SUBMISSION

Submission to the Department of Agriculture, Forestry and Fisheries

# Submission to Feeding Australia: A National Food Security Strategy

24 September 2025

**The Australian Academy of Technological Sciences and Engineering (ATSE) is a Learned Academy of independent, non-political experts helping Australians understand and use technology to solve complex problems. Bringing together Australia's leading thinkers in applied science, technology and engineering, ATSE provides impartial, practical and evidence-based advice on how to achieve sustainable solutions and advance prosperity.**

Food security is fundamental to Australia's national wellbeing, economic prosperity, and international responsibilities. Despite producing more than three times the food required to meet domestic needs, persistent challenges include rising rates of food insecurity, increasing workforce and skill shortages, increasing vulnerability to climate change, and fragile supply chains. At the same time, Australia exports most of the food produced, contributing significantly to global food security and suggesting opportunities to strengthen agricultural diplomacy. Australia has an opportunity to develop a coordinated, future-oriented approach to these challenges. Securing a sustainable and nutritious food supply will require long-term investment in research and development (R&D), alongside stronger partnerships between communities, industry and government.

ATSE makes the following recommendations:

**Recommendation 1:** Increase long-term R&D investment in agricultural innovation, targeting renewable, sustainable and climate-adaptive crops, technologies and systems, including by supporting research hubs such as the International Centre of Crop and Digital Agriculture in NSW and the Renewables in Agriculture Centre of Excellence.

**Recommendation 2:** Support connectivity in rural, regional and remote areas to ensure farmers are digitally included through expansion of programs, including the On Farm Connectivity Program.

**Recommendation 3:** Develop targeted incentives to attract, train, and retain skilled workers in agriculture and food production, including extending the Commonwealth Prac Payment scheme to agricultural and food placements.

**Recommendation 4:** Establish consultation groups or advisory panels at the regional and national levels to provide local community input in biosecurity planning and rulemaking.

**Recommendation 5:** Embed Aboriginal and Torres Strait Islander knowledge in biosecurity strategies and risk assessments, and continue supporting Aboriginal and Torres Strait Islander programs, including the Indigenous Biosecurity Ranger Program.

**Recommendation 6:** Increase targeted funding into community-led food programs, regional food hubs and local processing facilities to shorten supply chains, lower costs and increase food availability to regional, rural and remote communities.

**Recommendation 7:** Strengthen and expand evidence-based nutrition literacy campaigns and organisations to improve nutrition education and support healthier food choices across all communities.

**Recommendation 8:** Support agricultural diplomacy and international innovation in our region through agricultural R&D partnerships with regional neighbours and long-term support for the Australian Centre for International Agricultural Research (ACIAR).

## Supporting the development and uptake of sustainable and adaptive emerging technologies

Investment in the research and development (R&D) of new and emerging practices and technologies can help Australia maintain its position as a primary food producer in the face of a changing global environment. Climate change is already reshaping agriculture, with farmers facing more frequent droughts, extreme weather events, and shifting pest and disease pressures. The changes in seasonal conditions from 2001 to 2020 reduced the annual average Australian farm's profits by 23% (Hughes and Gooday 2021). Additionally, unsustainable practices and their effects, including land-clearing, toxic chemicals and fertilisers, soil degradation and water scarcity, are risking future food and agriculture systems. Food chains

are becoming increasingly fragile, with many typically stretching thousands of kilometres, increasing their vulnerability to environmental events (Race et al. 2023).

Increasing investment in renewable and regenerative technologies can assist Australia in strengthening agricultural resilience while working towards achieving emissions targets. Breeding and agronomy of drought and heat-tolerant crops may assist in mitigating the risks of rising temperatures and increasing water scarcity. Innovations in wheat, pulse and oilseed crops are promising drought and heat-tolerant yields (Bohra et al. 2024). Further research on indigenous food crops and cultivation methods may also assist in producing a more tolerant agricultural landscape. Many research areas that can directly reduce greenhouse gas (GHG) emissions can only be scaled with increased R&D, including advances in methane reduction from animal feed digestion, crops with biological nitrogen fixation inhibition traits and nitrogen-fixing non-legume crops (Li and Jiang 2020; Department of Climate Change 2025; Vega-Mas et al. 2023; Abdalla et al. 2019). Furthermore, sustainable technologies and water and nutrient recycling practices, including hydroponics, aquaponics, aeroponics, deep ocean aquaculture and plant and animal microbial cell cultures, can reduce up to 90% of the land and water used in farming (Rajaseger 2023; Food and Agriculture Organization of the United Nations 2018; Glockow et al. 2024).

Focusing on innovation and research translation as a cornerstone of the National Food Security Strategy would support the agricultural sector to evolve to current and future demands. ATSE recommends enhancing R&D into sustainable and regenerative technologies and investment into research hubs and centres, such as the International Centre of Crop and Digital Agriculture in NSW and the Renewables in Agriculture Centre of Excellence. Investing in sustainable and regenerative farming practices can also help prevent the damage caused by traditional food practices and improve the health, safety, and nutrition of food.

Innovative technologies are likely to underpin Australia's future agriculture and food production, with changes already underway. For instance, artificial intelligence is being increasingly used for monitoring, data analysis, marketing, security, and trade, while Internet of Things (IoT) devices can provide Australian farmers with real-time data on their water and power usage, crop growth, livestock, maintenance alerts and changing market prices (Agrifutures Australia 2024; Wu et al. 2019). However, connectivity challenges need to be addressed to ensure Australia is prepared for future innovations. A lack of adequate internet connection has been reported as a key obstacle for technology uptake by farmers across Australia (Wu et al. 2019). Around 65% of Australian farmland has little or no mobile coverage, leading to frustrations that have been exacerbated by the recent shutdown of 3G networks (NSW Farmers' Association 2024; National Farmers Federation 2024). To ensure farmers and producers can handle the future challenges that AI, Internet of Things, and the energy transition will bring, universal internet access will be needed. ATSE recommends increasing access to high-speed internet in rural, regional and remote areas to support farmers and producers with the tools needed to adopt emerging technologies. The extension of the Department of Infrastructure's On-Farm Connectivity Program beyond its current final round in 2025-26 could help farmers maintain connectivity alongside increasing network demands.

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## Addressing workforce challenges and skill shortages

Labour shortages are becoming a persistent challenge across the agricultural sector. Agriculture has the oldest group of owner-operators of any industry sector in Australia, and younger Australians are less likely to view farming as a viable career (Barr and Kancans 2020). Imported labour is often over-relied on to fill this gap, creating vulnerabilities from the unpredictability of global events and changing migration policies

(Wu et al. 2019). At the same time, education and training systems are experiencing challenges. Demands for agricultural graduates are at least 3000 a year; however, fewer than 900 graduates are suitably educated for these roles (Pratley 2022). These shortages are seen overwhelmingly in regional, rural and remote areas and among women and Aboriginal and Torres Strait Islander people (Wu et al. 2019; Future Ag 2024).

Improving education pathways into agriculture and food production may increase workforce numbers and skills in the sector. Traditional tertiary education pathways, vocational training, apprenticeships and on-the-job training can provide the skills needed for Australia's agricultural system and should be presented as attractive options for young people. Work placements are often mandatory in agriculture-related degrees, including Agriculture, Rural Science, Animal Science, Food Business and Agricultural Law. However, this can present a financial barrier, with some courses requiring at least 450 hours of internship experience, which is not required to be paid (The University of Adelaide 2025). Extending an existing paid placement program to support, such as the existing Commonwealth Prac Payment scheme, may encourage more young people to enter the sector while addressing labour shortages. Additionally, financial incentives for women and those in regional and rural communities can increase diversity and encourage underrepresented groups. Scholarships, such as ATSE's Elevate program, can help diverse students access education, including STEM courses essential to Australia's agriculture and food industries.

**Recommendation 3:** Develop targeted incentives to attract, train, and retain skilled workers in agriculture and food production, including extending the Commonwealth Prac Payment scheme to agricultural and food placements.

## Increasing national biosecurity from the bottom up

Australia's geographical isolation and strong biosecurity processes significantly contribute to the food sector's ability to remain largely pest and disease-free. However, the large-scale global movement of people and cargo driven by the rise of international trade has increased the risk of external threats. Australia's advanced and robust biosecurity system protects Australian agriculture, forestry and fisheries, an export industry worth $86.8 billion and more than 1.6 million jobs (Whattam et al. 2024). Annually, Australia sees over 42 million vessels, sea cargo consignments and air cargo consignments enter the country, leading to increased pressure on biosecurity defence (Whattam et al. 2024). While current biosecurity protocols are considered some of the strongest and strictest in the world, Australia's top-down approach to biosecurity, primarily implemented by the Department of Agriculture, Forestry and Fisheries and the Department of Home Affairs, is seeing rising issues. These issues include free riding, high personal costs, and mistrust, impacting the reporting of biosecurity threats (Maru et al. 2025).

Evidence shows that a collaborative approach, where communities, industry, and state and federal government share responsibility, can improve compliance and strengthen early detection (Maru et al. 2025). Creating opportunities for local stakeholders to contribute to biosecurity rulemaking can improve the practicality of those rules and increase adherence among stakeholders. Consultation with local communities can also enhance monitoring and response efforts. Aboriginal and Torres Strait Islander knowledge is crucial to Australia's biosecurity, and programs such as the Indigenous Biosecurity Ranger Program show how locally driven participation can strengthen biosecurity systems and build resilience at the community level. The establishment of consultation groups or advisory panels that involve local communities in biosecurity planning and rulemaking could help enable Australia to maintain and improve its strong biosecurity practices. Additionally, Aboriginal and Torres Strait Islander knowledge could be further embedded in biosecurity strategies and risk assessments, including through the continued support of programs such as the Indigenous Biosecurity Ranger Program.

**Recommendation 4:** Establish consultation groups or advisory panels at the regional and national levels to provide local community input in biosecurity planning and rulemaking.

**Recommendation 5:** Embed Aboriginal and Torres Strait Islander knowledge in biosecurity strategies and risk assessments and continue supporting Aboriginal and Torres Strait Islander programs, including the Indigenous Biosecurity Ranger Program.

## Improving food access and nutrition education

Australia's food system produces more than three times the amount of food the country needs, shaping a perception of food abundance. However, the 2024 Foodbank Hunger Report found that 32% of Australians faced food insecurity, which is largely attributed to rising cost-of-living prices (Guerrero et al. 2024). This is particularly prevalent in vulnerable groups, including those living in regional, rural, and remote areas and Aboriginal and Torres Strait Islander communities, where there are additional barriers such as distance, infrastructure limitations and economic barriers. Community-led food programs, regional food hubs, and local processing facilities can reduce food insecurity by shortening supply chains and lowering costs (Carrad et al. 2022). Increasing access to affordable, fresh, and nutritious food in high-need areas will require government investment in these models, alongside infrastructure support for regional supply chains. Targeted funding into community-led food programs, regional food hubs and local processing facilities would help increase food availability and accessibility to regional, rural and remote communities.

Poor diets present demands on the healthcare system. In Australia, obesity and diet-related chronic disease are the third leading preventable causes of illness. In 2022, more than half of adults did not meet the recommended daily servings of fruit, while 94% fell short on vegetable intake. On average, Australians also failed to meet recommended servings of grains, meat, and dairy products (Australian Institute of Health and Welfare 2024). Low nutrition literacy is a compounding factor of rising health issues related to diet. Educational campaigns to improve understanding of nutritional quality across all age groups can support healthier choices. However, previous nutrition and healthy eating campaigns have been inconsistent, poorly coordinated, and funded at less than half the level required for effective reach (McKinna 2020). Existing campaigns, such as Boost Your Healthy and organisations including the National Nutrition Foundation, can be further strengthened to increase their impact by increasing funding to recommended amounts, extending longevity and expanding reach. By combining education with improved access, Australia can strengthen both food security and national health outcomes.

**Recommendation 6:** Increase targeted funding into community-led food programs, regional food hubs and local processing facilities to shorten supply chains, lower costs and increase food availability to regional, rural and remote communities.

**Recommendation 7:** Strengthen and expand evidence-based nutrition literacy campaigns and organisations to improve nutrition education and support healthier food choices across all communities.

## Embedding agricultural diplomacy for the region

The food security of our region is critical to Australia's own resilience. Around 70% of Australian food production is exported, which supports both the national economy and global food security (Australian Bureau of Agricultural and Resource Economics and Sciences 2025). As global supply chains become more interconnected, Australia has an opportunity to strengthen international partnerships through agricultural R&D partnerships and aid. The Australia-Vietnam Partnership for Climate-Smart Agriculture, supported by DFAT, is an example that supports Australian expertise and encourages regional collaboration. The partnership will facilitate projects to improve rice and shrimp production with respect to adapting to climate change and reducing environmental impacts. Continuing to support existing and establishing new agricultural partnerships with regional neighbours would strengthen diplomatic relationships and increase mutually beneficial agricultural innovation in our region.

Aid partnerships provide Australia with access to valuable researchers and innovators while also encouraging economic development in partner countries (Campbell 2018). As many of Australia's neighbours have economies that are highly reliant on agricultural production, stronger resources also make them stronger trading partners. The demand for Australia to play a larger role in agricultural aid is rising, driven by pressures from climate change, resource scarcity and shifting geopolitical relationships. This could involve continued support for programs and organisations, including the Australian Centre for International Agricultural Research (ACIAR). ACIAR's partnership model includes training local scientists and policy makers in partner countries, which strengthens research capacity and Australia's international standing, supporting both domestic and global food security.

**Recommendation 8:** Support agricultural diplomacy and international innovation in our region through agricultural R&D partnerships with regional neighbours and long-term support for the Australian Centre for International Agricultural Research (ACIAR).

*ATSE thanks the Department of Agriculture, Fisheries and Forestry for the opportunity to respond to the consultation on Feeding Australia: A National Food Security Strategy. For further information, please contact academypolicyteam@atse.org.au.*

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