Submission No 68

FOOD PRODUCTION AND SUPPLY IN **NSW**

Organisation: Dietitians Australia

Date Received: 28 February 2022



Parliamentary inquiry into food production and supply in NSW

Response to consultation February 2022

Recipient

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About Dietitians Australia

Dietitians Australia is the national association of the dietetic profession with over 8000 members, and branches in each state and territory. Dietitians Australia is the leading voice in nutrition and dietetics and advocates for food and nutrition for healthier people and healthier communities.

The Accredited Practising Dietitian (APD) program provides an assurance of safety and quality and is the foundation of self-regulation of the dietetic profession in Australia. Dietetic practice promotes healthy and sustainable diets at various levels, for example in food-based dietary guidelines at the population-level, food procurement and menu planning policies at an institutional-level and in nutrition education to client groups, community groups and other health professionals, and medical nutrition therapy at the group and individual level. In terms of providing specific dietary advice, dietitians can provide advice on the many activities a person engages in to source, store, prepare, consume and dispose of the food they eat

This submission was prepared by members of the Dietitians Australia Food and Environment Interest Group, and Public Health and Community Nutrition Interest Group following the <u>Conflict of Interest Management Policy</u> and process approved by the Board of Dietitians Australia. Contributors include Dietitians Australia members with wide ranging expertise in areas including public health, food systems, food industry, emergency food relief and academia.

Dietitians Australia position on healthy and sustainable diets

It is the position of Dietitians Australia that to promote human and planetary health, a food system transformation is needed that supports the population to adopt healthy and sustainable diet-related practices. A healthy and sustainable diet must:

- Be nutritionally adequate, healthy and safe
- Have low environmental impact and be protective of natural resources and biodiversity
- Be culturally acceptable
- Be accessible, economically fair and affordable

Dietitians Australia acknowledges that it is critical to prioritise Indigenous knowledges in consultation, policymaking and implementation processes to achieve these recommendations. In facilitating the uptake of healthy and sustainable diets, dietitians are contributing to the transformation of our current food system that is urgently required to nourish present and future generations within planetary boundaries.

For more information about our position, see the evidence brief and position paper on our website.



Summary

In Australia, the way our food is produced, manufactured, distributed and consumed is contributing to climate change and malnutrition in all its forms. Our agricultural sector is responsible for 16% of Australia's greenhouse gas emissions as well as biodiversity loss, water consumption and unsustainable land management practices. This is only worsened by the fact that unhealthy foods (high saturated fat, added sugar and salt) account for 27% of diet-related emissions. Unhealthy dietary patterns are the leading preventable risk factor for chronic disease, particularly amongst lower socio-economic groups.

To achieve a more healthy, sustainable and equitable food system, change will need to occur across all sub-systems, including more sustainable agricultural practices, less energy use in food processing and transportation, a changed food supply chain and retail sector, significant changes in consumer food choices, as well as strategies that result in less food waste. This will require comprehensive action across multiple settings to bring about the necessary change. Food environments, including where people access food, the types of foods available, and the way that foods are marketed, have an enormous impact on population diets.⁷

This relationship between our food system and our climate is bidirectional. Climate change and poor environmental conditions also affects our food supply and security, for example through decreased crop yield, availability and quality, which adversely affects health. This requires a change to both food production and consumption practices to ensure current and future generations are nourished within planetary boundaries. Global targets are an effective mechanism for driving such change, such as Agenda 2030, the Paris Agreement and the United Nations Decade of Action on Nutrition. Efforts to improve our food system can have far-reaching benefits — improving food security and nutrition, social and gender equity, community resilience and more.

It is agreed that a whole-of-system approach is required, and efforts to promote healthy and sustainable diets can trigger action across the entire food system. The food system has six phases which make up 'the interconnected system of everything and everybody that influences, and is influenced by, the activities involved in bringing food from farm to fork and beyond': (i) agricultural production, (ii) distribution, transport and trade, (iii) processing, (iv) food retail/service, (v) consumption, and (vi) waste and disposal. The points of intersection between diet and this broader food system present a great opportunity to achieve systemic transformation, in particular, efforts to promote the consumption of healthy and sustainable diets. To

Dietitians have a key role to play in facilitating the required food system transformation. Dietetic practice promote healthy and sustainable diets at various levels, for example in food-based dietary guidelines at the population-level, food procurement and menu planning policies at an institutional-level and in nutrition education to client groups, community groups and other health professionals, and medical nutrition therapy at the group and individual level. ^{1, 11} In terms of providing specific dietary advice, dietitians can promote these practices, which describe the many activities a person engages in to source, store, prepare, consume and dispose of the food they eat. ¹

A list of recommendations is provided below.



Recommendations

- 1. Support an updated National Nutrition Strategy. 1, 12
- 2. Involve First Nations peoples at all levels of decision making and implementation, prioritising local expertise, local needs and local governance structures in both long-term planning and emergency responses to food and water security.^{1, 13, 14}
- 3. Incorporate First Nations people's knowledge of native plants and materials into consideration as sources of food.¹⁴
- 4. Implement recommendations of the New South Wales Aboriginal Land Council to the inquiry into food pricing and food security in remote Indigenous communities:¹⁵
 - a. Commence Section 21AA of the Fisheries Management Act 1994.
 - b. Remove restrictions on Aboriginal cultural fishers and cultural fishing activity, including for example regulations relating to size, gear, method and closure.
 - c. Place a moratorium on prosecuting Aboriginal cultural fishers.
- 5. Work with the Federal government to implement routine, robust food insecurity monitoring and surveillance system to identify drivers, impacts and effective strategies. Include the USDA 18-question Household Food Security Survey Module in government health surveillance systems and Australian Health Surveys.
- 6. Invest in a NSW Food Security Council to determine the degree to which NSW policy, legislation, services and projects represent the needs of low-socioeconomic populations, with the outcome of reducing food insecurity.^{1, 16, 17}
 - a. The Council be comprised of a range of experts and stakeholders, including but not limited to NSW Council of Social Services, NSW Health, Accredited Practising Dietitians, public health, urban planning and food relief.
 - b. The Council have a key goal of decreasing food insecurity by 10 percent by 2030.
 - c. To achieve this goal, the Council be given a legislative mandate that provides clear authority and capacity to affect change, clear transparent targets, performance indicators and financial capacity to support services.¹⁶
 - d. The Council be required to take a responsive and democratic approach that includes consultation with industry experts and with people experiencing food insecurity.
 - e. The Council have clear lines of reporting into key government departments to translate work into government policy and action.¹⁶
 - f. The Council:
 - i. Commit to regular monitoring of food prices and availability across NSW.
 - ii. Take a multi-sector participatory approach working with community stores to enhance food security in remote Indigenous communities¹⁸
 - iii. Require local government to create public health plans addressing insecurity, ^{19, 20} including more cities becoming signatories to the Milan Urban Food Policy Pact. ²¹
 - iv. Ensure NSW homeless services are provided with a quality framework, monitoring or training to include food and nutrition in their service provisions.²²



- v. Explore including alternative food networks (eg non-supermarket retail options and civil society groups) in urban policy.²³
- vi. Reform the emergency food relief system to ensure its efficiency and effectiveness, by reorienting to nutrition-focussed food relief and client-focussed services providing pathways to food security.
- 7. Take immediate action on recommendations in the Healthy Food Environment Policy Index report:²⁴
 - Require all organisations that receive funding from the NSW Government to restrict all promotion (including sponsorship) related to unhealthy food and beverages as a condition of funding.^{1, 24}
 - Implement additional policies to restrict unhealthy food and beverage advertising in all settings controlled or managed by the NSW Government, including public transport infrastructure and sports sponsorship.^{12, 24}
 - c. Continue efforts to implement policies on healthy food provision (ie the Healthy Food and Drink in NSW Health Facilities Framework and the NSW Healthy School Canteen Strategy) and extend them to apply across all NSW government departments and settings.²⁴
 - d. Identify policy mechanisms to assist local governments to limit access to unhealthy take-away foods, and to assist retail outlets (including restaurants, pubs and clubs) to improve the healthiness of the foods supplied.^{1, 24}
 - e. Implement formal health impact assessments on population nutrition and health as part of policy development proposal process.^{1, 12, 24}
- 8. Work across all institutional settings to adapt food service provision to support social normative shifts to less animal-derived foods and more plant-based proteins on the menu, and efforts to minimise food-related waste.
- 9. Adequately resource measures to reduce and reuse commercial and domestic food-related waste in line with circular economy principles.^{1, 14}
- 10. Ensure urban planning legislation/requirements allow for equitable access to healthy and sustainable food, including, zoning regulations to prioritise farmers markets, green grocers, social solidarity supermarkets and bulk food stores over retail outlets selling fast food and ultra-processed foods.¹
- 11. Incentivise commercial kitchens (eg cafes and restaurants) to offer healthy and sustainable menu options by rewarding and promoting their efforts.¹
- 12. Support open-source platforms (eg Open Food Network) to create online marketplaces for small-scale food producers, to connect producers and consumers without relying on the supermarket duopoly.¹
- 13. Recognise social, cultural and environmental determinants of health in all policy decisions, including climate and energy policy.¹⁴
- 14. Provide incentives for production of low emission, healthy foods and discourage production of highly processed foods which are damaging to both human and planetary health.^{1, 14}
- 15. Provide training for stakeholders from the hospitality, food procurement and food service industries (eg caterers and food service providers) in incorporating sustainability principles into food procurement, food service practices and menus.



16. Support a federal scheme for front-of-pack labelling identifying environmental impacts of packaged foods, with clear criteria to prevent eco-labelling of unhealthy foods.



Evidence

Consideration of Indigenous food and land management practices

Indigenous Peoples of the world have managed sustainable food systems for millennia, providing food, livelihoods and well-being to humankind.¹ Indigenous People's food systems are founded on values of reciprocity and respect for the whole ecosystem, whereby humans are interconnected with the natural environment. The way food is produced and consumed has changed substantially over the last decades and disregards these Indigenous knowledges.¹,² As we attempt to mitigate the effects of climate change and an increasing prevalence of diet-related disease, Indigenous Peoples' knowledges of sustainable food systems can provide insights, lessons and evidence.¹, 25

First Nations people are disproportionately impacted by food insecurity and food-related health conditions. More than one in five (22%) Aboriginal and Torres Strait Islander adults reported experiencing food insecurity in the most recent Aboriginal and Torres Strait Islander Health Survey. ²⁶ It is vital that any policy changes affecting Aboriginal and Torres Strait Islander people are made in recognition of the principles of self-determination.

The issues of food security and self-determination were explored in the report on food pricing and food security in remote Indigenous communities. In their submission, the New South Wales Aboriginal Land Council recognised the potential for bush foods to be viably produced at scale, giving the example of the Northern Australia Kakadu Plum Alliance. They told the Committee that the bush food market is currently valued at \$20 million annually, but it is estimated that Aboriginal and Torres Strait Islander people make up only 1-2% of the market. The same organisation also stated that governments can assist in rebuilding the capacity of communities to supply their own foods by returning land and fishing rights to Aboriginal people. The same organisation also stated that governments can assist in rebuilding the capacity of communities to supply their own foods by returning land and fishing rights to Aboriginal people.

Improving food security and equitable access to food

Food insecurity in New South Wales

Food insecurity is defined by the Food and Agricultural Organisation as the lack of reliable physical, social or economic access to a sufficient amount of nutritious, safe and appropriate foods for an active and healthy life.²⁷ Food insecurity is related to poorer physical and mental health and wellbeing.

According to the Foodbank Hunger Report 2021,²⁸ 1 in 6 adults and over 371,000 children in NSW and ACT had gone hungry in the last year, and 43% of parents facing food insecurity reported their children went an entire day without eating at least once a week. The COVID-19 pandemic has disproportionately impacted individuals who typically work casual part-time jobs, reducing their working hours, causing lost employment and undermining their career prospects. As a result, 65% of food insecure Australians are 18 to 25-year-olds going hungry at least once a week.²⁸

The reliance on food relief organisations may be masking a higher level issue of cost of living, stagnant wage growth and social welfare payments below the poverty line.²⁹

Food environment

The foods we eat are strongly influenced by the food environment surrounding us. This includes factors like the foods that are available in the local geographical area, experiences when shopping for food and food advertising a person is exposed to. NSW progress on improving food environments up to 2019 and recommendations for action are outlined in the Policies for tackling obesity and creating healthier food environments report. A



Food marketing

Food marketing and advertising influences what we eat. A 2018 study on food advertising on Australian free-to-air television found that 11% of ads were for food products, of which up to 71% were for unhealthy foods high in saturated fat, sugar or salt. A 2020 study on advertising on children's school routes in Sydney found that 32% of ads were for food or drinks, and of those, 75% were for unhealthy products high in saturated fat, sugar or salt. Fast foods such as burgers, chips and pizza were the most frequently advertised products (23%), followed by sugary drinks (17%) and snack foods (16%). Alcohol advertisements contributed 6% of all food and beverage advertisements. Almost all (97.4%) ads observed in this study were on NSW State Government-owned infrastructure (eg buses, train stations). Restriction of marketing to children, and establishing 'green zones' around schools have improved food environments overseas and should be implemented in NSW. 32

Food-sensitive planning and urban design

Different foods are available in different parts of NSW, including from grocery stores and food outlets. This is influenced by town planning regulations, supply chains and proximity of food stores to people's homes. Research shows that fewer varieties and poorer quality fruit and vegetables are found in stores in low socioeconomic suburbs, 33 and in regional areas. 4 Similarly, unhealthy food outlets outnumber healthy food outlets in areas of growth (eg outer suburbs), 35, 36 and foods available via online food delivery platforms (eg UberEats) are predominantly unhealthy. 7 This negatively impacts a person's ability to purchase and eat healthy foods like fruits, vegetables and wholegrains.

Food-sensitive planning and urban design (FSPUD) recognises that access to healthy, sustainable and equitable food is an essential part of achieving liveable communities. FSPUD principles outline the approaches and interventions required to shift to a more sustainable and resilient food system and ensure people can meet their food needs into the future.³⁸ A report commissioned by the Heart Foundation³⁸ outlines provides further information on FSPUD, including how to apply it in practice.

Food retail

Product placement and the shopping experience affect the way people buy food. A 2020 systematic review found that greater availability and more prominent positioning of healthy foods in stores, or reduced availability and less prominent positioning of unhealthy foods in stores, related to selection of healthier food options.³⁹ This was supported by a 2021 cluster trial which suggests that shoppers purchase healthier foods when fruit and vegetable displays are more obvious when entering a store and unhealthy foods are removed from end-of-aisle displays and checkout displays.⁴⁰ Cross-sectional analysis published in 2021 suggests Australians generally support changing retail environments to support healthy choices, such as by reducing the number of end-of-aisle displays containing unhealthy foods or soft drinks, and increasing the shelf space for fresh and healthier foods,⁴¹ suggesting that altering food placement in stores can improve healthiness of food baskets.

Prominent display areas such as end-of-aisles, island bins and checkouts are typically used to display price promotions on unhealthy foods. ⁴² Price promotions lead to impulse purchases, stockpiling and overconsumption. ⁴³ This is concerning, given research from Deakin University showing that price promotions (eg discounts, 2-for-1 deals) are applied more commonly to unhealthy foods than healthy foods, to the point of statistical significance. ^{42, 44} Policies should be implemented to reduce the prevalence of unhealthy food price promotions, as part of a comprehensive approach to improving population diets.



Food prices

A healthy diet is high in fruits, vegetables, legumes, wholegrains and dairy, contains lean meats, fish and nuts, and is low in saturated fats, sodium, refined grains and added sugars. Diets following this pattern are often unavailable or unaffordable for families experiencing low income and at risk of experiencing food insecurity, costing up to 31% of their disposable income. This can lead to families experiencing low income eating a diet low in plant foods (eg fruit, vegetables, wholegrains) and high in low-cost energy-dense packaged foods (eg bulking meals with pasta or white rice, cheap high-fat sausages, fast food 'family' meal deals). People experiencing food insecurity are also more likely to ration, reduce portion sizes or skip meals. These unhealthy dietary patterns are a known risk factor for chronic diseases such as heart disease and diabetes.

Australia lacks a national program to monitor the cost of healthy foods and the availability and quality of fresh fruit and vegetables. There have been several state-based programs, some longitudinal studies, and ad hoc studies in smaller communities that have undertaken food basket surveys. Since the late 1990s, the state government Health Departments in Queensland ⁴⁹ and the Northern Territory ⁵⁰ have regularly monitored the cost of healthy food. More recently the Western Australia government has conducted two food basket surveys in 2010 and 2013. ⁵¹ Other food basket surveys have been undertaken by academic researchers rather than led by government. A variety of methodologies and survey instruments have been used. ⁵² NSW does not currently have regular monitoring of food prices.

Cancer Council NSW has conducted three healthy food basket surveys in NSW – in 2006 (n=149 stores), 2008 (n=105 stores) and 2009 (n=129 stores). These studies used the Queensland Healthy Food and Access Basket survey by costing a 44-item food basket across the five core food groups of the Australian Dietary Guidelines. Total basket cost and mean cost of fruit and vegetables were consistently higher in remote locations compared with cities and urban centres, with a difference of up to \$221. Fruit and vegetables accounted for one-third (35%) of the total food basket cost.³⁴

A 2012 food basket survey in Sydney acknowledges the reduction in food prices with increasing competition from discount supermarkets. This study showed a food basket including mostly foods recommended by the Australian Dietary Guidelines was cheaper in low compared to high socioeconomic suburbs (\$177 vs \$189, p<0.01). While the actual cost of the food basket was cheaper in low SES areas, the cost relative to income is likely to be higher and therefore less affordable for people experiencing low-income.³³

Local government action

The NSW Public Health Act 2010 does not require local government to create public health plans, unlike Victoria, South Australian and Western Australia, and this limits local government's financial and technical capacity to address this serious public health issue.^{19, 20}

Local governments' closeness to their communities gives them a unique ability to lead a place-based approach that involves local food security partnerships and supporting existing community programs. Local governments' place-based approach requires engaging stakeholders form a diverse range of sectors including local government, social services and organisations that aim to address food insecurity to share resources and best practices to address one or more interconnected determinants of food insecurity affecting in the local community.²⁰ Participation of people who have experienced food insecurity is integral to this process, to develop sustainable and socially inclusive programs that support and empower individuals to access healthy foods.²² VicHealth have had great success using this approach in their Food For All program.⁵³

The role of local governments in transforming the food system has also been recognised through the development of the 2013 Milan Urban Food Policy Pact (MUFPP).²¹ Signatories to the Pact (in



Australia, only the City of Melbourne and City of Sydney) have publicly committed to developing sustainable food systems that are:

- Inclusive, resilient, safe and diverse
- Provide healthy and affordable food to all people in a human rights-based framework
- Minimise waste and conserve biodiversity while adapting to and mitigating impacts of climate change

Sixty-six different policy actions are being undertaken by MUFPP signatories, the most common being food procurement in public facilities (44%) and guidelines for school-feeding programs (33%).⁵⁴

A comprehensive policy analysis of actions concerned with creating a healthy, sustainable, and equitable food system from all local governments in New South Wales (n=128) and Victoria (n=79) was undertaken by researchers at the University of Sydney. Relevant policy documents were analysed against a framework of 34 recommendations for local government action on food systems. Only 13 of 207 local governments had dedicated food system policies, with most actions contained in general (non-food specific) policies. Almost all local governments acted on food safety, sustainable local food growing, food waste, drinking water, and food system-related education. Few local governments used economic tools to support consumption of healthier foods, restricted unhealthy food advertising, developed dietary guidelines for non-local government managed settings, or influenced the opening of types of food outlets. Only a handful of pioneer local governments had dedicated food system policies which points to opportunities for more strategic, 'joined-up' food policymaking at the local government level. Further qualitative case studies¹⁹ conducted with six exemplar local governments that had implemented food system policies identified the main challenges to be:

- Lack of state government mandate (eg restrictive land use planning)
- Lack of funding for food systems work rather than specific topics (eg waste, food relief)
- Lack of data to demonstrate effectiveness of policy implementation
- Loss of momentum after organisation restructures
- Shifting political priorities away from food systems

Reducing food waste and destruction

Food waste is a worldwide challenge which has environmental, economic and social impacts. As a Signatory to the United Nations 2030 Agenda for Sustainable Development, Australia is obliged to act on Development Goal 12.3 to halve food waste by 2030. In 2017 the Australian Government published the National Food Waste Strategy to provide a framework to support collective action towards reducing food waste. Food Innovation Australia Limited (FIAL), was commissioned by the government to implement the Strategy. In 2020 FIAL published A Roadmap for reducing Australia's food waste by half by 2030, and in 2021 published the National Food Waste Strategy Feasibility Study.

Australia wastes 7.6 million tonnes of food each year, 70% of which is edible. This equates to 312kg of wasted food per person per year. ⁵⁶ In NSW, 668,000 tonnes of food waste was generated in households in 2016/17. Over 90% of that food waste ended up in landfill. ⁵⁷ There are significant environmental, economic and social costs associated with wasted food that is fit for human consumption:

- 8-10% of global greenhouse gases comes from food that is produced but not eaten.⁵⁸
- More than 25 million hectares of land in Australia is wasted to grow food that is not eaten.



- Food waste across the supply chain (ie farm to fridge) costs the Australian economy \$36.6 billion a year.⁵⁶
- \$2.84 billion agricultural food losses to farmers in Australia.
- 1 in 6 adults in NSW are experiencing food insecurity²⁸ yet edible food is being wasted.

The drivers of food losses within the primary production sector are numerous, categorised broadly as on-farm damage, market forces, cosmetic standards, perishability and processing and transport losses. Among the market factors are price variation, which may make it uneconomic to harvest, and challenges securing seasonal employees for picking. Of the 392,900 tonnes of food waste generated in primary production in NSW, only 0.8% is given to food rescue.⁵⁷

Food waste in hospitals is an issue regularly investigated by dietitians. Despite patients generally wanting to avoid food and related waste (eg single use cutlery), ⁶⁰ waste in this setting is influenced by patient appetite or interest in food, food quality and quantity, and the foodservice model (eg set times of day, on demand ordering). ⁶¹ A systematic review of hospital food service has investigated environmental and associated economic impacts of food waste, outcomes of strategies aiming to improve sustainability and perspectives of patients, staff and stakeholders about these strategies. The review found that foodservice strategies to increase patient intake were the most common intervention to reduce food waste. Challenges to implementing other strategies to improve sustainability or reduce food waste included logistical barriers, requirement for efficiency, budget constraints, and the menu modifications required for the change in foods sourced. ⁶²

Developing technologies to bring food production into cities

In response to this section we discuss policy, planning, programs and practices beyond technology, to bring food production into cities.

In 2009, state legislature in Vermont, USA introduced the Farm-to-Plate (FTP) Investment Program, co-ordinated by the non-profit Vermont Sustainable Jobs Fund. Vermont, has extensively invested in its local food system and is considered an international leader in this effort. Evaluation of the program found that consumption of local food products increased from 5% of foods consumed in 2010 to 11.2% in 2017 while the program was running.⁶³

The FTP agribusiness concept has not been widely adopted in Australia, however the Cardinia Food Circles initiative in Victoria has evolved along the same co-design principles by building a shared understanding of the Cardinia Shire food system, and addressing its challenges and opportunities, amongst a diverse and representative group of stakeholders. Also in Victoria, the Open Food Network is piloting the Open Road program to connect farms, community food hubs and independent retailers.

The Australian Capital Territory (ACT) has pioneered planning reforms to support food production in cities. The ACT actively supports community gardens for growing food via grants and planning permissions, ⁶⁶ and allows planting of food plants on nature strips. ⁶⁷ Similar reforms should be implemented across NSW.

Limiting the impact food production has on the environment, including overfishing

A systematic literature review, co-authored by members of Dietitians Australia Food and Environment Interest Group has summarised the evidence on the environmental impacts associated with current food consumption patterns in Australia and NZ, in terms of greenhouse gas emissions (GHGe); water use/footprints and/or water scarcity footprints; and land use, ecological footprints,



and cropland footprints. Australia's food system-related greenhouse gas emissions currently represents 14.2% of the country's total annual emissions.⁶⁸

Discretionary foods are consistently one of the two highest contributors to environmental impacts across multiple metrics: GHGe, cropland footprints, ecological footprint, and water scarcity footprint. ^{3,5,69,70} The meat and alternatives group also has a high environmental impact across multiple metrics. Fruits and vegetables generally had a low environmental impact in other metrics. Due to differences in climatic conditions and availability of land and water for agriculture and farming, Australian data needs to be used for modelling the environmental impact of food consumption.

Consideration of workforce challenges and skills development

Dietitians working in the food industry can influence practices throughout the supply chain, including through procurement, manufacturing, distribution and packaging to increase public accessibility to healthy and sustainable diets.

Implications for quality control and labelling of processed/manufactured food

Food labelling is a core feature in supporting consumers to identify healthy and sustainable food options. Consumers are supported to identify healthier food options by the Health Star Rating, but there is no labelling system in Australia to identify the environmental sustainability of foods, despite consumers valuing this information and being will to pay more for sustainable products.^{71, 72} Environmental sustainability labelling would need to be evidence-based, fit-for purpose, appropriate for the unique setting of the Australia-New Zealand food system, and be trusted by consumers.⁷³ Any labelling system must have additional criteria around healthiness of foods to prevent environmental claims being used to promote unhealthy foods.



References

- 1. Barbour L, Bicknell E, Brimblecombe J, Carino S, Fairweather M, Lawrence M, et al. Dietitians Australia position statement on healthy and sustainable diets. Nutrition & Dietetics. 2022;79(1). 10.1111/1747-0080.12726
- WA Department of Primary Industries and Regional Development. Agriculture and Food: How Australia accounts for agricultural greenhouse gas emissions.; 2018. Available from: https://www.agric.wa.gov.au/climate-change/how-australia-accounts-agricultural-greenhouse-gas-emissions
- 3. Hadjikakou M. Trimming the excess: environmental impacts of discretionary food consumption in Australia. Ecological Economics. 2017;131:119-28. 10.1016/j.ecolecon.2016.08.006
- 4. Ridoutt B, Anastasiou K, Baird D, Garcia JN, Hendrie G. Cropland Footprints of Australian Dietary Choices. Nutrients. 2020;12(5). 10.3390/nu12051212
- 5. Hendrie GA, Ridoutt BG, Wiedmann TO, Noakes M. Greenhouse gas emissions and the Australian diet—comparing dietary recommendations with average intakes. Nutrients. 2014;6(1):289-303.
- 6. Swinburn BA, Kraak VI, Allender S, Atkins VJ, Baker PI, Bogard JR, et al. The Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet Commission report. Lancet. 2019;393(10173):791-846. 10.1016/s0140-6736(18)32822-8
- 7. Willett W, Rockström J, Loken B, Springmann M, Lang T, Vermeulen S, et al. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. The Lancet. 2019;393(10170):447-92. 10.1016/s0140-6736(18)31788-4
- 8. Tapsell LC, Probst Y, Lawrence M, Friel S, Flood V, McMahon A, et al. Food and Nutrition Security in the Australia-New Zealand Region: Impact of Climate Change. World Review of Nutrition and Dietetics. 2011;102:192-200. 10.1159/000327823
- High Level Panel of Experts. Nutrition and food systems. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security. Rome; 2017
- 10. Hawkes C, Halliday J. What makes urban food policy happen? Insights from five case studies.: International Panel of Experts on Sustainable Food Systems; 2017. Available from: www.ipes-food.org
- 11. Dietitians Australia. Food systems and environmental sustainability role statement. 2019 Available from: https://dietitiansaustralia.org.au/what-dietitans-do/information-for-healthcare-professionals/role-statements/.
- 12. Dietitians Australia, Public Health Association of Australia, Heart Foundation, Nutrition Australia. National Nutrition Strategy position paper. 2021 Available from: https://dietitiansaustralia.org.au/voice-of-daa/advocacy/joint-statements/.
- 13. Food and Agriculture Organisation. The White/Wiphala Paper on Indigenous Peoples' food systems. Rome, Italy; 2021
- 14. Climate and Health Alliance. Healthy, Regenerative and Just: Framework for a national strategy on climate, health and well-being for Australia. Melbourne; 2021. Available from: https://www.caha.org.au/endorse-hrj



- 15. House of Representatives Standing Committee on Indigenous Affairs. Chapter 4: Food security in remote Aboriginal and Torres Strait Islander communities. Report on food pricing and food security in remote Indigenous communities. Canberra 2020.
- 16. Adams D, Auckland S, Galvin L, Hiscock K, Mangan G, Murray S. Submission to the Healthy Tasmania 5 Year Strategy discussion paper. Hobart: Healthy Food Access Tasmania; 2016. Available from: https://www.healthyfoodaccesstasmania.org.au/wp-content/uploads/2017/09/Healthy-Tasmania-discussion-paper-1.pdf
- 17. McCartan J, Palermo C. The role of a food policy coalition in influencing a local food environment: an Australian case study. Public Health Nutrition. 2017;20(5):917-26. 10.1017/S1368980016003001
- 18. Brimblecombe J, Bailie R, van den Boogaard C, Wood B, Liberato SC, Ferguson M, et al. Feasibility of a novel participatory multi-sector continuous improvement approach to enhance food security in remote Indigenous Australian communities. SSM Population Health.3(2352-8273):566-76. https://doi.org/10.1016/j.ssmph.2017.06.002.
- 19. Reeve B, Thow AM, Baker P, Hresc J, May S. The role of Australian local governments in creating a healthy food environment: an analysis of policy documents from six Sydney local governments. Australian and New Zealand Journal of Public Health. 2020;44(2):137-44. https://doi.org/10.1111/1753-6405.12968
- Rewa J, Devine A, Godrich S. South West Food Community: understanding systemic change, and its associated challenges and successes, among food security projects. Australian and New Zealand Journal of Public Health. 2020;44(6):493-501. https://doi.org/10.1111/1753-6405.13046
- 21. Food and Agriculture Organisation, Milan Urban Food Policy Pact, RUAF. The Milan Urban Food Policy Pact Monitoring Framework. Rome, Italy: FAO; 2019
- 22. Crawford B, Yamazaki R, Franke E, Amanatidis S, Ravulo J, Torvaldsen S. Is something better than nothing? Food insecurity and eating patterns of young people experiencing homelessness. 2015.
- 23. Matacena R. Linking alternative food networks and urban food policy: a step forward in the transition towards a sustainable and equitable food system? International Review of Social Research. 2016;6(1):49-58. 10.1515/irsr-2016-0007
- 24. Australian Prevention Partnership Alliance, Deakin University, INFORMAS. Policies for tackling obesity and creating healthier food environments: 2019 progress update Australian governments. 2019. Available from: https://www.informas.org/modules/public-sector/
- 25. Food and Agriculture Organisation, Alliance of Biodiversity International, International Centre for Tropical Agriculture (CIAT). Indigenous Peoples' food systems: Insights on sustainability and resilience from the front line of climate change. Rome; 2021
- 26. Australian Aboriginal and Torres Strait Islander Health Survey: Nutrition results Foods and Nutrients, 2012-13. ABS Catalogue no. 4727.0.55.005 [press release]. Canberra: ABS2015.
- 27. Food and Agriculture Organisation. Trade reforms and food security: Conceptualizing linkages. Rome; 2003. Available from: http://www.fao.org/docrep/005/y4671e/y4671e06.htm
- 28. Foodbank. Foodbank hunger report 2021: The reality of the food crisis in Australia. 2021 Available from: https://www.foodbank.org.au/research-reports/.



- 29. McKay FH, Lindberg R. The important role of charity in the welfare system for those who are food insecure. Australian and New Zealand Journal of Public Health. 2019;43(4):310-2. https://doi.org/10.1111/1753-6405.12916
- 30. Smithers LG, Haag DG, Agnew B, Lynch J, Sorell M. Food advertising on Australian television: Frequency, duration and monthly pattern of advertising from a commercial network (four channels) for the entire 2016. Journal of Paediatrics and Child Health. 2018;54(9):962-7. https://doi.org/10.1111/jpc.13929
- 31. Richmond K, Watson W, Hughes C, Kelly B. Children's trips to school dominated by unhealthy food advertising in Sydney, Australia. Public Health Research & Practice.

 https://www.phrp.com.au/issues/march-2020-volume-30-issue-1/childrens-trips-to-school-dominated-by-unhealthy-food-advertising-in-sydney-australia/
- 32. Drewnowski A, Monterrosa EC, de Pee S, Frongillo EA, Vandevijvere S. Shaping Physical, Economic, and Policy Components of the Food Environment to Create Sustainable Healthy Diets. Food and Nutrition Bulletin. 2020;41(2_suppl):74S-86S. 10.1177/0379572120945904
- 33. Crawford B, Byun R, Mitchell E, Thompson S, Jalaludin B, Torvaldsen S. Socioeconomic differences in the cost, availability and quality of healthy food in Sydney. Aust N Z J Public Health. 2017;41(6):567-71. 10.1111/1753-6405.12694
- 34. Chapman K, Kelly B, Bauman A, Innes-Hughes C, Allman-Farinelli M. Trends in the cost of a healthy food basket and fruit and vegetable availability in New South Wales, Australia, between 2006 and 2009. Nutrition & Dietetics. 2014;71(2):117-26. https://doi.org/10.1111/1747-0080.12057
- 35. Needham C, Orellana L, Allender S, Sacks G, Blake MR, Strugnell C. Food Retail Environments in Greater Melbourne 2008–2016: Longitudinal Analysis of Intra-City Variation in Density and Healthiness of Food Outlets. International Journal of Environmental Research and Public Health. 2020;17(4):1321. https://www.mdpi.com/1660-4601/17/4/1321
- 36. Bivoltsis A, Trapp G, Knuiman M, Hooper P, Ambrosini GL. The evolution of local food environments within established neighbourhoods and new developments in Perth, Western Australia. Health & Place. 2019;57:204-17. https://doi.org/10.1016/j.healthplace.2019.04.011
- 37. Partridge SR, Gibson AA, Roy R, Malloy JA, Raeside R, Jia SS, et al. Junk Food on Demand: A Cross-Sectional Analysis of the Nutritional Quality of Popular Online Food Delivery Outlets in Australia and New Zealand. Nutrients. 2020;12(10):3107. https://www.mdpi.com/2072-6643/12/10/3107
- 38. Donovan J, Larsen K, McWhinnie J-A. Food-sensitive planning and urban design: A conceptual framework for achieving a sustainable and healthy food system. Melbourne: Report commissioned by the National Heart Foundation of Australia (Victorian Division); 2011.

 Available from: https://www.vichealth.vic.gov.au/media-and-resources/publications/food-sensitive-planning-urban-design
- 39. Shaw SC, Ntani G, Baird J, Vogel CA. A systematic review of the influences of food store product placement on dietary-related outcomes. Nutrition Reviews. 2020;78(12):1030-45. 10.1093/nutrit/nuaa024
- 40. Vogel C, Crozier S, Penn-Newman D, Ball K, Moon G, Lord J, et al. Altering product placement to create a healthier layout in supermarkets: Outcomes on store sales, customer purchasing, and diet in a prospective matched controlled cluster study. PLOS Medicine. 2021;18(9):e1003729. 10.1371/journal.pmed.1003729



- 41. Gómez-Donoso C, Sacks G, Vanderlee L, Hammond D, White CM, Nieto C, et al. Public support for healthy supermarket initiatives focused on product placement: a multi-country cross-sectional analysis of the 2018 International Food Policy Study. International Journal of Behavioral Nutrition and Physical Activity. 2021;18(1):78. 10.1186/s12966-021-01149-0
- 42. Grigsby-Duffy L, Schultz S, Orellana L, Robinson E, Cameron AJ, Marshall J, et al. The Healthiness of Food and Beverages on Price Promotion at Promotional Displays: A Cross-Sectional Audit of Australian Supermarkets. International journal of environmental research and public health. 2020;17(23):9026. 10.3390/ijerph17239026
- 43. Backholer K, Sacks G, Cameron AJ. Food and Beverage Price Promotions: an Untapped Policy Target for Improving Population Diets and Health. Current Nutrition Reports. 2019;8(3):250-5. 10.1007/s13668-019-00287-z
- 44. Riesenberg D, Backholer K, Zorbas C, Sacks G, Paix A, Marshall J, et al. Price Promotions by Food Category and Product Healthiness in an Australian Supermarket Chain, 2017–2018. American Journal of Public Health. 2019;109(10):1434-9. 10.2105/ajph.2019.305229
- 45. Lee AJ, Kane S, Ramsey R, Good E, Dick M. Testing the price and affordability of healthy and current (unhealthy) diets and the potential impacts of policy change in Australia. BMC Public Health. 2016;16(1):315. 10.1186/s12889-016-2996-y
- 46. Anand SS, Hawkes C, De Souza RJ, Mente A, Dehghan M, Nugent R, et al. Food Consumption and its Impact on Cardiovascular Disease: Importance of Solutions Focused on the Globalized Food System A Report from the Workshop Convened by the World Heart Federation. J Am Coll Cardiol. 2015;66(14):1590-614. 10.1016/j.jacc.2015.07.050
- 47. Munt AE, Partridge SR, Allman-Farinelli M. The barriers and enablers of healthy eating among young adults: a missing piece of the obesity puzzle: A scoping review. Obes Rev. 2017;18(1):1-17. 10.1111/obr.12472
- 48. Hanson KL, Connor LM. Food insecurity and dietary quality in US adults and children: a systematic review. Am J Clin Nutr. 2014;100(2):684-92. 10.3945/ajcn.114.084525
- 49. Queensland Health. Healthy Food Access Basket. 2014 Available from: https://www.health.qld.gov.au/research-reports/reports/public-health/food-nutrition/access.
- 50. Northern Territory Department of Health. 2019 NT Market Basket Survey. Casuarina: Northern Territory Government; 2020. Available from: https://data.nt.gov.au/dataset/nt-market-basket-survey-2019
- Pollard C, Savage V, Landrigan T, Hanbury A, Kerr D. Food access and cost survey 2013 report. Perth, Western Australia: Department of Health, Western Australia; 2015. Available from: https://ww2.health.wa.gov.au/Reports-and-publications/Food-Access-and-Cost-Survey
- 52. Lewis M, Lee A. Costing 'healthy' food baskets in Australia a systematic review of food price and affordability monitoring tools, protocols and methods. Public Health Nutr. 2016;19(16):2872-86. 10.1017/s1368980016002160
- 53. VicHealth. Food for All 2005–10 program evaluation report. 2011. Available from: https://www.vichealth.vic.gov.au/programs-and-projects/food-for-all
- 54. Barbour L, Lindberg R, Woods J, Charlton K, Brimblecombe J. Local urban government policies to facilitate healthy and environmentally sustainable diet-related practices: A scoping review. Public Health Nutrition. 2021:1-36.



- 55. Carrad A, Aguirre-Bielschowsky I, Reeve B, Rose N, Charlton K. The role of Australian local governments in creating a healthy, sustainable and equitable food system. Report. University of Sydney; 2021. Available from: http://law-food-systems.sydney.edu.au/
- 56. Food Innovation Australia Limited. National Food Waste Strategy Feasibility Study. 2021. Available from: https://www.fial.com.au/sharing-knowledge/food-waste
- 57. Arcadis. National food waste baseline: Final assessment report. 2019. Available from: https://www.awe.gov.au/sites/default/files/env/pages/25e36a8c-3a9c-487c-a9cb-66ec15ba61d0/files/national-food-waste-baseline-final-assessment.pdf
- 58. United Nations Environment Program. UNEP Food Waste Index Report 2021. 2021. Available from: https://www.unep.org/resources/report/unep-food-waste-index-report-2021
- 59. Commonwealth of Australia. National Food Waste Strategy: Halving Australia's food waste by 2030. 2017. Available from:

 https://www.awe.gov.au/environment/protection/waste/publications/national-food-waste-strategy
- 60. Sullivan VS, Smeltzer ME, Cox GA-OX, MacKenzie-Shalders KA-O. Consumer expectation and responses to environmental sustainability initiatives and their impact in foodservice operations: A systematic review. J Hum Nutr Diet. 2021;00:1-20. 10.1111/jhn.12897
- Porter J, Collins J. A Qualitative Study Exploring Hospital Food Waste From the Patient Perspective. Journal of Nutrition Education and Behavior. 2021;53(5):410-7. 10.1016/j.jneb.2020.10.008
- 62. Carino S, Porter J, Malekpour S, Collins J. Environmental Sustainability of Hospital Foodservices across the Food Supply Chain: A Systematic Review. J Acad Nutr Diet. 2020;120(5):825-73. 10.1016/j.jand.2020.01.001
- 63. Conner D, Becot F, Kahler E, Claro J, Harlow A. Counting Local Food Consumption Longitudinal Data and Lessons from Vermont. 2020.
- 64. Lourival I, Rose N. From Nar Nar Goon to Koo Wee Rup: can participatory food policy making processes contribute to healthier and fairer food systems in the Australian municipal context? A case study from Cardinia shire, Melbourne. Journal of hunger & environmental nutrition. 2020:1-35.
- 65. Open Food Network. Open Road: Logistics service designed for fair food. 2022 Available from: https://about.openfoodnetwork.org.au/open-road/.
- 66. ACT Government. Guide to Community Gardens in the ACT: Policy and Site Selection Criteria 2016 Available from: https://www.planning.act.gov.au/planning-our-city/planning-studies/community gardens in the act.
- 67. ACT Government. Your nature strip: Guidelines for use of residential nature strips. 2019 Available from: https://www.cityservices.act.gov.au/public-land/use/nature-strips.
- 68. Forbes S, Bicknell E, Guilovica L, Wingrove K, Charlton K. A Rapid Review of the Environmental Impacts Associated with Food Consumption in Australia and New Zealand. Current Nutrition Reports. 2021:1-18.
- 69. Hendrie GA, Baird D, Ridoutt B, Hadjikakou M, Noakes M. Overconsumption of energy and excessive discretionary food intake inflates dietary greenhouse gas emissions in Australia. Nutrients. 2016;8(11):690.
- 70. Drew J, Cleghorn C, Macmillan A, Mizdrak A. Healthy and climate-friendly eating patterns in the New Zealand context. Environmental health perspectives. 2020;128(1):017007.



- 71. Tobi RCA, Harris F, Rana R, Brown KA, Quaife M, Green R. Sustainable Diet Dimensions.

 Comparing Consumer Preference for Nutrition, Environmental and Social Responsibility Food Labelling: A Systematic Review. Sustainability. 2019;11(23). 10.3390/su11236575
- 72. Bastounis A, Buckell J, Hartmann-Boyce J, Cook B, King S, Potter C, et al. The Impact of Environmental Sustainability Labels on Willingness-to-Pay for Foods: A Systematic Review and Meta-Analysis of Discrete Choice Experiments. . Nutrients. 2021;13(8):2677. 10.3390/nu13082677
- 73. Sønderskov KM, Daugbjerg C. The state and consumer confidence in eco-labeling: organic labeling in Denmark, Sweden, The United Kingdom and The United States. Agriculture and Human Values. 2011;28(4):507-17. 10.1007/s10460-010-9295-5