



## Food security and traditional foods in remote Aboriginal communities: A review of the literature

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### Abstract

**Objective:** A review of the literature was conducted to describe and discuss the link between food security and traditional food access, availability and use in remote Aboriginal communities. Concepts and themes were revealed from the literature and the evidence examined to justify carrying out further research.

**Background:** Evidence suggests that Aboriginal people were healthy before European settlement and did not suffer from chronic lifestyle and nutrition related diseases. A rapid transition from a well-balanced, varied and nutrient dense diet to a diet today, which is energy dense, high in saturated fat and sugar has brought about a significant health transition. Aboriginal people in remote regions of Australia suffer higher rates of lifestyle and nutrition related diseases than any other Australians.

**Methods:** A systematic literature search examined specific computerised databases. Relevant journals and authoritative texts were examined. Prominent authors were identified from the literature and individual author searches were conducted. Reference lists were examined from the literature retrieved. Specific themes were identified from the data collected and critically analysed in the main body of the literature review.

**Discussion:** An overview and critical analysis of the literature related to traditional food and food security were presented. Traditional foods contribute positively to the diets of Aboriginal people as well as being socio-economically valued. The use of traditional foods must be examined further and precautions made to safeguard these foods from contaminants, particularly heavy

metals and mining residues. Threats from introduced pests like cane toads and natural and human induced environmental change are constant challenges.

**Conclusion:** Although there is limited information available on the access, availability and use of traditional foods, these gaps in literature should be examined further. The access, availability and use of traditional foods have the potential to recover, improve and safeguard food security in remote Aboriginal communities now and in the future will justify further research in this area.

*Keywords:* Food security, Aboriginal, Traditional food, Bush food, Diet transition

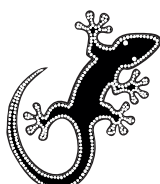
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## Introduction

Traditional foods in remote regions of Australia are widely available. These foods are accessible, well utilised and preferred by Aboriginal people, particularly those living in remote areas. The cost of traditional food is considerably less than market food purchased at the community store. Quality in community stores can be unreliable. The price and unpredictable quality of market food as well as freight costs in remote regions of Australia have been well documented in Australian literature (Lee et al 2002, Kettings et al 2009, Harrison et al 2010, Bussey 2012). Excessive cost, although a significant barrier to food security will not be discussed in this review.

In remote regions of Australia, where traditional foods are widely available, Aboriginal people are recognised, as most at risk of being food insecure, more so any than other subgroup in Australia (ABS 2006, Browne et al 2009). The association between food security in these regions and the access, availability and use of traditional food by Aboriginal people has not been examined. The 2004-2005 National Aboriginal and Torres Strait Islander Health Survey showed that 28% of Aboriginal people in remote areas were more likely to report running out of food (ABS 2006). This survey did illustrate that many Aboriginal people were able to acquire foods from non-conventional methods, including, but not limited to harvesting, hunting and fishing. Most recently, the socio-economic value of traditional food from two Northern Australia river systems have been illustrated by the CSIRO and findings suggest that replacing selected traditional food, highly valued by Aboriginal people with market foods is associated with high economic burden (Jackson et al 2011). These findings analysed cost alone and do not examine the social and nutrient value of these foods.

Food security is a flexible concept and according to Maxwell and Smith, there were two hundred definitions in published writings prior to 1992 (Maxwell and Smith 1992). The first definitions of food security were in response to the global food crisis in the mid-1970s and were mainly focussed on food supply problems. The current definition of food security was negotiated from international consultations at the 1996 World Food Summit. The negotiation of this term has reflected the complexities of a multidimensional phenomenon and considerable reconstruction of official thinking on food security over the last 25 years (Clay 2002).

The United Nations Food Agriculture Organisation defines food security, as existing when all people at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO 1996). The three key components of food security are:

- Food access
- Food availability
- Food use

Traditional food, often referred to as bush tucker in Australia relates to food native to its original location that can be used to sustain or nourish. These foods can be harvested, hunted, fished or farmed. Traditional bush foods include various species of plant foods; fruits, vegetables, legumes, nuts, seeds and herbs, as well as native animals and products from animals.

For the purpose of this review, remote communities include communities that are inhabited predominantly by Aboriginal people and often these communities are independently managed on a community basis. Services in remote communities can be limited, unreliable and difficult to access. The geographic isolation of remote communities can support a variety of reliable traditional foods that can be acquired from a number of locations, whether it be from the river, sea or impenetrable bush or sparse dessert.

The term Aboriginal is used to refer to original inhabitants of Australia and Canada. This review also mentions Torres Strait Islander peoples, a distinct group of Aboriginal people mainly living in the Torres Strait Islands, which are the northern most tip of Queensland, near Papua New Guinea.

Australian Aboriginal people have many historical, individual and community characteristics in common with Canadian Aboriginal people (Fouler & Trouton 2003). Canadian research has been included within this literature review and there are a number of reasons for doing this. Firstly, and most importantly, Aboriginal Canadians, not unlike Australian Aboriginals have suffered from European colonisation and the removal or alteration of traditional lands that produced a variety of traditional bush foods. Similarly, Aboriginal Canadians also suffer from disproportionately higher levels of chronic diet related diseases compared with the non-Aboriginal population (Lipski 2010). Secondly, Canadian researchers have led the most recent advances in identifying the association between food security and traditional foods within remote Canadian Aboriginal communities, particularly within the remote Inuit communities of the Circumpolar region (Lipski 2010). Finally, when research was deficient or absent and obvious gaps in Australian literature existed, Canadian literature was able to illustrate current knowledge about specific themes. Even though there are noticeable differences between the Australian and Canadian Aboriginal people, their regions and their communities and many aspects can be transferred to Australian research.

## Background

There is little evidence to suggest that Aboriginal people suffered from the debilitating effects of diabetes and obesity before European settlement (Basedow 1932, Abbie 1971, O'Dea et al 1986). A rapid health transition has a profound influence on Aboriginal people since European settlement (Caldwell and Calwell 1991). Aboriginal people today, suffer from significantly higher rates of these diseases than their non-Aboriginal counterparts; for instance

Aboriginal people are 3.4 times more likely to suffer from diabetes and twice as likely to be obese than other Australians (AIHW 2006). Before European settlement, Aboriginal diets were generally low in saturated fat, high in omega-3 polyunsaturated fat, contained significant levels of lean protein and complex carbohydrates and were nutrient rich (O'Dea, et al 1980, O'Dea, & Spargo 1982, O'Dea, & Sinclair 1985, Naughton, et al 1986, O'Dea, et al 1986, O'Dea, 1988, Lee 1996). Rapid changes in diet, specifically the introduction of energy dense, nutrient poor food, high in saturated fats, sugar and salt are accelerating diet related diseases (O'Dea, 1980, O'Dea, et al 1982, O'Dea, 1984, O'Dea, 1992, Lee 1996, Lipski, 2010). Traditional foods were safe, accessible and nutritious and met the dietary needs of Aboriginal people.

Relying exclusively on a traditional diet is no longer practical; however research findings suggest that eating a diet of between 30-40% of traditional foods within the diet can lower incidences of a number of chronic diseases (O'Dea 1991, Blanchet et al 2000).

The benefits of hunter-gatherer diets are gathering renewed strength. Professor Jeya Henry, Head of Food Sciences and Nutrition at Oxford Brookes University, presented evidence at the British Nutrition Foundations annual lecture in November 2011 and advocated for hunter gatherer type diets for improvements in health and prevention of chronic disease.

The preference for traditional foods in remote areas, as well as their availability, accessibility and use must be rigorously examined before food security in these Aboriginal communities can be determined.

## Methods

Individual authors were determined by their prominence in peer reviewed and grey literature. A thorough systematic literature search was used to identify the most relevant and valuable databases.

The systematic search utilised key words and combinations of these key words with Boolean operators. The key words selected, included: 'Food security', 'Aboriginal', 'Traditional food', 'Bush food' and 'Diet transition'. Aboriginal was truncated (Aborig\*) in selected databases to include Aboriginal, Aborigines, Aborigine and Aborigines. The selection of specific key words is justified by their prominence in public health literature, particularly of Australian and Canadian origin. Indigenous Australians and Canadians are more often referred to as Aboriginal peoples; however combinations of search terms using 'OR' to include 'Indigenous' and 'Hunter gatherer' broadened the search. 'First Nations' was omitted as this broadened the search unnecessarily, when using 'First + Nations'. Combinations of the search utilising 'OR' included: 'Traditional food' 'OR', 'Traditional diet' 'OR', 'bush food' 'OR', 'bush tucker'. Food security was used unaccompanied as it used universally as a key concept in literature.

## Inclusion/Exclusion criteria

The review included grey and peer reviewed literature published between 1997 and 2012. Literature before 1997 was not selected for inclusion as the universally accepted definition of food security was not negotiated by leading international consultants until November 1996. This definition can be transferred to remote Aboriginal communities. The review included studies of Australian or Canadian origin and only those studies or reviews conducted in remote Aboriginal communities were eligible for inclusion. Literature based on individual author presumptions and speculation was not selected for review. More rigorous study designs were selected for review and those eligible for inclusion include observational; cross-sectional, and cohort studies as well as experimental case control studies. It was hoped that the use of reviews would not be necessary; however reviews were often the only source of reliable information, a consequence of narrowing the time frame. The inclusion of reviews can be observed in this paper when observations and datasets of the first contacts with Aboriginal people and physicians occurred in remote regions. Much of this literature was first published as early as the mid-twentieth century, but considered essential for this review, particularly to give historical perspectives. Animal studies were included for the nutrient composition of traditional foods.

When the database searches were completed, a hand search of specific journals was conducted.

## Historical Diet transition/ Health transition

### Colonisation

McCalman et al (2004), using the first longitudinal, cradle to grave datasets created in Australia, constructed a comparative analysis, between all-age survival of birth cohorts of Aboriginals and impoverished whites born between 1851 and 1900. This extensive study illustrates the health burden that Aboriginal people endured from early European colonisation. McCalman et al (2004) describe Aboriginal people suffering from systematic legislative racism, social exclusion, a decline in social cohesion, social capital, material security and loss of traditional hunting grounds. Data exists for only 65% of Aboriginals and included only impoverished whites. McCalman et al (2004) does not illustrate the burden that Aboriginal people endured as most Aboriginal people were 'statistically invisible' for almost a century. A comparative analysis with other whites, other than those who were impoverished should have been completed. The representation of Aboriginal and Non-Aboriginal people in Australia's most extensive study of this time is incomplete.

By the mid-nineteenth century smallpox had decimated the

Aboriginal population and the last remaining people lost traditional hunting grounds and rights to water to the new settlers and their stock. In 1886 the Half-castes Act forced all Aboriginal people of mixed-ancestry to leave their traditional lands. Smith and Smith (1999) reviewing Commonwealth Department of Health documents from 1951, state Aboriginals were forced to adapt to extreme social change between 1890-1970. McCalman et al (2004) paints a horrifying picture that many Aboriginal people were now too 'white' to be 'black' and too 'black' to be allowed to be 'white'. With Federation in 1901, The Commonwealth introduced entitlements in pensions and child payments, amongst others that systematically excluded Aboriginal people. The Aboriginal cohort, although incomplete, reveals how colonisation has dislocated community cohesion and social capital.

## Diet and Health transition

Lipski (2010) explores the first observations of researchers, scientists and physicians working in small Aboriginal communities in the early to mid-twentieth century. These professionals were amongst the first working with Aboriginal people in their communities and at the crossroads of traditional and Western cultures. Individuals consuming traditional diets were in 'superb health'. Early reports by physicians claimed, those consuming market food had poor health (Lipski 2010). By the 1950s concern about the nutritional health of Aboriginal people living on stations prompted the Australian Commonwealth 1951 dietary survey. Smith and Smith (1999), illustrate that by the 1970s Aboriginal health was deteriorating further. So critical was Aboriginal health, that it gained attention from national and international critics. Until the 1970s, little information was recorded by the Health Department. Cases of malnutrition were frequent. There was an absence or undersupply of vegetables, fruits and dairy, especially in remote communities. Smith and Smith (1999) illustrate that the foods most valued on station camps were meat, flour and sugar and were available as staples without any direct effort for their acquisition.

By the end of the 1800s the Aboriginal diet was dominated by station rations, including sugar, tea, flour, jam and meat. In the 1960s and 1970s alcohol was freely available and welfare payments were relied on as unemployment increased. Kouris-Blazos and Wahlqvist (2000) report that westernisation of diet, loss of hunter gatherer skills and increasingly sedentary lifestyles have brought about susceptibility to so called lifestyle diseases. Smith and Smith (1999) found after reviewing the Commonwealth Department of Health publications in 1951, including Australia's first detailed nutrition survey and Gould's work in 1980, that beef, flour, tea and sugar and only small amount of vegetables made up the diets of Aboriginal people. Aboriginal people were relocated hundreds of kilometres from their homeland, rations were offered for work, as was shelter. By the 1980s traditional foods consisted of no more than 20% of total food intake.

Although these studies were amongst the earliest, nutritionists selected eight sample groups, from cattle stations, missions, hospitals and towns, using diet recall methods, still widely used today. It is a concern however that these surveys, not unlike the surveys conducted today did not include traditional foods collected or used to supplement the diet. This study proved to be the most satisfactory source of nutritional data for many years.

## Hunter gatherer diet

McArthur et al (2000) illustrates the work of an anthropologist, nutritionist and plant ecologist observing the daily living activities of nomadic hunter gatherers of Arnhem Land, Northern Australia. The research methodology included eight months observing food gathering techniques of four families 'living off' traditional foods. Similar to the findings of Smith and Smith (1999) and Kouris-Blazos (2000), the hunter gatherer diet was varied, seasonal and there were periods of feast and famine. If participants gorged one day, they rested the next. Men had defined roles in hunting, while women cared for the young and collected plant materials. Aboriginal people had unparalleled knowledge of their traditional foods. Preparation and cooking practices enhanced digestion, nutrient bioavailability and reduce levels of toxins (Lipski 2010). Many foods were also used as medicines. Kouris-Blazos & Wahlqvist (2000) noted that non-Aboriginal stockmen suffered from scurvy and 'Barcoo rot', while Aboriginal men, who ate traditional foods rarely suffered. Smith and Smith (1999) noted that hunter gatherer diets were high in vitamins and minerals. This was in direct contrast to station diets and rations, which contained little essential vitamins. Kouris-Blazos & Wahlqvist (2000) illustrate energy intakes to be high in two Aboriginal communities. An average intake of 16800 (kJ), twice today's recommended daily intake is concerning. Although traditional cultural values influence food choice, the dietary inadequacies of station diets still persist today. Although impossible to observe traditional hunter gatherer diets in isolation today, studies regarding the benefits of reverting back to traditional diets in Australian Aboriginals have been published (O'Dea 1984, McDermott et al 1998). Health improvements were temporary, lasting only as long as reversion back to traditional diet existed.

## Food security and health benefits of traditional foods

### Nutrition composition

Brand-Miller & Holt (1998) presented evidence that traditional, plant-based materials have a nutrient composition that is protective against diseases like diabetes, obesity and cardiovascular diseases. Fruits, roots, tubers, nuts, seeds, leaves and flowers were analysed by three major scientific centres. Eight hundred traditional bush food samples had been collected over two decades. Traditional

plants were compared to similar market foods and were often shown to be richer in nutrients.

Smith & Smith (2003) present evidence in their study that the nutritional composition of traditional foods can assist in averting cardiovascular diseases, diabetes and obesity. Smith and Smith (2003) combined the ethnographic records of hunter-gatherer subsistence diets observed by Richard Gould in the late 1960s and the Indigenous foods dataset, produced by Brand Miller et al, in 1993. The benefits of traditional foods were due to low total fat intakes and an almost vegetarian daily diet observed over five months. On closer examination the Aboriginal participants observed had a restricted diet, mainly due to drought and existed in a sparsely resourced and harsh environment. Gould described the physical environment as the most unreliable and impoverished in the world. Grass seeds made up the bulk of the diet and by modern standards many of the Aboriginal people may have been malnourished. Traditional foods, especially meat such as dugong fat are essentially energy dense and there would be concerns if large quantities were consumed regularly. The report conducted by Kingston and colleagues suggest however that consumption of such meats are occasional, often ceremonial and the consumption of these particular foods such as dugong are in decline (Kingston et al 2003).

## Diet quality

Receveur et al (1997) presents evidence gathered from 16 Canadian Arctic communities, with a cohort of 1012 participants. Traditional food was evaluated for its dietary quality and the differences in market foods and traditional foods were analysed. Traditional food diets correlated positively with higher intakes of iron, zinc, and potassium. Market food diets correlated positively with sodium, total fat, saturated fat, sugar and absolute energy intake. The authors concluded that poor nutritional status as a consequence of a deficient intake of traditional foods could be counteracted by education and access to good quality market foods.

Huet et al (2012) and Jamieson et al (2012) conducted compatible studies assessing household and individual food security. Extremely high prevalence of food insecurity was observed among surveyed households across the two studies. Huet et al (2012) presented findings from a cross-sectional survey of all 1901 Inuit households from the 2007-2008 survey and concluded that having an active hunter in the home promoted food security. Dietary assessments and surveys were conducted by trained bilingual interviewers. 'Quick list', 'time/occasion' and 'forgotten foods' stimuli were used to assist recall. Harvest calendars assisted in the identification of foods and periods of time. Comparable studies in Australia are limited.

## Micro nutrient intake

Kuhnlein et al (2006) & Hidioglou et al (2008) analysed samples from a number of traditional food species. These comparable studies analysed 180 and 200 traditional food samples respectively, which were collected and eaten by Aboriginal people in the Canadian Arctic. Kuhnlein et al analysed the fat soluble vitamins A, D and E and found traditional foods, both from plant and animals sources to be rich sources of these vitamins. Between 1994-2000, the cohort (n=2408) were administered 24-hour recalls. Two seasons were represented, including the times when highest and lowest amounts of traditional foods were expected to be harvested. Despite challenges in this study, it was demonstrated that traditional foods are good sources of vitamin A, D and E.

Jamieson et al (2012) in a cohort of 994 men found those without a household hunter had a higher risk of low or depleted iron stores. Traditional foods were the most important dietary source of Iron. This study is the first to report prevalence estimates for anaemia and depleted iron stores for Inuit men in Canada. Similarly in remote areas of Australia, high prevalence rates of iron deficiency anaemia in adults and children have been documented (Holt et al 1980, Hopkins et al 1997, Hoy 2005, Kruske 2012). Many Australian traditional foods have been shown to be rich in iron, copper and specific vitamins, including ascorbic acid (Brand et al 1982, O'Dea et al 1991, Brand-Miller & Holt 1998, Leemon & Sammam 1998, Beilken et al 2007).

Hidioglou et al (2008) presented evidence that traditional food samples, all of which were limited to animal species could contribute significantly to vitamin requirements of Canadian Arctic Aboriginal people. Limitations of this study were that plant species were excluded and that sample numbers were small in proportion to the number of traditional foods consumed in these communities. The full potential of traditional foods supplying water-soluble vitamins to Aboriginal Arctic diets will be illustrated when an increased number of traditional food samples are analysed. Comparable studies in Australia are limited.

## Food security, health risks and concerns with traditional foods

### Contamination of traditional food supply

Haswell-Elkins et al (2007) documented the concerns of local Aboriginal people in the Torres Strait and established a small cohort of women (n=60). The pilot presented evidence that high cadmium levels were linked to the consumption frequency of certain traditional foods. Cadmium, a toxic metal, was also found in a range of market foods and cigarettes. High cadmium levels can accumulate and cause kidney damage. In this study, safe limits were

defined by food standards Australia. An extensive questionnaire covered all relevant variations of cadmium exposure. This pilot study found the relationship between high cadmium and dietary intake of certain foods including, but not restricted to traditional turtle and dugong meat. The consumption of wild yams, coconut, peanuts, potato chips and chocolate were associated with high cadmium levels. Positive associations between turtle and dugong meat were significant; however the type of meat consumed and frequency, as well as exposure and consumption to other variables is significant.

The study findings were able to address concerns for local Aboriginal people and inform people about the consumption of foods and lifestyle practices that can place individuals at greater risk of cadmium toxicity.

Berti et al (1998) presents the misconception among Canadian Aboriginal people that eating traditional foods poses high risks to their health. This widespread confusion about the safety of traditional foods and the health consequences of contaminated food has to be clarified by researchers, scientists and health professionals. Key findings illustrate safe limits of contaminants in specific traditional foods. For instance, food items for which high daily consumption may lead to high contaminant intake can be delineated. These findings can be transferred quickly and appropriately to Aboriginal individuals and communities and help reinforce that traditional foods consumed in normal amounts pose little risk to health.

## Mining

There is little information currently available in Australia on the concentrations of radioactive elements in traditional foods. Ryan and Martin (2005) present evidence that bioaccumulation of uranium series radio-nuclides into traditional foods, namely fruits and vegetables are significant concerns for Aboriginal people. Most important are the years when mine site rehabilitation occurs and people can access these sites. Consultation with Aboriginal people in the Alligator region of the Northern Territory was followed up by traditional food gathering for a three year period. The strengths of this research were the consultation with Aboriginal people, the length of the collection period, covering all seasons and food types and the analysis of the foods and soil sample. Foods were also collected from past, operating and site rehabilitation areas. Foods were often not washed and eaten raw, mostly by children and this was a risk factor for higher uranium concentrations. This study presented evidence for other elements including actinium, radium, thorium and polonium, all radioactive elements. Lead also posed potentially significant concerns for Aboriginal people. Important factors illustrated by Martin and Ryan (2005), include food preparation and consumption habits, such as cleaning, cooking and the level of consumption of foods that could be contaminated with toxic radio-nuclides.

Martin and Ryan (2004) in their corresponding paper present findings on concentrations of radio-nuclides in freshwater mussels, turtles and water lilies. This presents potential concerns with copper, lead, silver, nickel, zinc and manganese originating from mine sites and making their way directly into TF or surface water. Freshwater mussels, a significant food source for Aboriginal people had very high concentrations of radium, which is harmful to human health. Importantly these high concentrations were found to be regional, rather than confined to specific areas around mine sites. Higher concentrations of radio-nuclides were found in the kidneys and livers of pigs and buffalo and in the bones of magpie geese. The geographic range, type and consumption frequency of foods and preparation methods of traditional foods were not assessed in these studies. Qualitative methods are required because of the wide diversity of foods, food practices and frequency of individual consumption.

## Impact of traditional foods on food security

### Food availability and access

Jackson et al (2011) illustrate the socio-economic value of traditional foods. The socio-economic significance of land and food was constructed from extensive structured and open community questionnaires. The study findings illustrate that there are significant benefits of consuming traditional foods, in comparison to market foods. The economic value of traditional foods was calculated using the replacement goods methods developed by Altman (Altman 1987). The evidence illustrates the replacement value of traditional foods would be excessive and unaffordable. For instance the store costs of the equivalent market foods with the same socio-economic value of selected traditional food would render foods unaffordable and that the availability and access to traditional food sources is highly valued by Aboriginal people. This study does not account for values associated with individual nutritional constituents or the social values of these foods.

### Food use

Schuster et al (2001) illustrate in a follow-up, cross sectional study that traditional foods remain essential components in Canadian Aboriginal diets of the Yukon. A 15 year follow-up study in 2007-2008 identified trends, matching FFQ conducted in 1991-1992. The study represented 30% of households in each of the communities and yielded food frequency data from 78 traditional foods sources. There was no decline in the frequency of traditional food consumption in this study and consumption of traditional foods was higher in more remote communities. Traditional foods were seen to be the most significant aspects of the diet and the concerns with limited availability, access and available time to harvest

specific foods, were food security challenges facing communities. The CSIRO conducted a project examining catch estimates of dugong and green turtle among the Torres Strait (Kingston et al 2003). Although these traditional foods are regarded as important foods in this region, numbers of dugong and turtle are declining. Further documentation of traditional food use in Australian Aboriginal communities is poor.

## Food preference

Lambden et al (2007) illustrates characteristics of food security in the Arctic region of Canada that are not typically explored. The qualitative methods used were minimal and study was constructed from four open ended questions to investigate the roles of traditional foods on food security, followed by a fifth question that explored cultural responses and the harvesting and use of traditional foods. Participation rates were high (75%-90%) throughout communities and the cohort 1711 were included. Evidence within this study found that women preferred traditional foods over market foods. Significant findings of this study illustrate that traditional foods were becoming increasingly difficult to acquire, placing participants at increased risk of food insecurity. Australian studies illustrating the use of traditional foods in Australian Aboriginal communities are lacking.

## Socio-economics of traditional food

Altman (2007) illustrates the developmental problems in remote Aboriginal communities of Australia. Altman gives evidence to propose that Aboriginal economic and cultural development can be achieved, even in the most remote regions of Australia. Altman suggests that the geographically dispersed Aboriginal communities throughout Australia must become commercially, economically and culturally viable to improve the health and wellbeing of individuals. The absence of commercial opportunity has been dissolved by mainstreaming Aboriginal people that are unique and diverse. Altman states, that, there is a limited market opportunity, especially in remote and very remote regions and there is a reliance on welfare payouts and other poverty traps. Altman believes there are exceptional opportunities for Aboriginal people to create their own hybrid economies within their region and support their traditional cultures. Enterprises that can be explored can include art, craft and other artefact trade, hunting and fishing and land and wildlife management and customary land exploration, expeditions and wildlife and adventure treks. Climate changes are national concerns, as is water quality and management (Altman 2002). Aboriginal people can develop and assist in land and water management practices, improving food security through the protection and management of traditional foods. Aboriginal people are living on some of the most bio-diverse land in Australia and Aboriginal people themselves have the potential to create unique opportunities towards greater self-determination.

## Limitations of the review

This literature review presents the best evidence available from 1997 to the present. Many important studies were conducted before 1997. These studies were used to provide an accurate picture of the complexities of food security among Aboriginal people.

This review did not include additional influences that can jeopardise traditional food stocks and food security. These include the impact of introduced pests, like the cane toad and the utilisation of foods as bio-fuels, rather than food for people (Kullander 2010). These influences are documented in current and developing research studies.

### Implications

The evidence presented within this literature review has been examined to provoke thought on the potentially significant role that traditional foods may have in alleviating food insecurity in remote Aboriginal communities throughout Australia.

## Conclusion

Traditional foods have had a significant and beneficial role in the diets and way of life of Aboriginal people for thousands of years. Before European settlement in Australia the diets of Aboriginal people safeguarded them against diabetes and obesity. The benefits of traditional foods and their procurement are well established and compelling. The indirect benefits of traditional foods on the wider social determinants of health are as equally important. Traditional foods and associated resources can be the foundations of improved education, employment and commercial opportunities. These foods must be protected from contaminants from mining or other practices that are increasingly widespread among regions where Aboriginal communities exist. Promoting and protection of traditional foods will improve food security and this will ultimately be dependent on the continued access and preference for these foods by Aboriginal people.

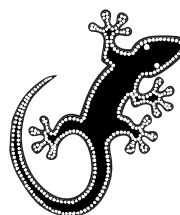
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