

Evidence Check

**Evidence for
improving food
security in
Aboriginal
communities in
NSW**



An Evidence Check rapid review brokered by the Sax Institute for Aboriginal Affairs NSW 2022.

This report was prepared by: Alyse Davies, Josephine Gwynn, Victoria Flood, Margaret Allman-Farinelli, Michelle Dickson, Nicole Turner, Mark Lock.

November 2022

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Enquiries regarding this report may be directed to the:

Aboriginal Affairs NSW

Department of Premier and Cabinet

201 Coward Street MASCOT NSW 2020

Tel: 1800 019 998

Email: enquiries@aboriginalaffairs.nsw.gov.au

Website: www.aboriginalaffairs.nsw.gov.au

Suggested Citation:

Davies A, Gwynn J, Flood V, Allman-Farinelli M, Dickson M, Turner N, Lock M. Evidence for improving food security in Aboriginal communities in NSW: an Evidence Check rapid review brokered by the Sax Institute (www.saxinstitute.org.au) for Aboriginal Affairs NSW, Department of Premier and Cabinet, 2022.

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Evidence for improving food security in Aboriginal communities in NSW

An Evidence Check rapid review brokered by the Sax Institute for Aboriginal Affairs NSW. December 2022.

This report was prepared by: Alyse Davies, Josephine Gwynn, Victoria Flood, Margaret Allman-Farinelli, Michelle Dickson, Nicole Turner, Mark Lock.

This review team comprised three Aboriginal reviewers (Mark Lock, a Ngaympaa man, Michelle Dickson, a Darkinjung/Ngarigu woman and Nicole Turner, a Kamilaroi woman) and four non-Aboriginal reviewers with expertise in nutrition, dietetics, public health, and Aboriginal health research. The team's approach allowed for the situated knowledges of each Aboriginal reviewer to be reflected, and for a decolonised lens to be applied to this report.

Acknowledgment

The authors wish to acknowledge Monica Cooper, an academic liaison librarian at the University of Sydney for her support in the development of the search strategy for the proposed rapid review.



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Summary of key messages

Three factors that contribute to food insecurity for Aboriginal peoples in NSW

- Affordability (food pricing for healthy food options and low household income)
- Systemic causes (defined here as the ongoing impacts of colonisation including changes in the local food systems, loss of cultural food practices, knowledge, language and lore)
- Crises exacerbate food insecurity (COVID-19 pandemic, droughts, floods and bushfires).

The scale and distribution of food insecurity for Aboriginal people in NSW

Aboriginal and Torres Strait Islander peoples living in urban, regional and remote areas of NSW are vulnerable to food insecurity. The scale and distribution of food insecurity, for all areas, could not be reported due to the lack of evidence for each specific setting.

Policies and programs that have been effective in improving food security for First Nations people, nationally and internationally

- Programs led and governed by community and reflecting community priorities
- Programs where cultural knowledges were integrated, e.g. food restoration programs
- Programs that utilised interagency collaborations.

Conclusions

- Programs and policies need to take a multi-faceted and integrated systems approach to address affordability in all settings (urban, regional and remote) of NSW
- Programs and policies need to be led and governed by Aboriginal communities, integrate cultural knowledge systems, adopt a multi-strategic approach and utilise interagency collaborations in all settings (urban, regional and remote) of NSW
- More funding and support is needed for evaluations of programs in all settings (urban, regional and remote) in NSW, and the development of a standardised evaluation framework.

Executive summary

Background

The deep and interconnected relationship of NSW Aboriginal and Torres Strait Islander peoples to lands, waterways and seas ensured optimum health, and social, emotional, spiritual and cultural wellbeing. For millennia, sophisticated agricultural and aquacultural practices ensured an abundant and reliable supply of fresh and healthy foods, with care for Country the central motif governing sustainable harvest and food procurement practices. The effects of colonisation have resulted in a forceful disconnect from Country, culture and knowledge systems for Aboriginal and Torres Strait Islander people (1). The ongoing effects of this disconnect contribute to the systemic, social and economic inequities which are the major factors underlying food insecurity.

In Australia, although poor data precludes robust estimates, 22% to 32% of Aboriginal and Torres Strait Islander people are food insecure (depending on location), whereas 4% to 13% of non-Indigenous Australians are food insecure (2). While the causes and nature of food insecurity among Aboriginal and Torres Strait Islander peoples have been explored nationally, in NSW, commentary and evidence about the root causes of food insecurity is largely absent. This rapid review informs findings on the factors, scale and distribution of food insecurity in Aboriginal and Torres Strait Islander communities in NSW and provides evidence and context for any program or policy recommendations arising from it. Throughout this report we respectfully use the term Aboriginal and Torres Strait Islander people/s when reporting on Australian studies, and First Nations when reporting on international studies.

Review questions

This review aimed to address the following questions:

Question 1: What factors contribute to food insecurity for Aboriginal peoples in NSW?

Question 2: What is known about the scale and distribution of food insecurity for Aboriginal peoples in NSW?

Question 3: What policies and programs have been effective in improving food security for First Nations people, nationally and internationally?

Summary of methods

The review team, comprising Aboriginal and non-Aboriginal researchers, conducted a rapid literature review over a six-week period.

In consultation with a librarian at The University of Sydney, two search strategies were developed to address the three questions. Three electronic databases (Medline, Global Health and Scopus) and grey literature were searched. A ten-year time period (2012-2022) was outlined in the original proposal. However, in initial searches several relevant articles from 2010 were found. Therefore, the time-period was adjusted to include publications from January 2010 to August 2022. One reviewer completed title and abstract screening, two reviewers, one of whom was Aboriginal completed full text screening, and one completed data extraction, which was checked by a second Aboriginal reviewer.

Study quality was assessed using the Aboriginal and Torres Strait Islander Quality Appraisal Tool (3, 4), which was designed to assess the quality of research conducted with Aboriginal and Torres Strait Islander people, families and communities through an Aboriginal and Torres Strait Islander lens (5). Two non-Aboriginal reviewers assessed the quality of evidence, which was checked by two Aboriginal reviewers.

Key findings

Thirty publications (peer-reviewed articles: n = 6; grey literature: n = 24) which focused on the factors, scale and distribution of food insecurity among Aboriginal and Torres Strait Islander communities in NSW met all inclusion criteria and underwent data extraction (Question 1 and 2). This highlights the limited evidence base for NSW. Twelve peer-reviewed articles and two grey literature publications describing programs or policies that were effective in improving food security met all inclusion criteria and underwent data extraction (Question 3).

Question 1: What factors contribute to food insecurity for Aboriginal peoples in NSW?

Five peer-reviewed articles identified factors contributing to food insecurity in NSW (three specific to NSW). Five grey literature reports were included, mostly reporting national data, therefore separating factors specific to NSW proved difficult. While programs specific to NSW addressing food security were identified through grey literature searching, most had not been evaluated, published, or reported. For all included publications, the main factors contributing to food insecurity were affordability, systemic causes (defined as the ongoing impacts of colonisation), and that food insecurity is also exacerbated by the impact of crises (COVID-19 pandemic, droughts, floods and bushfires).

“No one can afford to buy it because the healthy food is so expensive. It’s a big factor, like everyone wants all these kids to eat healthy, but they’re not looking at the price of things”
(Aboriginal community member) (5)

Question 2: What is known about the scale and distribution of food insecurity for Aboriginal peoples in NSW?

Five peer-reviewed articles were identified in response to Question 2, with three specific to NSW. There were eleven grey literature reports included which addressed the scale and distribution of food insecurity, but these mostly reported national data. Aboriginal and Torres Strait Islander peoples living in urban, regional, and remote areas of NSW are vulnerable to food insecurity, but the severity difference for each area could not be reported due to the lack of data.

“When I look back on my life, I think about it and I think, was I actually ever hungry? Like we were poor and that, but did I actually go starving and without food? I’m thinking, no, but I lived as if I was a starving child because my father was starving, his grandmother was starving, and food security was in our mindset“. (Aboriginal LHD staff member) (5)

Question 3: What policies and programs have been effective in improving food security for First Nations peoples, nationally and internationally?

Twelve peer-reviewed articles (American: n = 7; Canadian: n = 5) and two grey literature reports (Australian: n = 2) met the inclusion criteria. International programs effective in addressing food insecurity were participatory in design, led and governed by community and reflected community priorities. Other programs shown to be effective were those that integrated cultural knowledge and showed a consequent increase in the availability and accessibility of cultural foods. A number of programs for remote communities involved subsidising food and transport costs. However, the evidence for effectiveness was mixed. Programs that appeared to be suitable were participatory-based, governed by community, integrated cultural knowledge and food systems, and utilised interagency collaborations to increase availability and accessibility of cultural foods. No policies were identified.

Conclusions

- Programs and policies need to take a multi-faceted and integrated systems approach to address affordability in all settings (urban, regional and remote) of NSW
- Programs and policies need to be led and governed by Aboriginal communities, integrate cultural knowledge systems, adopt a multi-strategic approach and utilise interagency collaborations in all settings (urban, regional and remote) of NSW
- More funding and support is needed for evaluations of programs in all settings (urban, regional and remote) in NSW, and the development of a standardised evaluation framework.

Background

The deep and interconnected relationship of Aboriginal and Torres Strait Islander peoples to lands, waterways and seas ensures optimum health, and social, emotional, spiritual and cultural wellbeing. For millennia, sophisticated agriculture and aquacultural practices ensured an abundant and reliable supply of fresh and healthy foods, with care for Country the central motif governing sustainable harvest and food procurement practices.

The literature on Aboriginal and Torres Strait Islander peoples' nutrition and food security predominately pushes a historical narrative of the hunter-gather lifestyle, which fails to adequately portray sophisticated knowledge systems (6). For example, aquacultural techniques such as the construction of the Brewarrina fish traps on the Barwon River, the paperbark and bamboo fish traps of the Glyde River, and the large dams in Wiradjuri country. Diverse land management practices and agricultural techniques were noted by the anthropologist Tindell in 1977, and these practices were observed down the Nicholson River. Aboriginal and Torres Strait Islander methods of agriculture are integrated and complex, including practices such as traditional burning (7) and techniques for harvesting of native grains (8).

Invasion and colonisation resulted in the forced separation of families, in the removal and relocation from lands, and in the destruction and loss of traditional land management and maintenance systems, subsequently disconnecting Aboriginal and Torres Strait Islander peoples from Country (1). Forced relocation onto missions, stations and government reserves across Australia resulted in a sudden shift to a 'western' and frequently extremely impoverished diet for all, often centred around white flour, sugar, tea and off cuts of meat when available. The impacts of this on the health of Aboriginal and Torres Strait Islander people are still apparent today, with dietary factors contributing to overall disease burden at over three times the rate than for non-Indigenous Australians (9). Many agricultural and aquacultural knowledge systems have been fragmented or lost, which has had detrimental impacts on many communities. Furthermore, current laws deny Aboriginal and Torres Strait Islander peoples' land and water sovereignty rights, thus restricting access to cultural food sources (10).

The ongoing impacts of colonisation contribute to the systemic social and economic inequities faced by Aboriginal and Torres Strait Islander people today. It is well known that social and economic determinants, including employment, income, education, housing, area of residence and social inclusion, contribute to food security (11). In Australia, although poor data precludes robust estimates, 22% to 32% of Aboriginal and Torres Strait Islander people are food insecure (depending on location), whereas 4% to 13% of non-Indigenous Australians are food insecure (2). Factors contributing to food insecurity are likely to differ by geographical location (urban, regional and remote areas). For example, some key factors for Aboriginal and Torres Strait Islander people living in urban and regional areas of NSW, include low income, poverty and the abundance and availability of unhealthy food (5). Fast food companies target areas of low income and poverty, and in addition, public transport infrastructure is often inadequate in these areas, and walking distance to healthy food outlets from homes is further (12, 13). In rural and remote areas of NSW, Aboriginal and Torres Strait Islander people are less likely to have access to large supermarkets, resulting in limited access to healthy and affordable food and issues around transport (2). Some Aboriginal communities still have

neither food outlets nor public transport, for example the communities of Toomelah and Boggabilla. In many communities the ‘town’ water supply is not trusted and alternative drinks are preferred (14). The COVID-19 pandemic has further exacerbated the problem of food insecurity, both nationally and internationally (15).

The 2021 Census (16) reported that Aboriginal and Torres Strait Islander people represented 3.2% of Australia’s total population with the largest proportion residing in NSW (34.2%), followed by Queensland (29.2%), Western Australia (10.9%), Victoria (8.1%), the Northern Territory (7.5%), South Australia (5.2%), Tasmania (4%) and the Australian Capital Territory (1%). In terms of estimates by remoteness in NSW for 2016, the majority of Aboriginal and Torres Strait Islander people lived in major cities (46.3%), followed by inner regional (34.5%), outer regional (15.5%), and remote (2.8%) and very remote (0.9%) areas. To reach the breadth and depth of Aboriginal and Torres Strait Islander community diversity throughout NSW, and determine the frequency and severity of food insecurity, a targeted approach is required. Emphasis is needed on urban and regional areas of NSW as this is where the majority of Aboriginal and Torres Strait Islander peoples reside, and the complex nature of the food system is a major systemic factor contributing to food insecurity.

There are many definitions of food insecurity in the literature. The Food and Agriculture Organization of the United Nations defines food security as “*When all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life*” (17). Food security can be measured in four dimensions, termed the four pillars: availability, access, utilisation, and stability. Food availability refers to the adequacy of the food supply and distribution post-harvest; food access can be both economic or physical access, including transport; food utilisation refers to safe and sufficient nutritious food to meet requirements (physiological, sensory and cultural), and the transformation of foods into meals; and food stability refers to the consistency over time of the first three dimensions and the broader food system (18, 19).

The Council of Australian Governments defines food security as “*The ability of individuals, households and communities to acquire appropriate and nutritious food on a regular and reliable basis using socially acceptable means*” (20).

Importantly, to contextualise the meaning of food security, positionality is important and is where Aboriginal and Torres Strait Islander knowledge systems are reflected, respected, and privileged. Members of several remote Aboriginal and Torres Strait Islander communities throughout Australia have documented a more holistic definition of food security as follows:

“The land and the sea is our food security. It is our right. Food security for us has two parts: Food security is when the food from our ancestors is protected and always there for us and our children. It is also when we can easily access and afford the right non-traditional food for a collective healthy and active life. When we are food secure, we can provide share and fulfil our responsibilities, we can choose good food, knowing how to make choices and how to prepare and use it” (21).

This review team comprised three Aboriginal and four non-Aboriginal reviewers with expertise in nutrition, dietetics, public health, and Aboriginal health research. The team's approach allowed for the situated knowledges of each Aboriginal reviewer to be reflected, and for a decolonised lens to be applied to the research. This ensured Aboriginal voices and cultural knowledge systems were appropriately integrated into the analysis, interpretation, and presentation of this report. The methods section contains further detail on the research team's approach.

Mark Lock, a Ngiyampaa man, grew up in small town NSW in conditions of poverty, food insecurity, and racism. He was encouraged by his grandmother, a member of the stolen generations, to continue with his education as a means to fight for justice. His expertise in cultural safety is founded on both cultural and scientific rigour. These experiences and lenses were brought to bear in this rapid review.

Michelle Dickson, a Darkinjung/Ngarigu woman, grew up the first of four children to young and loving parents who often went without to provide for their children. Michelle's early passion for knowledge supported her to be the first in the family to complete high school and pursue higher education. A favourite photo is of her grandparents proudly holding her undergraduate testamur in their hands on her graduation day; her graduation day was also theirs. Michelle's Aboriginal and Torres Strait Islander Public Health expertise is grounded in research practices that privilege Aboriginal and Torres Strait Islander peoples' voices and lived experiences. She brings this commitment to the review.

Nicole Turner, is a proud Kamilaroi woman. *"My grandmother was part of the stolen generation. I spent my life growing up on Dunghutti land on the mid north coast of NSW. My passion for nutrition comes from many years ago being involved in a research project about Aboriginal children's physical activity and food habits. While involved in this research I soon realised there were very few Indigenous nutritionists. I then went on and completed a three year nutrition degree. I have been very fortunate to work in Aboriginal communities teaching our families about healthy lifestyles and have also been involved in research projects all around the country. My passion is making sure my people have access to good food and water regardless of where they live. I believe good nutrition is vital to good health and long lives"*.

This rapid review aims to inform findings of food insecurity severity in Aboriginal and Torres Strait Islander communities in NSW, and to provide evidence and context for any program or policy recommendations arising from it.

Methods

Aims and scope

This rapid review aimed to identify relevant peer-reviewed and grey literature published in Australia and other relevant countries. The research questions specified in the proposal were:

Question 1: What factors contribute to food insecurity for Aboriginal peoples in NSW?

Question 2: What is known about the scale and distribution of food insecurity for Aboriginal peoples in NSW?

Question 3: What policies and programs have been effective in improving food security for First Nations people, nationally and internationally?

Search strategy

This rapid review was conducted within a limited timeframe (six weeks), using a systematic approach. In consultation with a librarian at The University of Sydney (MC), an Aboriginal (ML) and non-Aboriginal (AD) reviewer developed two search strategies (one for questions one and two, and one for question three) and inclusion and exclusion criteria, and agreement was reached with the review team. The search was conducted in three electronic databases: Medline, Global Health and Scopus. Grey literature sources included the Australian Indigenous HealthInfoNet, Google (Government domains), Analysis and Policy Observatory, The Conversation, the Appendix of the Project Proposal, the reference list of the Preliminary Literature Review, and other relevant sources. The search strategies are listed in Appendix 1.

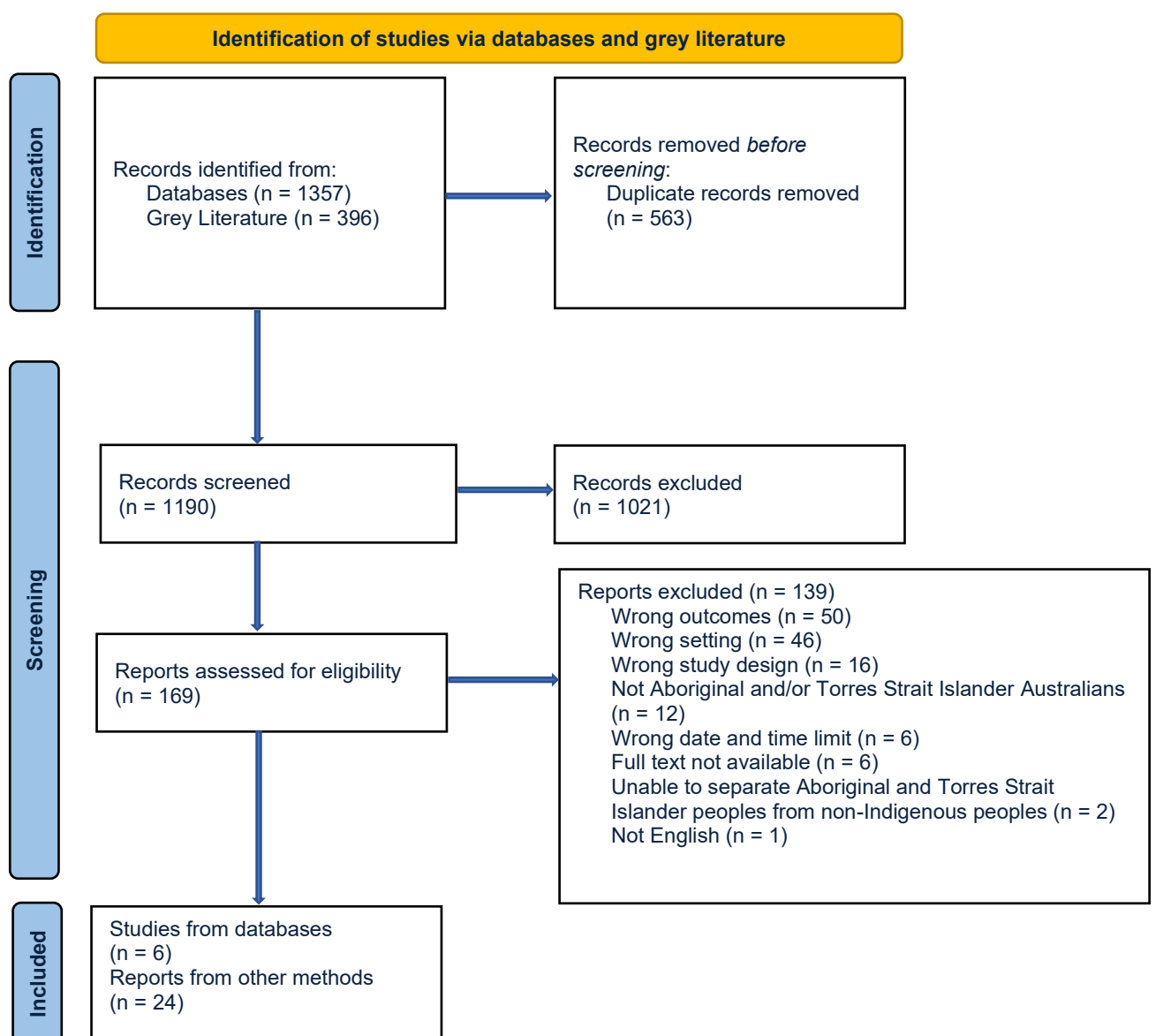
The first two questions aimed to understand food insecurity in Aboriginal and Torres Strait Islander communities in NSW (Search 1). The search was limited by strict inclusion and exclusion criteria including Aboriginal and Torres Strait Islander peoples from NSW (or Australia wide inclusive of NSW data), peer-reviewed and grey literature from 2010, studies written in English, and studies with the primary outcome being food insecurity.

The third question aimed to understand policies and programs that have been effective in improving food security for First Nations people, nationally and internationally (Search 2). The search was limited by strict inclusion and exclusion criteria. Inclusion criteria were: that the populations of interest were First Nations peoples of Australia (all states and territories), Aotearoa/New Zealand, Canada and the United States of America (excluding South America, Central America, Latin America, and Mexico); peer-reviewed and grey literature from 2010; studies written in English; and studies with the primary outcome being food security.

Selection process

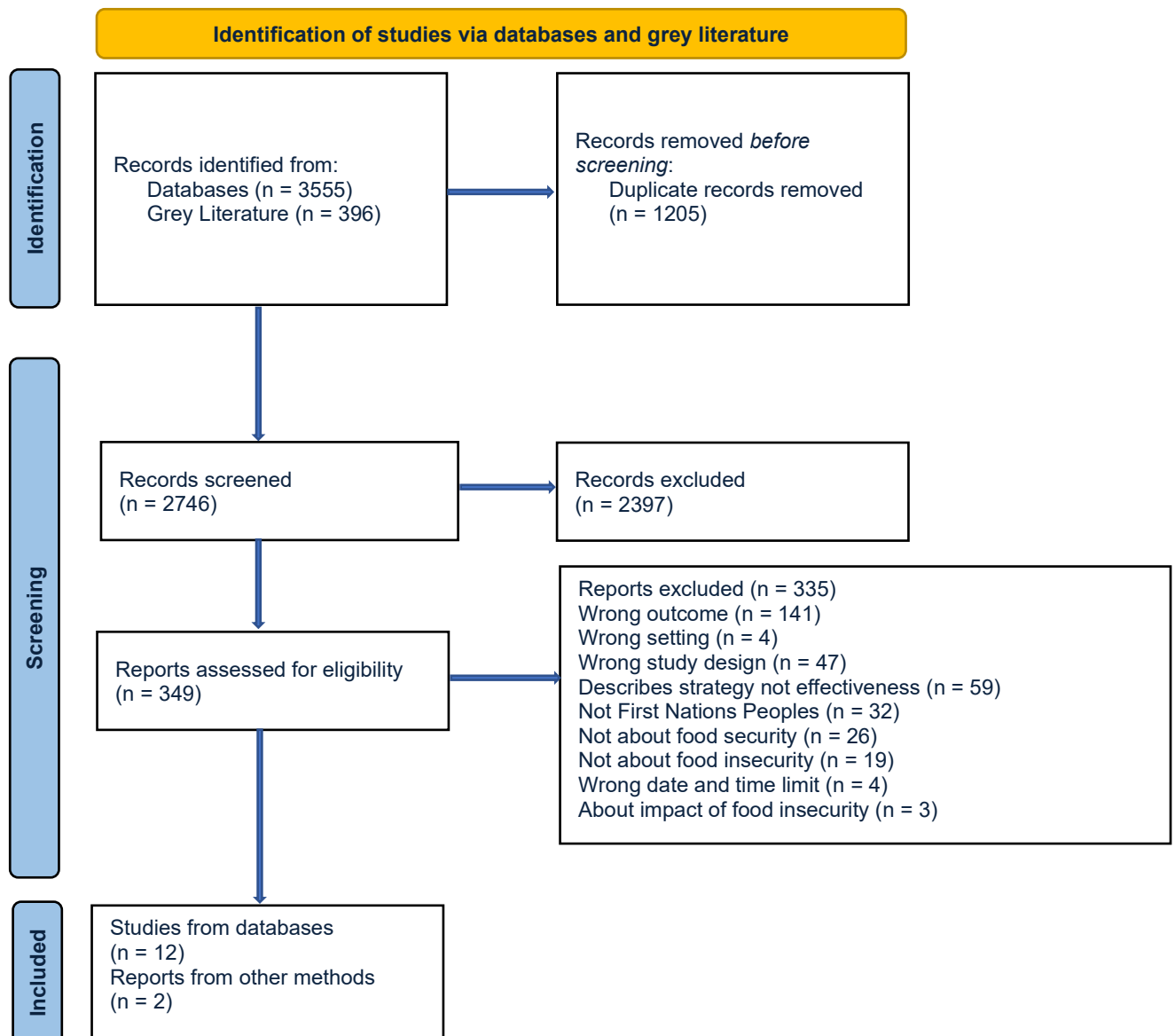
Search 1 – Questions 1 and 2: The identified records were downloaded into EndNote (22) and duplicates were removed. The citations were imported into Covidence (an article screening and extraction tool for managing systematic and other reviews) (23) and additional duplicates were removed. Titles and abstracts were screened by one non-Aboriginal reviewer (AD). Reports were assessed for eligibility by an Aboriginal reviewer (ML) and a non-Aboriginal reviewer (AD) and the reasons for exclusion were recorded in Covidence. The search results are presented in a PRISMA flow diagram (see Figure 1).

Figure 1: PRISMA Flow Diagram for Search 1.



Search 2 – Question 3: The identified records were downloaded into EndNote (22) and duplicates removed. The citations were imported into Covidence (23) and additional duplicates were removed. Titles and abstracts were screened by one non-Aboriginal reviewer (AD). Reports were assessed for eligibility by an Aboriginal reviewer (ML) and a non-Aboriginal reviewer (JG) and the reasons for exclusion were recorded in Covidence. The search results are presented in a PRISMA flow diagram (see Figure 2).

Figure 2: PRISMA Flow Diagram for Search 2.



Data charting and results synthesis

Question 1: What factors contribute to food insecurity for Aboriginal peoples in NSW?

The following information was extracted by one non-Aboriginal reviewer (AD): study information (first author, year, aim, setting, study design and methods), participant information (total number of participants, age, sex, and other information), and factors contributing to food insecurity and the impact of crises. A narrative summary describes the results, with the extraction tables presented in Appendices (see Appendix 2 for peer-reviewed articles and Appendix 3 for grey literature). Broad factors relating to the root causes of food insecurity were listed on the project proposal brief, including (and not limited to): financial; geographical location; transport; housing; cooking facilities; food storage; education; nutrition literacy; acceptability, availability, accessibility, affordability of healthy food; systemic causes; and social factors. While some of the individual factors listed also qualify under systemic causes, for this review, 'systemic causes' was defined as the ongoing impacts of colonisation including changes in local food systems, and loss of cultural food practices, knowledge, language and lore. A category 'other' was included for those not fitting the above. Each included article was screened for each factor, documented in the extraction tables and marked in an Excel spreadsheet. A count was applied and presented as a bar graph. The results were interpreted through a decolonised lens privileging Aboriginal and Torres Strait ways of knowing by Aboriginal reviewers (MD, NT and ML).

Question 2: What is known about the scale and distribution of food insecurity for Aboriginal peoples in NSW?

The following information was extracted by one non-Aboriginal reviewer (AD): study information (first author, year, setting, study design and methods), participant information (total number of participants), the scale and distribution of food insecurity, and the use of food relief. A narrative summary describes the results with the extraction tables presented in Appendices (see Appendix 4 for peer-reviewed articles and Appendix 5 for grey literature). The results were interpreted through a decolonised lens privileging Aboriginal and Torres Strait ways of knowing by Aboriginal reviewers (MD, NT and ML).

Question 3: What policies and programs have been effective in improving food security for First Nations peoples, nationally and internationally?

The following information was extracted by one non-Aboriginal reviewer (AD): study information (first author, year, aim, setting, intervention summary/methodology, population) and intervention outcomes. A narrative summary describes the results with the extraction tables presented in Appendices (see Appendix 8 for peer-reviewed articles and Appendix 9 for grey literature). The results were interpreted through a decolonised lens privileging Aboriginal and Torres Strait ways of knowing by Aboriginal reviewers (MD, NT and ML).

Critical appraisal

The 2018 South Australian Health and Medical Research Institute (SAHMRI) and the Centre of Research Excellence in Aboriginal Chronic Disease Knowledge Translation and Exchange (CREATE) Aboriginal and Torres Strait Islander Quality Appraisal Tool was used to assess the quality of the peer-reviewed articles (3).

The quality appraisal tool consists of 14 questions that assess the quality of studies from an Aboriginal and Torres Strait Islander perspective including Aboriginal and Torres Strait Islander governance, respect for cultural and intellectual property, and capacity building and beneficial outcomes for Aboriginal and Torres Strait Islander peoples.

The two non-Aboriginal reviewers (VF and MAF) used the Aboriginal and Torres Strait Islander Quality Appraisal Tool's Companion Document to guide their responses (4), which was checked by two Aboriginal reviewers (ML and MD).

Each question was answered as 'Yes', 'Partially', 'No', or 'Unclear' using explicit statements in the text. Studies were considered high quality if 'Yes' or 'Partially' was answered for at least ten questions, moderate quality if 'Yes' or 'Partially' was answered for six to nine questions and low quality if 'Yes' or 'Partially' was answered for five questions or less (24).

Analysis of evidence

Question 1: Factors that contribute to food insecurity for Aboriginal peoples in NSW

The review team identified five peer-reviewed food insecurity publications that met the inclusion criteria. Table 1 reports a summary of the main factors identified from the five peer-reviewed publications by geographic location. The data extraction table can be found in Appendix 2 which includes detailed information for each factor listed in the results text. There were twenty-two grey literature publications (reports, submissions and inquiries, media and websites) that also met the inclusion criteria. The data extraction table can be found in Appendix 3 which includes detailed information for each factor listed in the results text.

Peer-reviewed literature (n = 5)

Three publications were NSW specific (5, 25, 26) and two included national data inclusive of NSW (27, 28). Of the studies specific to NSW, two related to urban and regional areas (5, 26) and one to urban, regional and remote (25). From the NSW-only studies, the total number of participants ranged from 12 (100% Aboriginal) (25), to 44 (50% Aboriginal) (5), and 425 (65% Aboriginal) (26). Two studies mentioned the impact of crises, specifically COVID-19 (25, 28).

The publication by Follent et al. (25) was NSW specific wherein 12 Aboriginal community members shared lived experiences and perspectives regarding the indirect impacts of COVID-19 on food insecurity. Aboriginal community members were from urban, regional and remote areas (Eora, Wilyakali, Bundjalung, Yuin and Gumbaynggirr lands). The factors contributing to food insecurity related to geographical location and affordability: *“In some rural and remote areas, local shops have increased prices and people are left with no choice other than to purchase cheaper (and often less healthy) options”*. This publication addressed the impact of crises on food insecurity. It was mentioned that COVID-19 amplified the social determinants: *“Increase in government payments has resulted in the one and only shop in community providing food jamming their prices up. The price of food and water is beyond compare when you are paying \$10 for a loaf of bread. Because of COVID-19, people don’t want to come into town to do their shopping”*.

The publication by Miller et al. (26) was NSW specific and included 425 carers (76% Aboriginal). The study described carer perspectives on factors important for the health and wellbeing of their children living in urban and regional areas. The factors contributing to food insecurity related to transport, housing, nutrition literacy, acceptability, affordability and ‘other’ (such as the need for good role models). Systemic causes were discussed, such as breaking the cycle of disadvantage through Aboriginal health education programs that focused on common health problems, and nutrition and healthy meal preparation.

The publication by Sherriff et al. (5) was NSW specific and described Aboriginal community and stakeholders’ perspectives on food insecurity in NSW urban (Campbelltown) and NSW regional

(Wagga Wagga) areas. The factors contributing to food insecurity related to financial, transport, housing, cooking facilities, storage, nutrition literacy, and availability, accessibility and affordability of healthy food.

Systemic causes were discussed, and the ongoing impacts of colonisation was a key theme. The impact of ongoing colonisation included discussing cultural identity and food preference: *“We are like this because of those colonised practices. I think that any programs or things like that, we need to do that education and bringing back the cultural part of it”* (Aboriginal LHD staff member).

Experiences of trauma, racism and disruption to family structures were highlighted: *“The interruption to our parenting practices due to trauma and stress, and the impact, because when you’re stressed and trying to feed your family, it is easier to get the two-dollar chips and that.”* (Aboriginal Elder).

As were the effects of inter-generational poverty of food choice: *“You see a lot of Aboriginal people, they grew up really, really poor; now that they’ve grown up and they’ve got the money, a lot of them are overweight. Because they can afford that good [luxury] food.”* (Aboriginal LHD staff member).

A generational loss of healthy food knowledge and preparation skills was identified: *“You know that generational slippage when there is trauma or interrupted parenting practices, kids removed, coming back in, this is stuff [healthy meal preparation] we learnt but now how are we passing that and teaching that on?”* (Aboriginal Elder).

Other factors were discussed, including reliance on food relief services, the inflexibility of these services and the stigma and shame linked of accessing non-Aboriginal food relief services.

The publication by Temple et al. (27) used nationally representative data to examine the prevalence and correlates of food insecurity among older Aboriginal and Torres Strait Islander Australians. The factors contributing to food insecurity related to financial challenges; geographic location; housing; availability, accessibility and affordability of healthy food; and other factors (including language). Interestingly, it was shown that those who speak Aboriginal and Torres Strait Islander languages, and reside in remote areas, were more likely to be food insecure. The use of ‘bush tucker’ was suggested as an important component of overall food security.

Thurber et al. (28) was the second study that addressed the impact of crises on food security and did so by using nationally representative data. It was reported that: *“Those with access to fundamental determinants of health, income, living in an advantaged area, food security, no interpersonal discrimination, no forced separation from family, and access to healthcare are at a significantly lower risk of severe COVID-19 illness”*.

Table 1 reports a summary of the main factors identified from the peer-reviewed literature by geographic location. Specific details about each factor can be found in Appendix 2. Affordability was the main factor identified in all NSW specific studies from urban, regional and remote areas. The main themes around affordability were the increased prices of food (25) and limited affordability and availability of healthy food (5, 26).

"I had one mum who came in and said to me, 'I have five kids and yes, I know I don't eat properly but if I buy myself a large hot chips and a loaf of white bread, my kids are all full and can go to bed happy and satisfied. You're telling me to eat more fresh fruit and vegetables I don't even know if they're going to eat it. I can't afford to buy it. I don't even know if I'm going to waste my money on it'." (ACCHS staff member) (5).

Two out of the three studies that included urban and regional areas (5, 26) included transport, housing, nutritional literacy and systemic causes as factors contributing to food insecurity. The themes around transport included limited transport options to access healthy food (5, 26), inadequate or unavailable public transport (5), and the challenges and racism associated with using public transport for shopping (5): *"If there's no buses running at that time, and they can't get a lift off someone, then they'd have to walk or catch a taxi ... on a Sunday when there's no buses running, that would be difficult."* (Aboriginal Elder) (5).

The themes around housing were low quality housing (26) and lack of stable housing (5): *"In a car, somebody else's place, or you couch surf. Under somebody's house. Like it's all of those sorts of things are still in play today."* (Aboriginal LHD staff member) (26).

The themes around nutrition literacy were low nutritional awareness (26) and the generational loss of food knowledge and preparation skills: *"If families are taught meal prepping, young families, that you can have these meals in your freezer, whether you have two the next week or something, or it's lunch the next day or dinner the next night. It's something that young people need to be taught."* (Aboriginal Elder) (5).

For systemic causes, the main themes were around the impacts of colonisation and changes in the local food system (5) *"The [ACCHS] had a healthy food policy, and people were so resistant because they thought we were taking away their culture and their practices by saying now you've got to be like white fellas and eat this good way. We were forced like this because of those colonised practices."* (ACCHS staff member).

With access to only small, independent supermarkets the health food that was available was often limited, stale and expensive. *"Well, you go to the supermarket and it's disgraceful. There's nothing there. There's nothing fresh. It's mostly all tinned stuff"*. (Aboriginal Elder) (5)

Table 1: Factors contributing to food insecurity addressed from the peer-reviewed literature (n=5) identified in this review

First Author, ref, location	Financial	Geographical location	Transport	Housing	Cooking facilities	Storage	Education	Nutrition literacy	Acceptability	Availability	Accessibility	Affordability	Systemic	Social	Other	Crises
Follent (25) (NSW: Urban, Regional, Remote)		✓										✓				✓
Miller (26) (NSW: Urban, Regional)			✓	✓				✓	✓			✓	✓		✓	
Sherriff (5) (NSW: Urban, Regional)	✓		✓	✓	✓	✓		✓		✓	✓	✓	✓		✓	
Temple (27) (National data)	✓	✓		✓						✓	✓	✓			✓	
Thurber (28) (National data)																✓

Grey literature

There were twenty-two grey literature publications included (8, 29-48), inclusive of 14 submissions to inquiries (36-49), five government reports (8, 29-32) and three other study designs (33-35). Appendix 3 includes specific details of the factors related to food insecurity highlighted in each report.

Government Reports (n = 5)

The Aboriginal and Torres Strait Islander Health Performance Framework addressed factors contributing to food insecurity Australia wide (29). These factors related to financial, geographic location, housing, cooking facilities, storage, availability, accessibility, and affordability particularly for perishable items.

The House of Representatives Standing Committee on Indigenous Affairs, *Report on food pricing and food security in Remote Indigenous Communities* (30), addressed factors contributing to food insecurity Australia wide and NSW specific. The factors contributing to food insecurity related to financial, geographic location, transport, housing, cooking facilities, storage, nutrition literacy, availability, accessibility, affordability, and systemic causes. Specific to NSW, key factors were geographic location, availability, accessibility, and systemic causes (such as restriction on Aboriginal cultural fishers). The impact of crises such as COVID-19 was also addressed, with panic buying leading to food shortages and the impact of other crises such as floods, on the broader food supply and food pricing.

The National Rural Health Alliance report, *Food Security and Health in Rural and Remote Australia* (31), addressed factors contributing to food insecurity Australia wide and NSW specific. The factors contributing to food insecurity related to financial, geographic location, cooking facilities, storage, nutrition literacy, accessibility, and affordability. The impact of crises was also addressed. Specific to NSW, key factors were geographic location, financial and affordability. Results from the NSW healthy food basket survey (50), reported differences of as much as \$221 in the price of the same basket of goods, with fruit and vegetable prices increasing in 2009 due to severe weather conditions.

The 2018 NSW Legislative Council report, *Fresh food pricing* (32), addressed factors contributing to food insecurity Australia wide. The factors contributing to food insecurity related to financial, transport, housing, education, nutrition literacy, accessibility, affordability, systemic causes and 'other' (such as unhealthy food advertising). This report included preliminary findings from Sherriff et al., (5), with key factors being financial constraints and the limited affordability of food: "*Unaffordability of food was the biggest factor associated with running out of food fortnight or payday*". Limited access to healthy food was in issue, even in urban settings: "*Healthy food is not available anywhere close to where the majority of our Aboriginal families live, even in urban areas*". As well as unreliable public transport and limited access to private transport:

"Many families are without a car and have a number of kids in tow. For the families involved in our research, public transport is not very reliable, and it can often take three hours for them to get on the bus, go to the shops, buy the food and come back, all with three or four kids in tow. Accessing fresh food takes too much time and effort. Feeding the family is more of a priority than accessing fresh food". (32) preliminary findings from Sherriff et al (5).

The impact of crises was also addressed in the Country Women's Association submission to the Legislative Council report (51) reporting that: "*Drought adds to the cost of production due to greater need for livestock feed, itself at higher prices, as well as water for stock and crops, while extreme weather events such as flood may cause spikes in prices*".

The University of Sydney Institute of Agriculture report, *Native Grains from Paddock to Plate* (8), reported that systemic causes contributed to food insecurity "*Due to colonisation, much knowledge, language and lore was fragmented, and in some cases lost, including knowledge on managing, producing and handling native grains*".

In summary, the main factors addressed in four out of the five reports were financial, accessibility and affordability. Low income and unemployment were reported to be associated with food insecurity (29, 30, 32). Furthermore, low income combined with high food costs resulted in many Aboriginal and Torres Strait Islander Australians spending a large proportion of their income on food, and contributes to concerns about going without food (29). The cost of food is higher in remote Aboriginal and Torres Strait Islander communities than for those living in urban and regional areas (30). Accessibility was related to restrictions on Aboriginal cultural fishers (30) and difficulties in accessing affordable healthy food (31, 32).

Submissions and inquiries (n = 14)

The House of Representatives Standing Committee on Indigenous Affairs *Inquiry into food pricing and food security in Remote Communities* (30) identified factors contributing to food insecurity related to storage, availability, accessibility, affordability, systemic causes (including fishing enterprises), and other factors (such as continuity of power and reliable electricity and improved road infrastructure to improve the supply of food) and the impact of crises by ensuring food supply during pandemics, natural disasters and seasonal changes. The Australian Government response to the House of Representatives Inquiry acknowledged these factors and stated in principle support for recommendations 11 and 13 which relate to them (36).

The New South Wales Aboriginal Land Council's submission to the House of Representatives Inquiry (40) addressed factors contributing to food insecurity related to financial, geographical location, transport, housing, education, availability, affordability, social and systemic causes including inequities in social status. Systemic causes included restrictions on Aboriginal cultural fishing activity and suggested maintaining a primarily colonised diet denies people the option to reintroduce and/or maintain decolonised diets. The impact of COVID-19 was addressed suggesting that panic buying affected food supply and exacerbated existing food insecurity issues in remote towns.

The NSW Government Submission to the Legislative Assembly Committee on Environment and Planning *Inquiry into Food production and supply in NSW* (43), addressed the factors contributing to food insecurity related to financial, storage, nutrition literacy, availability, and accessibility. The impact of COVID-19 was addressed highlighting the food production and supply capability risks.

The Aboriginal Health and Medical Research Council (AH&MRC) of NSW's submission to the Inquiry into food production and supply in NSW (37) addressed factors contributing to food insecurity related to financial, geographical location, transport, housing, cooking facilities, storage, availability, affordability, systemic causes, and other factors such as environmental variability. Systemic causes included issues with food across the domains of availability, utilisation and stability underscored by

ongoing colonisation. The AH&MRC of NSW's supplementary questions to the Inquiry (38) addressed factors contributing to food insecurity related to financial, geographical location, housing, cooking facilities, storage and affordability. Environmental challenges such as severe weather events and natural disasters (for example, bushfires and floods) were described, as was their impact on supply chains and food access:

“An example of this were the recent Northern NSW floods during which communities experienced significant infrastructure damage and many were cut off from supply lines. These floods highlighted our food insecurity with images of fresh produce being dumped because of flood damage; empty supermarket shelves and local groups delivering meals to affected areas using jet skis and helicopters to feed desperate communities” (38).

The New South Wales Land Council's submission to the Inquiry into food production and supply in NSW (39) addressed factors contributing to food insecurity related to financial, geographical location, transport, housing, availability, affordability, and social including inequities in social status. The impacts of COVID-19 were addressed, suggesting that the pandemic exacerbated pre-existing disadvantages.

The City of Sydney Council's submission to the Inquiry into food production and supply in NSW (41) addressed factors contributing to food insecurity related to financial, availability, affordability and systemic causes including intergenerational trauma and traumatic food rationing. The impact of COVID-19 was addressed suggesting the pandemic and associated financial crisis exacerbated the issue.

The Community Gardens' submission to the Inquiry into food production and supply in NSW (42) reported that the factor contributing to food insecurity was geographical location in that Aboriginal communities are often isolated geographically and are vulnerable to supply chain shortages. The impact of COVID-19 was addressed suggesting panic buying increased supply chain shortages.

The NSW Government's submission to the House of Representatives Inquiry (49) addressed the factors contributing to food insecurity related to financial, geographical location, transport, nutrition literacy, availability, accessibility, affordability and crises. Examples across NSW:

- *“Baryulgil and Malabugilmah communities have no local food stores. These Aboriginal communities thus travel to Grafton for supplies (1hr drive)”.*
- *“In Ngulingah NSW, the food prices in their local store are high, with a lettuce for \$6.00 and tomatoes for \$9.00/kg”.*
- *“When the Walgett's only supermarket burned down in 2019, the community had to travel 80km for an alternate food store”.*

Foodswell Limited's submission to the Inquiry into food production and supply in NSW (44) addressed systemic causes regarding cultural burning practises.

Sustain: The Australian Food Network, submission to the Inquiry into food production and supply in NSW (47) addressed systemic causes including the loss of Aboriginal culture and farming practices.

The George Institute for Global Health's submission to the Inquiry into food production and supply in NSW (48) addressed factors contributing to food insecurity related to accessibility, affordability, systemic causes and other including the vulnerability of the current food system. Their recommendations included addressing systematic causes such as: "*The ongoing effects of colonisation, including racism, intergenerational trauma, stolen generations and loss of land [and that these], be addressed in relation to their effects on cultural continuity and well-being, as part of a holistic approach to tackling food and water security*". The impact of COVID-19 was addressed highlighting panic buying in cities disrupting food supplies.

Submissions were also made to inquiries by individuals (46) and these addressed financial factors as well as systemic causes.

Submissions to the Parliament of NSW *Inquiry into the commencement of the Fisheries Management Amendment Act 2009* specifically paragraph c) the failure to proclaim the commencement of Schedule 1 of the Fisheries Management Amendment Act 2009 concerning Aboriginal cultural fishing (45) emphasised the impact of non-commencement on Aboriginal peoples and the practice of Aboriginal cultural fishing and farming practices.

Other (n = 3)

The NSW Aboriginal Affairs website includes information on assistance packages to help Aboriginal communities impacted by COVID-19 (33) and highlighted the challenges and acute need to access to basic food in remote Aboriginal communities.

Media by The Conversation titled Restrictions on Cultural Hunting Practices are Limiting Indigenous Peoples Access to Food During the Pandemic (34) addressed systemic causes: "*The protection of cultural activities are not prioritised within the public health orders in NSW. This contributes to growing food insecurity in affected communities*". The impacts of COVID-19 were addressed, highlighting that: "*Western NSW has been significantly affected by rising COVID-19 cases in Aboriginal communities. Some have limited financial resources to purchase food, which in rural and remote areas, is comparatively overpriced*".

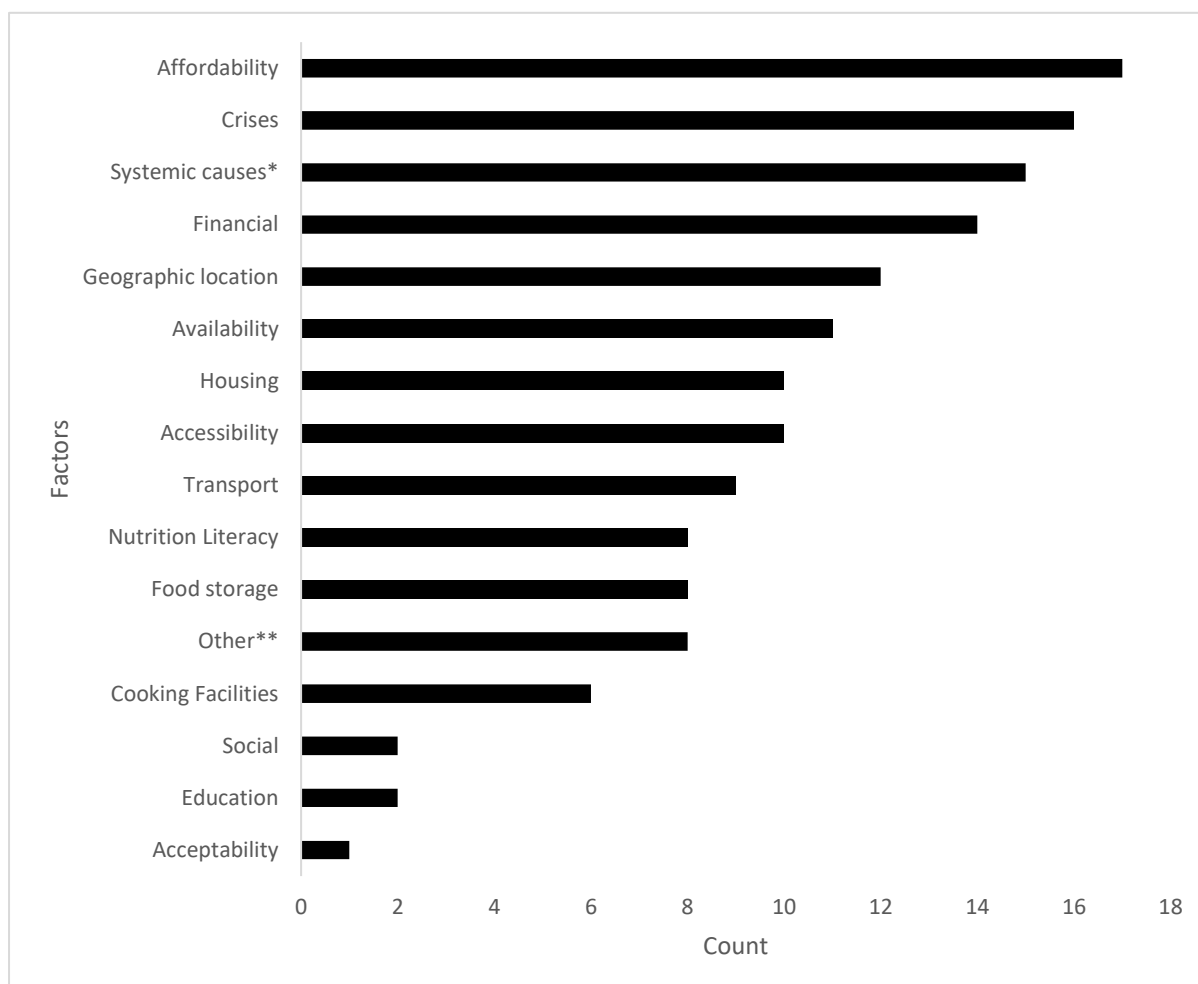
The Australian Prevention Partnership Centre's project Improving Aboriginal food security and dietary intake: approaches for remote and urban communities (35), addressed factors contributing to food insecurity related to geographic location, transport, nutrition literacy, affordability and others, such as the time taken to shop and cook healthy meals.

Defining and then categorising systemic causes of food insecurity for Aboriginal peoples in NSW, within the context of structural impacts within a settler colonial system, was beyond the scope of this review. However, such research needs to be undertaken to provide a framework for research and evaluation, and policy and practice.

Summary

Only five peer-reviewed articles were eligible for inclusion in this review, with three studies specific to NSW. This highlights the limited evidence base for NSW. Five reports were included in this review, mostly reporting national data, therefore separating factors specific for NSW proved difficult. While programs specific to NSW addressing food security were identified through grey literature searching (Search 1), most programs had not been evaluated, published, or reported (see Appendix 7). For all included literature, the main factors contributing to food insecurity for Aboriginal and Torres Strait Islander people in NSW were affordability and systemic causes which has been exacerbated by the impact of crises (see Figure 3).

Figure 3: Factors that contribute to food insecurity for Aboriginal and Torres Strait Islander peoples in New South Wales. This table includes data from peer-reviewed literature (n=5) and grey literature (n=22) Australia wide (inclusive of New South Wales).



*Systemic causes defined as the ongoing impacts of colonisation including changes in the local food systems, loss of cultural food practices, knowledge, language and lore. **Other includes those not fitting the included factors.

Question 2: The scale and distribution of food insecurity for Aboriginal peoples in NSW

The review team identified five peer-reviewed food insecurity publications that met the inclusion criteria for the rapid review. The data extraction table can be found in Appendix 4. Eleven grey literature publications also met the inclusion criteria. The data extraction table can be found in Appendix 5.

Peer-reviewed literature (n = 5)

Three of the five included peer-reviewed publications were NSW specific (5, 25, 52) and two included national data, inclusive of NSW (27, 28). Of the studies specific to NSW, one was urban (52), one urban and regional (5) and one included urban, regional and remote areas (25). From these studies, the total number of participants ranged from 12 (100% Aboriginal) (25), to 44 (50% Aboriginal) (5), and 162 (4% Aboriginal) (52).

The publication by Follent et al. (25) was NSW specific and included 12 Aboriginal community members with lived experiences and perspectives regarding the indirect impacts of COVID-19. Aboriginal community members were from urban, regional and remote areas (Eora, Wilyakali, Bundjalung, Yuin and Gumbaynggirr lands). Based on lived experiences from Aboriginal community members and anecdotal community feedback, food insecurity increased for some Aboriginal people in response to COVID-19.

The publication by Langton et al. (52) was NSW specific and included six urban Aboriginal participants. The United States Department Agriculture abbreviated six-item subset food insecurity tool was used to measure food security. All Aboriginal participants were reported to be food insecure. The authors acknowledged that even though Aboriginal people were more likely to be food insecure, the small sample did not allow for analysis and comment.

The publication by Sherriff et al. (5) was NSW specific and described Aboriginal community and stakeholders' perspectives on food insecurity in NSW urban (Campbelltown) and NSW regional (Wagga Wagga) areas. The authors reported that Aboriginal families in the urban location of Campbelltown and regional location of Wagga Wagga experienced food insecurity on a regular basis. An Aboriginal Elder described the fluctuating nature of food insecurity around employment. It was noted that many families in the community relied on food relief services, but some were unfamiliar with how to access the services, and that those who were employed considered themselves the "working poor" making them ineligible for many food relief services. Delays in appointments and constraints on accessing vouchers and hampers were discussed in this publication. Participants also expressed that generally Aboriginal families are larger, and the food relief services do not take this into consideration: "*\$30 for me and six children ... for the single families with two kids it was \$20. I don't know how they got a \$10 difference with an extra four kids. But that's how they work it out*" (Aboriginal mother).

Temple et al. (27) used nationally representative data from the Australian Bureau of Statistics (ABS) *Australian Aboriginal and Torres Strait Islander Health Survey 2012-2013*, to examine the prevalence and correlates of food insecurity among older Aboriginal and Torres Strait Islander Australians.

The survey asked two questions regarding food security: 'In the last 12 months was there any time when you (or members of this household) ran out of food and couldn't afford to buy more?', with a follow up question: 'When this happened, did you (or members of this household) go without food?'. Of the older Aboriginal and Torres Strait Islander population, 21% were food insecure. About 41% reported both food depletion and inadequate intake. The authors reported that food insecurity was high in both urban and remote settings.

Thurber et al. (28) published the second study using nationally representative data from the *National Aboriginal and Torres Strait Islander Health Survey*. Compared to the reference category (ran out of food and went without), it was reported that those that did not run out of food had 60% lower risk of severe COVID-19 illness.

In summary, Aboriginal Australians are experiencing food insecurity, but the scale and distribution in NSW is unknown due to the limited data available in NSW. Three studies were NSW specific, and each study had a small sample size therefore, the findings may not be generalisable to all Aboriginal peoples in NSW. In terms of location, Aboriginal peoples living in urban, regional and remote areas are vulnerable to food insecurity, but it was not possible to report the severity difference for each area due to the lack of evidence.

Grey literature (n = 11)

The ABS *Australian Aboriginal and Torres Strait Islander Health Survey: Nutrition Results – Foods and Nutrients* (53) used nationally representative data from 2012-2013. It reported that 22% of Aboriginal and Torres Strait Islander people were living in a household where someone went without food when the household ran out of food. In terms of location, a total of 31% of Aboriginal and Torres Strait Islander people living in remote areas had run out of food and could not afford to buy more, which was more than in non-remote areas (20%).

The Australian Health Ministers' Advisory Council *Aboriginal and Torres Strait Islander Health Performance Framework* (29) also used nationally representative data from 2012-2013. It reported that 9% of Indigenous Australians aged 15 years and over went without food when they could not afford to buy more.

The Australian Indigenous HealthInfoNet, *Summary of Nutrition among Aboriginal and Torres Strait Islander people* (54), used nationally representative data from 2012-2013. It was reported that 7% of Aboriginal and Torres Strait Islander people had run out of food and gone without food; 15% had run out but not gone without food; 22% had run out of food and couldn't afford to buy more; 31% in remote areas had run out of food compared with 20% in non-remote areas; 9.2% in remote areas had run out of and gone without food compared with 6.4% in non-remote areas.

The previously mentioned 2020 House of Representatives Standing Committee on Indigenous Affairs, *Report on food pricing and food security in Remote Indigenous Communities* (30), reported data from the ABS *National Aboriginal and Torres Strait Islander Health Survey 2018-2019*. In 2018-2019, 43% of Aboriginal and Torres Strait Islander people reported running out of food and could not afford to buy more in the last 12 months, compared to 37% in 2012-2013.

The National Rural Health Alliance's report, *Food Security and Health in Rural and Remote Australia*, used nationally representative data (31). The report documented that: "Food insecurity exists in all states and territories, and in both rural and urban settings, but those most seriously affected are in

remote Aboriginal and Torres Strait Islander communities". Evidence was reported for NSW (although not specific for Aboriginal and Torres Strait Islander peoples) via the NSW Population Health Survey which is conducted using assisted telephone interviewing technology. It was reported that food insecurity was experienced by between 5% to 7% of the NSW population aged 16 years and older in 2002, 2007 and 2014.

The previously mentioned 2018 Parliament of NSW report *Fresh food pricing* (32), used Australian wide data inclusive of NSW. In their submission to the report inquiry the Public Health Association of Australia noted that food insecurity was reported by 18.5% of Aboriginal people in NSW. In terms of location, one in five Aboriginal people in non-remote areas experience food insecurity and one in four in remote areas. It was reported that many use food relief services: *"It is common practice to rely on bargains and specials, buy large meat packs for a cheap prices that would feed a large family and pick up subsidised fruit and vegetable boxes from charitable organisations"*.

The NSW AH&MRC submission to the NSW Legislative Assembly Committee on Environment and Planning Inquiry into Food Production and Supply in NSW (37), reported that food security disproportionately impacts Aboriginal communities in NSW.

The City of Sydney Council's submission to the Inquiry into Food Production and Supply in NSW (41), used Australia wide data inclusive of NSW. The submission reported data from the 2018 City of Sydney's Wellbeing Survey in which 33.7% of Aboriginal and Torres Strait Islander people indicated that in the past year they had run out of food and could not afford to buy more. It was also documented that food insecurity is shown to affect people in cities right through to those in remote areas and it affects more people in some form of employment (64%) than those who have none.

The NSW Government's submission to the Inquiry into Food Production and Supply in NSW (43) reported on Census data in that Aboriginal and Torres Strait Islander people are at five to seven fold risk of experiencing food insecurity relative to their non-Indigenous peers.

The NSW Government submission to the House of Representatives Inquiry into food pricing and food security in remote Indigenous communities (49) reported that food security is not only an issue in remote Aboriginal communities, but in all Aboriginal communities in NSW including those located in outer regional and rural areas.

Media by The Conversation titled, *Restrictions on Cultural Hunting Practices are Limiting Indigenous Peoples Access to Food During the Pandemic* (34), used Australia wide data inclusive of NSW. It was reported that: *"Western NSW has been significantly affected by rising COVID-19 cases in Aboriginal communities. People are also having to rely on food donations. This has worsened the longer lockdowns have continued and may have lasting effects once they are over"*.

In summary, it is known from nationally representative data from 2012-2013 that 22% of Aboriginal and Torres Strait Islander Australians experience food insecurity. However, the data is not reported by state, so it is unclear what proportion of those experiencing food insecurity are from NSW. More recent data from the *National Aboriginal and Torres Strait Islander Health Survey 2018-2019*, showed that 43% of Aboriginal and Torres Strait Islander people were food insecure. In terms of NSW specific data, the *City of Sydney Wellbeing Survey* reported that 33.7% of Aboriginal and Torres Strait Islander people as food insecure, and The Public Health Association of Australia reported that 18.5%, of Aboriginal and Torres Strait Islander people were food insecure. While it has been documented that food insecurity exists in all states and territories, and in both rural and urban settings, the national

evidence shows that a higher proportion of Aboriginal and Torres Strait Islander people living in remote areas are food insecure compared to those in non-remote areas. However, all Aboriginal communities in NSW experience food insecurity, not just those in remote areas and given that the majority of Aboriginal and Torres Strait Islander people live in urban areas, addressing food security in urban areas would reach a greater number of Aboriginal and Torres Strait Islander people.

Summary

There were only five peer-reviewed articles with three studies specific to NSW. This highlights the limited evidence base for NSW. Eleven grey literature publications were included which addressed the scale and distribution of food insecurity, but these mostly reported national data. Aboriginal and Torres Strait Islander Australians are experiencing food insecurity, but the scale and distribution is unknown due to the limited data available in NSW. Aboriginal and Torres Strait Islander people living in urban, regional, and remote areas of NSW are vulnerable to food insecurity but the severity difference for each area could not be reported due to the lack of data.

Question 1 & 2: Critical appraisal

Assessment of quality of evidence

The studies included a report of a meeting of Aboriginal Elders to discuss community needs during the COVID-19 pandemic (25) which would be considered expert opinion in the evidence pyramid but is most appropriate to inform policy planning. The cross-sectional study by Langton et al. (52) which used recruitment by health professionals at six sites, appears to suffer from selection bias, and only six of the 162 participants were Aboriginal people and therefore, the results would not be generalisable. The cross-sectional study by Miller et al. (26) reported on a survey collection as part of a large cohort study of Aboriginal children. The study involved carers and analysed open-ended responses to an Aboriginal researcher administered question. The replies were analysed using best practice methods of content analysis with coding for major themes completed by more than one researcher and inter-rater agreement reported. The findings are likely generalisable and could be used to guide practice and policy. The study by Sheriff et al. (5) was a qualitative research study investigating perspectives on food insecurity. Results identified important actions applicable to easing food insecurity, and while conducted in a small population number (n = 44) the study provides important insights applicable to policy and practice planning. The cross-sectional survey by Temple et al. (27) was based on secondary analysis of the 2012-13 Australian Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey (27). As the sample was large (n = 1062), the findings are likely generalisable to Aboriginal and Torres Strait Islander people aged 45 years over and could be used to inform programs and policy. The cross-sectional study by Thurber et al. (28) was also based on analysis of a national survey (the 2018-19 *National Aboriginal and Torres Strait Islander Health Survey*).

The Aboriginal and Torres Strait Islander Quality Appraisal Tool

According to the Aboriginal and Torres Strait Islander Quality Appraisal Tool, two studies were rated as high (5, 25), two medium (26, 28) and two low (27, 52). Most studies demonstrated Aboriginal and Torres Strait Islander leadership and governance with the research responding to a need or priority determined by the community. Capacity building was also observed in most studies with research guided by Indigenous research paradigms, taking a strengths-based approach and translation of findings into sustained changes in policy or practice. The quality assessment elements most frequently lacking were respect for cultural and intellectual property and rights, as well as beneficial outcomes such as Aboriginal and Torres Strait Islander capacity strengthening. See Appendix 6, Table S7 for the Aboriginal and Torres Strait Islander Quality Appraisal Tool results table of peer-reviewed articles for Search 1.

Question 3: Policies and programs that have been effective in improving food security for First Nations people, nationally and internationally

The review team identified 12 peer-reviewed articles that met the inclusion criteria for the rapid review. Seven publications were from the United States of America (55-61) and five from Canada (62-66). No publications from Australia or New Zealand met the inclusion criteria. The data extraction table can be found in Appendix 8. Two grey literature publications from Australia also met the inclusion criteria for the rapid review (49, 67). The data extraction table can be found in Appendix 9.

Peer-reviewed literature (n = 12)

Majid et al. (64) described a Canadian study in remote communities in the North that aimed to 1) increase access by Northern populations to nutritious foods; 2) lower prices of nutritious foods in the North; and 3) promote healthy eating. The Food Mail Program increased access to healthy foods by subsidising the cost of food transport. While the program had mixed results, stakeholders agreed that the program provided value and served an important function to the community, with the program experiencing growth over the last five years. Some of the challenges included the difficulties of focusing primarily on the supply chain and issues with the shipment of perishable foods. Surveyed residents felt that the subsidy was not passed on by retailers. It was also suggested that the list of eligible foods needs revising to reflect community preferences (i.e. to include staple/cultural foods).

An American study by Jernigan et al. (55) in Round Valley aimed to 1) identify community priority factors using the Tool for Health and Resilience in Vulnerable Environments (THRIVE) assessment tool; 2) link these priority factors to local community issues; and 3) design and implement policies related to the community issues. In response, policies were developed and implemented (no evaluation of impact described) by the program team. The results suggested that participatory oriented research, coupled with a culturally adapted tool may be effective in identifying structural determinants of food insecurity and initiating novel policy interventions. Some key changes in the community were new training and job opportunities and local ownership for First Nations people supporting tribal sovereignty; local grocery stores changed the shelf space for inclusion of more fresh fruit and vegetables; portable Electronic Benefit Transfer (EBT) machines were implemented at the farmers markets allowing residents to use food assistance funds through a card-based system as well as culturally appropriate foods sold at the markets.

Key effective steps identified:

- Addressed and examined upstream determinants of food insecurity
- Priority determinants for change identified by community engagement
- Changed the food environment (e.g. removing barriers to healthy eating such as reallocation of shelf space to include fruit and vegetables)
- Established the 'Community Coalition' (community leaders, health centre staff and researchers) committed to creating sustainable change
- Funding was obtained for several novel pilot programs and interventions
- The use of the THRIVE tool which was culturally adapted
- Focus groups allowed community members to tell their stories

-
- Developed a “Community Supported Agriculture” program so that local produce could be sold in the local community and the guarantee of payment to growers
 - Successful translation into practice.

Ford et al. (65) described a Canadian study in Northwest Territories that aimed to develop a baseline understanding of the “Community Food Programs” usage (e.g. food banks and soup kitchens) and associated determining factors. The study used a mixed methods approach including photovoice workshops (n = 7) and open-ended questions (n = 54). The findings revealed that participants depended on the programs for regular food access with the main users being housing insecure and lacking regular employment. The authors acknowledge that *“While Community Food Programs do not address the underlying causes of food insecurity, they provide an important service for communities undergoing rapid change and need greater focus in food policy herein”*.

An American study by Gordon et al. (56) aimed to inform food assistance policy. The agencies of eight states and two Indian Tribal Organisations received grants to implement a “Summer Electronic Benefit Transfers for Children” (summer food assistance through EBT) using the Special Supplemental Nutrition Program for Women, Infants, and Children and the Supplemental Nutrition Assistance Program. Ten grantees administered the program in 14 sites in 2012 (42,000 households). The study was a randomised trial with households randomly assigned to the benefit group or control group. The benefit group received \$60 per child during summer. The findings showed that the benefit group had large reductions in very low food security among children compared to controls. Challenges included funding, attracting sponsor agencies and site locations, lack of transportation to program sites, lack of programs open for the full summer holiday period and that Indian Tribal Organisations could only be grantees for the Women, Infants, and Children model sites.

Another Canadian study, by Galloway (66) in remote Northern communities, aimed to provide an independent and comprehensive evaluation of the Nutrition North Canada program. The retail subsidy program was designed to reduce the cost of nutritious food within a context of severe food insecurity. The findings showed that the existing retail subsidy did not ensure fair and equitable access to nutritious, healthy food across regions and communities. The main limitation was the lack of accountability: *“These problems are compounded by the failure of the program to respond to the concerns about community eligibility, subsidy rates, eligible foods, and retailer accountability that have been raised by community members, critics, the Auditor General of Canada, and the program’s own Advisory Board”*. Findings from this study reported that food prices were high, and there was a consistent pattern of price inequities not being alleviated by current subsidy rates. The retail subsidy program requires a more rigorous system of retailer accountability and a strong regulatory framework for food pricing.

The publication by Mucioki et al. (57) was an American study in the Klamath Basin that aimed to investigate opportunities and challenges of the Food Distribution Program on Indian Reservations to achieve food security as well as the extent to which integration of traditional foods can enhance Native American food security, food sovereignty and wellbeing. Fourteen key informant interviews, 20 focus groups with 128 Native American participants, and 708 household surveys were completed. The findings showed that over 60% of respondents relied on food assistance and that the Food Distribution Program on Indian Reservations was essential to food security. Receiving monthly food boxes helped stretch income to cover other monthly expenses. It was identified that a *“more food sovereign”* box that integrates traditional and local foods produced according to cultural norms and values could enhance Native American food security, food sovereignty and wellbeing. However, the

authors acknowledged that “*True food sovereignty involves the return of lands and rights to govern them to Native people*”. Some of the challenges included client transport issues, an unreliable delivery system to remote areas and eligibility requirements.

Key effective steps identified:

- Home drop off service for the elderly or disabled clients and those who had limited access to transportation or insufficient funds for fuel
- Collective advocacy is required in order to improve nutritional quality
- Inclusion of traditional foods in the commodity food boxes
- Uphold cultural values and principles of self-determination that support holistic health and wellbeing.

A set of policy recommendations were proposed to better support a sustainable food secure environment:

- “Think beyond the [commodity] box in programming designed to reduce food insecurity such as enabling hunting/fishing and gathering rights and augmenting federal funding for cultural lands and fisheries restoration to restore the quality, availability and abundance of traditional food
- Reconsider policy restrictions that inhibit vulnerable populations from accessing [Food Distribution Program on Indian Reservations] when enrolled in other welfare assistance programs
- Increase the amount and frequency of delivery of fresh fruits and vegetables to ensure better quality. This could be accomplished by sourcing from local producers, allocating funds to support a farm or garden on-site at the [Indian Tribal Organisations], or having a bi-weekly vegetable and fruit drop-off
- [Decentralise] traditional foods procurement and distribution. This can be accomplished by funding the 2014 Farm Bill provision to allow tribes, pueblos and nations to purchase local produce and traditional foods for [Food Distribution Program on Indian Reservations]
- Augment funding allocations towards the purchase of traditional foods
- Tailor [United States Department of Agriculture] vendor and procurement procedures to prioritize culturally specific rearing and processing practices of traditional foods that are sourced for the [Food Distribution Program on Indian Reservations] program
- Source traditional foods for the [Food Distribution Program on Indian Reservations] program from Native American owned businesses that are local to the area of significance for each traditional food and that adhere to agreed upon tribal sustainability metrics developed in consultation with tribes, pueblos, and nations in each region
- Create Native American vendor pilot projects to supply traditional foods on a local scale. This will help develop local, Native American vendors, provide opportunity for education and training, and increase the likelihood of success
- Provide a different type of remuneration structure for tribes who do wish to provide their traditional foods to local [Food Distribution Program on Indian Reservations] clients but do not wish to commercialize their traditional foods through [United States Department of Agriculture] vending. This should include a way to manage for, harvest, and distribute these foods in a way consistent with tribal policies, codes, and values”.

Ahmed et al. (58) described a methodological approach to evaluating and improving food environments on the Flathead Reservations in America. The authors described their lessons learned towards the advancement of healthy and sustainable food environments:

- “Food environments are multifaceted and require multiple context-specific measurements to capture distinct yet complementary factors
- Food desirability is an important, but overlooked measurement of the food environment’
- Successful food-environment interventions are community-based, incremental and multi-phased
- Food-environment interventions should be linked with existing institutional structures
- Findings from food-environment interventions should be disseminated using a multi-pronged strategy to multiple groups of stakeholders”.

Bersamin et al. (59), aimed to evaluate the efficacy of the “Fish-to-School Program” on diet quality, fish intake, and attitudes and beliefs around traditional foods in rural and remote Alaskan Native communities. The intervention’s overarching framework used social cognitive theory combined with First Nations traditional knowledge. The intervention had two phases 1) identifying themes, and 2) integrating the themes into activities in the cafeteria, classroom and community. The school-based intervention demonstrated that a culturally-based food systems intervention can improve diet quality and increase intake of traditional foods. The authors acknowledge that *“The adaptation and implementation in other First Nation communities will require a participatory approach to align the intervention with local values and to adequately address contextual factors that may either support or impede program adoption”*.

Key effective steps identified:

- Multilevel intervention that combined communities’ worldviews with evidence-based strategies
- Balance scientific rigor with community desires and practical considerations
- Promotion of the local food system supported food security via leveraging cultural and physical resources of the traditional food system
- Evaluations efforts should incorporate a framework using mixed-methods to systematically measure the public impact.

The authors included translational implications for policy, practice and research:

Policy: *“Policy makers who want to improve food security and diet quality should understand the important role that traditional foods play in promoting well-being. Policies that require schools to adopt programs and curricula that meet standards for culturally responsive schools can help promote the cultural and physical well-being of students”*

Practice: *“Codeveloping an intervention with community members using a strength-based approach may result in faster adoption of the program and greater sustainability. Schools can serve as a key venue for health promotion programs to reach underserved students in remote communities”*

Research: *“Programs that reconnect Indigenous youth with their traditional food system may be used to promote food security and improve diet quality”*

The publication by Pindus et al. (60) was an American study on American Indians and Alaskan Natives with the aim of developing a national profile of Food Distribution Program on Indian Reservations (FDPIR) participation, and an understanding of program operations. The study used mixed methods and 1053 households were included. The findings showed that the FDPIR and locally sourced food initiatives helped to meet community needs. The FDPIR was the primary source of food for 38% of households and for some it contributed 81-100% of their food supply. Some challenges identified were lack of financial resources, the need for increased staffing, transport and scheduling constraints and limited technological or physical infrastructure to support operations.

Key effective steps identified:

- Multisector partnerships can facilitate access to healthy food options
- Inclusion of nutrition education activities and establishing partnerships
- Integration of gardening and farming skills
- Nutrition education showed to be a worthwhile investment
- Appropriate solutions will vary by community and should be regularly reassessed at the federal and community level to reflect community's needs.

The publication by Timler et al. (62) was a Canadian study which aimed to address inmate rehabilitation and First Nations' community food insecurity by supporting men in prison to grow and donate their produce to First Nations communities in rural and remote areas. Qualitative data was collected through interviews and observation, and cooking workshops were conducted in community. The findings suggested that benefits to the communities of receiving produce were minimal and the focus on food security ignored the ongoing colonial contexts. Cooking workshops were shown to be beneficial and to provide opportunities for social bonding. A limitation was that the distribution did not connect the communities to the men working in the prison garden and that there was limited information on unfamiliar vegetables.

Briefel et al. (61) described an American study in Chickasaw Nation Territory which aimed to determine if the "Packed Promise" intervention reduced food insecurity among low-income households with children eligible for free school meals. The study design was a cluster randomised control trial for 25 months with treatment (n = 20) and control school districts (n = 20), with a total of 115 schools. The households from the treatment schools selected from five types of food boxes that contained nutritious shelf stable foods (\$38 food value) and \$15 check was provided for fruits and vegetables. The findings revealed that the intervention improved adults' food security in the first year by three percentage points, benefiting the household as a whole and children indirectly but this was not observed at 18 months. The authors explained that the lack of impact may be due to the use of nutrition assistance programs among the treatment and control groups and that economic circumstances needed to be addressed.

The publication by Blanchet et al. (63) was a Canadian study in Okanagan Nation which aimed to describe the reach of the Syilx-led reintroduction of salmon (Okanagan Sockeye) intervention and assess its impact on Syilx households' income-related and cultural food security status. The study design was cross-sectional, based on survey data for 265 households. The findings showed that First Nations-led multi-level wild habitat restoration interventions increased salmon availability and accessibility which was shown to be associated with cultural food security. The authors highlighted that *"First Nations food sovereignty initiatives can increase traditional food access and consumption, thereby enhancing cultural food security"*.

Grey literature (n = 2)

Health and Wellbeing Queensland, *Affordable Access to Healthy Food and Drinks*, 2020 (67) is currently being delivered and aims to improve remote food insecurity for Aboriginal and Torres Strait Islander communities in the Torres Strait, Cape York and Lower Gulf regions of Queensland. Food security for Aboriginal and Torres Strait Islander communities is a strategic priority, and a framework was developed to address the three food security domains (access, availability and utilisation) at each level of the system (family and individual, community and system) (68). Round table themes highlighted a system for resilient, stable food secure remote communities:

The NSW Government's submission to the House of Representatives Inquiry into food pricing and food security in remote Indigenous communities, 2020 (49), highlighted that collaborative efforts across government and community is needed to achieve sustainable food security. For example, Ngulingah Local Aboriginal Land Council integrated community gardens through existing enterprises of a nursery and ranger programs. The Goodooga store is an example of a collaborative effort across governments and community whereby the Australian Government provided \$1.7 million to build the store on land owned by the Goodooga Local Aboriginal Land Council as the community had been without fresh food for over ten years. Wilcannia's Community Kitchen is another example of a locally driven project that is government supported to address food insecurity.

Summary

Twelve peer-reviewed and two grey literature publications met the inclusion criteria for the rapid review. There was a lack of evaluated programs for NSW (and Australia) with no peer-reviewed publications identified from Australia for inclusion in this report. International programs that were effective in addressing food insecurity were participatory research which were governed by community and reflected community priorities. Other international programs were shown to be effective when cultural knowledges were integrated to increase the availability and accessibility of cultural foods. Six articles (five programs) described subsidies (largely food provision and transport costs) and another described provision of financial benefits however, there were mixed results reported about their effectiveness. Programs that are participatory-based, governed by community, integrate cultural knowledge and food systems to increase availability and accessibility of cultural foods, and utilise interagency collaborations appear most suitable.

Question 3: Critical appraisal

Assessment of quality of evidence

The program evaluation by Majid et al. (64) was qualitative and involved stakeholder consultations conducted by internal and external consultants (including a Canadian government independent appointee). Methods of data analysis were not described. Jernigan et al. (55) applied a participatory research approach and used a community adapted policy engagement framework to rate social and environmental factors. Summative content analysis (using NVivo) was applied to focus group data and community members reviewed all findings. Ford et al. (65) used a mixed methods approach to understand users of the Community Food Program. Methods used were pre-tested and adapted for Inuvik peoples. Gordon et al. (56) also used a mixed methods approach with a US government food security scale and a Food Frequency Questionnaire to assess the key outcome of children's food security, plus an analysis (proportions) of benefit redemption records. Telephone interviews were conducted on children's food intake. Validated questions were used for collection of food data. Galloway (66) used a modified conceptual framework which focussed on program performance and equity of outcomes. An independent, comprehensive evaluation was conducted primarily using data extracted from program documents, along with some external reports. Descriptive statistics compared results across provinces and results were compared with program performance outcomes.

The study by Mucioki et al. (57) was part of larger project using mixed methods research, co-created with Tribal partners. It involved interviews with key informants, twenty focus groups and household surveys. NVivo was used to assist with coding and establishing themes. Quantitative data was analysed using descriptive statistics and the Fishers exact test was applied using Stata (version 14.2) to establish significance of key outcomes. The case study report by Ahmed et al. (58) in one community used 12 measures (three of which had been developed and validated for the study) including surveys, interviews and indices. However, the study only reported key findings with no methods or analysis described.

The pilot study described by Bersamin et al. (59) used a well-designed theoretical framework to a multi-level intervention, consideration was applied to the sample size and avoiding contamination between schools. Biomarkers and 24-hour recalls measured outcomes. Analysis established the statistical significance of key outcomes. The study had a good data analysis plan and did not appear to suffer from selection, measurement or reporting bias.

Pindus et al. (60) used a mixed methods study design. A nationally representative sample was recruited, and the method described. Descriptive data, short form food insecurity responses and interview data (high response rate of 69% to 95%) were collected however, no description of the analysis was provided.

The study by Timber et al. (62) was ethnographic in design. Qualitative data was collected via interviews and participant observation using purposive sampling.

Briefal et al. (61) used a cluster randomised controlled trial design and standardised data collection methods at three time points with an average monthly participation rate of 61%. A comprehensive analysis used sample weights to account for the complex design and adjusted for non-responders. Analysis established the statistical significance of key outcomes, and a logistic regression model was implemented. Standard errors accounted for clustering and stratification of households.

The cross-sectional study by Blanchet et al. (63) was part of a larger study using community-based participatory research. Measurement tools included a traditional Food Frequency Questionnaire adapted by the participating community, a food security survey developed by US government (adapted for First Nations populations generally) and a purpose designed food security question on worry about traditional food running out.

Aboriginal and Torres Strait Islander Quality Appraisal Tool

According to the Aboriginal and Torres Strait Islander Quality Appraisal Tool, six studies were rated as high (55, 57-59, 63, 65), two medium (61, 62) and four low (56, 60, 64, 66). Most studies demonstrated First Nations leadership and governance, with priorities determined by the community and community consultation. Capacity building was also observed in most studies with research guided by Indigenous research paradigms, taking a strengths-based approach and translation of findings into sustained changes in practice. The quality assessment elements most frequently lacking were respect for intellectual and cultural property and rights, negotiated agreements to protect knowledges of First Nations peoples, as well as beneficial outcomes including learning from each other. See Appendix 10, Table S11 for the Aboriginal and Torres Strait Islander Quality Appraisal Tool results table of peer-reviewed articles for Search 2.

Discussion

This rapid review aimed to inform findings on the factors, scale and distribution of food insecurity in Aboriginal and Torres Strait Islander communities in NSW, and to provide evidence and context for any program or policy recommendations arising from it. The twelve boxed 'guidances', below, underpin the three concluding points in the executive summary. The guidances were formed from research in the NSW context in addition to the programs that were shown to be effective from the international studies identified from question 3: "What policies and programs have been effective in improving food security for First Nations people, nationally and internationally?" There was a lack of evaluated programs for NSW (and Australia) with this question drawing on studies from America and Canada only.

The research base is sparse and of limited quality and specificity, such that the guidances should be considered advisory rather than definitive. The majority of the research for the effective programs was conducted in remote locations, and therefore the suggestions are largely limited to this context. It is important to note that in NSW food insecurity is not only an issue in remote Aboriginal and Torres Strait Islander communities, but in all Aboriginal and Torres Strait Islander communities, including urban and regional areas. As reported in the background of this report, the largest proportion of Aboriginal and Torres Strait Islander families live in urban and regional locations and their needs must also be taken into account.

The search also identified numerous examples of food security activities that demonstrated the necessity for food security programs to address multiple and inter-related factors such as affordability, Aboriginal community ownership, government policy and legislation, crises, and cultural foods. Therefore, in improving food security for Aboriginal people in NSW, the twelve guidances in the discussion should be bound to an approach that privileges Aboriginal community voices.

When examining the peer-reviewed articles and grey literature this rapid review found that the three major factors contributing to food insecurity for Aboriginal and Torres Strait Islander peoples in NSW are affordability, the impact of crises and systemic causes. These factors form the basis of our discussion with reference to the studies that met the inclusion criteria from question 3 and linking into the context for NSW.

Aboriginal and Torres Strait Islander communities in NSW who experience disadvantage are also adversely impacted by other food system challenges in their locality. These include higher prevalence of fast food and alcohol outlets, poor public transport infrastructure and high cost of fuel if there is a family car, lack of healthy food options within reasonable walking distance from home, and poor availability of fresh healthy foods in general. In rural Aboriginal and Torres Strait Islander communities these factors are further compounded by caution around drinking water, and for some no food outlets (see background section for details). At a societal level Aboriginal and Torres Strait Islander people report the 'anguish and shame of racism' (24) and poor housing conditions as impacting food access and management. Finally, it is important to note that food and nutrition policies and targets are largely absent from key strategies such as Closing the Gap and the Aboriginal and Torres Strait Islander Health Implementation Plan, and that there is no Aboriginal and Torres Strait Islander nutrition workforce in Australia.

Affordability

This section discusses the included programs which aimed to address underlying factors of affordability as causes of food insecurity related to food pricing for healthy food options and low household income.

Some programs being implemented internationally in remote communities to address affordability, involved subsidising food and transport costs. Galloway (66) provided an independent and comprehensive evaluation of the The Nutrition North Canada program designed to reduce the cost of nutritious foods. However, concerns were raised about eligibility criteria, subsidy rates, eligible foods, and retailer accountability. It was suggested that the retail subsidy program required a more rigorous system of retailer accountability such as increasing subsidy information on point-of-sale receipts and a strong regulatory framework for food pricing. Integrating lessons learned from subsidising nutritious food costs may prove a useful strategy for remote NSW communities. However, programs must be adapted to embed Aboriginal and Torres Strait Islander community governance to provide a contextualised understanding of eligibility criteria, inclusion of suitable and acceptable nutritious foods, and importantly this will provide one measure to ensure retailer accountability on food pricing.

A similar program by Majid et al. (64) in remote northern regions of Canada, the Food Mail Program, showed mixed results. The program increased access to healthy foods by subsidising the cost of food transport for both personal and retail orders. Key barriers related to logistical issues in the drop off point of food packages, lack of culturally appropriate or acceptable foods on the list of subsidised retail products and the inability of community members to place orders as they did not have access to a required credit card. Unlike other remote Australian State and Territory communities that use community run “Outback stores”, remote NSW communities rely primarily on independent or smaller retailers, and without their own supply chains the price for healthy food options is considerably higher in these retail outlets. Integrating lessons learned from this program subsidising transportation costs from wholesale supply chains may serve as a potential strategy for remote NSW communities. However, consideration must again be applied to embed Aboriginal and Torres Strait Islander community governance to provide a contextualised understanding of appropriate and acceptable foods to be subsidised in retail outlets and provide insight into suitable methods to ensure community members can independently place food orders.

A program by Ford et al. (65) highlighted affordability as an underlying factor for the Canadian Community Food Program. The main users of this program were housing insecure and those who had not benefited from economic development and job opportunities. Addressing affordability factors is setting specific therefore, again, widespread consultations with communities is needed, particularly those in urban and regional settings where little evidence exists (only three peer-reviewed publications identified from our search for studies specific to NSW and it proved difficult to separate factors by location). This would be advantageous to provide a clear and contextualised setting specific understanding of underlying affordability factors causing food insecurity. The publication by Sherriff et al. (5) provided detailed information on food affordability in urban and regional areas in NSW and recommendations for local action were provided. These included the introduction of breakfast programs at schools, practical nutrition sessions at Aboriginal Community Controlled Health Services (including cooking and budgeting which ties into nutrition literacy) and community gardens to help ease food insecurity. Subsidised food programs that cater to the communities’ needs was also suggested in this publication and importantly, Aboriginal community members wanted their culture and values embedded in any new food security initiatives.

The evidence from this rapid review suggests that widespread consultations with communities in urban, regional and remote settings are needed to provide a clear and contextualised setting specific understanding of systemic causes of food insecurity. Programs that are participatory, and have a form of governance by community, may serve as one measure to control point of sale pricing. Some international programs subsidised the cost and transport of nutritious, cultural and acceptable foods for remote communities, but evaluations would need to be done to prove effectiveness for the NSW specific context.

Impact of Crises

Crises such as the COVID-19 pandemic, droughts, floods and bushfires exacerbated the issues of food insecurity for Aboriginal and Torres Strait Islander peoples in NSW.

Internationally, the Food Distribution Program on Indian Reservations in North America was reported by Mucioki et al. (57) and Pindus et al. (60) as being effective in addressing food security. While it was acknowledged that this process does not address the underlying causes of food insecurity, the food boxes were a major food supply for many food insecure families and communities. It was reported that receiving the monthly food boxes helped stretch income to cover monthly expenses. Through focus groups, it was identified that a more 'food sovereign' box and the integration of traditional foods could enhance food security and help meet communities' needs. Ahmed et al. (58) showed that linking in with pre-existing institutional structures was shown to be important with an international study evaluating food environments. In the NSW communities of Illawarra, Nowra, Kinchela, Armidale, Glenn Innes, Moree, Broken Hill and Wilcannia a similar strategy that provides emergency food boxes for crisis relief was implemented in response to the COVID-19 pandemic (49). Consideration of providing sustained and consistent food relief services would be beneficial particularly for families and communities who experience acute food insecurity requiring immediate relief.

In NSW, food programs support emergency relief by distributing food to local charities throughout NSW, however it was identified that Aboriginal peoples often experience stigma and shame when accessing non-Aboriginal food relief services: *"We don't want to be looked on as poor or judged"* (5). Furthermore, Aboriginal peoples are reluctant to access such services: *"People have experienced families and kids being taken away so there is a fear of accessing services as they think you can't provide for your kids so they might get taken way"*. (Aboriginal LHD staff member) (5).

While beneficial, a key lesson from international programs was interagency collaborations. The ability of a not-for-profit charity organisation providing food relief to connect with an Aboriginal community-controlled organisation may provide a more culturally appropriate and acceptable method of providing emergency food relief. An additional burden to Aboriginal families accessing emergency food relief services was transportation. Subsidising food 'drop-off' or interagency collaboration with community transport services may address issues of transportation.

Systemic Causes

A key issue contributing to food insecurity for Aboriginal and Torres Strait Islander peoples in NSW is systemic causes. The underlying factors of systematic causes of food insecurity are related to the

ongoing impacts of colonisation including changes in the local food systems, loss of cultural food practices, knowledge, language and lore.

International programs effective in addressing systemic causes of food insecurity applied a participatory research framework governed by community and reflected community priorities. The study by Jernigan et al. (55) identified priority determinants for change via community-based participatory research using a culturally adapted tool. Priority factors were then actioned through the implementation of alternative policies of a community coalition to support agriculture development in community and culturally acceptable foods being sold in local farmer markets. Ahmed et al. (58) described a methodological approach to evaluating the food environment and one of the key lessons was that successful food environment interventions are community-based. This is a key consideration for Aboriginal and Torres Strait Islander communities in NSW, whereby programs, policies and initiatives need to be informed by extensive consultation to better understand and reflect specific community priorities. Investing in this culturally appropriate process will ensure the underlying factors of systemic causes of food insecurity are addressed. This ties into Aboriginal Affairs NSW self-determining initiatives in which local decision making (negotiation between Aboriginal regional governance bodies and the NSW Government) underpins the theory of self-determination, privileging the voice of Aboriginal and Torres Strait Islander peoples (69).

Other international programs shown to be effective were those in which cultural knowledges were integrated to increase the availability and accessibility of cultural foods. The study by Blanchet et al. (63) documented a community-led restoration program to increase the supply, availability and accessibility of the cultural food salmon. Another study by Bersamin et al. (59) was a farm-to-school multilevel intervention where local traditional food systems were promoted that supported food security using traditional foods. It appears that the integration of cultural knowledges, practices and food systems in community-led processes that promote cultural foods can contribute to addressing factors of systemic causes of food insecurity. To enhance cultural food procurement practices in NSW, legislation on water sovereignty rights needs to be addressed to prevent the criminalisation of Aboriginal peoples practising cultural fishing, and to promote restoration programs that include participation from Aboriginal and Torres Strait Islander communities.

An underlying theme in a NSW Government's submission to the House of Representatives Inquiry into food pricing and food security (49) indicated that successful programs addressing food insecurity were those that utilised interagency collaboration with pre-existing community services. Remote community gardens in Boggabilla and Wilcannia provided access to sustainable supply of fresh and healthy foods through interagency collaborations with a Botanic Garden and non-profit organisation, respectively. In the regional setting of Lismore the Ngulingah Local Aboriginal Land Council took a strengths-based approach that integrated community gardens through existing enterprises of a nursery and ranger programs. Although not evaluated, the Koori Community Kitchen Program in an urban setting (outer Sydney) encouraged culturally appropriate foods to reduce the factors associated with food insecurity.

Integrating lessons learned from international programs to augment what is currently being delivered in NSW would provide valuable discussion points within the community consultation process to develop a holistic framework for addressing food insecurity. The evidence from this rapid review suggests that widespread consultations with communities in urban, regional and remote settings are needed to provide a clear and contextualised setting specific understanding of systemic causes of food insecurity. Programs that are participatory, governed by community, integrate cultural knowledge and food systems to increase availability and accessibility of cultural foods, and utilise interagency collaborations appear most suitable.

Summary

This rapid review highlighted the limited evidence base for NSW addressing factors related to food insecurity among Aboriginal and Torres Strait Islander people. Five peer-reviewed articles, with only three specific to NSW, were included and most of the grey literature reported national data, therefore separating factors specific for NSW proved difficult. For all included literature, the main factors contributing to food insecurity for Aboriginal and Torres Strait people living in urban, regional and remote NSW stemmed from affordability and systemic causes, which is exacerbated by the impact of crises.

Aboriginal and Torres Strait Islander people are experiencing food insecurity, but the scale and distribution in NSW is unknown due to the limited available data specific for the state. Aboriginal and Torres Strait Islander people living in urban, regional and remote areas of NSW are vulnerable to food insecurity but the severity difference for each area could not be reported due to the lack of evidence specific for each setting.

This review highlighted the lack of quantitative and qualitative research in NSW to properly inform government actions to address food insecurity for Aboriginal and Torres Strait Islander peoples in NSW. While the majority of Aboriginal and Torres Strait Islander people live in urban areas of NSW, there are limited documented programs in all areas of NSW that address food insecurity. Of the programs documented, none have been evaluated (see Table S8, Appendix 7). Evaluations are important to understanding the viability, effectiveness and impact of programs that address food insecurity as they inform nutrition policy and practice. Further, they provide an evidence base to support funding and resourcing, and can enhance community support and awareness when released appropriately to stakeholders and disseminated to community (70). An evidence base also allows for sustainability and scalability of programs.

The key twelve guidance points below are drawn from the available evidence related to Question 3 for the NSW context. The NSW Government provides \$5.48 billion dollars a year for First Nations expenditure with \$1.1 billion for health, \$1.5 billion for education and \$1.9 billion for stronger communities (71). The suggestions below would require a percentage of this funding to be allocated to improving food insecurity.

Guidance

Food System

Guidance 1: That the NSW Government identify and implement supportive changes to the food environment. Namely, increase the availability of and access to healthy food, in the regional and urban locations where Aboriginal communities live.

Remote Community Support

Guidance 2: That the NSW Government ensures all communities have a food outlet/store and subsidises the costs of nutritious, cultural and acceptable foods for remote communities in NSW. This needs a rigorous system of retailer accountability through an external stakeholder and a strong regulatory framework for food pricing.

Guidance 3: That transportation costs for nutritious, cultural and acceptable foods for remote areas in NSW be subsidised through direct Government investment or incentive schemes for private transport and logistics companies.

Guidance 4: Appropriate involvement of Aboriginal community governance for accountability for point-of-sale food prices in remote settings should be ensured.

Emergency Food Relief

Guidance 5: Organisations that supply food relief should be encouraged to partner with and provide services through Aboriginal Controlled Organisations in urban, regional and remote settings.

Guidance 6: Funding should be provided for end-to-end culturally appropriate holistic approaches to food relief in urban, regional and remote settings.

Community and Land Management

Guidance 7: That the NSW Government supports Aboriginal community involvement in land management and water restoration projects in urban, regional and remote settings.

Guidance 8: That the NSW Government recognises water sovereignty rights (Water Management Act 2000) and decriminalises sustainable Aboriginal cultural fishing (Fisheries Management Act 1994) in urban, regional and remote settings.

Community Collaboration

Guidance 9: Target financial support towards platforms that facilitate interagency collaborations for food security programs in urban, regional and remote settings.

Programs, Research and Evaluation

Guidance 10: Prioritise community-based participatory research that places the agenda and control of food security research in the hands of communities to reflect self-determined needs in urban, regional and remote settings.

Guidance 11: That the NSW Government fund and support food security programs and their (mandated) evaluations in urban, regional and remote settings.

Guidance 12: That the NSW Government investment for the development and recognition of a standardised food and food security evaluation framework appropriate for Aboriginal and Torres Strait Islander communities.

Conclusion

This rapid review highlighted that there is a limited evidence base in NSW addressing factors related to food insecurity and calls for evaluation of programs and policies. Aboriginal and Torres Strait Islander people living in urban, regional and remote areas of NSW are vulnerable to food insecurity. The key factors identified from the available data from NSW relate to systemic causes (defined as the ongoing impacts of colonisation including changes in the local food systems, loss of cultural food practices, knowledge, language and lore), affordability (food pricing for healthy food options) and the impact of crises (COVID-19 pandemic, droughts, floods and bushfires). From effective international programs, this review highlighted a need for setting specific programs that are participatory, governed by community, integrate cultural knowledge and food systems, and utilise interagency collaborations.

Post-script

Post-script: The NSW Parliament's Legislative Assembly released the report *Food production and supply in NSW* (72). The report, tabled on 1/11/2022, made 36 recommendations based on 77 written submissions, three public sessions, a petition and one site visit. Some of the submissions are included in this review as background but did not merit inclusion as high-quality research and evaluation. Recommendations (R) that specifically mentioned NSW Aboriginal peoples: 2, 3, 29, 30, and 31, and findings (F) that specifically mentioned NSW Aboriginal peoples: 2 and 5. The themes relate to NSW Aboriginal peoples': inclusion in food security governance (R2); design and conduct of food security and nutrition surveys (R3); inclusion in local emergency management committees (F2); recognition of community gardens and local agricultural projects as important sources of fresh produce (F5); ownership in the traditional foods industry (R29); desire for the growth and protection of traditional foods and land management (R30). These themes encompass the findings and guidances of this rapid review. Of note is that the report stated the absence of consistently collected and reliable data on food insecurity, a key finding of this rapid review. The report noted concepts such as food sovereignty, cultural and intellectual property, connection to Country, traditional knowledge, and cultural values.

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Appendices

Appendix 1—Search strategies

Table S1: Medline Search 1 (Question 1 and 2)

#	Query	Results from 27 Aug 2022
1	Indigenous Peoples/	1,020
2	"Native Hawaiian or Other Pacific Islander"/	11,864
3	Health Services, Indigenous/	3,913
4	(Aborigin* or Indigen* or First People* or First Nation* or 1st nation* or Koori*).tw.	55,580
5	or/1-4	61,230
6	Australia/	120,407
7	New South Wales/	13,879
8	(Australia* or New South Wales or NSW or N S W).tw.	167,560
9	(Australia* or New South Wales or NSW or N S W).in.	712,016
10	or/6-9	792,893
11	exp Food Insecurity/	1,062
12	exp Food Security/	464
13	Food Storage/	4,119
14	Cooking/	13,911

#	Query	Results from 27 Aug 2022
15	Hunger/	5,904
16	exp Food Supply/	16,218
17	Food Assistance/	1,666
18	Malnutrition/	17,703
19	Starvation/	10,146
20	nutritional status/	51,864
21	exp Nutritional Requirements/	22,074
22	(Food* adj4 (secur* or insecur* or sufficien* or insufficien* or access* or accept* or availab* or acquir* or supply or supplies or usage or utilisation or utilisation or stability or stable or adequa* or provide or provision or production or share or sharing or good or choice* or choos* or resource* or price* or cost* or quantit* or store* or storage or knowledg* or prepar* or system* or healthy or bank* or pantr* or relief* or hamper* or stamp* or assistance or protect* or land* or sea or seas or water* or river* or lake* or stream* or spring* or ground or borehole or billabong or tradition* or nontradition* or household* or communit* or ancest* or sovereign* or vulnerab* or socioeconomic* or economic* or equity or afford* or poverty or educat* or train* or finance* or income or fund* or employ* or unemploy* or job* or vocation* or work* or career* or occupation* or coloni?ation or colonial or precoloni* or settlement* or setting or relocate* or mission* or reserve* or oppression or cultur* or holistic or wellbeing or spiritual or physical or social or emotional or ecological or knowing or yarn* or intake* or diet* or nutriti* or processed or ultraprocessed or discretionary or covid* or corona* or SARSCoV2 or behavio?r or habit* or determinant* or risk* or commercial or shop* or marketing or industr* or advertis* or regional or remote or rural or urban)).tw.	234,673
23	(Nutriti* adj4 (secur* or insecur* or sufficien* or insufficien* or access* or availab* or acquir* or supply or supplies or usage or utilisation or utilisation or stability or stable or adequa* or provide or provision or share or sharing or good or choice* or choos* or resource* or price* or cost* or quantit* or store* or storage or knowledg* or prepar* or system* or healthy or assistance or protect* or land* or sea or seas or water* or river* or lake* or stream* or spring* or ground or borehole or billabong or tradition* or	129,626

#	Query	Results from 27 Aug 2022
	nontradition* or household* or communit* or ancest* or sovereign* or vulnerab* or socioeconomic* or economic* or equity or afford* or poverty or educat* or train* or finance* or income or fund* or employ* or unemploy* or job* or vocation* or work* or career* or occupation* or coloni?ation or colonial or precoloni* or settlement* or setting or relocate* or mission* or reserve* or oppression or cultur* or holistic or wellbeing or spiritual or physical or social or emotional or ecological or knowing or yarn* or intake* or diet* or food* or status or requirement* or need* or processed or ultraprocesed or discretionary or covid* or corona* or SARSCoV2 or behavio?r or habit* or determinant* or risk* or commercial or shop* or marketing or industr* or advertis* or regional or remote or rural or urban)).tw.	
24	(Diet* adj4 (sufficien* or insufficien* or access* or availab* or acquir* or supply or supplies or adequa* or provide or provision or share or sharing or good or choice* or choos* or resource* or cost* or knowledg* or prepar* or healthy or assistance or protect* or land* or sea or seas or water* or river* or lake* or stream* or spring* or ground or borehole or billabong or tradition* or nontradition* or household* or communit* or ancest* or socioeconomic* or economic* or equity or afford* or poverty or educat* or train* or finance* or income or fund* or employ* or unemploy* or job* or vocation* or work* or career* or occupation* or coloni?ation or colonial or precoloni* or settlement* or setting or relocate* or mission* or reserve* or oppression or cultur* or holistic or wellbeing or spiritual or physical or social or emotional or ecological or knowing or yarn* or intake* or nutriti* or food* or status or requirement* or need* or processed or ultraprocesed or discretionary or covid* or corona* or SARSCoV2 or behavio?r or habit* or determinant* or risk* or commercial or shop* or marketing or industry or advertis* or regional or remote or rural or urban)).tw.	181,291
25	(Tucker or grub*).tw.	5,100
26	(hunger* or hungry or malnutrition or malnourish* or starv*).tw.	103,140
27	Cooking facilit*.tw.	41
28	or/11-27	589,814
29	5 and 10 and 28	639
30	limit 29 to yr="2010 -Current"	427

Table S2: Medline Search 2 (Question 3).

#	Query	Results from 27 Aug 2022
1	exp American native continental ancestry group/	22,899
2	Indigenous Peoples/	1,022
3	"Native Hawaiian or Other Pacific Islander"/	11,868
4	United States Indian Health Service/	598
5	Health Services, Indigenous/	3,913
6	(Aborigin* or Indigen* or First People* or First Nation* or 1st nation* or Maori* or American Indian* or on-reserve or off-reserve or tribal or tribe* or autochtone* or amerindien* or Torres Strait Islander* or Pacific Islander*).tw.	82,220
7	(Native* adj3 (American* or Canad* or Hawaii* or Alaska* or Australia*)).tw.	12,999
8	or/1-7	103,862
9	exp Australia/	164,650
10	New Zealand/	43,316
11	exp Canada/	176,941
12	Americas/	11,215
13	exp North America/	1,652,089
14	(Austral* or New South Wales or NSW or N S W or Northern Territor* or NT or Victoria* or Queensland* or QLD or Tasmania).tw.	235,391
15	(Austral* or New South Wales or NSW or N S W or Northern Territor* or NT or Victoria* or Queensland* or QLD or Tasmania).in.	805,530

#	Query	Results from 27 Aug 2022
16	(New Zealand or NZ or Canad* or USA or America*).tw.	758,824
17	(New Zealand or NZ or Canad* or USA or America*).in.	5,981,077
18	or/9-17	8,084,758
19	exp Food Insecurity/	1,066
20	exp Food Security/	465
21	Food Storage/	4,120
22	"Cooking and Eating Utensils"/	1,271
23	Cooking/	13,911
24	Hunger/	5,905
25	exp Food Supply/	16,228
26	Food Assistance/	1,667
27	Malnutrition/	17,710
28	Starvation/	10,146
29	nutritional status/	51,872
30	exp Nutritional Requirements/	22,075
31	(Food* adj4 (secur* or insecur* or sufficien* or insufficien* or access* or accept* or availab* or acquir* or supply or supplies or usage or utilisation or utilisation or stability or stable or adequa* or provide or provision or production or share or sharing or good or choice* or choos* or resource* or price* or cost* or quantit* or store* or storage or knowledg* or prepar* or system* or healthy or bank* or pantr* or relief* or hamper* or stamp* or assistance or protect* or land* or sea or seas or water* or river* or lake* or stream* or spring* or ground or borehole or billabong or tradition* or nontradition* or household* or communit* or ancest* or sovereign* or vulnerab* or socioeconomic* or economic* or equity or	234,244

#	Query	Results from 27 Aug 2022
	afford* or poverty or educat* or train* or finance* or income or fund* or employ* or unemploy* or job* or vocation* or work* or career* or occupation* or coloni?ation or colonial or precoloni* or settlement* or setting or relocate* or mission* or reserve* or oppression or cultur* or holistic or wellbeing or spiritual or physical or social or emotional or ecological or knowing or yarn* or intake* or diet* or nutriti* or processed or ultraprocessed or discretionary or behavio?r or habit* or determinant* or risk* or commercial or shop* or marketing or industr* or advertis*)).tw.	
32	(Nutriti* adj4 (secur* or insecur* or sufficien* or insufficien* or access* or availab* or acquir* or supply or supplies or usage or utilisation or utilisation or stability or stable or adequa* or provide or provision or share or sharing or good or choice* or choos* or resource* or price* or cost* or quantit* or store* or storage or knowledg* or prepar* or system* or healthy or assistance or protect* or land* or sea or seas or water* or river* or lake* or stream* or spring* or ground or borehole or billabong or tradition* or nontradition* or household* or communit* or ancest* or sovereign* or vulnerab* or socioeconomic* or economic* or equity or afford* or poverty or educat* or train* or finance* or income or fund* or employ* or unemploy* or job* or vocation* or work* or career* or occupation* or coloni?ation or colonial or precoloni* or settlement* or setting or relocate* or mission* or reserve* or oppression or cultur* or holistic or wellbeing or spiritual or physical or social or emotional or ecological or knowing or yarn* or intake* or diet* or food* or status or requirement* or need* or processed or ultraprocessed or discretionary or behavio?r or habit* or determinant* or risk* or commercial or shop* or marketing or industr* or advertis*)).tw.	129,114
33	(Diet* adj4 (sufficien* or insufficien* or access* or availab* or acquir* or supply or supplies or adequa* or provide or provision or share or sharing or good or choice* or choos* or resource* or cost* or knowledg* or prepar* or healthy or assistance or protect* or land* or sea or seas or water* or river* or lake* or stream* or spring* or ground or borehole or billabong or tradition* or nontradition* or household* or communit* or ancest* or socioeconomic* or economic* or equity or afford* or poverty or educat* or train* or finance* or income or fund* or employ* or unemploy* or job* or vocation* or work* or career* or occupation* or coloni?ation or colonial or precoloni* or settlement* or setting or relocate* or mission* or reserve* or oppression or cultur* or holistic or wellbeing or spiritual or physical or social or emotional or ecological or knowing or yarn* or intake* or nutriti* or food* or status or requirement* or need* or processed or ultraprocessed or discretionary or behavio?r or	180,305

#	Query	Results from 27 Aug 2022
	habit* or determinant* or risk* or commercial or shop* or marketing or industry or advertis*)).tw.	
34	(Tucker or grub* or kai).tw.	5,795
35	(hunger* or hungry or malnutrition or malnourish* or starv*).tw.	103,186
36	Cooking facilit*.tw.	41
37	(Supplemental Nutrition Assistance Program or SNAP).tw.	11,786
38	or/19-37	600,908
39	Policy/	6,738
40	exp Nutrition Policy/	12,565
41	Health Policy/	71,283
42	Program Evaluation/	66,786
43	National Health Programs/	33,297
44	Fisheries/	7,868
45	(program* or polic* or intervention*).tw.	2,315,746
46	or/39-45	2,404,706
47	8 and 18 and 38 and 46	1,437
48	limit 47 to yr="2010 -Current"	1,008

Appendix 2—Question 1 Peer-reviewed articles

Table S3: Peer-reviewed articles (n=5) on factors contributing to food insecurity for Aboriginal and Torres Strait Islander peoples in NSW

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
Follent, 2021, (25)	Evidence to inform conversations on Aboriginal health issues in response to COVID-19 and beyond	NSW Specific, Eora, Wilyakali, Bundjalung, Yuin and Gumbaynggirr Lands (Urban, Regional, Remote)	Expert opinion. Shared lived experiences and perspectives regarding the indirect impacts of COVID-19.	12 Aboriginal community members.	NR	<u>Geographical/Affordability</u> 'In some rural and remote areas, local shops have increased prices and people are left with no choice other than to purchase cheaper (and often less healthy) options'.	<u>Pandemic</u> Amplify the social determinants of health Increase in government payments: resulted in the one and only shop in community providing food and increasing prices (\$10 for a loaf of bread).
Miller, 2020, (26)	To identify and describe caregiver perspectives on factors important for the	NSW Specific (Urban and Regional)	Cross-sectional survey. Baseline questionnaire about themselves (carers) and their children	Carers (n=626); Responders, (n=425, 68%); Aboriginal (n=321, 76%);	<u>Education</u> Of responders (n=425); Degree (n=70, 17%); College certificate (n=133; 31%); Trade/apprenticeship (n=15, 4%);	Frequency of factors raised by carers perceived to promote the health and wellbeing of Aboriginal children (n=425)	NR

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
	health and wellbeing of urban Aboriginal children			Mean age 35 years (18 to 66), Aboriginal (75%); Male (n=42, 10%); Female (n=383, 90%)	None (n=206, 48%)	Adequate nutrition and food security (n=95, 22%); Availability and affordability of quality housing (n=25, 6%); Education for children and families (n=62, 15%); Breaking the cycle of disadvantage (n=33, 8%); Physical, emotional and cultural safety (n=43, 10%) <u>Transport</u> Limited transport. <u>Housing</u> Low quality housing and the need for clean and secure houses_ <u>Nutrition Literacy</u> Low nutritional awareness.	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						<p>Carers wanted more health education on nutrition and cooking.</p> <p><u>Acceptability</u></p> <p>Low acceptability of healthy meals to children.</p> <p><u>Affordability</u></p> <p>Limited affordability of healthy food.</p> <p><u>Systemic</u></p> <p>Breaking the cycle of disadvantage through more Aboriginal health education for families around common health problems, nutrition, preparing healthy meals and environmental risk factors.</p> <p><u>Other</u></p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						Need for good role models.	
Sherriff 2022, (5)	To describe Aboriginal community and stakeholder perspectives on food insecurity to get a better understanding of the key contributing factors and recommendations for potential	NSW Specific (Urban and Regional)	Cross-sectional Qualitative - Semi structured interviews. Thematic analysis, drawing on principles of grounded theory to guide the process.	Invited n=52 Participated (n=44, 85%) Aboriginal (n=22, 50%) 20-39 (n=15, 34%); 40-49 (n=10, 23%); 50-59 (n=8, 18%); 60-69 (n=6, 14%); >70 (n=5, 11%) Male (n=12, 27%); Female (n=32, 73%)	<u>Education</u> Masters or above (n=6, 14%); Bachelor's degree (n=8, 18%); Diploma (n=6, 14%); Certificate/some college (n=5, 11%); High school (n=15, 34%); Primary school (n=1, 2%); No answer (n=3, 7%); <u>Stakeholder group</u> Aboriginal Community Controlled Health Service staff and board members (n=9, 20%);	<u>Financial</u> Trapped in financial disadvantage. Caught in constant debt and struggling to survive. Dominating and competing priorities draining the food budget. Fluctuating nature of food insecurity, where people may lose employment and experience food insecurity for a period of time. Effects of inter-generational	NR

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
	strategies to address this issue in Aboriginal communities in urban and regional Australia.				<p>Aboriginal community members (n=13, 30%); Food supplier, food relief organizations/charities (n=12, 27%); Council, local government, Local Health Districts and Education sectors (n=10, 23%)</p> <p><u>Income</u></p> <p>Weekly household income \$105 lower (Campbelltown) and \$242 lower (Wagga Wagga) when compared to the median weekly household income</p>	<p>poverty on food choices.</p> <p><u>Transport</u></p> <p>Limited transport options to access healthy food, shops and large supermarkets. Racism plays a role in limiting transport options for families. Limited public transport in their area. Challenging utilising public transport for food shopping.</p> <p><u>Housing</u></p> <p>Lack of stable housing</p> <p><u>Cooking Facilities</u></p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
					for their respective LGA.	<p>Lack of cooking facilities (e.g. fridge or freezer is a barrier to preparation of healthy meals), spending more on food (daily shops), more likely to impulse shop and purchase easy, take away options.</p> <p><u>Storage</u></p> <p>Inadequate storage and bench space making it difficult to prepare and store foods.</p> <p><u>Nutrition Literacy</u></p> <p>Generational loss of healthy food knowledge and preparation skills.</p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						<p><u>Availability</u></p> <p>Limited availability of fresh, healthy food.</p> <p><u>Accessibility</u></p> <p>Abundance and easy access to unhealthy fast food.</p> <p><u>Affordability</u></p> <p>Rationing and relying on cheap, filling foods.</p> <p>Families in their communities were generally big meat eaters but noted that good cuts of meat are often expensive and unaffordable for many family budgets. Healthy</p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						<p>food was regularly available at larger supermarkets in neighbouring suburbs, but unaffordable for many families.</p> <p><u>Systemic</u></p> <p>On-going impacts of colonisation and changes in the local food system. Trauma, racism and disruption to family structures. Healthy eating and food affordability were challenges for parents/caregivers who were suffering with social and emotional wellbeing</p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						<p>difficulties themselves or who had children, or multiple family members experiencing inter-generational trauma.</p> <p><u>Other</u></p> <p>Reliance on food relief and the inflexibility of services. Stigma and shame linked to accessing non-Aboriginal food relief services. Fulfilling other family responsibilities.</p>	
Temple, 2018, (27)	Examined the prevalence and	Nationally representative data	Cross-sectional. 2012–2013 National	n=1062, 45 years and older, Female	<u>Education</u> Post school education or	<u>Financial</u> Those in the top 20% of the income	NR

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
	correlates of food insecurity among older Aboriginal and Torres Strait Islanders		Aboriginal and Torres Strait Islander Nutrition and Physical Activity Survey.	(n=618); Male (n=444) Aboriginal only (n=779); Aboriginal and non-indigenous household members (n= 283)	training Yes (n=370); No (n=692) <u>Income</u> Lowest 20% (n=472); 20-40% (n=215); 40-60% (n=109); 60-80% (n=77); 80-100% (n=57); Unknown; (n=132) <u>Household size</u> 1 (n=422); 2 (n=413); 3 to 4 (n=174); 5+ (n=51) <u>Language and Remoteness</u> Non-remote (n=451); Remote-English (n=374); Remote-	distribution were about 88% less likely to suffer food insecurity and those in the 60–80 percentile were about 76% less likely when compared to lowest income earners. <u>Geographical/Other</u> Lack of locally grown food in remote areas of Australia. For those who speak Aboriginal and Torres Strait Islander languages residing in remote areas, the prevalence of food	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
					Indigenous (n=236)	<p>insecurity was 37%. A total of 12% of Indigenous language speakers in remote areas were severely food insecure.</p> <p><u>Housing</u></p> <p>Households with both Aboriginal and non-Indigenous residents were about 60% less likely to experience food insecurity compared with Aboriginal only households, even with controls for geography. Persons in large households were</p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						<p>at a high risk of food insecurity, particularly those in household with five or more.</p> <p><u>Availability</u></p> <p>Lack of availability and variety of healthier food choices.</p> <p><u>Accessibility/Affordability</u></p> <p>Access to and availability of skills to use traditional foods or 'bush tucker' is likely to be an important component of food security. Limited access to affordable food sources. High cost</p>	

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
						of food in remote regions.	
Thurber, 2017, (28)	To quantify the prevalence of known health-related risk factors for severe COVID-19 illness among Aboriginal and Torres Strait Islander adults, and their relationship with	Nationally representative data	Cross-sectional 2018-19 National Aboriginal and Torres Strait Islander Health Survey	n=6,423 Aboriginal and Torres Strait Islander adults, >18 years	<u>Household income</u> Lowest 1st decile (26.8%); Middle 2-4th decile (35.7%); Highest 5-10th decile (37.5%). <u>Area-level disadvantage</u> Most disadvantaged 1st decile (36.8%); Middle 2-3rd decile (27.2%); Most advantaged 4-10th decile (35.9%); <u>Discrimination</u> Unfair treatment sometimes to	NR	Those with access to fundamental determinants of health, income, living in an advantaged area, food security, no interpersonal discrimination, no forced separation from family, and access to healthcare are at a significantly lower risk of severe COVID-19 illness.

First author, year, ref	Aim	Setting	Study design, data collection	Total number of participants, age, sex	Other participant information	Factors contributing to food insecurity	The impact of crises
	social determinants				<p>always (13.4%); Unfair treatment once or rarely (11.5%); No unfair treatment 71.1%.</p> <p><u>Forced removal</u></p> <p>Respondent was forcibly removed (14.8%); Relative was forcibly removed (30.3%); Neither respondent nor relative was removed (39.1%); Not stated (15.9%).</p>		

Abbreviations: NR Not reported; NSW New South Wales.

Appendix 3—Question 1 Grey literature

Table S4: Grey literature (n=22) on factors contributing to food insecurity for Aboriginal and Torres Strait Islander peoples in NSW

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
AHMAC, Aboriginal and Torres Strait Islander Health Performance Framework, 2017, (29)	Australia wide inclusive of NSW	Report	<p><u>Financial/Affordability</u></p> <p>Low income is associated with food security problems. Low income combined with high food costs result in many Indigenous Australians spending a large proportion of their income on food and contributes to concerns about going without food. Health risks from being unemployed include deprivation for necessities such as food. Purchase prices are usually higher particularly for perishable items.</p> <p><u>Geographical/Availability/Accessibility</u></p> <p>Food security and food supply issues are of particular importance in rural and remote</p>	NR	NR

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<p>areas. Food security and food access are of particular importance in rural and remote areas.</p> <p>Remote stores often have a limited range of foods, particularly perishable foods (fresh fruit, vegetables and dairy)</p> <p><u>Housing/Cooking Facilities/Storage</u></p> <p>Problems with storing and preparing food</p>		
House of Representatives Standing Committee on Indigenous Affairs, Report on food pricing and food security in remote Indigenous communities, 2020, (30)	Australia wide inclusive of NSW	Report	<p><u>Financial</u></p> <p>Falling and low incomes</p> <p><u>Geographical/Transport</u></p> <p>No access to transport among those living remotely and lack of public transport options. The logistics of public transport in regional areas is a barrier as services are infrequent/short operating times. Lack the</p>	<p><u>Geographical/Availability</u></p> <p>NSW Aboriginal Land Council 'small communities lack the purchasing power and the ability to negotiate the lower bulk prices of larger communities'</p> <p>'NSW Aboriginal Land Council identified the problem of communities sometimes having no food retail outlet at all: the</p>	<p><u>Pandemic</u></p> <p>Mass shopping and stripping of the stores. Inability to buy fruit, vegetables and toilet paper. Panic-buying led to shortages of some food and grocery items across Australia. Panic-buying in urban centres had a flow on effect for</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<p>means to travel elsewhere due to the long distances. Most remote communities rely on a single store to purchase food and other essential items. The remote retail operating environment is therefore very different from those in urban areas.</p> <p><u>Housing</u></p> <p>Overcrowding among those living remotely.</p> <p><u>Cooking Facilities</u></p> <p>Lack of cooking facilities and fridges to prepare healthy meals at home</p> <p><u>Storage</u></p> <p>Inability to store adequate supplies of food. Unreliable electricity supply for storage of food and the need to top up</p>	<p>lack of supermarkets in many remote towns in NSW is a principal barrier to food security for many remote Aboriginal residents. ... In three towns (Brewarrina, Goodooga, and Ivanhoe) there are no commercial supermarkets at all. In Walgett, the only supermarket in the town burnt down over a year ago, and until recently when a pop-up shop was opened, community members had to make a two-hour round trip to Lightning Ridge to shop for food'</p> <p><u>Systemic</u></p> <p>'NSW Aboriginal Land Council, restrictions on Aboriginal cultural fishers'</p>	<p>remote communities where food security is already less stable.</p> <p><u>Other crises</u></p> <p>Severe impact of seasonal weather patterns on food supply and therefore food pricing. Bare shelves in supermarkets caused by annual floods. Due to weather conditions, some communities were cut off from sea, air and road freight.</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<p>credit on 'power cards' to maintain the supply.</p> <p><u>Nutrition Literacy</u></p> <p>Lack of food preparation skills among those living remotely. A lack of food literacy.</p> <p><u>Availability</u></p> <p>For remote communities: stores often struggle to guarantee stock. Single supply sources. Stock management practices.</p> <p>Carrying capacity of the store. Delivery delays. Consumer demand. Road conditions and weather. Long delivery distances results in short shelf life of fresh produce, lowering the nutritional content and appeal.</p> <p><u>Accessibility</u></p> <p>Lack of access to food among those living remotely. Rely on one community store, and</p>		

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<p>possibly one additional takeaway business</p> <p><u>Affordability</u></p> <p>The cost of food is considerably higher for remote Aboriginal and Torres Strait Islander communities than for people living in larger population centres in urban and regional Australia.</p>		
The National Rural Health Alliance, Food Security and Health in Rural and Remote Australia, 2016, (31)	Australia wide	Report	<p><u>Storage</u></p> <p>Limited access to appropriate storage resulting in increased wastage of food in remote communities</p> <p><u>Cooking Facilities</u></p> <p>Limited access to appropriate cooking facilities</p> <p><u>Nutritional Literacy</u></p> <p>Limited food knowledge in remote communities</p>	<p><u>Geographical</u></p> <p>Differences between locations of as much as \$221 in the price of the same basket of goods (healthy food Basket surveys) (50).</p> <p><u>Financial/Affordability</u></p> <p>Based on the healthy food basket survey in NSW between 2006 and 2009 (50), the price of dairy, bread/cereals and meat/seafood increased by more than the Consumer Price Index over the</p>	Fruit and vegetable prices reduced between 2006 and 2008 but increased in 2009 due to drought and climate conditions (healthy food basket surveys) (50).

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<u>Accessibility/Affordability</u> Difficulties in accessing affordable, healthy food in remote areas including fresh fruit and vegetables	length of the study and energy dense nutrient poor foods became cheaper over the length of the study. Families in the lower socio-economic quintiles of income used between 48 and 64% of their income to purchase a healthy food basket.	
Parliament NSW, Fresh food pricing, 2018, (32)	Australia wide inclusive of NSW data	Report	<u>Financial</u> Low income and unemployment <u>Transport</u> Lack of transport <u>Housing</u> Inadequate housing and overcrowding. <u>Educational/Nutrition Literacy</u> Lack of educational opportunities, literacy and knowledge/skills in respect to food and nutrition <u>Affordability</u>	Based on a study of urban Aboriginal families (Sax Institute): <u>Financial/Affordability</u> Running out of food is common in urban communities and that it is a recurring problem, occurring every fortnight or payday. 'unaffordability of food was the biggest factor associated with running out of food'. High prices of healthy food. <u>Transport/Accessibility</u> Poor local access to healthy foods	'Drought adds to the cost of production due to greater need for livestock feed, itself at higher prices, as well as water for stock and crops, while extreme weather events such as flood may cause spikes in prices' (Country Women's Association).

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<p>High food costs</p> <p><u>Systemic</u></p> <p>Lack of cultural food values</p>	<p>'Many families are without a car and have a number of kids in tow. For the families involved in our research, public transport is not very reliable and it can often take three hours for them to get on the bus, go to the shops, buy the food and come back, all with three or four kids in tow. Accessing fresh food takes too much time and effort. Feeding the family is more of a priority than accessing fresh food'.</p> <p>'Healthy food is not available anywhere close to where the majority of our Aboriginal families live, even in urban areas'.</p> <p><u>Other</u></p> <p>'The other problem is the advertisements of specials in fast food shops. Families race to get one of those bargains'.</p>	
The University of Sydney Institute of	NR	Report	<u>Systemic</u>	NR	NR

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
Agriculture, Native Grains from Paddock to Plate, 2020, (8)			'Due to colonisation, much knowledge, language and lore was fragmented, and in some cases lost, including knowledge on managing, producing and handling native grains'.		
Australian Government response to the House of Representatives, Inquiry into food pricing and food security in remote Indigenous communities, 2021, (36)	Australia wide	Inquiry	<p><u>Storage</u></p> <p>Improving cold and dry storage</p> <p><u>Availability/Affordability</u></p> <p>Improving food security and the availability of affordable, fresh and nutritious foods. More local distribution centres by wholesalers in major regional centres closer to remote communities.</p> <p><u>Accessibility</u></p> <p>Improved access to food supply and community gardens. Encourage use of locally sources food.</p>	NR	Logistics of food and grocery supply into remote communities. Ensuring food supply during pandemics, natural disasters and seasonal changes.

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<p><u>Systemic</u></p> <p>Need for support of fishing enterprises</p> <p><u>Other</u></p> <p>Continuity of power and reliable electricity. Upgrading road infrastructure into remote communities to improve food supply.</p>		
AH&MRC NSW, Submission to the Inquiry into food production and supply in NSW, 2022, (37)	NSW	Inquiry	NR	<p><u>Financial/Geographical/Availability/Affordability</u></p> <p>Poor income, limited employment opportunities and reliance on welfare systems (weekly median gross income for Aboriginal households was \$553 in 2018-19, Australian Bureau of Statistics). As remoteness increases, income levels decrease. Income is a central factor in one's ability to access food. Fresh produce is often more expensive and poor quality. Higher cost of food, limited</p>	Access to food is especially sensitive to environmental variability such as unprecedented weather events, natural disasters, and natural hazards such as pest infestations and disease outbreaks. These events lead to disruptions in harvest growth and distribution. Impacts of crises from the 2019-20 bushfires and the ongoing COVID-19 pandemic led

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>variety and lower quality of products in remote areas compared to urban areas, limiting food choice, and forcing families to purchase cheaper, less nutritious options (food basket surveys in remote areas). Long distances to the nearest grocery stores in remote areas, which can take upwards of 90 minutes. Where a community store is available: Higher overhead costs of community stores (freight, limited storage), increase in food pricing, limited variety of fresh produce (often lower quality).</p> <p><u>Transport</u></p> <p>Limited transport (additional strain on community food security)</p> <p><u>Housing</u></p> <p>Inadequate housing</p> <p><u>Cooking Facilities/Storage</u></p>	<p>to significant disruptions to food production and supply with remote communities.</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>Inadequate kitchen amenities and infrastructure to properly prepare, cook and store food (significant barrier to purchasing fresh produce when available and affordable), making already cooked or takeaway meals a more practical option.</p> <p><u>Systemic</u></p> <p>Experience issues with food across the domains of availability, utilisation and stability that is underscored by colonisation and ongoing dispossession.</p> <p><u>Other</u></p> <p>Food is especially sensitive to environmental variability.</p>	
AH&MRC NSW, Supplementary Questions: Inquiry into Food production	NSW	Inquiry: Supplementary Questions	NR	<p>Factors affecting food supply:</p> <p><u>Geographical/Affordability</u></p> <p>Higher food costs in regional and remote areas (cost of groceries can be 60% higher in remote</p>	<p><u>Environmental challenges</u></p> <p>Severe weather events and natural disasters (i.e. bushfires and floods)</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
and supply in NSW, 2022 (38)				<p>areas across compared to urban areas)</p> <p><u>Financial/Housing/Cooking Facilities/Storage</u></p> <p>Poor Infrastructure (household and community infrastructure). Housing and poverty are key contributors to food insecurity. A lack of adequate household infrastructure including refrigerators, stovetops and storage impacts healthy eating as people are unable to prepare, store or cook foods in their home and as a result often opt for lower nutritional quality options that are convenient. Housing cost limits access to food and higher housing costs place additional financial strain on families, limiting disposable income available for groceries.</p>	<p>disrupt supply chains and access to food.</p> <p>‘An example of this were the recent Northern NSW floods during which communities experienced significant infrastructure damage and many were cut off from supply lines. These floods highlighted our food insecurity with images of fresh produce being dumped because of flood damage; empty supermarket shelves and local groups delivering meals to affected areas using jet skis and helicopters to feed desperate communities’.</p>
New South Wales Aboriginal Land Council, Submission	Australia Wide	Inquiry	<u>Geographical/Availability</u>	<p><u>Financial</u></p> <p>Employment, income and welfare</p>	The COVID-19 pandemic has exacerbated pre-existing disadvantage.

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
to the Inquiry into food production and supply in NSW, 2022, (39)			Lack of locally produced food in remote areas of Australia	<p><u>Geographical/Affordability</u></p> <p>Lack of food stores in many remote towns in NSW (25 towns across NSW without any stores at all). This reduces competition and enables stores to raise prices. The additional costs of groceries further compounds disadvantage within these communities. The cost of food is reported to be 15-20% higher in remote areas in comparison to major cities.</p> <p><u>Transport</u></p> <p>Travelling hours to reach food stores only to find stores out of stock or with purchasing limits</p> <p><u>Housing</u></p> <p>Access to adequate housing</p> <p><u>Social</u></p> <p>Inequities in social status</p>	Limited stock or purchasing limits impacted Aboriginal households in regional towns. The impacts of COVID led to the heightened price of oil and costs of travel impacted the accessibility and affordability of food throughout NSW. NSW Government funded the delivery of food and emergency relief boxes, of which 5,596 were delivered by NSW Aboriginal Land Council across the state. Despite these efforts, supplies of emergency food relief are only temporary measures, and do not address the systemic issues underpinning food insecurity. Longer-term food security solutions need to be developed

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
					that take into account structural inequities throughout NSW.
New South Wales Aboriginal Land Council, Submission to the House of Representatives Inquiry into food pricing and food security in remote Indigenous communities, 2020, (40)	NSW	Inquiry	NR	<p><u>Financial</u></p> <p>Issues related to employment, income and welfare</p> <p><u>Geography/Affordability/Availability</u></p> <p>Remote towns in NSW are disadvantaged and the additional costs of groceries further compounds their disadvantage. Barriers of remote communities from having reliable access and supply of affordable, fresh and healthy food and limited locally produced food.</p> <p>The affordability of food in remote towns is affected by distance and the lack of competition. The cost of food is at least 24% higher in remote areas compared to major cities. The higher price is attributed to</p>	<p>Panic buying during COVID-19 affected food supply and exacerbated existing food insecurity issues in remote towns.</p> <p>NSW Aboriginal Land Council purchased 1000 food and emergency relief supplies for vulnerable Aboriginal peoples impacted by COVID-19.</p> <p>NSW Aboriginal Land Council sought support from the NSW Government and supermarket chains, the NSW.</p> <p>Government donated 2000 emergency relief packages and</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>operational costs in geographically isolated locations, including freight and repairing store infrastructure as well as the lack of locally sourced perishable produce. Many remote towns only have one store, and because of the limited competition, stores sell goods at high prices (or provide inferior products and/or poor service).</p> <p>Availability of stores and the high price of groceries in stores in remote NSW. 'Across NSW there are 25 towns where there are few stores. In three towns (Brewarrina, Goodooga, and Ivanhoe) there are no commercial supermarkets at all. In Walgett, the only supermarket in the town burnt down over a year ago, and until recently when a pop-up shop was opened, community members had to make a two-hour round trip to Lightning Ridge to shop for food'.</p>	<p>Woolworths donated 1000 each.</p> <p>The supply of emergency food relief can only be a temporary measure and does not address the systemic issues underpinning food insecurity in these towns.</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p><u>Transport</u></p> <p>If people want to shop in towns or cities where grocery prices are cheaper and there is more variety, there are few transport options. Limited public transport in remote communities.</p> <p><u>Housing</u></p> <p>Issues with adequate housing</p> <p><u>Education</u></p> <p>Addressing education</p> <p><u>Systemic</u></p> <p>A focus on maintaining a primarily colonised diet also denies people the option to reintroduce and/or maintain decolonised diets. Restrictions on Aboriginal cultural fishing and cultural fishing activity. Need to reconnect with traditional food practices.</p> <p><u>Social</u></p>	

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				Inequities in social status.	
City of Sydney Council, Submissions to the Inquiry on food production and supply NSW, 2022, (41)	Australia wide	Inquiry	<u>Financial/Systemic</u> Intergenerational trauma and traumatic food rationing <u>Availability/Affordability</u> Food shortages and overpriced, poor-quality groceries	NR	The COVID-19 Pandemic and associated financial crisis have exacerbated the issue.
Community Gardens Australia, Submissions to the Inquiry on food production and supply in NSW, 2022, (42)	NSW	Inquiry	NR	<u>Geographical</u> Aboriginal communities are often isolated geographically and are vulnerable to supply chain shortages	Panic buying during COVID-19 increase supply chain shortages.
NSW Government, Submissions to the Inquiry on food production and supply in NSW, 2021, (43)	Australia wide	Inquiry	<u>Financial</u> Household income is a predictor of food insecurity <u>Storage</u> Issues of storage	NR	COVID-19 pandemic has shown that the food production and supply capabilities face risks. International freight disruption, contribute to rising costs for some key

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
			<u>Nutritional Literacy</u> Issues of knowledge <u>Availability</u> Issues of food availability <u>Accessibility</u> Issues of access		agriculture inputs such fuel, fertilisers and pesticides have flow on effects on food prices.
NSW Government, Submission to the House of Representatives Inquiry into food pricing and food security in remote Indigenous communities, 2020 (49)	NSW	Inquiry	NR	<u>Financial</u> Food insecurity affects those with lower incomes disproportionately. Food security is not just an issue for remote Aboriginal communities but an issue for all Aboriginal people living in NSW due to the comparatively lower income levels. <u>Geography</u> Freight cost is a key expense in ensuring food supply and food relief for NSW rural and remote areas. Geographic distance and	The drought, COVID-19 pandemic and recent NSW bushfires have disrupted traditional supply chains and demand trends, further highlighting that food security is an ongoing concern across NSW. Emergency food boxes, sent in response to COVID-19 food shortages.

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>limited supply chains have created a monopoly effect.</p> <p><u>Transport</u></p> <p>Many Aboriginal people rely on one another to get a lift to the towns to go shopping, as they do not have their own access to transport</p> <p><u>Nutrition Literacy</u></p> <p>It is not uncommon for Aboriginal children living in remote communities to not know healthy food options (e.g. fruit types) that others take for granted</p> <p><u>Affordability/Availability</u></p> <p>Food pricing is a key aspect as well as the quality, variety and availability of safe and nutritious food (e.g. fresh fruit and vegetables). Consequently, families turn to cheaper take away food options with less nutritional value. In many NSW rural and remote towns, there is</p>	

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>only one store that operates, and in some towns, none (charge higher prices). The limited market in regional and remote Aboriginal communities has also contributed to a smaller range of fresh food choices and thus consumption of fresh food.</p> <p><u>Accessibility</u></p> <p>Most rural and remote areas in NSW do not have a major retailer (Coles or Woolworths). Community residents usually travel lengthy distances to regional centres for weekly or fortnightly supplies and use the local stores for top-up shops.</p>	
Foodswell Limited, Food Production and Supply in NSW, 2022, (44)	NSW	Inquiry	NR	<p><u>Systemic</u></p> <p>Cultural burning services</p>	NR
Sustain: The Australian Food Network, Food	NSW	Inquiry	NR	<p><u>Systemic</u></p>	NR

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
Production and Supply in NSW, 2022, (47)				Loss of Aboriginal culture and farming practises.	
The George Institute for Global Health, Food Production and Supply in NSW, 2022, (48)	NSW	Inquiry	NR	<p><u>Accessibility</u></p> <p>Sufficient access to safe water. 'In July 2019, Walgett's main food store, the local Independent Grocers' Association burnt down, and access to food was challenging due to the nearest supermarket being 80 kilometres away and supplies in the temporary pop-up store restricted and expensive'.</p> <p><u>Affordability</u></p> <p>High costs of fresh fruit and vegetables locally</p> <p><u>Systemic</u></p> <p>'The ongoing effects of colonisation, including racism, intergenerational trauma, stolen generations and loss of land, be addressed in relation to their</p>	<p>COVID-19-related panic buying in cities disrupted food supplies.</p> <p>'The Walgett Independent Grocers' Association reopened in November 2020, but reported consecutive deliveries that were less than 30% of stock ordered, as the stock was prioritised to meet extra demand in cities and urban centres. As the Independent Grocers' Association is the only store in Walgett, and due to travel restrictions during the COVID-19 outbreak, this further increased food insecurity and led to</p>

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>effects on cultural continuity and well-being, as part of a holistic approach to tackling food and water security’.</p> <p><u>Other</u></p> <p>Drying up of local rivers and the related quality of the local drinking water. Vulnerability of the current food system.</p>	reports of residents going without food and water’
Individual submissions (45, 46)	NSW	Inquiry	NR	<p><u>Financial</u></p> <p>Continued or exacerbated poverty and unemployment</p> <p><u>Systemic</u></p> <p>Impact of the non-commencement of Schedule 1 on Aboriginal peoples and the practice of Aboriginal cultural fishing</p> <p>Loss of cultural knowledge and intergenerational transmission, poorer diet and family hunger as</p>	NR

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
				<p>inability to fish means no seafood.</p> <p>Loss of Aboriginal culture and farming practises.</p>	
Aboriginal Affairs, Assistance Packages to Help Aboriginal Communities Impacted by COVID-19, 2020, (33)	NSW	Website	NR	<u>NR</u>	'We know that COVID-19 is impacting everyone across NSW, but we are also aware that there is an acute need in remote Aboriginal communities where access to basic food and hygiene supplies is challenging'.
The Conversation, Restrictions on Cultural Hunting Practices are Limiting Indigenous People's Access to Food during the Pandemic, 2021, (34)	Australia wide	Media	NR	<p><u>Systemic</u></p> <p>'The NSW government has long made engaging in cultural food practices difficult, with game meat regulations, and culling and licensing legislation'</p>	'Western NSW has been significantly affected by rising COVID-19 cases in Aboriginal communities. People have also become increasingly food insecure. Some have limited financial resources to purchase food, which in rural and remote areas,

Reference	Setting	Study design	Factors contributing to food insecurity (Australia wide)	Factors contributing to food insecurity (NSW)	The impact of crises
					is comparatively overpriced'
The Australian Prevention Partnership Centre, Improving Aboriginal Food Security and Dietary Intake: Approaches for Remote and Urban Communities, 2022, (35)	NSW	Website	NA	<u>Geographical/Transport</u> Distance to healthy food outlets and transport limitations <u>Nutritional Literacy</u> Ability to cook healthy meals <u>Affordability</u> High cost of food <u>Other</u> Time taken to shop and cook healthy food	NR

Abbreviations: NA Not applicable; NR Not reported; NSW New South Wales

Appendix 4—Question 2 Peer-reviewed articles

Table S5: Peer-reviewed articles (n=5) of the scale and distribution of food insecurity for Aboriginal and Torres Strait Islander peoples in NSW

First author, year, ref	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale and distribution)	Use of food relief	Other
Follent, 2021, (25)	NSW Specific, Eora, Wilyakali, Bundjalung, Yuin and Gumbaynggirr Lands (Urban, Regional, Remote)	Expert opinion, shared experiences and perspectives regarding the indirect impacts of COVID-19	12 Aboriginal community members	Based lived experiences and anecdotal community feedback, food insecurity has increased for some Aboriginal people in response to COVID-19	NR	People are fearful of going into large shopping centres, fearful of COVID 19.
Langton, 2019, (52)	NSW Specific (Urban)	Cross-sectional survey. Questionnaire (food security assessment tool and demographic questionnaire). The United States Department of Agriculture abbreviated six-item subset food insecurity tool (validated tool). Classifications: food secure, food insecure without	n=162 (n=6 Aboriginal)	All Aboriginal participants were food insecure	NR	Even though Aboriginal people were more likely to be food insecure, the recruitment numbers were too small for analysis and comment.

First author, year, ref	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale and distribution)	Use of food relief	Other
		hunger, and food insecure with hunger				
Sherriff, 2022, (5)	NSW Specific (Urban, Campbelltown and Regional, Wagga Wagga, Regional)	Qualitative - Semi structured interviews. Thematic analysis, drawing on principles of grounded theory to guide the process	Invited (n=52); Participated (n=44, 85%); Aboriginal (n=22, 50%)	Aboriginal families in urban and regional Australia are experiencing food insecurity on a regular basis	Participants felt many families in their community relied on emergency food relief services and subsidised food boxes. Some participants (employed) consider themselves to be the “working poor”, making them ineligible for food relief services. Aboriginal families are generally larger and felt some	Limitations of non-Aboriginal food relief services. Fluctuating nature of food insecurity, where people may lose employment and experience food insecurity for a period of time.

First author, year, ref	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale and distribution)	Use of food relief	Other
					<p>food relief organizations do not take this into consideration.</p> <p>Delayed appointments and access to food vouchers and hampers.</p>	
Temple, 2018, (27)	Nationally representative data	Cross-sectional, Australian Aboriginal and Torres Strait Islander Health Survey, two questions regarding food insecurity; 'In the last 12 months was there any time when you (or members of this household) ran out of food and couldn't afford to buy more?' Follow up, 'When this happened, did you (or members of this household) go without food?'	n=1062	<p>Food Insecurity is high in Both urban and remote Settings.</p> <p>Of the older Aboriginal and Torres Strait Islander population, 21% were food insecure. About 41% reported both food depletion and inadequate intake. This places this population at a five-to-seven fold risk of experiencing food insecurity relative to their older non-Indigenous peers.</p>	NR	Non-English-speaking persons in remote areas (37.3%) are at double the risk of exposure to food insecurity than English speakers in either remote (19%) or non-

First author, year, ref	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale and distribution)	Use of food relief	Other
						remote (18.7%) Australia.
Thurber, 2017, (28)	Nationally representative data	Cross-sectional, 2018-19 National Aboriginal and Torres Strait Islander Health Survey; food security measured by whether a household ran out of food in the last 12 months and couldn't afford to buy more, and whether went without food when ran out	n=6423	Compared to the reference category (ran out of food and went without), those that did not run out of food were 60% lower risk of severe COVID 19 illness.	NR	NR

Abbreviations: NR Not reported

Appendix 5—Question 2 Grey literature

Table S6: Grey literature (n=11) of the scale and distribution of food insecurity for Aboriginal people in New South Wales

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
ABS, Australian Aboriginal and Torres Strait Islander Health Survey: Nutrition Results – Foods and Nutrients, 2012- 2013, (53)	Nationally representative data. The National Aboriginal and Torres Strait Islander Nutrition Physical Activity Survey rate varies across states and territories, with NSW (68%) among the highest rate of under-coverage	Report. Nutrition data collected in the National Aboriginal and Torres Strait Islander Nutrition Physical Activity Survey (The first Australian Bureau of Statistics survey to collect detailed nutrition information from Aboriginal and Torres Strait Islander peoples)	n=2900 private dwellings across Australia. Non-remote and remote areas in all states and territories of Australia, including discrete Aboriginal and Torres Strait Islander communities	22% of Aboriginal and Torres Strait Islander people were living in a household where someone went without food when the household ran out of food. A total of 31% of Aboriginal and Torres Strait Islander people living in remote areas had run out of food and couldn't afford to buy more, which was more than non-remote areas 20%.	NR	NR
AHMAC, Aboriginal and Torres Strait Islander Health	Australia wide inclusive of NSW	Report.	NR	In 2012–13 Health Survey, 9% of Indigenous Australians aged 15 years and over went without	NR	NR

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
Performance Framework, 2017, (29)				food when they could not afford to buy more.		
Australian Indigenous HealthInfoNet, Summary of Nutrition among Aboriginal and Torres Strait Islander people, 2020, (54)	Australia wide inclusive of NSW	Summary (use of journal publications, government reports, national data collections and national surveys). The 2012-2013 National Aboriginal and Torres Strait Islander Nutrition Physical Activity Survey measured food security by asking respondents if they had run out of food and couldn't afford to buy more in the last 12 months.	NR	Of the respondents: 7% had run out of food and gone without food; 15% had run out but not gone without food; 22% run out of food and couldn't afford to buy more; 31% in remote areas had run out of food compared with 20% in non-remote areas; 9.2% in remote areas had run out of and gone without food compared with 6.4% in non-remote areas.	NR	NR

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
House of Representatives Standing Committee on Indigenous Affairs, Report on food pricing and food security in Remote Indigenous Communities, 2020, (30)	Australia wide inclusive of NSW	Report	NR	<p>National Aboriginal and Torres Strait Islander Health Survey:</p> <p>2012-2013 , 37% food insecure; 2018-19, 43% food insecure.</p> <p>‘National data (2012-2013) shows one in five or 22% of Indigenous people were living in a household that, in the previous 12 months, had run out of food and had not been able to afford to buy more’.</p> <p>‘Indigenous people living in remote areas were more likely than those in non-remote areas to be living in a household that had run out of food and couldn’t afford to buy more (31% compared with 20%)’.</p>	<p>Food charity organisations report high and increasing demand for food relief in remote areas and are unable to meet the demand.</p> <p>Food charity organisations report an incidence of 18% of food insecurity across Australia.</p>	The prevalence and severity of food insecurity in Australia is not routinely measured.

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
The National Rural Health Alliance, Food Security and Health in Rural and Remote Australia, 2016, (31)	Australia wide inclusive of NSW	Report. Evidence for NSW via the Population Health Survey, conducted using computer assisted telephone interviewing technology	NR	Food insecurity exists in all states and territories, (both rural and urban settings), but those most affected are remote Aboriginal and Torres Strait Islander communities. The 2012-13 National Aboriginal and Torres Strait Islander Health Survey found remoteness a significant factor correlated with food insecurity (31% of remote Indigenous households reported food insecurity, compared with 20% in non-remote areas) and approximately 20% of Aboriginal and Torres Strait Islander Australians ran out of food at least	NR	Both the Australian Health Survey and the Australian Aboriginal and Torres Strait Islander Health Survey use sampling methodologies which may result in underreporting of results for people living in remote and very remote areas. May under-sample people where telephone

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
				<p>once in the previous 12 months.</p> <p>Food insecurity was experienced by between 5 to 7% of the NSW population aged 16 years and older in 2002, 2007 and 2014. The NSW survey suggests food insecurity levels are well above national rates.</p>		<p>connectivity is poor or unreliable and those on low income, in public housing and in more remote areas, therefore under-estimate</p> <p>Those experiencing food insecure.</p>
NSW Legislative Council, Fresh food pricing, 2018, (32)	Australia wide inclusive of NSW data	Report	NR	Food insecurity was reported by 18.5% of Aboriginal people in NSW (Public Health Association Australia). One in five Aboriginal people in non-remote areas experience food insecurity and one in four in remote areas.	'It is common practice to rely on bargains and specials, buy large meat packs for a cheap price that would feed a large family and pick up subsidised	NR

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
					fruit and vegetable boxes from charitable organisations' (Sax Institute).	
The Conversation, Restrictions on Cultural Hunting Practices are Limiting Indigenous People's Access to Food During the Pandemic, 2021, (34)	Australia wide inclusive of NSW data	Media	NR	Western NSW has been significantly affected by rising COVID-19 cases in Aboriginal communities and people have also become increasingly food insecure.	'People are also having to rely on food donations. This has worsened the longer lockdowns have continued and may have lasting effects once they are over'.	NR
AH&MRC NSW, Inquiry into Food Production and	NSW	Inquiry	NR	Food security disproportionately impacts Aboriginal communities in NSW. More than one fifth	NR	NR

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
Supply in NSW, 2022, (37)				of Aboriginal and Torres Strait Islander people were living in households that had run out of food in the previous 12 months (Census).		
City of Sydney Council, Food Production and Supply in NSW, 2022, (41)	Australia wide of NSW data	Inquiry	NR	<p>From the City of Sydney's 2018 Wellbeing Survey, 33.7% of Aboriginal and Torres Strait Islander people had run out of food and could not afford to buy more.</p> <p>NSW Council of Social Services sample was significantly higher than the NSW average of people experiencing food insecurity at the time (6.9%) which more than doubled for Aboriginal and Torres Strait Islander people (18.9%).</p>	'The City has provided Meals on Wheels service since 1957. Along with the delivery of nutritious meals, Meals on Wheels provides essential wellness checks and companionship to clients, who are people over 65 (and	NR

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
				Food insecurity is shown to affect people in cities right through to those in remote areas and it affects more people in some form of employment (64%) than those who have none.	over 50 for Aboriginal and Torres Strait Islander Peoples) or people with National Disability Insurance Scheme approval for meal funding. In 2021, the City provided 4,000 meals per month to 349 eligible clients'.	
NSW Government, Food Production and Supply in NSW, 2021, (43)	Australia wide of NSW data	Inquiry	NR	Aboriginal and Torres Strait Islander people are at 5 to 7-fold risk of experiencing food insecurity relative to their non-Indigenous peers (Australian Bureau of	NR	The NSW Government provided small grants funding to Aboriginal Community Controlled

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
				Statistics and other health data)		Organisations across NSW to develop and implement local solutions to support the health and wellbeing of Aboriginal people impacted by COVID-19. They were focused on the development and delivery of local food relief programs to support Aboriginal people's access to fresh and healthy food.

Reference	Setting	Study design, data collection, food security tool	Total number of participants	Food insecurity (scale, and distribution)	Use of food relief	Other
NSW Government, Food Production and Supply in NSW, 2020, (49)	NSW	Inquiry	NR	Food security is not only an issue in remote Aboriginal communities, but in all Aboriginal communities in NSW including those located in outer regional and rural areas.	Emergency food boxes, sent in response to COVID-19 food shortages	NR

Abbreviations: NR Not reported; NSW New South Wales.

Appendix 6—Aboriginal and Torres Strait Islander Quality Appraisal Tool (Search 1)

Table S7: The 2018 SAHMRI CREATE Aboriginal and Torres Strait Islander Quality Appraisal Tool results of peer-reviewed articles for Search 1

First Author, Reference	Indigenous Governance				Respect for Cultural and Intellectual Property				Capacity Building			Beneficial Outcomes			Overall Assessment
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	
Follent (25)	Y	Y	Y	P	Y	U	U	Y	Y	Y	P	P	N	Y	High
Langton (52)	U	N	N	N	U	N	N	N	N	N	U	U	N	U	Low
Miller (26)	Y	Y	Y	Y	U	U	U	P	Y	Y	P	U	U	U	Moderate
Sherriff (5)	P	Y	Y	Y	Y	U	U	P	Y	Y	Y	Y	Y	Y	High
Temple (27)	U	N	N	U	U	U	U	U	U	U	U	U	N	U	Low
Thurber (28)	Y	P	Y	Y	U	U	U	U	P	Y	Y	Y	U	U	Moderate

Y = Yes, P = Partially, U = Unclear, N = No explicit statements in the body of the text to provide evidence for each question below

-
1. Did the research respond to a need or priority determined by the community?
 2. Was community consultation and engagement appropriately inclusive?
 3. Did the research have Aboriginal and Torres Strait Islander research leadership?
 4. Did the research have Aboriginal and Torres Strait Islander governance?
 5. Were local community protocols respected and followed?
 6. Did the researchers negotiate agreements in regards to rights of access to existing Aboriginal and Torres Strait Islander peoples' intellectual and cultural property?
 7. Did the researchers negotiate agreements to protect Aboriginal and Torres Strait Islander peoples' ownership of intellectual and cultural property created through the research?
 8. Did Aboriginal and Torres Strait Islander peoples and communities have control over the collection and management of research materials?
 9. Was the research guided by an Indigenous research paradigm?
 10. Does the research take a strengths-based approach, acknowledging and moving beyond practices that have harmed Aboriginal and Torres Strait peoples in the past?
 11. Did the researchers plan to and translate the findings into sustainable changes in policy and/or practice?
 12. Did the research benefit the participants and Aboriginal and Torres Strait Islander communities?
 13. Did the research demonstrate capacity strengthening for Aboriginal and Torres Strait Islander individuals?
 14. Did everyone involved in the research have opportunities to learn from each other?

Appendix 7—Programs in NSW

Table S8: Evaluation of programs (n=10) in NSW

Program	Summary	Evaluation	Status
Koori Community Kitchen Program (Tharawal Aboriginal Corporation) (42, 73, 74)	Encouraging healthy eating, good nutrition, and culturally appropriate meals, and to reduce the factors associated with food insecurity.	No	Complete (2008-2013)
A Systems Perspective on the Prevention of Chronic Disease for Urban Aboriginal Communities: Improving Food Security (The Australian Prevention Partnership Centre) (75, 76)	To better understand the systemic factors contributing to food insecurity among Aboriginal communities, and to identify barriers and potential areas for whole-of-system interventions to tackle food security.	No	Complete (2016-2017)
Food, Family, Community Program (Foodswell) (77)	To connect people to promote local action to improve food security, social enterprise and social inclusion	No	Unclear (dates not specified)
Waminda South Coast Women's Health and Welfare Aboriginal Corporation (42, 78)	To support Aboriginal women and their families to be strong, independent, prosperous, powerful, and self-determining.	No	Active
Brungle Bush Tucker Garden (42, 79)	A community driven sustainable food centre project with the goal to provide nutritious, affordable, culturally appreciate food source. To live off the land.	No	Active

Program	Summary	Evaluation	Status
Alive and Well Walgett Shire (80)	To focus on improving access to healthy food choices across the Walgett community.	No	Complete
The Community Garden at Walgett Aboriginal Medical Services (42, 81)	Part of the Healthy for Life Program and is maintained by a full-time gardener, a local Aboriginal woman. The fresh fruit, vegetables and herbs from the garden are distributed to community members who are elderly and/or have a chronic disease.	No	Active
Armidale Aboriginal Community Garden (42, 82)	Collaborative initiative between Anaiwan Elder Uncle Steve Widders; former project manager, Mr Peter Hall; and postdoctoral research fellow Dr Kate Wright. It is hoped that the community garden will have a long-term community-directed future.	No	Active
Second Bite (83)	To rescue and distribute surplus edible food to Aboriginal and Torres Strait Islander communities, in order to support those experiencing food insecurity.	No	Active
Wilcannia's Community Kitchen (49)	To provide hot meals to the elderly and vulnerable three days per week who struggle due to the ongoing food security issues.	No	Unclear

Appendix 8—Question 3 Peer-reviewed articles

Table S9: Peer-reviewed articles (n=12) of effective programs for improving food security for First Nations people nationally and internationally

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
Majid, 2010, (64)	<p>Food Mail Program</p> <ol style="list-style-type: none"> 1) to increase access by Northern populations to nutritious foods 2) to lower prices to nutritious foods in the North 3) to promote healthy eating. 	Canada, North remote regions	<p>Increase access to healthy foods for remote communities by subsidizing the cost of food transport.</p> <p>Orders are placed, goods are transported from wholesalers, goods flown by regional carriers to the destination for final delivery.</p> <p>To create awareness: program promoted through retailers and community health centres.</p> <p>Education component: taste testing at grocery stores, cooking classes and nutrition activities.</p>	135 Northern communities are eligible to receive subsidised food	<p>The program has mixed results.</p> <p>Stakeholders agree that the program provides value and serves an important function to the community.</p> <p>The program has experienced growth in the last five years with the quantity of food orders increasing but a large number of the Aboriginal population do not use the program either because they are not aware of the program or that the foods eligible are not cultural/staple foods.</p>

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
Jernigan, 2011, (55)	<ol style="list-style-type: none"> 1) Identify community priority factors using the Tool for Health and Resilience in Vulnerable Environments assessment tool 2) Link these priority factors to local community issues 3) Design and implement policies related to the 	<p>America, Northern California, Round Valley</p> <p>(Geographically isolated community; single small grocery store selling predominantly 85% packaged foods; community do not feel welcome/high cost at farmers market)</p> <p>~1/3 of the families receive food from Food Distribution</p>	<p>Community-based participatory research study places the agenda and control of research in the hands of communities.</p> <p>Formations of community coalition; adaptation and localization of the Tool for Health and Resilience in Vulnerable Environments; implementation of adapted Tool for Health and Resilience in Vulnerable Environments to rank and explore factors; data analysis and interpretation sharing findings with community; policy development and implementation.</p> <p>The Tool for Health and Resilience in Vulnerable Environments is a policy engagement framework which assist community members with the identification of social and environmental factors in their community which affect their health divided into 3 domains; equitable opportunity, the people, the place.</p>	Native Americans living on reservations, community coalition (n=12), focus groups (n=40; n=31 Native American)	<p>Top three community priorities (NOTE: racial injustice was seen as the overwhelming priority however community felt it too large a factor to address directly and decided on the following related factors as priority):</p> <ol style="list-style-type: none"> 1) Jobs and local ownership; 2) What's sold and how it's promoted; 3) Community look, feel and safety. <p>Policies developed and implemented from focus group priority factors.</p> <ul style="list-style-type: none"> - A Producers Guild was established - Development of a Community Supported Agriculture program (produce used in schools and Food Distribution)

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
	community issues.	Program on Indian Reservations			Program on Indian Reservations) <ul style="list-style-type: none"> - New training and job opportunities were created - Funding pilot programs - Portable EBT machines at local farmers markets allowing - Culturally appropriate foods sold at the local farmers markets. - Local grocery stores changed the shelf-space allocation to include fresh fruit and vegetables, special order and bulk foods and traditional foods.
Ford, 2013, (65)	To develop a baseline understanding of Community Food Programs usage and	Canada, Northwest Territories, Inuvik	A mixed methods approach combining qualitative and quantitative methods Consultation with territorial level policy makers, local leaders, community members and northern science bodies	Northwest Territories, Inuvik has a population of 3463 (63% Aboriginal)	Participants depend on Community Food Programs for regular food access, with users housing insecure and lacking regular employment.

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
	associated determining factors		Community Food Programs include one food bank, one homeless shelter and a Soup and Bannock program Modified United States Department of Agriculture food security survey	Photovoice workshops (n=7; 3 males and 4 females) Open-ended interviews with Community Food Programs users (n=54)	
Gordon, 2016, (56)	To inform food assistance policy and describe how demonstrations using Women, Infants, and children and the Supplemental Nutrition Assistance Program models differed in benefit take-up and impacts on	America, eight states and two Indian Tribal Organizations (Cherokee Nation, Chickasaw Nation, Chicksaw Nation)	Sites chose to deliver the Summer Electronic Benefit Transfers for Children using the Supplemental Nutrition Assistance Program or Women, Infants, and children EBT system. Randomized trial. Households were randomly assigned to a benefit group or control group. Benefit: \$60/child/summer month using Supplemental Nutrition Assistance Program or Women, Infants, and children EBT system. Control: No benefit. Food insecurity assessed using the United States Department of Agriculture food security scale.	Agencies of states and Indian Tribal Organizations received grants (e.g. grantees) proposed specific sites (schools with low-income children) within their states to implement Summer Electronic Benefit Transfers for Children. Ten	The benefit groups had large reductions in very low food security among children, compared to relative to controls.

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
	food security and children's food consumption			grantees administered the program in 14 sites in 2012 (42,000 households)	
Galloway, 2017, (66)	To provide an independent and comprehensive evaluation of the Nutrition North Canada program	Canada, Remote Northern communities	<p>Retail subsidy program designed to reduce the cost of nutritious food within a context of severe food insecurity (subsidise freight costs borne by retailers and other suppliers). The program was designed to operate within a budget of \$60 million/year.</p> <p>Program documents (fiscal and food cost reports), retailer compliance reports, program audits, and the program's performance measurement strategy examined to understand if the subsidy is meeting its objectives in a manner both comprehensive and equitable across regions and communities.</p> <p>Communities reliant on-air freight shipments: the subsidy is paid directly to retailers who sell eligible foods in local stores.</p>	128 isolated northern communities	<p>The existing retail subsidy does not ensure access to nutritious, healthy food in a manner that is fair and equitable across regions and communities.</p> <p>Lack of accountability: 'These problems are compounded by the failure of the program to respond to the concerns about community eligibility, subsidy rates, eligible foods, and retailer accountability that have been raised by community members, critics, the Auditor General of Canada, and the program's own Advisory Board'.</p>

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
Mucioki, 2018, (57)	To investigate opportunities and challenges of the Food Distribution Program on Indian Reservations to achieve food security as well as the extent to which integration of traditional foods can enhance Native American food security, food sovereignty and wellbeing	America, Indian Reservations , Klamath Basin, Karuck tribe, Yurok Tribe, Klamath Tribe	Key informant interviews, focus groups and a household survey co-created with tribal partners. Two tiers: understand local Food Distribution Program on Indian Reservations manager/client experiences as well as national/local program issues and procedures.	14 interviews; 20 focus groups with a total of 128 Native American participants (age range 14 to 62 years); 708 completed surveys	Over 60% of respondents relied on food assistance. Focus groups revealed that: Food Distribution Program on Indian Reservations is essential to food security and survival of many vulnerable and low-income Native American households. Receiving monthly food boxes helped stretch income to cover other monthly expenses.
Ahmed, 2019, (58)	To describe a methodological approach to evaluating and	America, Flathead Reservation, Montana's Bitterroot Salish,	Implementation of complementary methodologies to evaluate multiple dimensions of the food environment, including the availability of food, as well as convenience, affordability and desirability.	NA	Key lessoned learned.

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
	improving food environments	Kootenai and Pend d'Oreilles tribes.			
Bersamin, 2019, (59)	To evaluate the preliminary efficacy of a school-based intervention (Neqa Elicarvigmun or the Fish to School Program) on diet quality, fish intake, and attitudes and beliefs around traditional foods using a pre–post comparison group design	America, Rural and Remote Alaska Native communities, Yup'ik people	<p>Fish-to-school program: the intervention community received all components of the intervention throughout the academic year.</p> <p>Social cognitive theory combined with indigenous traditional knowledge provided the overarching framework for the intervention.</p> <ol style="list-style-type: none"> 1) Locally caught salmon served in cafeteria for lunch 2) Education component included five culturally responsive, experiential lessons that highlighted the benefits of eating a traditional diet to personal, community, and environmental well-being 3) Four intergenerational community events were held, celebrating traditional foods which were designed 	Middle school/high school students from two communities; total 76 participants, 3 time points (baseline, 4 months; and 9 months)	<p>School-based Interventions can be used to reconnect students to their traditional food system with benefits to diet quality.</p> <p>The use of culturally based food systems intervention can improve diet quality and increase intake of traditional foods.</p>

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
			to link school-based activities with the home and community.		
Pindus, 2018, (60)	To develop a national profile of Food Distribution Program on Indian Reservations participation and an understanding of program operations	America, American Indian and Alaska Natives	<p>Mixed method and culturally responsive study design.</p> <p>30 min survey administered by Native American interviewers addressing participation in other nutrition assistance programs, access to food stores, access to facilities for storing and preparing food, perspectives on Food Distribution Program on Indian Reservations customer service, and reasons for participating in Food Distribution Program on Indian Reservations and for switching between Food Distribution Program on Indian Reservations and Supplemental Nutrition Assistance Program.</p> <p>Food insecurity was assessed using the six-item short form measure used by the Economic Research Service.</p>	1053 households of all ages	<p>Food Distribution Program on Indian Reservations and locally sourced food initiatives help to meet needs.</p> <p>While the Food Distribution Program on Indian Reservations is intended to be a supplemental food package program, the findings showed that it was the primary source of food for 38% of households, contributing 81–100% of their food supply.</p> <p>Food Distribution Program on Indian Reservations promotes healthy eating through nutrition education activities using a variety of federal, state, and local tribal resources. Nutrition education shown to be a worthwhile investment.</p>

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
Timler, 2019, (62)	A prison garden program to address inmate rehabilitation and Indigenous community food insecurity by supporting incarcerated men to grow and subsequently donate organic produce to rural and remote Indigenous communities	Canada, Prisoners, T̓silhqot̓in community members	Ethnographic in design Qualitative data was collected through interviews and observation (prison garden and community members) Cooking workshops were conducted within three communities	Community members (n=10), men working in the prison garden (n=10), and program stakeholders (n=5)	The prison garden has potential of increasing community engagement and recognizing community strengths. Community cooking workshops strengthened community relationships. 'T̓silhqot̓in individuals understood the donated vegetables within the wider context of T̓silhqot̓in values surrounding foodways, highlighting that food is not only nutritionally required, but also based in relationships and, meaningfully grounded in responsibility'.
Briefel, 2021, (61)	To determine if the Packed Promise intervention reduces food insecurity among low-	America, Oklahoma, Chickasaw Nation Territory	Cluster Randomised Control Trial Households selected from 5 types of food boxes that contained nutritious shelf stable foods (\$38 food value), plus a \$15 check for purchasing fruits and vegetables	Low-income households with children aged >4 years, 40 school districts (n=4750) (treatment and control schools),	Significantly ($p=0.002$) Improved adults' food security (by three percentage points) in the first year only. No improvement in either children or household food security. A decline in out-of-pocket food

First author, year, ref	Aim	Setting	Intervention summary/ methodology	Population	Outcome
	income households with children eligible for free school meals			25-month intervention	expenditure was noted but not significant.
Blanchet, 2021, (63)	To describe the reach of the Syilx-led reintroduction of Okanagan Sockeye salmon intervention and assess its impact on Syilx households' income-related and cultural food security status	Canada, Okanagan Nation	<p>Cross-sectional based on survey data</p> <p>To use hatchery supplementation for the restoration of sockeye salmon</p> <p>The intervention also included an education component (fish in schools)</p> <p>The 18-item United States Department of Agriculture Household Food Security Survey Module (adapted). Cultural food security was assessed by asking participants if they worried that traditional food would run out before they could get more.</p>	Syilx communities, 265 households	<p>Indigenous-led multi-level wild habitat restoration interventions increased both Okanagan sockeye salmon availability and accessibility.</p> <p>Households' access to salmon was significantly associated with cultural food security and the perceived importance of cultural food security.</p> <p>Indigenous food sovereignty initiatives can increase traditional food access and consumption, thereby enhancing cultural food security.</p>

Abbreviations: NA Not applicable

Appendix 9—Question 3 Grey literature

Table S10: Grey literature (n=2) of effective programs for improving food security for First Nations people nationally and internationally

Reference	Aim	Setting	Intervention summary/ methodology	Population	Outcome
health + wellbeing Queensland, Affordable access to healthy food and drinks, 2020, (67)	Focused on improving remote food insecurity for Aboriginal and Torres Strait Islander communities	Aboriginal and Torres Strait Islander communities in the Torres Strait, Cape York and Lower Gulf regions of Queensland	<p>Building the capacity and capability of remote food stores and engaging communities and community organisations to identify priorities and lead actions that will improve access to healthy food and drinks.</p> <p>Framework to address food security in remote Aboriginal and Torres Strait Islander communities in Queensland:</p> <p><u>Availability</u></p> <ol style="list-style-type: none"> 1) System: freight; laws for hunting grounds; policies for schools, workplaces and other institutions 2) Community: quality food in stores, workplaces and institutions; food assistance; traditional foods 	Health and Wellbeing Queensland; Community; External partners (Apunipima Cape York Health Council, Gidgee Healing, Mura Kosker Sorority Community Enterprise Queensland)	<p>‘A localised, resilient food supply with adequate transport and housing infrastructure were identified as critical to availability, access and utilisation of healthy, quality food in remote First Nations communities.</p> <p>The themes identified will be used to inform a remote Food Security action plan for First Nations Torres Strait, Cape York and Lower Gulf communities.</p>

Reference	Aim	Setting	Intervention summary/ methodology	Population	Outcome
			<p>3) Family and individual: adequate safe, healthy and cultural appropriate food for everyone in the household.</p> <p><u>Access</u></p> <p>1) System: economic development and education opportunities; welfare; transport infrastructure</p> <p>2) Community: local upskilling, traineeships and employment; school attendance; transport to reach food sources</p> <p>3) Family and individual: meal planning, budgeting and vouchers; proximity to food sources; available transport.</p> <p><u>Utilisation</u></p> <p>1) System: housing availability and quality, school curriculum, campaigns</p> <p>2) Community: local food business practices, education and awareness, traditional</p>		

Reference	Aim	Setting	Intervention summary/ methodology	Population	Outcome
			<p>knowledge, cooking and storing facilities</p> <p>3) Family and individual: homes can support preparation, cooking and storage (water and electricity), individual knowledge and skills.</p> <p>The Healthy Remote Food Stores project aims to increase customers healthy purchasing behaviours.</p>		
NSW Government, Submission to the House of Representatives Inquiry into food pricing and food security in remote Indigenous communities, 2020, (49)	NA	NSW	NA	NA	<p>Ngulingah Local Aboriginal Land Council Food Security Project</p> <p>Goodooga Store on land owned by the Goodooga Local Aboriginal Land Council</p> <p>Boggabilla School Food Program</p> <p>Wilcannia's Community Kitchen</p>

Abbreviations: NA Not applicable; NR Not reported; NSW New South Wales

Appendix 10—Aboriginal and Torres Strait Islander Quality Appraisal Tool (Search 2)

Table S11: The 2018 SAHMRI CREATE Aboriginal and Torres Strait Islander Quality Appraisal Tool results of peer-reviewed articles for Search 2

First Author, Reference	Indigenous Governance				Respect for Cultural and Intellectual Property				Capacity Building			Beneficial Outcomes			Overall Assessment
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	
Majid (64)	N	N	N	Y	U	U	N	N	N	U	Y	P	N	N	Low
Jernigan (55)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	Y	High
Ford (65)	Y	Y	Y	Y	Y	U	Y	Y	Y	Y	Y	Y	U	U	High
Gordon (56)	N	N	N	U	N	N	N	N	U	U	P	P	N	N	Low
Galloway (66)	P	N	Y	U	N	N	N	N	N	N	P	N	N	N	Low
Mucioki (57)	Y	Y	Y	Y	Y	U	U	Y	Y	Y	Y	Y	Y	Y	High
Ahmed (58)	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	High
Bersamin (59)	U	Y	Y	P	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	High
Pindus (60)	U	P	N	N	U	U	U	U	U	N	P	N	P	N	Low
Timler (62)	U	U	U	P	U	U	U	P	Y	P	U	P	P	U	Moderate
Briefal (61)	Y	Y	Y	Y	U	U	U	N	U	U	P	Y	N	N	Moderate
Blanchet (63)	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	U	Y	Y	U	High

Y = Yes, P = Partially, U = Unclear, N = No explicit statements in the body of the text to provide evidence for each question below

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1. Did the research respond to a need or priority determined by the community?
 2. Was community consultation and engagement appropriately inclusive?
 3. Did the research have Aboriginal and Torres Strait Islander research leadership?
 4. Did the research have Aboriginal and Torres Strait Islander governance?
 5. Were local community protocols respected and followed?
 6. Did the researchers negotiate agreements in regards to rights of access to existing Aboriginal and Torres Strait Islander peoples' intellectual and cultural property?
 7. Did the researchers negotiate agreements to protect Aboriginal and Torres Strait Islander peoples' ownership of intellectual and cultural property created through the research?
 8. Did Aboriginal and Torres Strait Islander peoples and communities have control over the collection and management of research materials?
 9. Was the research guided by an Indigenous research paradigm?
 10. Does the research take a strengths-based approach, acknowledging and moving beyond practices that have harmed Aboriginal and Torres Strait peoples in the past?
 11. Did the researchers plan to and translate the findings into sustainable changes in policy and/or practice?
 12. Did the research benefit the participants and Aboriginal and Torres Strait Islander communities?
 13. Did the research demonstrate capacity strengthening for Aboriginal and Torres Strait Islander individuals?
 14. Did everyone involved in the research have opportunities to learn from each other?