

# **Acting on food insecurity in urban Aboriginal and Torres Strait Islander communities**

## **Policy and practice interventions to improve local access and supply of nutritious food**

**October 2009**

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### **Acknowledgements**

The '*Food Security Options Paper: A planning framework and menu of options for policy and practice interventions*', developed by the NSW Centre for Public Health Nutrition (2003) has been used to inform the development of this paper and is recommended for further reading. To download a copy of this report visit [www.cphn.biochem.usyd.edu.au](http://www.cphn.biochem.usyd.edu.au)

The authors wish to thank the following people for their valuable input and comment in the development of this paper: Dr Cate Burns, Dr Andrew Black, Ms Noeleen Tunny, Ms Nicole Turner, Ms Katherine Cullerton & Ms Judith Myers.

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## ***Purpose of the paper***

Access to nutritious and affordable food is a key determinant of achieving health equality and 'closing the gap' in life expectancy between Indigenous and non-Indigenous Australians. 'Food security and socio-economic status' and 'Nutrition issues in urban areas' are key priorities for action in the National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan-2000- 2010. While there are commonly reported issues relating to poor food supply across remote Australia, this paper focuses instead on the unique and often hidden challenges for Aboriginal and Torres Strait Islander people residing in urban and regional centres. This paper will explore a range of issues which contribute to the poor nutritional health of Indigenous Australians in urban and regional settings; review and show-case best practice examples from across the country and provide recommendations for action.

### **This paper has the following aims:**

- To promote food security as a key agenda for policy and practice in addressing health inequalities for Aboriginal and Torres Strait Islander people.
- To review available evidence and documented evaluation of interventions to promote nutrition in Aboriginal and Torres Strait Islander people in order to inform best practice.
- To inform inter-sectoral and multi-strategy options for policy and practice interventions to improve food security for Aboriginal and Torres Strait Islander people, with a focus on urban Australia.

### **Who this paper is relevant for:**

This paper is relevant for policy and program developers and researchers across government and non-government spheres within health and related sectors.

## ***Policy context***

The National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan 2000-2010 (NATSINSAP) recognises that poor nutrition is central to the poor health and disproportionate burden of chronic disease experienced by Aboriginal and Torres Strait Islander peoples [1]. The NATSINSAP sets a framework for action across all levels of government, in conjunction with partners from industry and the non-government sector. Through the identification of seven priority areas, the NATSINSAP has been designed to build on existing efforts to improve access to nutritious and affordable food across urban, rural and remote communities.

Nearing the end of its 2000-2010 term, there have been key achievements of the NATSINSAP, particularly in relation to Aboriginal and Torres Strait Islander nutrition training and remote food supply. However for the priority areas of 'food security', 'nutrition issues in urban areas' and the 'environment and household infrastructure', policy action and funding has been limited.

With the 2008 commitment to 'Close the Gap' in life expectancy outcomes between Indigenous and non-Indigenous Australians there is a renewed sense of optimism and political willingness to act. For the first time the Australian Government in cooperation with all State and Territory Governments through the Council of Australian governments (COAG) agreed to six ambitious targets relating to Indigenous life expectancy, health, education and employment [2]. It is the challenge now for policy makers and practitioners to articulate the critical role that access and supply of nutritious food has across all these target areas as a key determinant of health and wellbeing.

## ***Defining urban Aboriginal and Torres Strait Islander communities***

For the purposes of this review, Aboriginal and Torres Strait Islander people living in urbanised environments refers to those living in cities, major regional or rural towns where Aboriginal and Torres Strait Islander populations are a minority, often dispersed within a larger population. The majority of Indigenous people live in capital cities (32%) and regional areas (43%) and 25% in remote areas [3].

Scrimgeour et.al (2007) describe Aboriginal and Torres Strait Islander people living in urban areas as a heterogeneous and a mobile population that can be difficult to identify (compared with communities in remote areas) [4],

*In urban areas there may not be a 'community' at all, but a loose network of geographically dispersed family and organisational affiliations not at all obvious to non-Aboriginal observers. The needs of those without networks at all often go unnoticed and unmet. The disadvantages of cultural isolation can be just as acute as those of geographic locations (Para 2.28).*

*In urban areas with a dispersed Indigenous population, it may be more difficult for service providers and planners to know whether they are reaching the Indigenous people most at need of assistance or involving all sectors of the community in decision making. Indigenous people, when only a small proportion of the community, may have a 'very quiet voice' in local decision making forums (Para 2.29) .*

*Urban dwelling Indigenous people may also suffer from having their Aboriginality denied and be assumed to be assimilated. The stereotypes of 'real' Aboriginals being those living 'outbush' or in traditional' settings may lead to the denial of the possibility of a dynamic, contemporary Indigenous culture in urban areas (Para 2.3) (House of Representatives Standing Committee on Aboriginal and Torres Strait Islander Affairs 2001: 18) [4].*

Despite the challenges, Brough, Bond and Hunt (2004) describe five key strengths identified by urban Aboriginal and Torres Strait Islander people: (1) extended family, (2) commitment to community (3) neighbourhood networks (4) community organisations and (5) community events. Scrimgeour et.al (2007) emphasise the importance of Aboriginal and Torres Strait Islander identity, and the family and community bonds that are part of this identity, which are crucial to efforts to improve the health of Aboriginal and Torres Strait Islander people living in urban areas[4].

### ***Health status of urban populations***

Life expectancy for Indigenous people is 17 years lower than the national average [1]. Such discrepancies in health status are not confined to remote areas, but rather occur across all residential areas within Australia [4]. For example in Victoria, an Aboriginal boy can be expected to live 60.0 years and an Aboriginal girl 65.1 years [6]. Life expectancy for non-Indigenous Victorians males and females is 79.3 and 83.7 years respectively [7].

Chronic diseases are responsible for the majority of the Indigenous health gap. Cardiovascular disease is the leading cause of death and disability for both Indigenous males and females followed by diabetes [8]. For endocrine, nutritional and metabolic diseases such as diabetes, the inequalities are particularly marked, with death rates among Indigenous males and females 8 and 10 times higher than the rate for non-Indigenous males and females respectively [5].

After tobacco, high body mass is the second leading cause of the burden of disease for Indigenous Australians, largely due to its contribution to ischaemic heart disease and type 2 diabetes [8]. In 2004–05, more than half (57%) of Indigenous people aged 15 years and over were overweight or obese [5]. While rates of overweight are similar for both Indigenous and non-Indigenous adults, rates of obesity are significantly higher among Indigenous people (29%) compared with non-Indigenous people (17%) [9]. Evidence suggests the risk of obesity is 20-40% higher in people experiencing food insecurity [10].

Poor nutrition is associated with low birth weight; ill health in infancy and childhood; and increased risk of obesity, cardiovascular disease, type 2 diabetes, certain cancers, osteoporosis and dental disease [11]. According to the National Heart Foundation, there is good evidence linking dietary saturated and trans fat to high blood cholesterol levels [12] and dietary sodium to high blood pressure [13]. In 2003, high cholesterol and high blood pressure were responsible for 8.3% and 9.5% of deaths respectively among Indigenous Australians [8].

Since European colonisation, the diet of Indigenous Australians has undergone a transition. The traditional nutrient-dense, hunter-gatherer diet and associated physical activity have been replaced with an energy-dense "Western" diet which is high in sugar, saturated fat and refined carbohydrate [14]. Data from the 2004-2005 Aboriginal and Torres Strait Islander Health Survey indicate that 55% of Indigenous people have a low fruit intake, and 90% eat less than the

recommended number of servings of vegetables per day [9]. Low fruit and vegetable consumption was responsible for 6% of Indigenous deaths in 2003 [8].

### ***Defining food security***

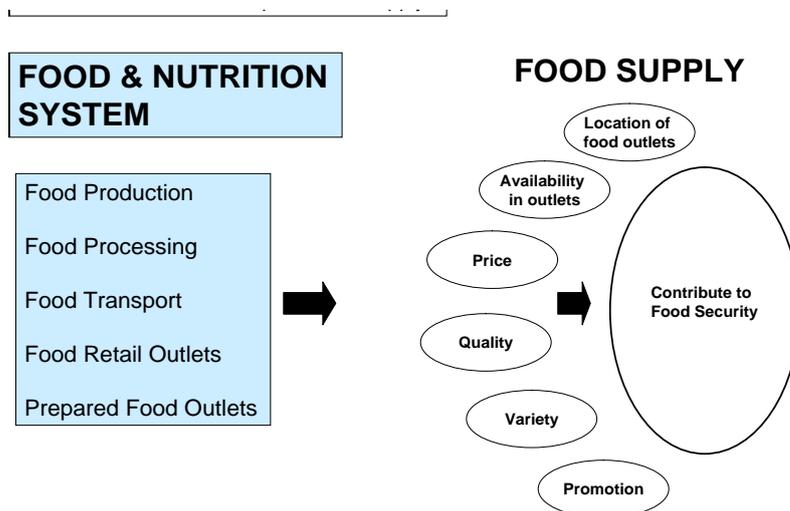
Poor nutrition due to insufficient, low quality or unreliable food intake leads to ill health [15]. While Australia compared with other countries of the world is considered 'food secure', this is increasingly not the case among disadvantaged and low income groups. Food insecurity can refer to the following: 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; anxiety about acquiring food; or having to rely on food relief [15].

The term 'food security' is increasingly used to broaden understanding of the causes of poor nutrition and to encourage a spectrum of changes a community can take in order to prevent its occurrence. As described by Marmot and Wilkonson [16],

*'Access to nutritious food makes more of a difference than nutrition education'.*

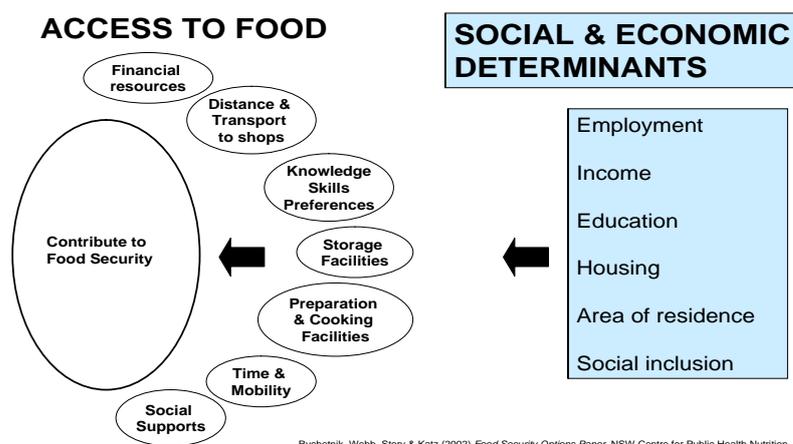
For the purposes of this paper, food security refers to the ability of individuals, households and communities to acquire appropriate and nutritious food on a regular and reliable basis and using socially acceptable means. Food security is determined by people's local 'food supply' and their capacity and resources to 'access and use that food' [15]. This paper has been based upon the intervention planning framework developed by Rychetnik & Webb et.al (2003) [15], *Food Security Options Paper* which is displayed in **Figure. 1 & 2.**

**Figure 1. Points of intervention to improve food supply**



Rychetnik, Webb, Story & Katz (2002) *Food Security Options Paper*, NSW Centre for Public Health Nutrition.

**Figure 2. Points of intervention to improve access to food**



### ***The extent of food security experienced by Aboriginal and Torres Strait Islander people across Australia***

In 2004-2005, 24% of Indigenous Australians aged 15 years and over reported they ran out of food in the last 12 months, compared to 5% of non-Indigenous Australians [18]. While Indigenous Australians living in remote areas were more likely to report having run out of food in the last 12 months (36%), this figure was also disturbingly high for those in non-remote areas (20%). The high proportion of Indigenous Australians who reported they ran out of food was consistently high across all states and territories [18]. Refer to Table 1. National survey statistics are likely to underestimate the true extent of the problem as they do not often include the most vulnerable residents (for example homeless people). In a 2006 Victorian study 51% of Aboriginal families reported experiencing food insecurity. Of the 63 parents and carers interviewed 32 (51%) had run out of food and could not afford to buy more over the past 12 months [19]. High food costs, poor access to healthy foods/convenience of take-away foods, budgeting issues, overcrowding, and poor knowledge and skills were identified as barriers to healthy eating and potential food insecurity for Aboriginal people consulted in a recent Victorian nutrition project in an urbanised setting [20].

In the short term, food insecurity can cause constant hunger, anxiety related to food shortage and a lack of energy. Psychological suffering due to food insecurity can lead to feelings of exclusion, social disruption to family life and in some cases the inability to provide a nourishing diet for children can lead to anxiety about possible loss of custody [21]. The National Aboriginal and Torres Strait Islander Survey (1994) found 30% worry about going without food (ABS) [22]. A study of Indigenous Australians found that those who reported worrying about food were 1.6 (women) and 1.9 (men) times more likely to have a lower self-rated health status compared to those without such worries [21].

In the longer term, food insecurity can lead to becoming overweight or obese, particularly in women [10]. While it seems paradoxical that food insecurity is linked to unhealthy weight, these health issues arise because foods of poorer quality with high fat, salt and/ or sugar content are the lowest cost options, whereas

diets based on lean meats, whole grains and fresh vegetables and fruits are more costly [23] [100].

Young children are particularly vulnerable to the short and longer-term effects of food insecurity as it impacts on their growth, physical and socio-emotional development and learning potential. Early life is recognised as one of the social determinants of health [16]. Poor nutrition during pregnancy increases the risk of low birth weight and chronic disease in adulthood [24]. Again such issues are not confined to remote areas. In Victoria the proportion of low birth weight among babies born to Indigenous mothers is higher than the national Indigenous average [25].

**Table. 1.** Proportion of persons aged 15 years and over who ran out of food in the previous 12 months, by Indigenous status 2004-05 [18]\*

	NSW	VIC	WA	NT	SA	TAS/ACT	QLD	Australia
Indigenous	18%	21%	26%	45%	29%	19%	21%	<b>24%</b>
Non-Indigenous	4%	5%	5%	3%	5%	6%	6%	<b>5%</b>

\*Data has been analysed from the 2004-05 National Aboriginal and Torres Strait Islander Health Survey (NATSIHS) which collected information from 10,439 Indigenous Australians of all ages. The survey was conducted in remote and non-remote areas of Australia.

### ***Determinants of food security for Aboriginal and Torres Strait Islander people***

While conventional risk factors influence food security for urbanised Aboriginal communities, such as poor income; access to transport and storage and cooking facilities, there are also confounding issues relating to history, identity, racism and the quality of relationship to the wider mainstream [26].

#### **Low income**

Across Australia the average equivalent household income of Aboriginal and Torres Strait Islander people in 2003 was only 59 per cent of the corresponding income of non-Indigenous people [3]. As an indicator of financial stress, the 2004-05 NATSIHS determined that about half (49%) of all Indigenous persons aged 15 years and over reported they were living in households in which they could not raise \$2,000 within a week in a time of crisis[18].

While national surveys of the cost and availability of healthy foods do not exist in Australia, research and monitoring undertaken in select states shows evidence of a disparity between the cost of healthy foods compared with unhealthy food items. Across Queensland annual surveys of food cost are undertaken using the 'Healthy Food Access Basket' (HFAB) which includes standard commonly available foods selected to provide 70% of nutritional requirements and 95% of estimated energy requirement of a reference family of six people over a 2 week period [100]. Across Queensland, the cost of the HFAB has increased above Consumer Price Index (CPI) for food (based on a wider range of food items including cakes, biscuits, confectionary, takeaway foods and fast foods and soft drinks), across 56 stores surveyed between 1998 and 2004 in both urban, regional and remote areas. This suggests that the cost for basic foods necessary to achieve good health has become, and continues to be more expensive than less nutritious alternatives. Similarly, a study of food cost in 34 supermarkets in rural areas

across Victoria found a high absolute cost and higher variation in the cost of healthy foods compared with unhealthy food items. This study estimated that typical family would need to spend 40% of their welfare income to consume a nutritionally adequate diet [101]. This varies substantially from the 17% of income which the average Australian will spend on food [101]. Both studies demonstrate that the increasing cost of healthy food is a potential barrier for people of low socio-economic status, such as Indigenous people to achieving good health.

The impact of financial issues and the affordability of healthy food are dominant themes in consultations with urban Aboriginal people across Australia. Focus groups involving 27 Aboriginal participants in Victoria's Goulbourn Valley revealed that food choices are dictated by finances rather than nutrition and that it is difficult to eat healthily on a tight budget. *"I can go down to Hungry Jacks and feed at least 5 kids for \$20. That's 5 kids fed. Whereas if I was to prepare a meal it would cost me more to make a meal with the right stuff"* [26]. Similarly findings from a qualitative study undertaken with 31 urban Indigenous families in Brisbane found that while women in the community are generally aware of healthy eating principles, disadvantage limits the uptake of healthy eating recommendations. Healthy diets were found to cost more than less healthy equivalents and that the cost of food is of primary importance when deciding what to buy: *"Generally we don't get lean cuts (of meat)... We don't eat that much lamb. It's too expensive"* [27]. Similar themes were reflected in consultations undertaken in 2008 across Aboriginal communities across Victoria. *"Because we're a lower income community, most of our community are living from pay-check to pay-check"* and *"Its convenient and easier to grab a feed that's already cooked than grab all bit and pieces and cook it yourself especially if they can't afford to keep the electricity on"* [28].

### **Household infrastructure and overcrowding**

Associated with poor income, poor household infrastructure and overcrowding have been highlighted as barriers to food security for urban and rural Indigenous families. In the 2004–05 NATSIHS in New South Wales, Victoria, Tasmania and the Australian Capital Territory between 9% and 10% of Indigenous Australians were living in overcrowded houses [18]. In such circumstances kitchen storage facilities may not be adequate for the number of persons residing within the house. Also, kitchen appliances designed for use by four to six people are often used in an Indigenous household of at least 10 people. As reflected in consultation undertaken in rural Victoria, *"...diet and education is crucial but how do you address overcrowding? People don't want to cook if there's too many people. It's physically impossible"* [28]. In 2002 2.5% of Indigenous households in major cities and regional areas reported that they did not have working facilities for storing and preparing food [18].

### **Social and cultural determinants**

Other determinants of nutrition and food security for urbanised Aboriginal and Torres Strait Islander people that have been emphasised through consultations across Australia over the last decade [29][30][31] include:

- Food choices are dictated by financial constraints rather than nutrition. At times financial stress leads to a reliance on emergency food relief,
- Gaps in knowledge about healthy choices, budgeting and cooking skills,
- Alcohol, drug use, smoking and gambling can take priority over purchasing food,

- Busy lifestyle, large households and mixed preferences in the house were highlighted as a barrier to changing eating habits,
- Lack of transport to food outlets, and/or the impact of town planning upon the accessibility of nutritious food (eg transport routes and location of food outlets). In contrast fast foods are easy to access,
- Transient lifestyles, cultural and family commitments can inhibit budgeting and cooking healthy food on a regular basis

In addition to these factors, issues of history, cultural identity and discrimination are likely to further impact on nutrition and food access in urban and rural settings. These issues are identified barriers in relation to access to mainstream health care services. Houston (2004) describes the notion of 'cultural security'. In metropolitan areas people commonly demonstrate a preference for accessing community controlled health services because services are delivered in ways that are considered culturally secure. In such circumstances there is a psychological distance which is as great in its effect as geographical distance [4]. How this notion translates in relation to food access from mainstream retail operations is unclear and requires further investigation. 'Social exclusion' which can result from racism and discrimination is identified by the WHO as one of the ten social determinants of health which impact upon physical health and longevity [16].

#### **Key points: determinants of food insecurity**

- \* For urbanised Aboriginal and Torres Strait Islander communities financial stress and the affordability of healthy food has a dominant influence on nutrition and food security.
- \* Other related factors include access to transport, household infrastructure & overcrowding, nutrition knowledge & skills and a range of social and cultural issues, including discrimination.

### ***Interventions to address food supply and food access***

As described, the determinants of food security are multi- dimensional and a broad mix of intervention strategies are required. In 2003 Rychetnick, Webb, Story and Katz developed the 'Food Security Options Paper' [15] which identified a range of intervention points to guide policy makers and practitioners to effect both 'food supply' and 'food access' as outlined in Figure 1. and Figure.2. The aim of this section is to review and highlight examples within Aboriginal and Torres Strait Islander settings, utilising this framework to illustrate the possible mix of interventions to improve food security.

The selection of interventions are presented as a guide and should be informed by an assessment of local food security needs and priorities, as well as the capacity of the program developers. Planned interventions should also demonstrate clear program logic and a rigorous evaluation framework to ensure learnings are captured to build the limited evidence base in this area.

To inform intervention planning decision makers will need answers to the following questions [15]:

1. What is the prevalence of food insecurity (among at risk groups)?
2. In what areas is the food supply inadequate and why?
3. Who has problems with acquiring food and why?
4. What is the workforce/organisational capacity to initiate or collaborate in an intervention, the available resources, and the ability to engage relevant partners (within and most likely external to the health sector)?

In line with good practice principles, answers to the above questions will be dependent upon genuine consultation and engagement by the local community. For Aboriginal people, the determinants of health and health behaviour are broader than socio- economic issues and include history, the quality of relationship to the wider mainstream community, connectedness to community members and land, opportunities for cultural expression and issues relating to personal and community control [26]. It is critical therefore, that programs to address nutrition and food security are community directed and culturally aligned. In 2000, a critical review of the evidence for successful food supply and nutrition programs for Aboriginal and Torres Strait Islander people (NHMRC 2000) [31] found little evidence that mainstream nutrition programs address the nutrition needs of Aboriginal and Torres Strait Islander people. To engender community control, consultation with communities should not only explore food security barriers, but most importantly focus on potential solutions to improve food supply and food access.

### **Interventions to improve food supply**

The term 'food supply' describes those aspects which affect the 'availability' of food in a community that can ultimately affect the food security of individuals, households or the entire population. While food supply is affected by national and even global forces, the focus for this review is the availability, variety, quality and promotion of foods for local population groups. In particular, interventions to influence the food supply have been categorised into local 'food production', 'food retail outlets and food transport', 'prepared food outlets' and 'food aid and subsidised food and meals'. There are also a range of upstream factors which can have significant impacts on local food supply, including urban planning, land use regulation; agricultural policy and food processing regulations. While analysis of these factors which have whole of population impact is beyond the scope of this paper, greater advocacy is required to ensure the rights of Aboriginal and Torres Strait Islander people are considered within broad policy and regulatory decision making.

### **Food production**

At the local level, strategies to increase food production can include growing fruit and vegetables in the form of 'Community gardens', 'Community allotments', 'Home gardens' and 'School gardens'. Supporting small scale, local farmers is another way of providing a relatively secure, more locally controlled source of fresh food.

Community gardens are commonly identified as a solution to addressing food security in disadvantaged areas, with a number reviewed within Indigenous communities[32] [33] [34]. Community gardens increase access to fresh fruit and vegetables, particularly for participants, and provide opportunities for physical activity, community pride and social interaction through gardening. A community garden approach does however require a great deal of organisation to manage the shared responsibility for maintaining the garden. The sustainability of a community garden is often dependent on one or two individuals having the

capacity to coordinate the activities of other participants [15], as well as access ongoing funding for infrastructure costs associated with vehicles, fuel costs and repair of equipment etc [40].

While only one example of a home gardening program in an urbanised Aboriginal community [35] was found in this review, 'Community allotments' are popular particularly in the UK, where councils lease (at a very cheap rate) small pieces of crown to local residents or families to grow their own fruit and vegetables. Community allotments are usually located in walking distances from residential areas [15]. For residents who have the time and who are experienced gardeners this can be an effective way of supplementing their diets. This strategy is less effective for community members who lack gardening expertise, time or resources to manage an allotment of their own.

School gardens are often a popular alternative in Indigenous [36] [37] [38] [33] [39] and mainstream schools as they are easier to coordinate and have the backup of staff and students to work in the garden on a daily basis (school holidays do need to be considered). The value of school based gardens is that learning about gardening, composting, healthy eating and cooking can be integrated into the school curriculum in a positive and practical way. The Stephanie Alexander Kitchen Gardens Foundation has developed a model which provides children across Years 3 to 6 to help to design, build and maintain a vegetables garden on the school grounds, combined with a kitchen classroom where each week student prepare and share a variety of meals created from their local produce. In 2009, 37 schools across Australia, including a selection of Indigenous schools, commenced the Stephanie Alexander Kitchen Garden Program with grants provided through the Australian Government. For more information visit [www.kitchengardenfoundation.org.au](http://www.kitchengardenfoundation.org.au).

The integration of bush tucker within gardens was repeatedly cited as a desirable goal for traditional owners and participants in a recent qualitative research project undertaken of Aboriginal community gardens in remote communities [40]. While not all wild foods will be suitable for horticulture purposes, or produce significant volume to feed large communities, they hold significant cultural value and are important to engender community ownership and acceptance.

Supporting local farmers to continue to grow local food is an issue of increasing concern given the impact of urban sprawl and the substantial challenges brought about by climate change. Community Supported Agriculture (CSA) is a model popular in the USA with emerging interest in Australia. CSA schemes link farmers to their community through the direct sale of farm shares. The sale of shares supports farming and acts as an incentive for consumers to purchase regular supplies of seasonal, competitively priced fruit and vegetables. Low income groups can be assisted through schemes that offer subsidised shares and subsidised produce (15). Encouraging people to shop at farmers markets, roadside stalls, or joining vegetable box subscription schemes also provide farmers with alternative avenues for selling their produce locally.

Individuals and organisations can get involved in promoting urban agriculture through working with local planners and policy makers to establish new urban agriculture projects. This could include preserving open space for food production or advocating for legislative change that impedes the development of urban horticulture to improve the supply of locally grown vegetables and fruits.

## **Food retail outlets and food transport**

The majority of people across Australia obtain their weekly food supplies from supermarkets or local retail outlets. Large supermarkets, through economies of scale, are generally less expensive and offer the greatest variety of food choices compared with smaller independent food stores [101]. As such the food security of local communities is heavily influenced by the location of supermarkets and residents ability to easily access them; particularly if they do not own a car.

Mapping the location of supermarkets within disadvantaged communities and the accessibility by foot or by public transport can provide important information about the ease of accessing the local food supply. When this information is used to influence planning decisions around the construction of new food retail businesses or to lobby for enhanced public transport routes it can be a powerful way of influencing community food security. While studies in the United Kingdom and in Australia have shown relatively good supply of affordable healthy food in disadvantaged urban areas, a higher density of fast food outlets has also been consistently shown in poor neighborhoods (99). Extensive mapping of community access to food outlets was undertaken as part of the Many Rivers Research project (University of Newcastle) across the Kempsey, Taree and the Lower Hunter regions of NSW. However at the time of writing, outcomes of this work have not yet been published.

Among Aboriginal and Torres Strait Islander communities successful strategies to influence local food supply through changes in food retail and marketing practices have been most commonly applied in remote communities that rely on a single community store [41] [42] [43] [44] [45] [36]. In remote communities there is good evidence that community directed nutrition programs which address both food supply and demand issues can influence consumption patterns and lead to marked and sustained improvements in anthropometric, biochemical and haematological risk factors of chronic disease [44][42]. In 2007 a set of nine resources were developed as part of the Remote Indigenous Stores and Takeaways project to assist all remote stores, regardless of their size to stock, promote and monitor the sales of healthy food choices ([www.healthinonet.ecu.edu.au/health-risks/nutrition/resources/rist](http://www.healthinonet.ecu.edu.au/health-risks/nutrition/resources/rist)). These resources build upon the successful examples of developing food and nutrition policies for remote store groups, well established by the Arnhem Land Progress Association stores & the Mai Wiru Food Policy in the APY Lands in South Australia.

## **Prepared food outlets (institutional food services, workplaces, clubs, restaurants & takeaways).**

Aboriginal organisations can be significant providers of food and have a major influence on the food culture within a community. For example, Aboriginal Community Controlled Health Organisations provide food at meetings, community barbecues, group programs and other community events. Aboriginal Health Workers are often seen as role models in their community and have the potential to be advocates for healthy lifestyle choices. The opportunity to influence food supply and food culture were reflected in consultations undertaken in 2008 across Aboriginal Community Controlled Health Organisations in Victoria [28], with comments including

*"All the catering...it hasn't really been that healthy"*

*"I think maybe the organisation could look at taking a policy out and promoting it through the workers"*

*"It's an overall approach that all programs take to healthy eating. It's done generally anyway but it would be good to have it more documented and some guidelines around it"*

*"I've seen kids stand over their mother for Coke and a Mars bar at the Aboriginal Medical Service because the vending machine was there in the waiting room"*

*"We're role models, whether we like it or not"*

Food services also play a major role in other Aboriginal and Torres Strait Islander organisations such as the Multifunctional Aboriginal Children's Services (MACS), Aboriginal hostels, Sports Clubs, and the Aboriginal and Torres Strait Islander Community Elders Services. There is great potential to improve food provided in Aboriginal and Torres Strait Islander organisations through implementation of nutrition and healthy catering policies. While nutrition policies have been successfully implemented in remote communities that relied on a single community store [33] [44] [45] [46], they have not yet been widely used in urban settings. This review included one Victorian program which improved the food sold in the sports club canteen [26] while another influenced the food provided at a school holiday program [47].

Across mainstream Australia, local policy action to improve the supply of healthy food has included award programs for food retailers that provide healthier choices [48] and early childhood settings that implement nutrition policies [49]. This approach could be more widely used within Aboriginal organisations that provide food. Nutrition policies that are developed through consultative processes and have commitment through management have the greatest potential to influence long term change in dietary patterns and food culture; making healthy choices the easy choices for the community.

### **Food aid and subsidised food and meals**

Food aid typically refers to food parcels or meals that are provided for free (or highly subsidised); often to the poorest and most vulnerable members of the community. Some people may require food aid on a temporary basis during a period of crisis, while others are dependent on food aid for many years [15]. While food aid is an essential welfare service, a person or family relying on food aid would not be considered 'food secure'. By definition 'food security' refers to the ability to acquire food on a reliable basis by socially acceptable means. As such a food secure household would not need to seek emergency food relief.

Subsidised food and meals can however be an effective way of preventing or relieving food insecurity for low income groups. Subsidised food is typically perceived differently to food aid because it is considered a 'service' rather than a 'charity'. This review identified a variety of programs which attempt to increase access to nutritious food by subsidising food to Aboriginal community members. Food was provided at breakfast programs [50] [38] [46] [51] [26] or for lunch [46] [52] [53] [54] [55] [51] as part of many programs. This strategy is particularly popular in children's settings such as schools. The Bulgarr Fruit and Vegetable Program featured below reported significant improvements in health by providing fruit to school children [39]. Other programs report increased growth among younger children receiving supplementary meals [55] [51]. International evidence suggests that food subsidy programs linked to parental nutrition education can improve childhood growth and nutrient intake among Indigenous children [56]. In Victoria, provision of subsidised meals through local cafés has resulted in improved food access and social inclusion for homeless people [57].

Important distinctions in the design of effective food subsidy programs is that they preserve personal dignity and are highly valued by participants, rather than being perceived as a 'free handout' that people may feel shame in accessing. The program delivered at the Mullum Mullum Indigenous Gathering Place (featured below) illustrates this point. While participating families may be unable to afford to buy a weekly box of fresh fruit and vegetables, they contribute instead by volunteering two hours of their time every month to assist in a variety of programs held at the centre. This principle of 'giving and receiving' ensures the fresh produce is highly valued and families feel they are contributing to a service, rather than passive recipients of charity.

### **Second Bite- food for people in need**

Second Bite a not-for-profit organisation based in Melbourne committed to making a positive difference by sourcing fresh nutritious food that would otherwise go to waste and redistributing it to over 70 food relief agencies providing thousands of meals for people in need. After only two years of operation, in 2008 Second Bite distributed a record 204 tonnes of food. Before SecondBite, agencies purchased much of their food with donated funds – often at retail prices. By saving money on their food bill, agencies can divert funds back into educational, social, recreational and outreach programs for their clients. Receiving regular deliveries of fresh vegetables and fruits has given agencies the capacity to create wholesome, nutritious and culturally diverse menus for their clients

[www.secondbite.org](http://www.secondbite.org)

### **Mullum Mullum Indigenous Gathering Place Food Bank Program**

Mullum Mullum Indigenous Gathering Place (MMIGP) was established in 2006 to address needs identified by the Indigenous community of the eastern metropolitan region of Melbourne. MMIGP has a focus on early intervention rather than welfare and aims to be proactive rather than reactive to government policy. It was this aim that was behind the creation of the food bank program which services around 20 Aboriginal families every fortnight.

The food cooperative has a unique focus on the supply of fresh healthy food. Each fortnight, the co-op volunteers make a morning trip to pick up fresh produce, including fruits, vegetables and dairy goods from the 'Second Bite' warehouse in Melbourne (as above). On their return, all food is weighed, recorded and distributed into family boxes ready for collection in the afternoon. The fortnightly box of fresh food has supplemented family diets and encouraged people to try new foods they have never tasted before.

Bronwyn Fenn, the Food Bank Coordinator says, "The most important aspect of the model is the principle of giving and receiving". No money is exchanged. Instead people register to join and agree to volunteer a minimum of two hours per month either working at the food bank or within a range of other programs run through the MMIGP. "This has been critical to our success as people feel no shame walking through our doors. This has allowed us to shift the focus from welfare dependency to one of Community strengthening based on sharing and working together to look after family and Community". The partnering of MMIGP's 'Health Promotion' and 'Volunteering' programs has helped to make this unique initiative so successful.

The food bank program has helped to turn around the notion that the Indigenous Community is always the recipient of volunteering services and welfare rather than contributors to community and civic participation. The food bank has been identified as a way to offer meaningful and sustainable volunteering roles. It has had many benefits, as an introduction to the Indigenous Community and it has enabled some ownership by the Indigenous community to steer projects. Volunteering by Indigenous families has also led to an increased uptake of local health services and the creation of a home goods exchange service, based again on the principles of exchange rather than money.

### **Bulgarr Fruit and Vegetable Program**

A nutrition project instigated by a health team based in the Aboriginal Medical Service in Grafton produced a marked improvement in the health of Aboriginal students in an isolated rural community school. The team had been constantly treating skin infections, such as impetigo, and recurrent otitis media on every visit, with an average of 25% of the children having infected skin lesions on many occasions, and up to 50% having had significant middle ear disease. The children in these communities had limited access to fresh food as the closest source of fresh fruit and vegetables, bread and milk is 80km away in Grafton.

With the support of the local communities and the school, a program of nutritional supplementation was instituted so that fresh fruit and vegetables were provided daily to the children at school along with vitamin C supplementation. The children are involved in maintaining a vegetable garden at the school and a program has been established to teach them to prepare healthy meals. After six months the skin infections rate dropped to almost nil, while rates of chronic middle ear pathology had improved by 30% on routine screening. The implication of this project is that to improve the general health of regional Aboriginal communities nutrition has to be addressed as a major causal factor in poor health outcomes. A simple intervention such as providing fresh fruit and vegetables into these children's diet had a profound effect on improving their health.

After the success of this school program, the Bulgarr Ngaru Medical Aboriginal Corporation (BNMAC) fruit and vegetable program was developed. This was due to the recognition that poor nutrition appeared to be a significant problem in other local Aboriginal communities. In these urban communities, a family approach was proposed as it proved impractical to target the small minority of Aboriginal children in local schools.

The BNMAC fruit and vegetable program involves the provision of a weekly \$40 box of subsidised fruit and vegetables with an individual contribution of five dollars. Cooking classes and nutrition education are offered to participants with individual consultations by dietitians also available. The program is also intended to engage people in preventive health activities. Hence, annual health assessments including dental and hearing checks are undertaken for each child. The program currently has funding for 50 families with a waiting list of eligible families due to funding constraints. The program is managed by the BNMAC fruit and vegetable committee which includes mostly Aboriginal staff members. An evaluation of the Bulgarr fruit and vegetable program is currently underway with all new participants having a blood test and 24 hour dietary recall. The purpose of the evaluation is to determine the impact of the program on children's nutrition and health. Process evaluation will also be important to understand how

the program works in these communities, which may be useful for other communities considering similar initiatives. As a result of additional funding, the Galambila Aboriginal Health Service and Bowraville Aboriginal Medical Service have both commenced similar fruit and vegetable subsidy programs. These communities will also participate in the evaluation.

### **Key points: interventions to improve food supply**

To influence food supply in urbanised settings, socially inclusive health promotion programs which incorporate a form of subsidy for healthy food and/or meals have good potential to improve health outcomes of those for those at risk of food security.

Food production strategies such as community gardens and school kitchen gardens are popular strategies that have educational value and promote community building and physical activity. Participants are also likely to increase their consumption of vegetables and fruits. Success however often depends upon committed individuals and securing ongoing resources. Schemes which support farmers on the urban fringe is another way of providing a relatively secure, more locally controlled source of fresh vegetables and fruits.

There is good potential to influence the nutritional quality of the food supply through the development of nutrition and catering policies across Indigenous organisations and within key settings such as Indigenous child care services.

### **Interventions to improve food access**

To improve people's access to food, interventions are required that directly increase people's capacity and resources to obtain and consume nutritious food. For this review, interventions that are designed to improve local food access have been categorised under "Integrated services and referral systems"; improving "Transport to food suppliers"; ensuring homes have adequate "Storage and kitchen facilities" and enhancing "Health education-food, nutrition and life skills". In the longer term, addressing the broader social and economic determinants such as employment, income and education will ensure improvements in food access are sustainable.

### **Integrated services and referral systems**

Addressing nutrition and food security concerns within health, welfare and food assistance programs can be an effective way of reaching those greatest at need. Establishing formal referral systems between health and welfare agencies to better address an individual's material, financial and social barriers to food security can ensure the most vulnerable people do not 'fall through the cracks'. This kind of approach, (typically involving a food security assessment, referral, advice and follow-up) are best integrated into existing health and welfare services, providing generalist staff with appropriate up skilling and support from nutrition experts [15]. The following types of services and programs are relevant to a nutrition/food security assessment and referral network:

- Aboriginal medical services/primary health services
- Nutrition and dietetics programs
- Social and welfare services, aged care and disability services

- Home visiting programs
- Local food and nutrition projects such as shopper shuttles to shops and delivery services
- Food and material aid
- Social security/income support/housing assistance [15]

The Café Meals program is an innovative example of an inner city food security program established through a partnership between a community health service and local government. While not specifically developed for the local Aboriginal community, Aboriginal clients have been engaged in the program over time.

#### **Case Study – Café Meals program [57]**

The Café Meals program is a successful model which originated through collaboration between North Yarra Community Health Centre and the City of Yarra in Melbourne's inner north. The aim of the program is to improve access to nutritious, affordable and socially acceptable meals for homeless people. The Café Meals program services 50-60 homeless people (or at risk of being homeless) who are referred into the program through health and welfare agencies. Each person is provided with a membership card that can be used once per day to purchase a meal (to the value of \$10.20) for the price of \$2.00. Providing people with the choice over where and what they will eat among a select number of local cafes and restaurants was a crucial factor behind the success of the program. This improved sense of social connectedness has had significant effects on the self-esteem of the program participants, and, subsequently, on their ability to make choices that improve their health and wellbeing. Outcomes have included:

- \*Self reported improvement in nutritional status for some participants (weight, glycaemic control, appetite)
- \*Improvements in general sense of well-being & physical appearance,
- \*Improved frequency of meals,

The program has received recurrent funding from the HACC Flexible Service Response funding and has now been replicated in other sites across metropolitan Melbourne.

#### **Transport to food suppliers**

Regular and reliable public transport between residential areas and a supermarket is a key requirement for food security, particularly for those who do not have access to a car. For vulnerable residents, strategies can be pursued such as negotiating home delivery services, or a community bus to courier local residents to a supermarket or fresh food market. For example, in the City of Maribyrnong in Victoria, a community bus managed by a local disability organisation (WestNet) operates a mobile fruit and vegetable shop; selling affordable fresh fruit and vegetables on a weekly basis at designated public housing estates and a local school. A fruit and vegetable shop is also located at the organisation where residents can purchase fresh produce, or individual orders are delivered free of charge for holders of health care and pension cards [14].

## **Storage and kitchen facilities**

Households need adequate storage and food preparation facilities to provide healthy meals on a low income. Basic facilities include clean running water, adequate food storage space, a functioning stove, a fridge/freezer and a food preparation area. While poor housing infrastructure and overcrowding is wide spread in remote Aboriginal and Torres Strait Islander communities, less is known about the status and extent of overcrowding in urbanised settings. Intervention strategies include monitoring, reporting and advocating for targeted funding to improve household kitchen facilities; reviewing building regulations and design specifications of kitchen facilities in low cost housing, hostels, rooming houses and other forms of accommodation [15].

### **Swan Hill- Food-for-all program**

In rural Victoria, the council led Swan Hill Food-for-all program, has established a number of initiatives to increase supply and access to fresh foods for local residents. A Community Growers Market now operates on a monthly basis in the town of Robinvale; selling fresh food straight from the local growers. Produce from the Manatunga Community Garden- which is managed by the local Manatunga Aboriginal community is sold at the Robinvale markets, providing income to purchase seedlings and equipment. The garden has been operating for 10 years, and the food grown is available for anyone in the wider community who is unable to provide for themselves. Establishing linkages between the garden and the market has enabled a stronger relationship to develop between the council and the local Aboriginal community.

The 'Rent to own' initiative is another element of the broader Food-for-all program; providing an opportunity for low income residents to own their own refrigerator. Welfare agencies in the area identified the lack of household infrastructure such as fridge's and washing machines among low income residents, many of whom were using esky's filled with ice to keep food cold. Welfare agencies provided the initial point of referral for people to enter the program, which was managed through a partnership between the local credit union, Centre Link, the local housing authority and the Aboriginal Medical Service. When accepted as being eligible for the program, people are provided with a refrigerator and agree to participate in a budgeting program to assist them to establish a loan from the local credit union. Through small monthly contributions on a 'no interest' basis, successful participants will own their own fridge over an agreed period of time.

[www.vichealth.vic.gov.au](http://www.vichealth.vic.gov.au)

## **Health education- food, nutrition, and life skills**

Nutrition education alone will not improve food security [59] [60] [31]. However, when education is combined with a range of other strategies to help people access and afford healthy food it can be effective. In this review, the majority of programs included some form of health education. This ranged from structured sets of workshops [61] [76] [63] [64] [65] [54] [66] [67] to less formal information sessions [68] [69] [42] [43] [36] [32] [44] [70] [38] [49] [72] [73] [74] [46] [26]. Cooking programs in particular are a very popular strategy [35] [42] [38] [64] [47] [73] [75] [65] [49] in local communities. Different models used include cooking demonstrations [61] [62] [63] [66] [38] [66] [74] [77] cooking classes [78] [65] [75] [38] [71] and the development of 'community kitchens' [73] [35] [47] [42] [79] [65].

The community kitchens model may be particularly relevant for Aboriginal and Torres Strait Islander communities as it is based on community development principles and supports empowerment and self-efficacy. There is both local and international evidence to suggest that these programs can improve participants' food security through developing cooking, shopping and budgeting skills as well as reducing social isolation [81] [82].

The effectiveness of education type strategies can be enhanced when a 'train the trainer' or peer education model is used to deliver education to individual or small groups. Of the programs reviewed many used a peer education approach, training Aboriginal workers to deliver nutrition activities for their own communities [61] [63] [66] [74] [44] [70] [83] [62] [26] [73] [67]. The sustainability of a peer education approach strategy is likely to be greater when educators are paid for their time, rather than relying upon volunteers. It is clear that an Aboriginal person who is familiar with the language, cultural and family context is well placed to deliver education that is appropriate and relevant for their local community. International evidence suggests structured education programs using peer educators have the potential to improve nutrition and physical activity among Indigenous adults [84] and children [85]. Providing opportunities for Aboriginal people to train and be employed in dedicated nutrition positions is critical to advancing nutrition and food security in the longer term.

### **Community Foodies [73]**

'Community Foodies' is a state-wide peer education program that is adapted at the local level to manage responses to locally identified nutrition issues. The program aims to develop cross-sectoral collaboration and capacity building in communities, by ensuring local partner agencies are engaged. Local programs are developed and implemented by the communities themselves. Community members are trained in basic nutrition, program planning & facilitation, and work directly with their own communities as peers. These strategies extend the capacity of health services and other agencies to work with disadvantaged and hard-to-reach communities in ways that are relevant, engaging and accessible.

An example of where this has worked well is Southern Fleurieu Health Service. The health service trained three Aboriginal Community Education Officers (ACEOs) in their Community Foodies training. The idea was to use "embedded staff" who were already working in schools as well as in community, so that they would be more aware of promoting healthy eating in the course of their everyday work.

Community Foodies and ACEO's have worked together to run a 5 week nutrition program in three different schools. This program was run by non-Nunga Foodies but facilitated by ACEOs in Nunga education class time. It involved a mix of discussion about food, food literacy, taste-testing and making some recipes. Popular activities for the kids included cooking and practical demonstrations of measuring out teaspoons of fat and sugars in foods. Southern Fleurieu Health Service and Community Foodies are planning to run cooking programs with the kids on a monthly basis.

### **Key points: interventions to improve food access**

A wide range of programs have been highlighted which focus on nutrition education, budgeting and skill development to improve 'food access'. While a greater mix of strategies are needed, the value of educative approaches are

maximised when a 'train the trainer' or peer education model are used to support Aboriginal workers to deliver nutrition activities for their own communities. Building a dedicated Aboriginal and Torres Strait Islander nutrition workforce is the ultimate goal.

Among urbanised Indigenous settings, there is a need to trial multifaceted approaches which assist people to access better food, such as transport assistance or initiatives to improve household kitchen and storage facilities. Nutrition education and skill development interventions are of value, however will not alone improve food security.

### ***Building focus and sustained action in Aboriginal and Torres Strait Islander food security- what is required***

To ensure sustained and effective interventions to improve nutrition and food security, critical building blocks include an adequately trained workforce; sustained resourcing; intersectoral partnerships and a monitoring, research and evaluation framework. This section describes these essential components.

#### **Workforce development and capacity building**

The essential role of nutrition and food security in improving health outcomes within the Aboriginal and Torres Strait Islander population has led to a critical need for an experienced nutrition and health promotion workforce orientated towards 'prevention' activities. Specialised nutrition and food security positions are required to drive 'good practice' interventions forged through local partnerships. Such positions would have a focus on broad based program development and coordination and may be based at a health services, councils or relevant community service organisations. Increasing the number of local and regional positions will extend the geographic coverage & access (increase the 'dose') of well informed policies and programs. In their absence, the best intentioned policies fail to gain traction at the local level or are short term and poorly implemented.

Building the Aboriginal and Torres Strait Islander workforce is a national priority identified within the NATSINSAP [1]. However throughout Australia there continues to be an insufficient specialist workforce focussed on Aboriginal and Torres Strait Islander nutrition, particularly in urban settings. The NATSINSAP specifically identifies the need to increase the numbers of skilled and supported Aboriginal and Torres Strait Islander people in the nutrition workforce. However of the approximately 100 recognised nutrition positions across Australia with a dedicated focus on the Aboriginal and Torres Strait Islander population, it is estimated that only one third of these positions are filled by Aboriginal or Torres Strait Islander people [102].

A key feature of many of the successful interventions identified in this review was the recruitment, training and support of Aboriginal workers in dedicated positions to promote nutrition [32] [83] [45] [38] [86] [75] [72] [87] [46] [26] [43] [42] [46]. Many of these programs emphasized the importance of professional partnerships between Nutritionists and Aboriginal Health Workers [89] [38] [32] [87] [72] [74] [90]. Furthermore, several papers demonstrated the effectiveness of providing culturally appropriate training programs and educational resources for Aboriginal Health Workers [66] [63] [76] [67] [91] [92] [90], however, ongoing support structures, professional development, mentoring

and sustainable funding are also required to support workers to translate training into practice in their communities [46] [91].

### **Funding commitments and infrastructure**

A key limitation affecting the capacity to promote nutrition and food security is the ad hoc way in which many programs are funded. Many of the interventions described in this review were short term research or pilot projects [88] [44] [37] [38] [26] [69] [63] [32] [64] [93] [72] [54] [74] [46] [77]. This is a major barrier to sustaining nutrition and food security initiatives and their associated health outcomes. Furthermore, many papers reported that the project timeframes were too short to demonstrate changes in clinical outcomes [88] [44] [32] [38] [74] [46], especially since significant time was often needed to develop trust and build relationships in the community. Systematic and ongoing program funding is required to address these issues effectively in the long term. As above, building the Aboriginal and Torres Strait Islander nutrition workforce is an essential part of this process.

### **Monitoring food security**

The limited monitoring of nutrition and food security status across mainstream Australia and particularly among the Aboriginal and Torres Strait Islander population has restricted awareness and concerted policy action.

Nearly 15 years ago the Australian National Nutrition Survey (1995) included a single question around individual food security: 'In the last 12 months, were there any times that you ran out of food and couldn't afford to buy any more?' [94]. A similar question was again included in the 2004 -05 National Aboriginal and Torres Strait Islander Health Survey which collected information from 10,439 Indigenous Australians from remote and non-remote areas across Australia [18]. While a useful indicator, it is likely to underestimate the degree or nature of food security problems, as the question only addresses one aspect of food security (running out of food as a result of running out of money). It has also not been possible from this limited information to isolate nutrition and food security data for the majority of Indigenous people that live in urbanised environments. There is a need to better understand food insecurity from an Indigenous perspective and to develop Indigenous specific tools for assessment.

At the time of writing, a research project is commencing among the urban Indigenous population in Darwin to measure food security at the household level using the Radimer/Cornell Food security measurement tool [96]. While broadly used and validated in various population groups and countries, it has not yet been validated for Indigenous populations. This tool has the potential to better describe the dimensions and degree of household food security through distinguishing whether a household is marginally food secure; food secure without hunger; food secure with moderate hunger; or food insecure with severe hunger [96].

Monitoring activities can focus, as in the above example on measuring the prevalence of food security for particular groups (that is quality of food, shortage of food, experiences of hunger, anxiety about food intake). Another approach is to assess the determinants of food security, in relation to the factors which impact 'food supply' and 'food access'. Examples here may include:

- documenting the price, availability, quality and promotion of food in community retail outlets,

- mapping the location of supermarkets and other food outlets in relation to residential areas, or
- monitoring the uptake of food aid programs.

The need to develop national nutrition and food security indicators has been highlighted repeatedly. This has been identified in the NATSINSAP under the Key Action area: National food and nutrition information systems [1]. More recently at the 2008 National Nutrition Networks conference, a key conference recommendation was that 'food security issues impacting Aboriginal and Torres Strait Islander people living in urban, rural and remote locations are researched, reported and food security indicators developed for routine monitoring and reporting nationally' ([http://www.healthinfonet.ecu.edu.au/uploads/conferences/81\\_nnncrecommendations.pdf](http://www.healthinfonet.ecu.edu.au/uploads/conferences/81_nnncrecommendations.pdf)).

### **Research and evaluation**

After undertaking an extensive review of 'mainstream' food security programs Rychetnick & Webb et.al [15] concluded that few interventions addressing 'food supply' or 'food access' had been evaluated in a way that demonstrate their effectiveness at improving food security. As such they concluded it was not possible to make 'evidence-based recommendations' for selecting the most effective policy and practice options from among the interventions they presented.

Similarly, across Australia there is serious lack of research attention on effective interventions to address nutrition and food security for Aboriginal and Torres Strait Islander populations. This is particularly the case in urbanised settings [1] [94] [98]. In this review, a number of successful programs and principles of good practice have been identified. However, assessing the impact of published programs was difficult due to their short duration, small sample size and lack of control groups. While some improvements were demonstrated in relation to dietary intake, biochemical markers, weight, and waist circumference, very few interventions have assessed long term health benefits.

Barriers to conducting rigorous evaluations of Aboriginal and Torres Strait Islander nutrition programs include the perceived inappropriateness of nutrition surveys [26]; lack of community interest in participating as a control group [69]; difficulty following up participants [97] [62] and lack of evaluation expertise among Aboriginal health workers [74].

However, a lack of a rigorous evidence base should be a call to action rather than complacency. There is a need for more research and evaluation of effective interventions to address 'food supply', 'food access' and ultimately the food security of urbanised Aboriginal and Torres Strait Islander people. It has been suggested that a participatory action research approach may be the most appropriate [54] [74] [26].

This review has highlighted a range of interventions which are important starting points that provide considerable value and are based on principles of good practice. A number of common factors associated with successful programs included:

- high levels of community participation and control of project design,
- employment and training of specific Aboriginal or Torres Strait Islander nutrition workers,
- use of peer-education, support and role modeling,

- building the capacity of Aboriginal or Torres Strait Islander workers and organisations,
- combination of the Nutritionist (for nutrition content expertise) and the Aboriginal or Torres Strait Islander Worker (for cultural expertise and acceptance),
- using multiple strategies in multiple settings,
- facilitating partnerships between organisations and between health and other sectors,
- addressing food security issues as well as providing nutrition education,
- including policy and structural change to make health choices easier,
- linking screening/health assessments with health promotion programs,
- using a participatory action research approach,
- ensuring results are fed back to the community,
- sustainable funding rather than short-term pilot projects.

When developing new nutrition programs for Aboriginal and Torres Strait Islander communities, these factors should be considered in the planning process. The experience of Queensland and the Northern Territory suggest that a systematic approach to workforce development and capacity building is an essential prerequisite for ensuring the delivery of good practice nutrition and physical activity programs [102].

### **Partnerships**

While concerns around poor nutrition and associated poor health outcomes are generated through the health sector, it is rarely the case that health professionals in isolation have the power to successfully intervene. The paper has detailed the broad reaching determinants of food security, including all the factors which impact on 'food supply' and 'food access'. It is clear that, while the health sector may initiate action, the engagement of partners drawn from across the food supply system is critical. The formation of partnerships involving local government, welfare and housing sectors, in addition to health and community controlled Indigenous agencies was a key recommendation of a report prepared in 2006 describing 'Urban Indigenous Nutrition Issues in the Greater Brisbane Area' [29].

The formation of partnerships ranging from 'networking' through to formal 'collaboration' will be a measure of success of any food security intervention. This approach aims to build on the capacity of a wide range of sectors to deliver quality programs and to reduce duplication and fragmentation of effort [98].

### **VIC HEALTH- Food-for-all program**

The Victorian Health Promotion Foundation recognises that food insecurity is much more common than people realise and it has much broader consequences than just diet. Food insecurity impacts on people's physical, mental and social wellbeing, and their ability to work. Across 53 of Victoria's 79 local government areas it has been reported that one in 20 residents ran out of food and could not afford to buy more.

To begin to address this issue, Vic Health funded two food security demonstrations projects in 2001. These projects (one in the City of Maribyrnong and the other in the City of Yarra) demonstrated that local sustainable action is needed to reduce the barriers that make it difficult for people to have access to food for healthy eating. The formation of local partnerships between local government, health and welfare services were the corner stone of the creation of

innovative programs such as the Yarra Café Meals program and the WestNet Fruit and Vegetable shop & delivery service which continue today.

The demonstration projects helped to build experience and knowledge to develop potential frameworks and models. In particular, they informed the development of the long term program 'Food-for-All'. Local government is identified as primary partners that are best placed to develop integrated and long lasting food insecurity solutions by linking to other community and government activities, such as housing strategies, community and urban planning, shopping strip revitalisations and relevant policies. Through Food-for-all, eight councils in identified socially disadvantaged areas are funded for three years to help residents to regularly access a variety of nutritious foods. Practical activities have included: a peer education nutrition program for newly arrived refugees; the establishment of community kitchens, an emergency food relief warehouse; food gardens; local enterprises for the sale of good quality produce; free grocery delivery services and community buses to improve food access for vulnerable residents and municipal mapping of fruit and vegetable outlets.

Through council leadership and dedicated funding, the issue of food security has been highlighted both within councils, and by pulling together a diverse mix of organisations and people to contribute their skills, ideas and services.

Food for All. How local government is improving access to nutritious food.  
[www.vichealth.viv.gov.au](http://www.vichealth.viv.gov.au)

**Key points:**

Systematic and ongoing funding is required to create specialised Aboriginal and Torres Strait Islander nutrition positions to develop and coordinate nutrition and food security programs in urbanised settings.

Training and support of Aboriginal workers will help ensure program sustainability and cultural relevance. Professional partnerships between Nutritionists and Aboriginal Health Workers have evidence of good practice.

The extent and nature of food security issues impacting on Aboriginal and Torres Strait Islander people living in urban settings requires further research. Food security indicators need to be developed for routine monitoring and reporting nationally across urban, rural and remote Australia.

There is a need for more research and evaluation of effective 'interventions' to improve 'food supply' and 'food access'. The applicability to Indigenous communities of strategies previously applied to mainstream communities requires further exploration. This review has highlighted a range of good practice principles that are associated with successful program development.

The formation of partnerships including local government, welfare and housing sectors, in addition to health and Community Controlled Indigenous agencies are necessary to drive multi-faceted community based interventions to improve food security.

## ***Conclusion***

Poor nutrition has a significant contribution to the burden of disease experienced by Indigenous Australians. This review has focussed on the issues relevant to Aboriginal and Torres Strait Islander people living in urban settings. There are a number of factors, often hidden, that affect the 'supply' and 'access' of nutritious food for urban communities and increase vulnerability towards food insecurity. Food insecurity can result in poor nutrition, as well as having impacts on people's physical, mental and social wellbeing, and their ability to work. Despite this, there has been insufficient policy, program or research focussed on these issues.

A number of successful interventions and principles of good practice have been identified in this review using the food security framework developed by Rychetnick & Webb et.al [15]. By describing a range of intervention points to affect food supply and food access, a broad spectrum of changes a community can make have been highlighted. This review has revealed that the majority of urban based nutrition programs currently focus on education. While food and nutrition education can be important to improving diet, effectiveness depends on healthy food being available and accessible. As outlined in this report the causes of food security are multi-factorial and require multi-strategy responses.

This review has highlighted the need for long term commitment to improve nutrition and food security for Aboriginal and Torres Strait Islander people living in urban settings. This requires investment in the Aboriginal and Torres Strait Islander nutrition workforce, intersectoral partnerships, monitoring, research, evaluation and sustainable program funding.

## ***Recommendations to improve nutrition and food security for urbanised Aboriginal and Torres Strait Islander communities***

- The NATSINSAP has identified food insecurity and nutrition issues in urban areas as national policy priority since 1999. Greater advocacy and policy action is needed to bring these issues to the fore front of national efforts to 'Close the gap' in Indigenous life expectancy and health outcomes.
- Increased action at all levels between health, local government, welfare, housing and Indigenous organisations to trial interventions which use a mix of strategies to improve 'food supply' (the 'availability' of nutritious food in a community) and 'food access' ( the capacity and resources to obtain and consume nutritious food ) in urban settings.
- Given the limited evidence base which exists, trial promising interventions which offer opportunities for innovation. Evaluate and document selected interventions and disseminate findings to contribute to the limited knowledge in this area.
- Trial and extend the reach of socially inclusive nutrition promotion programs which incorporate a form of subsidy for healthy food and/or meals for those at risk of food security.
- Ensure program development is empowering for Aboriginal and Torres Strait Islander people, is planned with the community and involves Indigenous people as key decision makers.
- Ensure systematic and sustainable funding to achieve long term outcomes.
- Create specialised Aboriginal and Torres Strait Islander nutrition positions to develop and coordinate nutrition and food security programs through partnerships between health and other local agencies.
- Advocate for and collaborate with experts to improve the current housing policy and housing infrastructure inadequacies that currently contribute to food insecurity in Aboriginal and Torres Strait Islander homes.

- Ensure food security issues impacting on Aboriginal and Torres Strait Islander people living in urban, rural and remote locations are researched, reported and food security indicators are developed for routine monitoring and reporting nationally.

## References

1. Strategic Inter-Governmental Nutrition Alliance, *The National Aboriginal and Torres Strait Islander Nutrition Strategy and Action Plan 2000-2010* 2001, National Public Health Partnership: Canberra.
2. Australian Government. Closing the Gap of Indigenous Disadvantage. The Challenge for Australia, February 2009
3. Australian Bureau of Statistics, Australian Institute of Health and Welfare (2005) *Health and Welfare of Australia's Aboriginal and Torres Strait Islander peoples 2005*. (ABS catalogue no. 4704.0) Canberra: Australian Institute of Health and Welfare and the Australian Bureau of Statistics
4. Scrimgeour, M. & Scrimgeour, D. 2007, *Health Care Access for Aboriginal and Torres Strait Islander People Living in Urban Areas, and Related Research Issues: a Review of the Literature*, Cooperative Research Centre for Aboriginal Health, Darwin.
5. Pink, B. and P. Albon, *The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples 2008*. 2008, Australian Bureau of Statistics and Australian Institute of Health and Welfare: Canberra.
6. Department of Human Services, *Koori Health Counts! 2005/2006: Improving Care for Aboriginal and Torres Strait Islander Patients Program (ICAP)*. 2007, DHS: Melbourne.
7. Australian Bureau of Statistics, *Deaths Australia 2006*, in *Cat. No. 3302.0*. 2007, ABS: Canberra.
8. Vos, T., Barker, B., Stanley, L., Lopez, A.D., *The Burden of Disease and Injury in Aboriginal and Torres Strait Islander Peoples*. 2003, The University of Queensland.
9. Australian Bureau of Statistics, *National Aboriginal and Torres Strait Islander Health Survey: Australia, 2004-05*. , in *Cat no. 4715.0* 2006, ABS: Canberra.
10. Burns, C., *A review of the literature describing the link between poverty, food insecurity and obesity with specific reference to Australia*. Victorian Health Promotion Foundation, 2004
11. WHO, *Diet, Nutrition and the Prevention of Chronic Disease: report of a joint WHO/FAO expert consultation*, in *WHO technical report series 916*. 2002, Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases, Geneva.
12. National Heart Foundation of Australia, *Position Statement on Dietary Fats and Heart Disease* 1999, National Heart Foundation: Melbourne.
13. National Heart Foundation of Australia, *The relationship between dietary electrolytes and cardiovascular disease*. 2006, National Heart Foundation: Melbourne.
14. Shannon, C., *Acculturation: Aboriginal and Torres Strait Islander nutrition*. Asia Pacific Journal of Clinical Nutrition, 2002. **11**(Suppl): p. S576-78.
15. Rychetnik, L., Webb, K., Story, L & Katz, T., *Food Security Options Paper: A planning framework and menu of options for policy and practice interventions*, NSW Centre for Public Health Nutrition, 2003 ([http://www.health.nsw.gov.au/pubs/f/pdf/food\\_security.pdf](http://www.health.nsw.gov.au/pubs/f/pdf/food_security.pdf))
16. Wilkinson, R. and M. Marmot, *Social determinants of health: The solid facts (2nd edition)*. 2003, World Health Organisation: Europe.
17. VicHealth, *Healthy Eating- Food Security Investment Plan 2005-2010*. 2005, VicHealth: Melbourne.
18. Australian Institute of Health and Welfare. Aboriginal and Torres Strait Islander Health Performance Framework 2008 Report, Detailed analysis, Cat. No. IHW 22

19. Adams, K., *Koori Kids and Ear Health*. 2006, Onemda VicHealth Koori Health Unit, The University of Melbourne: Melbourne.
20. Doyle J et al. (2007) *Developing nutrition and physical activity guidelines for interventions for Aboriginal and Torres Strait Islander communities*. Onemda VicHealth Koori Health Research Unit and Department of Human Services.
21. Booth S & Smith A. *Food security and poverty in Australia- challenges for dietitians*. Australian Journal of Nutrition and Dietetic (2001) 58.3
22. Australian Bureau of Statistics. *National Aboriginal and Torres Strait Islander Survey 1994*. ABS Cat. No4190.0 1994. Canberra, Commonwealth of Australia
23. Drewnowski A & Spencer SE 2004. *Poverty and obesity: the role of energy density and energy costs*. American Journal of Clinical Nutrition 79:6-16.
24. Barker, D. and P. Clark, *Fetal undernutrition and disease in later life*. Reviews of reproduction, 1997. p. 105-12
25. Laws, P., N. Grayson, and E. Sullivan, *Australia's mothers and babies 2004*, in (AIHW catalogue no. PER 34). 2004, National Perinatal Statistics Unit, Australian Institute of Health and Welfare: Canberra.
26. Reilly, R., *Koori community directed health promotion in the Goulbourn Valley*, The Australian Community Psychologist, Vol. 19, No. 1, May 2007
27. Foley, W, *Family food work: Lessons learned from Indigenous women about nutrition promotion*. (in press)
28. Thorpe, S. & Browne, J. 2009. *Closing the Nutrition & Physical Activity Gap in Victoria: Victorian Aboriginal Nutrition & Physical Activity Strategy*. Melbourne: Victorian Aboriginal Community Controlled Health Organisation.
29. Queensland Health. *Urban Indigenous Nutrition Issues in the Greater Brisbane Area*, Central Area Population Health Services, Queensland Health, 2006
30. Palermo, C. and C. Mitchell, *Urban Victorian Aboriginal Community Nutrition Needs Assessment Report*. 2002, Victorian Aboriginal Health Service: Melbourne.
31. National Health and Medical Research Council, *Nutrition in Aboriginal and Torres Strait Islander Peoples*. 2000, NHMRC: Canberra.
32. Tyrrell, M., Grundy, J., Lynch, P. & Wakerman, J., *Laramba Diabetes Project: An evaluation of a participatory project in a remote Northern Territory Community*. Health Promotion Journal of Australia, 2003. **14**(1): p. 48 - 53.
33. Rowe, F., et al., *Community Harvest Project: Improving Food Security in Urban Areas*. 2007, Queensland Health: Brisbane.
34. Mills, P., P. Pensio, and B. Sailor, *The Garden Kai Kai Project*, in *Promoting the Health of Aboriginal and Torres Strait Islander Communities: Case Studies and principles of good practise*. 1997, National Health and Medical Research Council. p. 3-8.
35. Department of Rural Health, *Evaluation of the Healthy Lifestyles Program of the Rumbalara Football Netball Club*. 2001, University of Melbourne: Shepparton.
36. Gracey, M., Bridge, E., Martin, D., Jones, T., Spargo, R.M., Shepherd, M., Davis, E.A., *An Aboriginal-driven program to prevent, control and manage nutrition-related "lifestyle" diseases including diabetes*. Asia Pacific Journal of Clinical Nutrition, 2006. **15**(2): p. 178-188.
37. Viola, A., *Evaluation of the outreach school garden project: building the capacity of two Indigenous remote school communities to integrate nutrition into the core school curriculum*. Health Promotion Journal of Australia, 2006. **17**(3): p. 233-239.
38. Fergie, D., *Good Food, Great Kids: An Indigenous Community Nutrition Project 2002-2004*. 2005, Indigenous Health Service, Yarra Valley Community Health Service, Eastern Health: Melbourne.
39. Jones, R. and F. Smith, *Fighting Disease with Fruit*. Australian Family Physician, 2007. **36**(10): p. 863-4.
40. Green, R. *From Little things, Big Things Grow: Investigating Remote Aboriginal Community Gardens*, Honors thesis, University of Sydney 2009

41. Rowley, K., et al., *Lower than expected morbidity and mortality for an Australian Aboriginal population: 10-year follow-up in a decentralised community*. Medical Journal of Australia, 2008. **188**(5): p. 283-7.
42. Rowley, K.G., Daniel, M., Skinner, K., Skinner, M., White, G.A. & O'Dea, *Effectiveness of a community-directed 'Healthy Lifestyle' Program in a remote Australian Aboriginal community*. Australian and New Zealand Journal of Public Health, 2000. **24**(2): p. 136-144.
43. Rowley, K.G., Gault, A., McDermott, R., Knight, S., Mcleay T., O'Dea, K., *Reduced Prevalence of Impaired Glucose Tolerance and No change in prevalence of Diabetes despite increasing BMI among Aboriginal People from a group of remote homeland communities*. Diabetic Care, 2000. **23**(7): p. 898-904.
44. Lee, A., et al., *Survival Tucker: Improved diet and health indicators in an Aboriginal community*. Australian Journal of Public Health, 1994. **18**: p. 277-85
45. Lee, A., V. Hobson, and L. Katarski, *Review of the nutrition policy of the Arnhem Land Progress Association*. Australian and New Zealand Journal of Public Health, 1996. **20**(5): p. 538-44.
46. Miller, M., et al., *Evaluation of Indigenous Nutrition Projects Funded by the National Childhood Nutrition Program in Western Australia: Final Report*. 2004, Telethon Institute for Child Health Research and Combined Universities Centre for Rural Health: Perth.
47. Edwards, C. and A. Colbey, *Yirrkala Active Cooking*. Aboriginal and Islander Health Worker Journal, 2007. **31**(4): p. 5-7.
48. Department of Human Services. Be Active Eat Well. 2008 [cited 23/6/08]; available from <http://www.goforyourlife.vic.gov.au/hav/articles.nsf/pracpages/Be Active Eat Well?open>.
49. Department of Human Services. *Kids- 'go for your life' Healthy Children's Settings*. 2008 [cited 24/6/08]; Available from: [http://www.goforyourlife.vic.gov.au/hav/articles.nsf/practitioners/early\\_childhood\\_services?Open](http://www.goforyourlife.vic.gov.au/hav/articles.nsf/practitioners/early_childhood_services?Open).
50. Gracey, M., Bridge, E., Martin, D., Jones, T., Spargo, R.M., Shepherd, M., Davis, E.A., *An Aboriginal-driven program to prevent, control and manage nutrition-related "lifestyle" diseases including diabetes*. Asia Pacific Journal of Clinical Nutrition, 2006. **15** (2): p. 178-188
51. Warchivker, I. and A. Hayter. *An Evaluation of a Nutrition Program in a Remote Community in Central Australia*. in *6th National Rural Health Conference*. 2001. Canberra.
52. Roberts, D. and T. Simmond, *Grace Close Nutrition and Wellbeing Programme*. 2007, Collaborative Centre for Aboriginal Health Promotion: Sydney.
53. Briggs, J., et al., *Impact of an Integrated approach to Diabetes Care at Rumbalara Aboriginal Health Service*. 2001, Rumbalara Aboriginal Health Service, Goulburn Valley Health and the Department of Rural Health, University of Melbourne: Shepparton
54. Curtis, S., D. Pegg, and O. Curtis, *Aunty Jean's Good Health Team - listening to the voices of the Elders to create an Aboriginal Chronic and Complex Care program*. 2004, Illawarra Health
55. Coyne, T., M. Dowling, and D. Paoloni, *Evaluation of preschool meals programmes on the nutritional health of Aboriginal children*. Medical Journal of Australia, 1980. **2**: p. 369-375.
56. Peck, R., J. Marks, and M. Dibley, *Birth weight and subsequent growth among Navajo children*. 1987. **Public Health Reports**(102): p. 500-7.
57. Doljanin, K. and K. Olaris, *Subsidised Café Meals Program: more than "just a cheap meal"* Australian Journal of Primary Health, 2004. **10**(3): p. 54-60.

58. VicHealth, *Food for All? Lessons from two community demonstration projects*. 2005, Victorian Health Promotion Foundation: Melbourne.
59. Butlin, A., K. Cashel, and A. Lee, *Food and Nutrition Programs for Aboriginal and Torres Strait Islander Peoples*. 1997, Office of Aboriginal and Torres Strait Islander Health Services, Commonwealth Department of Health and Family Services: Canberra.
60. Black, A., *Evidence of Effective Interventions to Improve the Social and Environmental Factors Impacting on Health: Informing the developments of Indigenous Community Agreements*. 2007, Office for Aboriginal and Torres Strait Islander Health: Canberra.
61. Dunn, S. and E. Dewis, *Healthy Weight Program Evaluation, Queensland 1996-1999*. *Aboriginal and Islander Health Worker Journal*, 2001. **25**(4): p.26-28.
62. Queensland Health, *2005 Evaluation of the Healthy weight Program Summary Report*. 2005, Queensland Government.
63. Egger, G., et al., *Abdominal obesity reduction in Indigenous men*. *International Journal of Obesity*, 1999. **23**: p. 564-569.
64. Smith, J., *Wadja Warriors football team's healthy weight program*. *Aboriginal and Islander Health Worker Journal*, 2002. **26**(4): p. 13-15.
65. Gui, G. and Q. Lau, *Quick meals for Kooris: An Evaluation*. *Aboriginal and Islander Health Worker Journal*, 2007. **31**(4): p. 20-22.
66. Foley, R. and C. Pollard, *Food Cent\$ - implementing and evaluating a nutrition education project focusing on value for money*. *Australian and New Zealand Journal of Public Health*, 1998. **22**(4): p. 494-501.
67. Woods, B., et al., *'Eat Healthy Tucker' Aboriginal Nutrition Training Workshops*. *Health Promotion Journal of Australia*, 1998. **8**(1): p. 62-3.
68. Department of Rural Health, *Evaluation of the Healthy Lifestyles Program of the Rumbalara Football Netball Club*. 2001, University of Melbourne: Shepparton.
69. Chan, L., et al., *Short term efficacy of a lifestyle intervention programme on cardiovascular health outcome in overweight Indigenous Australians with and without type 2 diabetes mellitus The healthy lifestyle programme (HELP)*. *Diabetes Research and Clinical Practice*, 2007. **75**: p. 65-71.
70. Lee, A., et al., *Sustainability of a successful health and nutrition program in a remote Aboriginal community*. *Medical Journal of Australia*, 1995. **162**(19): p. 632-635.
71. Lorraine, A., G. Cummins, and L. Pickett. *Fun, Food and Fitness for Noongars*. in *6th National Rural Health Conference*. 2001. Canberra.
72. Seaby, N. and T. Hazel, *The Gubba Binbee nGoodija Inda Diabetes and Nutrition project*, in *Promoting the Health of Aboriginal and Torres Strait Islander Communities: Case studies and principles of good practice 1997*, National Health and Medical Research Council. p. 39-43.
73. Community Matters Consultancy, *Community Foodies Program 2006-07: A realist evaluation*. 2007, Southern Adelaide Health Service: Noarlunga.
74. Howie, r., *Formative Evaluation of the Kuwinyuwardu Aboriginal Resource Unit Gascoyne Healthy Lifestyle Program*. 2004, Telethon Institute for Child Health Research: Subiaco.
75. Moore, L., et al., *Cooking Classes for Diabetes*. *Aboriginal and Islander Health Worker Journal*, 2006. **30**(6): p. 11-13.
76. Queensland Health, *2005 Evaluation of the Healthy weight Program Summary Report*. 2005, Queensland Government.
77. Lee, P., et al., *Diabetes Program Development in Aboriginal and Torres Strait Islander Populations*. 1999, Department of Health and Aged Care: Sydney.
78. Amy, S., *Food For All Program Progress Report*. 2008, Swan Hill Rural City Council: Swan Hill.
79. Gunyon, T., *Frankston Community Kitchens Pilot Project Final Project Report*. 2008, Peninsula Health: Melbourne.

80. Manders, M. and J. Coaby, *Nunga Kids Cafe*. Auseinetter, 2005. **3**: p. 28-30.
81. Tarasuk, V., *A critical examination of community-based responses to household food insecurity in Canada*. Health Education and Behaviour, 2001. **28**: p. 487.
82. Crawford, S. and L. Kallina, *Perspectives in practice. Building food security through health promotion: community kitchens*. Journal of the Canadian Dietetic Association, 1997. **58**(4): p. 197-201.
83. Mackerras, D., *Birthweight changes in the pilot phase of the Strong Women Strong Babies Strong Culture Program in the Northern Territory*. Australian and New Zealand Journal of Public Health, 2001. **25**(1): p. 34-40.
84. Diabetes Prevention Program Research Group, *Reduction in the Incidence of Type 2 Diabetes with Lifestyle Intervention or Metformin*. New England Journal of Medicine, 2002. **346**(6): p. 393-403.
85. Harvey-Berino, J. and J. Rourke, *Obesity Prevention in Preschool Native American Children: A pilot study using home visiting*. Obesity Research, 2003. **11**(5): p. 606-11.
86. Cawood, C., *Aboriginal WAVES project*. Aboriginal and Islander Health Worker Journal, 1999. **23**(5): p. 3-4.
87. Smith, R., et al., *Birthweights and growth of infants in five Aboriginal communities*. Australian and New Zealand Journal of Public Health, 2000. **24**(2): p. 124-35.
88. Aitken, L., Anderson, I., Atkinson, V., Best, J.D., Briggs, P., Calleja, J., Charles, S., Doyle, J., Mahomed, J., Patten, R., Rowley, K., Simmons, D., *A collaborative Cardiovascular Health Program for Aboriginal and Torres Strait Islander People in the Goulburn-Murray Region: Development and Risk Factors screening at Indigenous community organizations*. Australian Journal of Primary Health, 2007. **13**(1): p. 9-17.
89. Australian Centre for International and Tropical Health and Nutrition, *Queensland Aboriginal and Torres Strait Islander Food and Nutrition Strategy*. 1995, Queensland Health: Brisbane.
90. Gabriel, R. and H. Vidgen, *Growing Strong: feeding you and your baby Evaluation Summary Report*. 2006, Queensland Health: Brisbane
91. Browne, J., *Improving Heart Health in Aboriginal Communities: Victorian Implementation of the Course in Cardiovascular Health for Aboriginal Health Workers: Evaluation Report*
92. Taylor, A., *Living Strong Facilitator Training Report*. 2007, Central/Southern Area Health Service: Brisbane.
93. Mills, P., P. Pensio, and B. Sailor, *The Garden Kai Kai Project*, in *Promoting the Health of Aboriginal and Torres Strait Islander Communities: Case Studies and principles of good practise*. 1997, National Health and Medical Research Council. p. 3-8.
94. Australian Bureau of Statistics. National Nutrition Survey. Australian Bureau of Statistics Canberra, 1998
95. Office of Aboriginal Health, *Aboriginal Food and Nutrition Policy for Western Australia*. 2001, Department of Health: Perth.
96. Radimer K. Measurement of household food security in the USA and other industrialised countries. Public Health Nutrition 2002 Dec; **5**(6A): 859-64
97. Longstreet, D., et al., *Estimated nutrient intake of urban Indigenous participants enrolled in a lifestyle intervention program*. Nutrition & Dietetics, 2008. **65**(2): p. 128-33.
98. DHS Integrated health promotion: a practice guide for service providers
99. Cummins S, Macintyre S. *Food environments and obesity- neighbourhood or nation?* Int. J. Epidemiol 2006; **35**(1): 100-4
100. Harrison M, Coyne, R., Lee, A.J., Leonard, D., Lawson, S., Groos, A., Ashton, B.A. *The increasing cost of basic foods required to promote health in Queensland*. Med J Aust 2007; **186**(1): 9-14

101. Palermo CE, Walker KZ, Hill P, McDonald J. *The cost of healthy food in rural Victoria. Rural and Remote Health 8: 1074. (Online), 2008 (Available from: <http://www.rrh.org.au>)*
102. Laurence S, *Development of an Australian Aboriginal and Torres Strait Islander Nutrition Workforce- Information paper*, May 2009. Available from <http://www.healthinonet.ecu.edu.au/health-risks/nutrition/nutrition-workforce/nutrition-workforce-development>

**Appendix: Summary of programs included in review**

<b>Program</b>	<b>Setting</b>	<b>Description of strategies</b>	<b>Evaluation outcomes</b>
Healthy Weight Program [61]	Various sites across Queensland  (urban & rural)	Training of Aboriginal facilitators to deliver a series of 8 workshops Topics: nutrition, exercise, label reading, budgeting, cooking, self esteem 3 screening sessions	Majority of continuing participants reduced weight and waist circumference; ↑ fruit and veg; ↓ fat; ↑ physical activity High drop-out rate, low male participation
Heart Health Project/ Hungry for Victory [46]	Shepparton & Moama, Victoria  (rural)	Training of Aboriginal workers at QUT Nutrition workshops, mentoring & breakfast program at footy club Improve club canteen Women's health and wellbeing group at Cummeragunja. 10 week pedometer challenge for staff	Lack of support for nutrition survey High participation & satisfaction in workshops, breakfast program & women's support group ↑ fruit, veg & vitamins; ↓ pies & sausage rolls sold in canteen Money and time remained barriers to dietary change
Healthy Lifestyles Program [35]	Shepparton Victoria  (rural)	Nutrition information sessions. Mums cooking group (community kitchens model). Meals served to football players after training. Gardening program, tool/seedling bank Football/netball player fitness program 10 week women's fitness program (aerobics, weights, water aerobics) Elders' health camp.	↑ mothers' self-esteem, confidence & social support Some tried recipes at home, most didn't make diet changes. 8/11 home gardens produced some food At least 50% players used the club for other sports. Women's program well attended. Self-reported ↑ fitness & energy ↓ weight. 10 Elders attended.
Diabetes Clinic [53]	Mooroopna, Victoria  (rural)	Diabetes specialist clinic at Rumbalara held after weekly Elders lunch Coordinated by AHW Cultural awareness Diabetic management guidelines developed	High attendance and satisfaction The 10 patients who were seen at least twice ↓ HbA1c by 1.1, BP by 15 mmHg and 0.6kg in 4 months
The Healthy Lifestyle	North Stradbroke	Culturally appropriate community education	Small short-term improvements in

Program (HELP) [69]	Island & Redland Bay, Queensland (urban)	program + self-monitor fasting blood glucose for people with diabetes + self-monitor physical activity with pedometers	waist ↓3.1cm DBP ↓4.6mmHg, & lipids. HbA1c remained sub-optimal
Good Food Great Kids [38]	Healesville, Victoria (urban)	Employed Aboriginal nutrition worker Community Garden Spend Wisely program (budgeting, shopping, cooking education) Wise Women's Circle (community kitchen) Cooking demos at community events Nutrition & gardening education at 2 schools Kitchen/garden model Canteen policy Breakfast program Nutrition info in newsletter for 10 schools	↑ nutrition-related life skills (e.g. cooking) Improved family eating habits ↑ low fat cooking 120 Indigenous children given opportunity to learn about nutrition, gardening & culture Kitchen/garden reached >600 kids Community garden continues to thrive ↑ horticultural skill development & employment options
Community Harvest Project [33]	Brisbane, Queensland (urban)	Development of a community garden in three schools, one childcare centre and in a community organisation.	Improved food security for community members directly involved in the gardens. Fruit and vegetables became more affordable, available and accessible to these participants. Social, recreational and environmental benefits to the community.
Cooking Classes for Diabetes [75]	Sydney, New South Wales (urban)	Weekly cooking classes for people with diabetes & their families/carers Run by Aboriginal teacher + Aboriginal Diabetes Worker Modified participants recipes from home Community Cookbook Shopping tours Cooking demos at community events	9 males & 35 females attended Participants reported changing their diet: ↑ fruit, vegetables, ↓ fatty foods & take away food ↑ confidence in cooking Staff perception that participants more likely to undertake diabetes cycle of care
Quick Meals for Kooris [65]	New South Wales	Train the trainer kit developed for AHWs to	More than 350 copies sold, 75%

		run cooking program 2 x 3 hour sessions: budgeting & nutrition info, cooking session	survey respondents had used resource, high satisfaction. Lack of staff, funds, venue, childcare & transport were barriers to implementation
Gubba Binbee n Goodjida Inda Diabetes & Nutrition Project [72]	Rockhampton, Queensland  (urban)	Diabetes education Diabetes camps Culturally appropriate educational booklet Diabetes support groups Home visits	High satisfaction Community expressed desire to ↑ diabetes knowledge, health status and activity Median HbA1c= 7.1
Community Foodies [73]	Adelaide, South Australia (urban)	Trained community members to deliver peer education/health promotion around nutrition	Trained 9 Aboriginal Foodies, 6 actively working in the community. One runs a weekly cooking program.
Aunty Jean's Good Health Team [54]	Illawarra, New South Wales  (rural)	Weekly chronic disease self management program 12 modules + physical activity session + weekly self-directed home physical activity program.	10-15 Elders attended High satisfaction ↑ physical activity ↑ distance in 6 minute walk test ↑ self-assessed function & health
Fighting Disease with Fruit [39]	Grafton, New South Wales  (rural)	School children's diet supplemented with fresh fruit Kitchen/garden Families pay \$5/week to receive \$40 of home-delivered fruit and vegetables	↑ blood vitamin C levels Improved hearing ↓ skin infections ↓ rates of otitis media. Dramatic improvements in children's health
Macleah Hastings Valley Diabetes Pilot [77]	Port Macquarie, New South Wales  (urban)	Employed Aboriginal diabetes educator Diabetes clinics Diabetes camps Lifestyle education Talks at school/TAFE Exercise groups Supermarket tours Cooking demos Weekly veg co-op	Early data suggested ↓ diabetes incidence ↓ diabetes hospital admissions by 15% ↑ diabetes knowledge and self- efficacy ↓ social and environmental barriers
Gascoyne Healthy Lifestyle Program [74]	Carnarvon and surrounding communities, Western Australia,  (urban/remote)	Employed 2 Healthy Lifestyle workers in each community via CDEP top-up 3 day worker training + PD every 6 weeks Developed resources for healthy lifestyle stories/education	↑ attendance at health clinics ↑ motivation of workers to adopt healthy lifestyle Workers did not use brief interventions Effective networking

		Brief intervention Cooking demos Walking group, 10,000 steps with pedometer School visits Improved healthy food at remote store	and integration with other programs 2 workers undertook further AHW training ↑ sales of healthy food in store 12 month project not long enough
National Child Nutrition Program- Indigenous Projects [46]	Western Australia  (urban/rural/remote)	Employed Aboriginal Nutrition workers School and community based nutrition education Supply of healthy food School nutrition policy Breakfast programs Low cost school lunch Child-care based nutrition programs Activities with parents	↑ access to healthy foods at school Improved school attendance and attention in class Perceived improvements in child nutrition ↑ community awareness & discussion about child nutrition issues
FoodCent\$ [66]	Greater Southern Health Region, Western Australia  (urban/rural)	AHWs trained to deliver program Sessions on budgeting, cooking, supermarket tour Resources- menus, shopping lists, recipes Kilocents counter	19% of participants were Aboriginal At 6 week follow-up 60% of participants changed diet: ↑ fruit, veg, ↓ sweets, cakes 51% changes spending
Eat Healthy Tucker Workshops [67]	Western Australia  (urban/rural/remote)	AHW nutrition training Manual for AHWs to use in workplace Included hands-on food preparation	89% felt confident using the manual At 6 months, 57% used it monthly Involvement in nutrition activities did not ↑ after training
Living Strong [92]	Central and Southern Queensland  (urban/rural)	Training Indigenous facilitators to deliver community-based healthy lifestyle workshops and screening sessions. Participants practice 'presenting' at the end of the 4 day training and are assessed to ensure they have the confidence and competence to facilitate the program in their community.	17 participants attended training. High standard of presentations delivered indicated that the majority of participants had gained the skills to conduct the presentations. Participants were confident they would be able to implement the program in their own communities
Course in Cardiovascular Health for Aboriginal	Melbourne and Shepparton, Victoria	60 hour accredited short course for AHWs covering cardiovascular	30 AHWs trained. ↑ cardiovascular health knowledge ↑ confidence in

Health Workers [91]	(urban/rural)	diseases, risk factors and prevention including nutrition, physical activity and planning health promotion programs	delivering programs. Relatively few new health promotion initiatives implemented following training.
Walk About Together Program [97]	Townsville, Queensland (urban)	Individual nutrition & physical activity counseling, pedometer & log book provided, health assessments and regular follow-up, weekly support group	↑ participation in physical activity. ↓ energy, fat, saturated fat and carbohydrate intake. ↓ mean weight by 2kg and mean waist by 2cm
Community Kitchens [79]	Frankston, Victoria (urban)	Groups of 6-8 people that regularly come together to cook and eat nutritious and affordable meals. Facilitator training (nutrition, budgeting, food safety). Linked to art classes.	Successfully engaged Koori community. Inconsistent attendance made planning, shopping and recouping costs difficult. Transport was a barrier.
Swan Hill Food For All program [78]	Swan Hill & Robinvale, Victoria (regional)	'Rent to Own' fridge program; improve transport to retail food outlets; gFr's market; Aboriginal community garden; Kitchen Know How course; Aboriginal Community Kitchen	250 people came to the market and mix of people from different cultures. 5 Aboriginal parents attended cooking program. Variety of vegetables planted in Aboriginal community garden.
Nunga Kids Café [80]	Port Lincoln, South Australia (urban)	Fortnightly cooking, serving to family, table attendance and washing up for year 6/7 students at community house.	Program provided positive learning experience for Aboriginal children ↑ confidence of kids at school
Preschool meals programmes [55]	Five towns in New South Wales (rural)	Preschool meals program Growth monitoring and pathology testing	↑ growth but ↓ haemoglobin, ferritin & vitamin C among children receiving meals