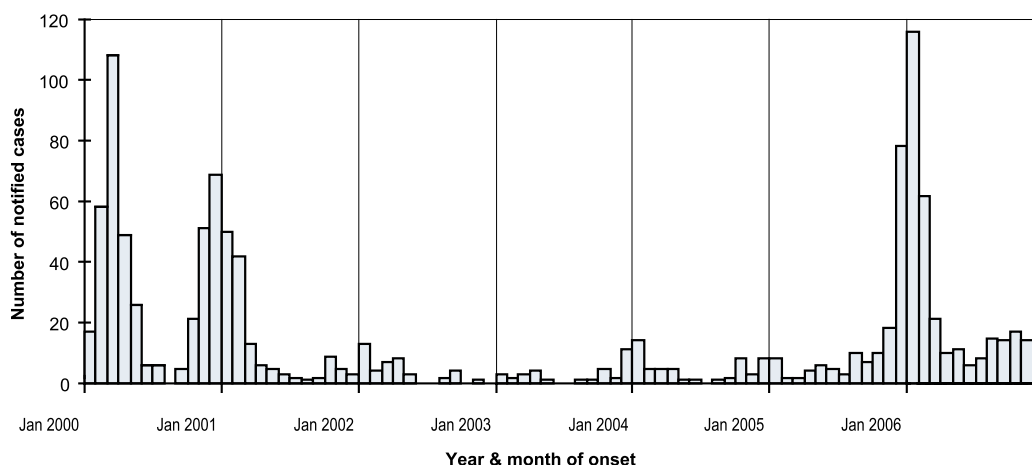


Figure 2: Notified cases of Ross River virus infection, by month of onset, 1 January 2000 to 31 December 2006

Dengue fever

In the period under review, dengue fever infections were reported in three people (1 male, 2 females: age range 38-49 years). All reported recent travel to Asia.

Malaria

Twenty cases of malaria were reported in the latter half of 2006; 8 males, 12 females, with an age range from 2 to 61 years. All infections were acquired overseas.

Of the 20 cases, 12 were caused by *Plasmodium falciparum*; 11 cases reported exposure in Africa, and one in Asia. Four cases with *Plasmodium vivax* infection reported recent travel to the Pacific Islands or Asia. Two mixed infections of *Plasmodium vivax* and *Plasmodium falciparum* were reported, in both cases these infections originated in Africa, as did one case due to *Plasmodium ovale* infection. In one further case with recent travel to Africa, no further typing of *Plasmodium* was possible.

ZOONOSES

Hydatid Disease

One case was reported in a 24 year old male who had migrated to Australia from rural Eastern Europe; medical notification reported a previous history of hydatid disease.

Q fever

Seven cases of Q fever, comprising 6 males and 1 female, with an age range from 26 to 45 years were reported in the period. All seven cases reported common risk factors for Q fever infection associated with close animal contact.

VACCINE PREVENTABLE DISEASES

Pertussis

The escalation of pertussis infections since mid-2004 continued until late in 2006. (See Figure 3). A total of 1333 cases (490 males, 843 females, age range: 1 to 95 years) were notified during the second half of 2006, compared to 755 for the same period in 2005. Cases were geographically dispersed throughout metropolitan and rural South Australia. Figure 3 illustrates the high number of reported cases by age group and year of onset of illness. Most cases (75%) were more than 38 years of age, and only 19 cases were less than 10 years old at diagnosis.

Invasive *Haemophilus influenzae*

Six cases (2 males, 4 females, age range: 0 to 75 years) of invasive *Haemophilus influenzae* infection were notified between July and December, 2006. None were group B isolates.

Mumps

Fifteen cases of mumps (8 males, 7 females, age range: 8 to 59 years) were notified during this period. Two cases reported no past vaccination, and vaccination status was unknown for the remaining cases.

Rubella

One case was notified in a 50 year old male of unknown vaccination status, who had no identified risks for acquiring rubella infection.

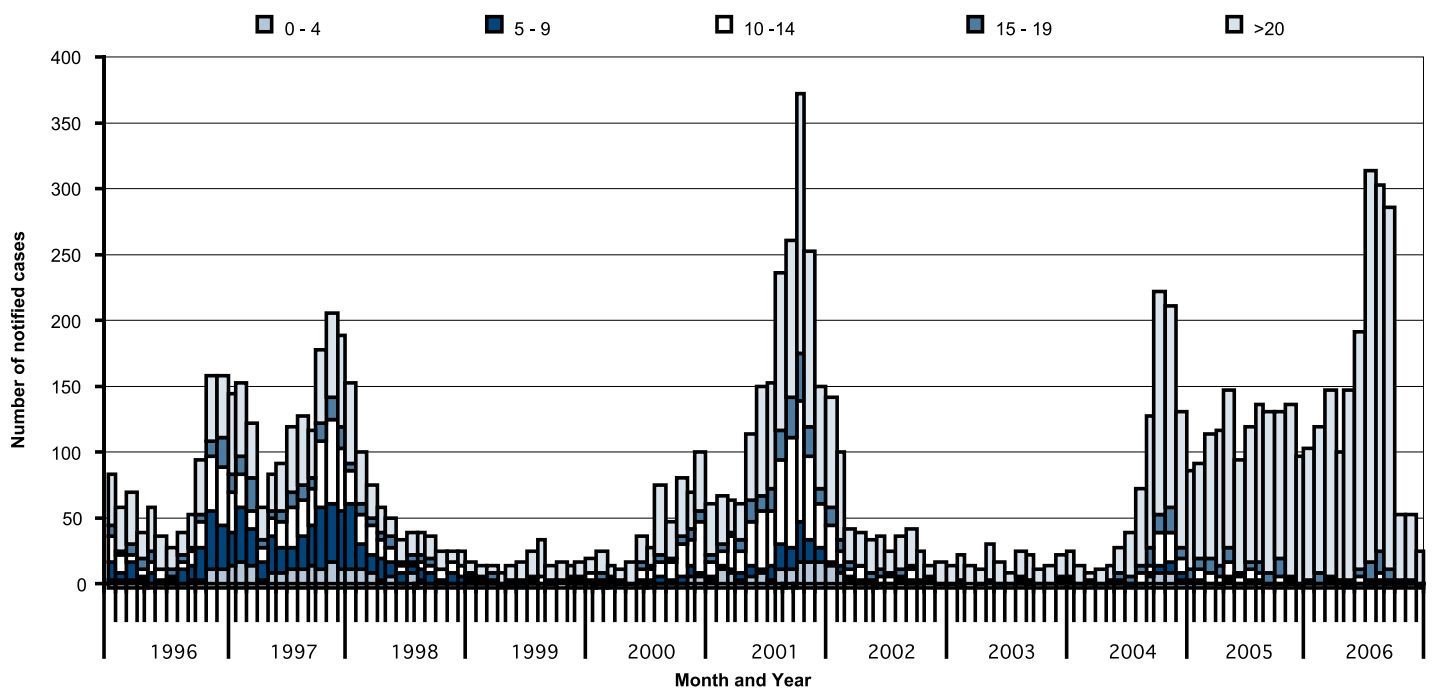


Figure 3: Notified cases of Pertussis infection, by year & month of notification and age group 1 January 1996 to 31 December 2006

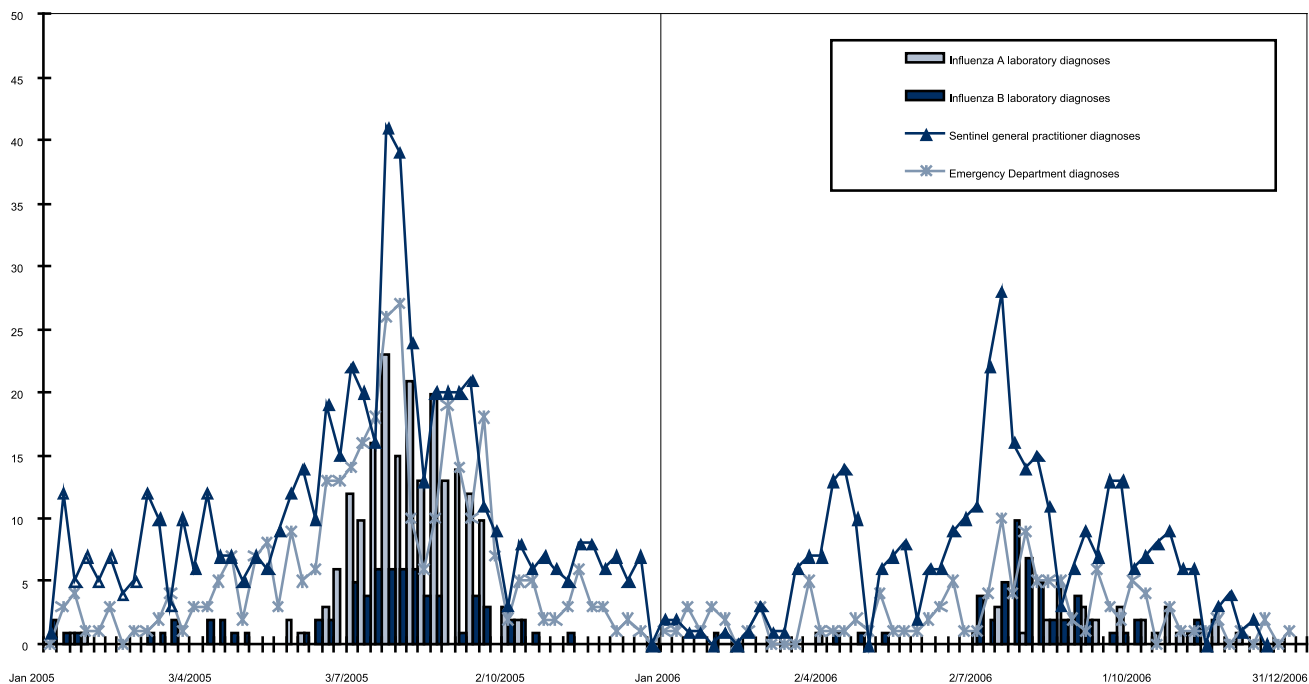


Figure 4. Influenza-like illness in South Australia; clinical and laboratory diagnoses per week and year 1 January 2005 to 31 December 2006

Influenza

South Australian influenza surveillance collates sets of information from both laboratory and clinical sources. Several laboratories report the number of positive tests (Institute of Medical and Veterinary Science, SouthPath, Women’s and Children’s Hospital). Clinical diagnoses of ‘influenza-like illness’ are collected from two sources, the Royal College of General Practitioner members participating in the Australian Sentinel Practice Research Network (ASPREN), and emergency departments of several public hospitals. These combined data provide a weekly picture of influenza-like activity across South Australia.

In the second half of 2006, 31 laboratory isolates of influenza A (16 males, 15 females, age range: 0 to 89 years) were reported, as well as 46 influenza B isolates (27 males, 19 females, age range: 0-80 years). This compares to 2 and 9 influenza A and B isolates, respectively, for the first half of 2006, and 351 laboratory isolates during the same period of 2005. Figure 4 illustrates combined laboratory confirmed cases and clinical diagnosis per week during 2005 and 2006.

Information about influenza and respiratory diseases is available on our web site: www.health.sa.gov.au/pehs/

Each year, Australian influenza isolates are typed in Melbourne by the WHO Collaborating Centre for Reference and Research on Influenza. (See Figure 5). South Australian isolates from 2006 were a mixture of two co-circulating influenza A (H3) and influenza B viruses. In 2006, Australian Influenza B viruses were predominantly from the B/Victoria-lineage (89.3%), with some B/Malaysia/2506/2004-like viruses and B/Shanghai/361/2002-like (B/Yamagata-lineage) viruses (www.influenzacentre.org).¹

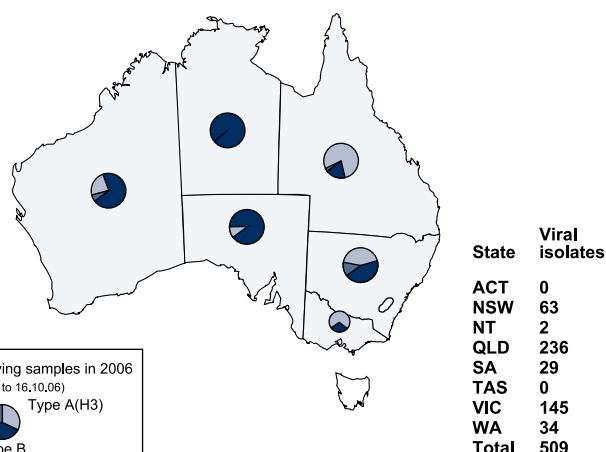


Figure 5. Influenza activity in Australia 1 January 2006 to 16 October 2006

Source: WHO Collaborating Centre for Reference and Research on Influenza http://www.influenzacentre.org/images/16.10.06_states_flu_map_650.jpg

Invasive pneumococcal disease

Among 64 cases of pneumococcal disease reported during this period were 34 males and 30 females, with an age range of 0 to 95 years. The racial origin of four cases was reported as Aboriginal. Eleven cases (16%) were notified in children less than 5 years of age. One death was linked to this disease.

Measles

No cases of measles were reported during this period, in contrast to nine cases earlier in the year.

GASTROINTESTINAL DISEASES

In summer, gastrointestinal illnesses dominate weekly reports of notifiable infections in South Australia, often demonstrating seasonal patterns of disease. These illnesses were responsible for about 40% of all notifications to the Communicable Disease Control Branch in the second half of 2006.

Campylobacteriosis

Campylobacter infection remains the most commonly reported gastrointestinal disease in South Australia and accounts for 84% of notifiable gastrointestinal illness. In the period under review, 1547 notifications were received for cases resident in South Australia, both metropolitan Adelaide and rural, compared to 1226 cases during the corresponding period in 2005. Some clusters of infection were identified and investigated. One cohort study investigated the source of infection for a group of people with *Campylobacter* infection who had shared a common meal. After collecting data through a standard questionnaire, statistical analysis attributed the source to a chicken dish.

Cryptosporidiosis

In the second half of 2006, 45 cases of Cryptosporidiosis were reported; they comprised 25 males and 20 females, with an age range of 0 to 86 years. However, only 5 cases were more than 41 years of age. This is a slight decrease from number reported in the same period of 2005 (61).

Cases of Cryptosporidiosis with reported risks that potentially require public health action were referred to Local Council Area Environmental Health Officers, often with further review by the Environmental Health Branch.

Hepatitis A

Two related cases of Hepatitis A infection were reported during this period (1 male, 1 female, aged 47 and 54 years). Both cases reported recent overseas travel to South East Asia; neither was Indigenous.

Listeriosis

Three cases of *Listeria monocytogenes* serogroup 1 infection were notified in the reporting period (2 male, 1 female, age range: 45 to 73 years). All three cases had underlying chronic illnesses. Each case was interviewed using a standard food history questionnaire and no links were found between cases.

Molecular typing undertaken on one isolate established that it was different to an isolate from contaminated food that was related to cases earlier in the year.

Shigellosis

Seventeen cases of shigellosis were reported in the second half of 2006; 9 males, 8 females, age range from 3 to 67 years. Of these, *Shigella sonnei* biotype g was the most frequently reported species (7 infections).

Transmission of *Shigella flexneri* type 4a Mannitol negative was restricted to cases reported as Aboriginal; one further Indigenous case was due to *Shigella flexneri* type 4a. These cases were relatively young, and only one case was older than 18 years of age (age range: 3 to 42 years).

Seven cases of *Shigella sonnei* biotype g infection were notified during this period; (4 males, 3 females, age range: 15 to 67 years). Five cases reported recent overseas travel.

Two cases each of *Shigella flexneri* 1a and *Shigella flexneri* 3a were reported, as well as one case due to infection with *Shigella flexneri* y. Two of the five cases reported recent overseas travel.

Shiga toxin producing *Escherichia coli* (STEC) Haemolytic Uraemic Syndrome (HUS)

In the period under review, 16 cases of infection with Shiga-toxin producing *Escherichia coli* (STEC) were notified. The age range of cases (7 males, 9 females) was 1 to 85 years. Most cases were residents of metropolitan Adelaide; three were from rural areas of South Australia. No links, common exposures or source of infection was identified among the cases.

All sporadic cases of Shiga-toxin producing *Escherichia coli* meeting case definition criteria were enrolled in a national case-control study designed to identify risk factors for STEC infection in Australia.

No cases of Haemolytic Uraemic Syndrome (HUS) were reported in the period.

Salmonellosis

Salmonella infection is the second most common notifiable gastrointestinal illness reported in South Australia. In the period under review, 213 cases of Salmonellosis were reported, compared to 337 in the first half of the year. Laboratory tests characterise *Salmonella* isolates by serotype and/ or phage type. Commonly reported *Salmonella* types in the latter half of 2006 included *Salmonella* Typhimurium phage type 135a (40 cases), *Salmonella* Typhimurium phage type 9 (30 cases), *Salmonella* Typhimurium phage type 108 (12 cases), *Salmonella* Infantis (9 cases), *Salmonella* Typhimurium phage type 35 (8 cases) and *Salmonella* Hessarek (7 cases). Several clusters of *Salmonella* infection were identified and investigated during the year.

Salmonella Typhimurium phage type 135a

The Communicable Disease Control Branch investigated a cluster of *Salmonella* Typhimurium 135a cases when the usual annual number was exceeded by mid-year. Initially, cases were clustered geographically in an area of Adelaide, then cases spread across other metropolitan and rural areas of the state. Interviews elicited that a high proportion of cases had eaten chicken in the seven days before the onset of illness. However, trace-backs conducted by the Environmental Health Branch Food section elicited that the chicken came from different sources; no common source was identified, nor was any microbiological evidence

obtained. At the same time, an increase in *Salmonella* Typhimurium 135a cases was recorded interstate. Molecular typing of isolates from South Australia and interstate was unable to prove a link between cases. Thus, a high index of suspicion rested on chicken, but no epidemiological or evidence supported this hypothesis.

Salmonella Hessarek

Salmonella Hessarek is a rare cause of human infection in South Australia. Between October and December 2006, seven notifications of *Salmonella* Hessarek infection were received, compared with two cases during 2005. This increase in numbers triggered an outbreak investigation.

Standard food interviews found that three cases ate at a common restaurant in metropolitan Adelaide. An environmental investigation of the restaurant by the Environmental Health Branch Food section found that food handling procedures met food safety standards, and microbiological investigation did not identify any food item as a source of infection.

An unusual feature of the diets of the remaining four cases was that all had eaten raw or semi-cooked eggs. Eggs could not be confirmed as a source of infection by microbiological testing for this outbreak as the eggs had all been consumed and testing of similar eggs did not isolate the agent.

Salmonella Paratyphi

Four cases of paratyphoid fever were notified during this period; 3 males, 1 female, age range: 21-53 years. All four infections were caused by *Salmonella* Paratyphi B var java. Three were residents of the metropolitan Adelaide and one was from rural South Australia. However, one case became ill while travelling overseas. No links were identified between the cases.

Salmonella Typhi

One case was notified in a 28 year old female who reported recent travel to the Indian subcontinent. Contact tracing was undertaken covering the period of infectiousness in Australian; no contacts became infected.

Yersiniosis

Four cases of *Yersinia enterocolitica* infection were notified during this period (1 male, 3 females, age range 0 to 52 years). Two cases resided in metropolitan Adelaide and two in rural South Australia.

OTHER DISEASES

Legionellosis

Fifteen sporadic cases of legionellosis reported during this period. Of the 13 cases, 7 were attributed to *Legionella longbeachae* infection, (6 males, 1 female; age range: 47 to 85 years). Five were *Legionella pneumophila* serogroup 1 infections; 4 males, 1 female; age range 52 to 78 years. A standard environmental questionnaire was used to assist with contact tracing in these cases. One further case in a 77 year old male was caused by *Legionella bozemanii*.

Invasive meningococcal disease

Eight laboratory confirmed cases of meningococcal disease were reported in the period; 4 males, 4 females, age range 6 months to 102 years. Of the 8 cases, 6 were *Neisseria meningitidis* serogroup B infections, and two were *Neisseria meningitidis* serogroup W-135 infections. One case was identified as Indigenous.

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Notifiable Disease in South Australia 1 July to 31 December 2006 & Annual Comparisons for 2000 to 2006

Disease	2000		2001		2002		2003		2004		2005		2006	
	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun	Jul-Dec
Aeromonas infection	12	0	0	0	0	0	0	0	0	0	0	0	0	0
Anthrax	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barmah Forest Virus infection	0	9	7	0	4	0	1	0	2	4	6	15	27	138
Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Campylobacter infection	827	1036	998	1589	1119	1372	1527	1103	876	1074	863	1226	2089	900
Chlamydia trachomatis	444	474	710	719	905	862	1008	967	1191	1154	1335	1295	2630	1568
Cholera	1	1	0	23	1	2	0	2	0	0	0	1	2	0
Cryptosporidiosis	119	34	41	23	66	52	47	34	28	48	99	61	160	146
Dengue Fever	3	2	4	4	4	4	6	4	3	1	2	3	5	7
Diphtheria	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Donovanosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gonorrhoea	82	39	84	50	51	84	125	92	106	97	104	84	188	122
Haemophilus influenzae	636	592	561	520	453	409	428	444	439	362	386	372	758	362
Hepatitis - viral (C)	38	15	7	9	8	5	7	6	8	9	5	8	13	2
Hepatitis A infection	152	165	184	173	131	131	112	118	115	150	177	138	315	145
Hepatitis B	25	23	29	37	24	22	24	34	33	34	45	35	80	47
HIV	3	0	5	4	6	1	3	5	2	3	0	2	2	1
Hydatid Disease	0	0	16	114	138	146	20	289	25	47	58	215	273	11
Influenza (laboratory confirmed)	36	47	9	22	28	40	20	43	9	12	13	14	27	15
Legionellosis	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Leprosy	0	0	0	3	1	1	0	2	0	1	1	2	3	0
Leptospirosis	4	3	3	6	0	2	1	0	1	2	1	5	6	1
Listeria infection	16	17	10	20	13	6	13	14	9	11	24	19	43	14
Malaria	8	3	0	2	0	1	4	21	2	4	0	0	0	0
Measles	9	23	9	28	16	15	9	22	9	4	5	18	23	9
Meningococcal infection	6	10	6	6	4	6	10	7	1	2	3	5	8	5
Mumps	22	25	20	24	27	20	25	25	37	32	35	33	68	26
Non-Tuberculous Mycobacterial Disease	2	4	6	8	3	1	0	1	3	2	0	0	0	0
Ornithosis / Psittacosis	1	1	1	0	1	1	0	1	4	2	4	2	6	4
Paratyphoid Fever	130	409	523	1425	395	168	118	114	110	799	654	755	1409	820
Pertussis (Whooping cough)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plague	0	0	0	78	101	106	71	96	101	98	59	75	134	40
Pneumococcal infection (invasive)	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Q Fever	3	10	6	10	10	19	9	3	10	26	14	6	20	9
Ross River Virus infection	260	108	159	17	40	7	11	9	38	17	28	64	92	284
Rubella	3	4	7	4	2	3	5	1	0	2	0	0	0	1
Salmonella infection	298	151	315	289	290	217	259	175	294	227	284	292	576	337
Severe Acute Respiratory Syndrome (SARS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Shigella infection	20	10	20	12	22	3	12	15	36	10	16	25	41	11
Smallpox	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STEC / HUS / TTP	22	15	19	10	20	18	26	15	10	23	25	13	38	21
Suspected Food Poisoning	1	1	0	1	2	2	1	1	19	55	18	48	66	325
Syphilis	0	4	1	9	10	4	5	6	7	5	4	5	9	20
Tetanus	2	2	4	1	1	0	0	0	1	2	0	0	0	0
Tuberculosis	25	31	28	21	49	21	24	22	37	27	26	21	47	31
Typhoid Fever (S typhi)	3	0	1	3	1	2	1	1	2	1	1	1	2	1
Varicella virus	0	0	0	0	0	529	445	781	823	750	625	1070	1695	728
Vibrio parahaemolyticus Infection	0	0	0	0	0	0	0	0	0	0	0	1	2	2
Yellow Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Yersinia infection	6	5	4	4	4	8	12	13	5	6	5	2	7	4

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