

NATIONAL COMMITTEE FOR
NUTRITION



NOURISHING AUSTRALIA

A decadal plan for the science of nutrition

MID-TERM REVIEW





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Acknowledgement of Country

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EXECUTIVE SUMMARY

The Australian Academy of Science's National Committee for Nutrition produced *Nourishing Australia: A decadal plan for the science of nutrition*¹ in 2019. This plan presents an aspirational overview of the vision for nutrition science in Australia over the following decade. The plan sets out pathways to realising the vision that **Australian nutrition science plays a key role in improving long-term health and wellbeing globally, while delivering environmental, social and economic benefits nationally** with core values of equity, sustainability, collaboration and innovation.

The mid-term review steering committee has evaluated the decadal plan, assessing the current relevance of the original goals and providing insight into the progress made since the plan's release.

The review highlighted that, while progress has been made in the nutrition science ecosystem, significant work remains to be done to achieve a collaborative and consolidated approach to building capacity and connections, and advancing research for the benefit of all Australians and their nutritional health. Notably, the COVID-19 pandemic presented resourcing and human challenges in relation to the implementation of the plan. The plan can only succeed with recognition by the government and research sectors of the crucial role nutrition science plays in health, wellbeing and the economy, and that adequate development of infrastructure and sufficient resourcing and funding is required to facilitate action.

The mid-term review also presented an opportunity to reflect on the plan's four pillars and the enabling platforms in the context of today's environment.

Four pillars:

1. Societal determinants
2. Nutrition mechanisms
3. Precision and personalised nutrition
4. Education and research training

Enabling platforms:

1. Nutrition as a national research priority
2. A national capability for nutrition data
3. A trusted voice

While the original pillars and enabling platforms remain relevant, there are additional aspects that need consideration as implementation progresses. Evolving issues such as food security, sustainability, food processing, and acknowledgement and awareness of the social issues that impact nutrition literacy are now more prominent in nutrition science than in previous years. Furthermore, there is a greater understanding now of recognising the role Indigenous people and Indigenous foods can play in advancing nutrition science.

¹ The Australian Academy of Science, *Nourishing Australia: A decadal plan for the science of nutrition*, 2019, www.science.org.au/supporting-science/science-policy-and-analysis/decadal-plans-science/nourishing-australia-decadal-plan

1 NUTRITION AS A NATIONAL RESEARCH PRIORITY

to address technical, social and environmental challenges through multidisciplinary collaboration and innovation, resulting in major health and economic benefits.

2 A NATIONAL CAPABILITY FOR NUTRITION DATA

to capture and analyse dietary intake and health outcomes of Australians to guide national policy and intervention strategies and stimulate the science of nutrition.

3 A 'TRUSTED VOICE'

to provide credible, evidence-based nutrition information and use professional communicators to counteract misinformation and improve general society nutrition literacy.

THE DECADAL PLAN

The mid-term review has been framed around the four pillars of the initial decadal plan, with consideration of the enabling platforms of the decadal plan integrated within these sections. The original four pillars can be summarised as:

1. **Societal determinants** – incorporating frameworks and qualitative and quantitative data to connect nutrition with humans, food systems and societal context.
2. **Nutrition mechanisms** – better understanding and utilising of the underlying mechanisms in nutrition.
3. **Precision and personalised nutrition** – better leveraging and understanding of the inter-individual and inter-group responses to nutrition.
4. **Education and research training** – supporting the future workforce of nutrition and other professionals to acquire knowledge and skills in nutrition science, supporting a more nutrition-literate Australia.

The three enabling platforms are:

1. **Nutrition as a national research priority**
2. **A national capability for nutrition data**
3. **A trusted voice for nutrition science**

The decadal plan recommends that the science of nutrition becomes a national research priority for the coming decade. Prioritising the science of nutrition emphasises the importance of food and nutrition in addressing health, social and agricultural challenges. This would have flow-on effects to reducing healthcare costs, supporting welfare strategies and boosting the agrifood and nutritech industries.

From the outset, the plan acknowledged that commitment and resources are required to embed and monitor current nutrition knowledge and dietary recommendations into agrifood and manufacturing practices and policies; social, welfare and education policies; food marketing and regulation; and preventive and curative services, with integrative nutrition frames as the systems biology challenge of our time.

A further two major initiatives were recommended as part of the original plan to ensure a high level of national impact on the future health and wellbeing of all Australians:

- **The development of a living database** (a national capability for nutrition data) of the Australian food supply; societal, welfare, commercial and media environments; and dietary intake patterns, nutritional status and health outcomes of a large and representative cohort across Australia.
- **The development of a national nutrition entity** (linked to the national nutrition data capability) to provide a credible, independent, evidence-based professional trusted voice that can use information technology and media experts to communicate the state of evidence and advice around healthy diets and fact-check or myth-bust the latest fads and health claims.

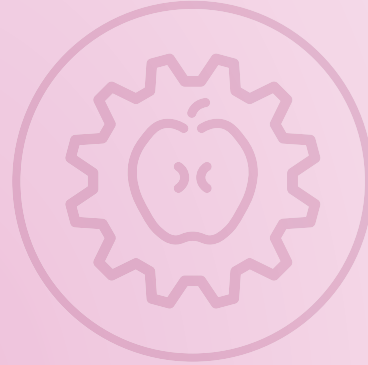
PILLAR 1 SOCIETAL DETERMINANTS

- Developing a framework for the food system that supports equitable access to healthy foods and effective population nutrition interventions, underpinned by national policy development
- Combining quantitative and qualitative research to assess the drivers of dietary choices and the social context within which they are made
- Quantitatively mapping Australia's food and nutrient intake and health (biomarkers) to identify intervention opportunities, leading to:
 - cost-effective use of resources and increased impact of nutrition messages, programs and policies
 - assessment and monitoring of food environments and contributory factors.



PILLAR 2 NUTRITION MECHANISMS

- Identifying mechanisms by which diets, foods and nutrients influence human biology
- Defining how and why dietary patterns affect health and wellbeing outcomes, leading to:
 - enhanced population dietary advice
 - targets for high-value agrifood.



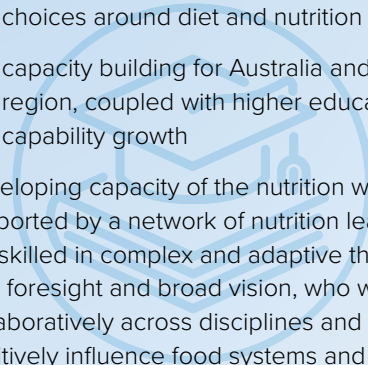
PILLAR 3 PRECISION AND PERSONALISED NUTRITION

- Understanding group and individual differences in responses to dietary patterns and their interactions with prescribed medications
- Developing data analytics from measurement of nutritional status, health status, age and genotype and envirotypes sufficient to predict solutions for diet and lifestyle change, leading to:
 - precision and personalised diet and lifestyle advice with cost-effective health benefits
 - nutritech start-up opportunities aimed at fostering innovation through developing new tools, products, programs and services to deliver better health outcomes.



PILLAR 4 EDUCATION AND RESEARCH TRAINING

- Supporting a future workforce in the science of nutrition via competency-based education that incorporates genomics, bioinformatics and systems biology, both in formal nutrition education as well as incorporating nutrition into medical and allied health professional training and development
- Developing and sustaining skilled professionals to research, innovate, communicate, counsel, train and educate, leading to:
 - a nutrition literate and well-informed general populace, able to make effective choices around diet and nutrition
 - capacity building for Australia and the region, coupled with higher education capability growth
- Developing capacity of the nutrition workforce, supported by a network of nutrition leaders who are skilled in complex and adaptive thinking with foresight and broad vision, who work collaboratively across disciplines and sectors to positively influence food systems and nutrition.



THE MID-TERM REVIEW

The decadal plan requires the discipline, through the Australian Academy of Science’s National Committee for Nutrition (NCN), to monitor progress on the recommendations. In 2024, at five years into the life of the decadal plan, the NCN conducted a mid-term review of progress against the recommendations. A dedicated steering committee including the NCN chair, and chaired by an NCN member with three additional external members, reviewed the progress of the plan in the context of the current nutrition science ecosystem.

The steering committee obtained input from the professional societies represented on the NCN and over 45 interested parties (individual and organisations) via surveys, a virtual town hall, and direct consultation. The recently published implementation paper was also reviewed². The NCN provided feedback on the review document and process.

2 Truby H, Allman-Farinelli M, Beck EJ, et al. Advancing the decadal plan for the science of nutrition: Progressing a framework for implementation. *Nutrition & Dietetics*. 2024; 81(2): 133-148. doi:[10.1111/1747-0080.12876](https://doi.org/10.1111/1747-0080.12876)



PILLAR 1 – SOCIETAL DETERMINANTS

This pillar focuses on understanding nutrition in context, with a view to improving the quality of diets of Australians, reducing (over- and under-) malnutrition, creating a new generation of beneficial agrifood products, creating a common purpose between all stakeholders, and elevating informed nutrition messaging, policy and commercial strategy above diet culture.

Since the release of the decadal plan in 2019, the influential role of food environments in shaping dietary patterns has been robustly recognised.

The concept of the ‘commercial determinants of health’ has evolved, acknowledging the economic reality that food production, distribution and consumption systems are driven by capitalist market forces that are agnostic of health and wellbeing principles.

These determinants hinder food and nutrition efforts in health promotion, health care treatment, and management of diverse conditions, which are also costly in Australia. The inherent conflicts of interest in industry and commercial endeavours have persevered; therefore, aligning commercial activities with health benefits will be essential in realising the potential of the decadal plan.

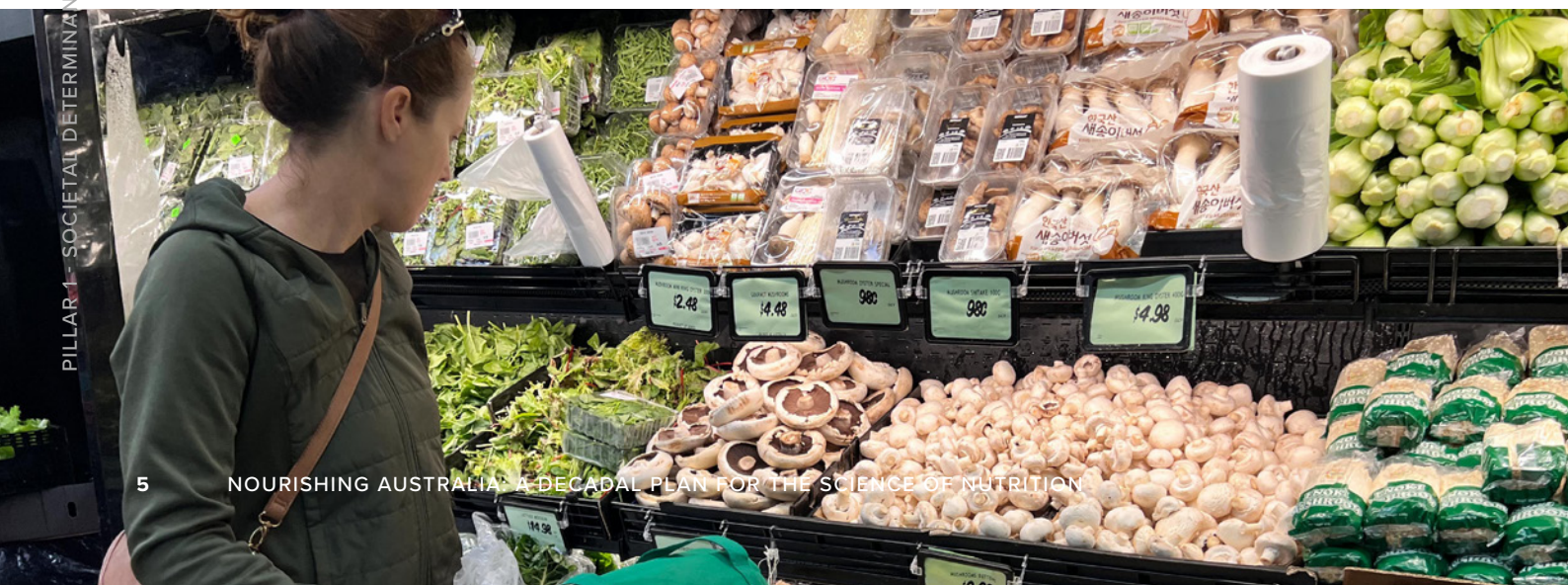
Further opportunities exist to amplify the voices of consumers regarding their nutrition and health preferences to shape the nutritional profile of typical supermarket and retail food offerings. It is also worth recognising that economic hardship and uncertainty is playing a major role in the decisions that many consumers make, and affordability of and access to nutritious foods is critical in realising any real change.

Despite some gains in academic outputs regarding consumer testing, there is an opportunity for further work to translate knowledge into action by non-academic stakeholders, likely requiring government or other knowledge transfer facilitation.

With the increased recognition and acceptance that nutrition plays in health outcomes, intervention strategies now generally incorporate interdisciplinary perspectives beyond allied and medical views, such as food science, psychology, social science, biomedical science, public health and food manufacturing. Modest gains in new knowledge have occurred regarding consumer preferences and decision-making regarding food and nutrition. However, greater coordination between these groups has been noted as a priority in the implementation plan³ and in engagements with key stakeholders including the Australian Institute of Food Science and Technology (AIFST), Nutrition Society of Australia (NSA) and Dietitians Australia (DA).

While a national nutrition entity is yet to be formed, early work on several cross-organisational nutrition initiatives has commenced since the decadal plan was introduced, including the proposed Alliance for Nutrition Science Australia (ANSA), Australian Food Innovation Network (AFIN) and Parliamentary Friends of Nutrition Group. The potential for these groups to support cohesion between professions and maximise progress on national priorities relies on sustained resourcing and activities that bring diverse people together for shared action. Further considerations of actors across the breadth of agriculture, food supply, nutrition and health care need to be considered to ensure genuine innovation.

3 Truby H, Allman-Farinelli M, Beck EJ, et al. Advancing the decadal plan for the science of nutrition: Progressing a framework for implementation. *Nutrition & Dietetics*. 2024; 81(2): 133-148. doi: [10.1111/1747-0080.12876](https://doi.org/10.1111/1747-0080.12876)



PILLAR 2 – NUTRITION MECHANISMS: FROM EPIDEMIOLOGY TO CAUSE-AND-EFFECT RELATIONSHIPS

This pillar envisions Australia as a world leader in linking nutrition mechanisms to non-communicable diseases, with high-quality foods in a sustainable supply chain, and with a greater efficiency of nutrition data collection, analysis and linkage across scales, from experimental to population level.

At the time of performing this review, the Australian Government released Australia's National Science and Research Priorities⁴. While health is a major focus of a number of the priority areas, there is no specific mention of nutrition. Although not specifically mentioned, it is well understood that nutrition plays a major role in maintaining overall health and, therefore, nutrition science will play a significant role in achieving many of the health-focused aspirations set out in the national research priorities.

Food is mentioned under 'Priority 5: Building a secure and resilient nation'. This is mainly framed around the need for greater food security, especially in regard to strengthening our local food systems in response to climate change events and biosecurity issues. Nutrition science in this context is required to ensure that our food systems continue to provide the sustenance needed to support a healthy nation.

Other Australian Government strategies and priorities related to nutrition have been advanced. These include The National Obesity Strategy 2022–2032⁵; the Australian National Diabetes Strategy 2021–2030⁶; and the Food and Nutrition Report 2021–2022⁷.

The steering committee for this mid-term review analysed Australian Research Council (ARC) and National Health and Research Medical Council (NHMRC) funding outcomes since the original decadal plan in 2019. The results show that funding for nutrition science in Australia is lacking. ARC funding rates for nutrition, dietetics and food science remain low, with only five funded projects directly referencing relevant Field of Research (FoR) codes in the last five years: dietary assessment, digital environments, food security, legumes nutrition and food

governance. NHMRC funding over the same period has regularly included nutrition-related research projects and investigator grants, however not in large numbers (<2% of successful applications annually). Success rates appear higher for Investigator grants compared to other grant schemes (Ideas and Cohort). Notable large NHMRC funding includes the Healthy Food, Healthy Planet, Healthy People Centre of Research Excellence (CRE), funded in 2021, and the CRE in Human Milk Nutrition for Preterm Infants, funded in 2023. Success rates appear higher for obesity-related research than other aspects of nutrition science. Additional research funding in nutrition science is necessary to sustain improvements, and long-term and sustainable funding should be considered essential to achieving the aims of the decadal plan for nutrition science in Australia.

During 2022, the Australian Medical Research and Innovation Priorities were released by the Medical Research Future Fund (MRFF) for the 2022–24 period. Nutrition was recognised as one of the modifiable primary causes that is leading to chronic health conditions, such as illness, disability and death in Australia. However, a review of the MRFF grant recipients database shows that since 2018 just under 1% (13 of 1357) of awarded grants have gone towards projects that sit under the category of 'nutrition and dietetics'. The reviewers note that additional grants may be related to nutrition without sitting in this key area.

While there are many nutrition-related datasets that are publicly available, they are mostly outdated, incomplete or of low resolution (for example apparent consumption data), limiting their utility for driving progress. For example, the Australian Institute of Health and Welfare (AIHW) hosts the Australian Bureau of Statistics (ABS) National Health Survey that provides data from a 2014–15 survey, and the ABS Nutrition and Physical Activity Survey provides data for the 2011–12 period. More recently, during 2020, the AIHW released a project that would begin looking at

4 Australian Government Department of Industry, Science and Resources, Australia's National Science and Research Priorities, 2024, www.industry.gov.au/publications/national-science-and-research-priorities-2024

5 Australian Government Department of Health and Aged Care, The National Obesity Strategy 2022-2032, www.health.gov.au/resources/publications/national-obesity-strategy-2022-2032

6 Australian Government Department of Health, Australian National Diabetes Strategy 2021-2030, www.health.gov.au/resources/publications/australian-national-diabetes-strategy-2021-2030?language=en

7 Australian Government Department of Health and Aged Care, Food and Nutrition Report 2021–2022, www.health.gov.au/resources/publications/food-and-nutrition-report-2021-2022

novel data sources for food and nutrition that could help generate contemporary data. Interestingly, the novel data sources project summary highlights the limitations of many of the data sources that have traditionally been used in food and nutrition monitoring, stating that 'data sources are infrequently and/or irregularly collected, are subject to various biases, are expensive to collect, and/or have a high participant burden'. This could indicate why the available datasets are outdated.

While identifying data collection approaches that can perform data scraping to bring together multiple data sets is a worthy pursuit, the major limitation to this exercise is outdated data sources that would have little relevance to current dietary patterns.

National, representative and accessible data sets are necessary to advance nutrition science in Australia. Further efforts to advance the utilisation of contemporary data to inform policy, practice and research are therefore warranted.

There were several initiatives designed to support early- and mid-career researchers (EMCRs) in nutrition science over the past five years. These include the Theo Murphy Initiative-funded symposium 'Empowering EMCRs to Lead the Future of the Science of Nutrition', which was held in 2023. The Oceanic Nutrition Leadership Platform (ONLP) was established, with over 50 alumni of the program to date. Over recent years, the number of postgraduate students completing degrees in nutrition science appears to have increased, however data are not centralised to substantiate this. This could be a role for a national nutrition data capability as per the original recommendation.

The recent proposed reduction of capacity in nutrition clinical trials conducted by CSIRO reflects a deprioritising of research into nutrition mechanisms. To further achieve the critical mass needed to move this research sector forward, there is an increased need for greater investment that drives action, such as scholarships, grants and fellowships to attract and support students in nutrition science. This includes mentoring opportunities for students and EMCRs so that career opportunities in this sector can be realised and achieved. Facilities, measurement tools and modelling capabilities do exist across the nation within CSIRO, many universities and research institutes, but access is often limited due to competing time and space. Furthermore, these facilities, tools and capabilities often require personnel with the appropriate expertise to operate, which limits the availability of these systems. There is also a lack of transparency as to what resources or expertise is available, and therefore researchers or industry often do not know what is accessible. This is one of the action

items in the implementation plan⁸. To make these systems widely available, a centralised database of available resources is needed.

Over the past five years, there has been increased interest in the nutritional and functional attributes that can be attributed to native Australian foods. Although many of these foods have a long history of use in Aboriginal and Torres Strait Islander communities, little research has been done to understand how these foods may fit into a modern diet. Since the initial decadal plan, there has been increased recognition of the need to work collaboratively with Aboriginal and Torres Strait Islander knowledge holders to understand how these foods can contribute to food security and environmental challenges. Successfully achieving this collaborative approach will take some time, as past practices have largely been extractive and exploitative in nature. As such, addressing the nutritional functional attributes of many of these native foods is still a work in progress for many of the national research initiatives that have been established.

To successfully realise the opportunity that Australian native foods may offer, there is a need for research sectors and government to form stronger relationships with Aboriginal and Torres Strait Islander knowledge holders who have been using many of these foods traditionally for centuries. This would contribute to 'Priority 3: Elevating Aboriginal and Torres Strait Islander knowledge systems' of Australia's National Science and Research Priorities. Successfully achieving this would see greater knowledge transfer and therefore a wealth of new food opportunities being developed that may help alleviate food security concerns and global environmental challenges, contributing to food security in 'Priority 5: Building a secure and resilient nation'.

The ARC Industrial Transformation Training Centre for Uniquely Australian Foods (2018–24) is driving ethical research in this space. The goal of the centre is to help train the next generation of researchers and industry stakeholders in the sustainable growth of high-value products within the premium Australian food sector. The centre has trained 30 PhD and other postgraduate students and plays a key role in the development of Indigenous-led supply chains that now service the sector. Importantly, the centre established a strong Indigenous-led cooperative that is working towards empowering Indigenous leadership in the native food industry.

8 Truby H, Allman-Farinelli M, Beck EJ, et al. Advancing the decadal plan for the science of nutrition: Progressing a framework for implementation. *Nutrition & Dietetics*. 2024; 81(2): 133-148. doi: [10.1111/1747-0080.12876](https://doi.org/10.1111/1747-0080.12876)

PILLAR 3 – PRECISION AND PERSONALISED NUTRITION

This pillar focuses on targeted responses to foods and diets, with a view to Australia becoming a leader in precision and personalised nutrition through innovation, education, engagement, collaboration and personalisation.

The incorporation of the nutritional genomics policy into a national nutrition policy framework has not yet been achieved, largely because no national nutrition policy exists. Some relevant initiatives have been established, such as the National Centre for Indigenous Genomics (NCIG) at the Australian National University. This project is predominantly focused on the transformation of medical research and healthcare in the context of understanding the genomics of Indigenous populations in Australia. The centre aims to develop resources for genomic health and medical research, which should include nutrition. However, in the 2023 annual report, there was no mention of nutrition science⁹.

The development of precision medicine and the use of genomics are prevalent in the medical field, with a focus on medical interventions rather than the application within nutrigenomics. However, nutritional genomics and precision nutrition are taught (to varying levels of depth) in undergraduate and postgraduate degrees related to food science, human nutrition and dietetics. It is further suggested that nutritional genomics and precision nutrition should also be promoted in other fields of allied health.

While costs for genetic and genomic testing have dropped in the last five years, there are still significant costs¹⁰. However, these costs have the potential to come with significant benefits, both for health and long-term finances. Despite the cost barriers, some research centres such as the University of South Australia's Australian Centre for Precision Health and the Australian National Phenome Centre (ANPC) at Murdoch University are already incorporating nutrition as a part of precision health, but more organised and targeted approaches towards cost-effectiveness should be considered.

There has been an increased demand for the adequate use of information technology tools in food, nutrition and health educational programs. The use of AI modelling and coding is commonplace in research areas that relate to nutrition and health (nutritional epidemiology, food science, product development, medicinal nutrition), and therefore requires strong support from an educational perspective. This is one of the current and fast-growing modalities within the education and research areas that also requires intersectional skills across the sciences, and specialised IT knowledge. One of the points that is not included in the decadal plan is the historical lack of data from Australian Indigenous populations being generated and included in data sets. The decadal plan should also consider this as one of the key issues, ensuring that genomic information and its variability is included from the national perspective.

Although some states and territories include literacy in genetics, genomics and bioinformatics as a part of the secondary science curriculum, only genetics and bioinformatics are included in the Australian curriculum (biology), while there is no mention of genomics. Nutritional genomics as a core subject is included in the tertiary education for nutrition and dietetics professionals. This should also be considered for all food and nutrition programs that span beyond the basic level. An Australian report on genomics education and training for non-genomic professionals did not include nutrition or dietetics¹¹. This also provides an opportunity to expand the knowledge and education in nutritional genomics across tertiary programs that offer food and nutrition science courses.

9 National Centre for Indigenous Genomics, *Annual Report 2023*,

https://ncig.anu.edu.au/files/NCIG%20Annual%20Report%202023_Final.pdf#overlay-context=annual-report-current

10 Robert S Wildin, Cost Effectiveness of Genomic Population Health Screening in Adults: A Review of Modeling Studies and Future Directions, *The Journal of Applied Laboratory Medicine*, Volume 9, Issue 1, January 2024, Pages 92–103, <https://doi.org/10.1093/jalm/jfad093>

11 Janinski M, McClaren B, Nisselle A, Dunlop K, Prichard Z, Terrill T & S Metcalfe for the Australian Workforce & Education Working Group. (2018) Perspectives of Education Providers on Education & Training Needs of Non-Genomic Health Professionals. Australian Genomics, Melbourne Available at www.australiangenomics.org

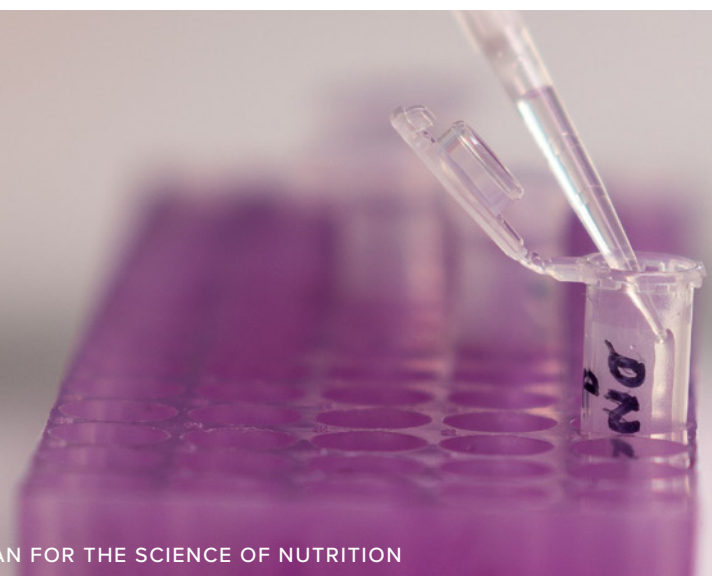
Cross-disciplinary research is increasingly occurring in response to funding pressures currently imposed on all research in Australia. Health economics is now generally embedded in many large research projects, as well as broader considerations of information sciences. This is predominately project based rather than having a strong national strategy that can generate national data capability. Some examples of this include the Future Food Systems Cooperative Research Centre that can be seen as a potential opportunity to translate cross-disciplinary methods and associated research findings into wider nutrition and health areas. There is also a need to normalise the use of big data to answer questions previously addressed through new clinical trials and 'basic' food and nutritional science studies, which will utilise resources efficiently.

The implementation plan¹² proposes the development of a set of principles for ownership and ethics related to personalised and precision nutrition, but also acknowledges the need for data collection and storage systems that are safe and provide assurance to individuals that their data is confidential. This should particularly be emphasised for Indigenous populations and populations of lower socioeconomic status and people living with different health conditions. Management of data currently sits with the respective institutional research bodies. Although NCIG addresses this for Australian Indigenous populations, there is a need for national data policies for personalised nutrition via genomic testing. Currently, professional policies regarding personalised and precision nutrition remain underdeveloped. Nutritional treatments are predominantly focused on phenotypical characteristics, with limited engagement with nutritional genomics in practice.

Some products relating to precision and personalised nutrition have been developed, including direct-to-consumer testing options. However, ensuring the ongoing and independent evaluation and synthesis of commercial precision and personalised nutritech products is still not achieved, and consequently, public trust has not been obtained in the overarching premise and promise of genetic testing for nutrition. For benefits to health and for the growth of the precision and personalised nutrition sector, the public needs to have confidence in the genetic data collected, and trust in the information and future use of the collected data to drive positive outcomes. Ongoing efforts need to be made for researchers to remain transparent and to appropriately manage conflicts of interest, although a majority of researchers are widely reporting their partnerships.

The vision of the decadal plan, and of researchers engaging with the public regarding precision and personalised nutrition, of cost-effective health benefits and an engaged and literate community, remains largely unachieved as there remain socio-economic, ethics and equality challenges to meaningful implementation. Unfortunately, there is no strong initiative from the Australian Government to promote the narrative of the benefits of understanding more about human nutrition as a science, and without this, no support of precision and personalised nutrition can be achieved. Similarly, although cross-disciplinary ethical analysis of genetics and genomics for nutritional purposes is a regular part of the different institutional research boards (human ethics committees) assessing individual projects, this challenge has not been well addressed on a state and/or nationwide level.

12 Truby H, Allman-Farinelli M, Beck EJ, et al. Advancing the decadal plan for the science of nutrition: Progressing a framework for implementation. *Nutrition & Dietetics*. 2024; 81(2): 133-148. doi: [10.1111/1747-0080.12876](https://doi.org/10.1111/1747-0080.12876)



PILLAR 4 – EDUCATION AND RESEARCH TRAINING

This pillar addresses the vision for education and research training of nutrition professionals, including health practitioners and scientists, education of allied and adjacent professions, and students of all ages.

Since the launch of the decadal plan, much progress has been made by professional bodies such as the Nutrition Society of Australia (NSA) and Dietitians Australia (DA). Both bodies have continued with established codes of ethical practice for members and competency-based education and ongoing updates. This is enforced by DA via an accreditation process for universities and individual member accreditation. The NSA has a voluntary registration process. The education of dietitians and nutritionists in areas suggested by the decadal plan has been incorporated. This includes personalised and precision nutrition, responsible use of social media and communication skills, societal determinants of health, and epidemiology of disease. More knowledge of commercial determinants and conflicts of interest was suggested as also important. Additionally, DA has competencies for cultural responsiveness that were omitted from the original decadal plan but are now considered critical.

Improvement in nutrition education for medical, nursing and allied health professionals is inconsistent as it depends on individual universities and professional and accreditation organisations. In the next five years, formalised discussions and actions are needed to ensure competencies in food and nutrition literacy become part of tertiary education and professional development for graduates. Additionally, all teachers from early childhood through secondary school require food and nutrition skills to educate Australian children, making teachers a priority for upskilling.

With regard to doctoral training and professional development pathways, the nutrition community had mixed reactions. There appears to be some progress in early-career development, with fellowships successfully funded from a variety of sources including the NHMRC, ARC, National Heart Foundation, Cancer Councils, institutional fellowships like Alfred Deakin (Deakin University) and Horizon (University of Sydney), and those

funded by research grants. However, the number of PhD graduates is rising, and not all saw growth in opportunities equal to graduate numbers. Opportunities lessen on the progression to mid-career researchers and beyond. There seemed to be universal agreement that it was extremely difficult to obtain Category 1 research funding for nutrition science projects. Thus, while frameworks exist for career progression, the nutrition research community would like to see more opportunities created and further leadership training would be one enabling factor. There may be a need for other scientists in related disciplines to gain some nutritional knowledge and skills. This may be addressed by further formal education processes although enrolment in postgraduate education typically incurs fees. It was a recommendation of the decadal plan that all professional nutritionists undertake competency-based education. The definition was restricted to university graduates including those degrees accredited by the Australian Dietetic Council of Dietitians Australia and graduates of degrees with a minimum three years of study that are eligible for membership of the NSA. This does not include graduates of non-university-based degrees claiming to produce nutritionists, but these require consideration and are of concern in a non-regulated environment. DA has mandatory prescribed competencies¹³ that all accredited degrees and Accredited Practising Dietitians (APDs) need to meet. The NSA has developed a paper on suggested competencies in training nutritionists, but these are not regulated via an accreditation process of degrees¹⁴ and instead registered members of NSA must demonstrate competence. For other health professionals, specific competencies in nutrition are not the norm and the potential need for prescribed and accredited competencies for medical graduates was described in the implementation planning¹⁵ with a potential position paper proposed, as general practitioners and practice nurses are often the front line of nutrition advice to their patients. The implementation plan has identified a logic model of the inputs, activities, outputs and outcomes that are required for university training of all health professionals, and the upskilling of graduates already practising via engagement with accrediting and professional bodies.

13 National competency standards for dietitians available at <https://dietitiansaustralia.org.au/working-dietetics/standards-and-scope/national-competency-standards-dietitians>

14 Lawlis T, Torres SJ, Coates AM, et al. Development of nutrition science competencies for undergraduate degrees in Australia. *Asia Pacific Journal of Clinical Nutrition*. 2019; 28(1):166-176. doi: [10.6133/apjcn.201903_28\(1\).0022](https://doi.org/10.6133/apjcn.201903_28(1).0022)

15 Truby H, Allman-Farinelli M, Beck EJ, et al. Advancing the decadal plan for the science of nutrition: Progressing a framework for implementation. *Nutrition & Dietetics*. 2024; 81(2): 133-148. doi: [10.1111/1747-0080.12876](https://doi.org/10.1111/1747-0080.12876)

It was also proposed that liaison occur with other scientific and professional bodies involved in food science, food technology, biotechnology and biomedical sciences and other relevant disciplines that do not have specific nutrition competencies but may be involved in food- and nutrition-related outputs that influence the diet and health of Australians as well as related economies.

Competencies for cultural responsiveness should have been spelled out and were omitted from the decadal plan. In the five years since the plan was developed, professional bodies have developed competencies. The plan must be revised to include the importance of working with Aboriginal and Torres Strait Islander people, understanding their ways of knowing, being and doing, and respecting their knowledge of food and nutrition, and wellbeing.

Codes of conduct were highlighted as important to the success of the plan. DA has a code of practice that members demonstrate they adhere to each time they renew their APD credential, but not all dietitians maintain APD status within the state government health systems and other areas of dietetic practice. Accredited university degrees ensure that students are familiar with the DA code of ethics. When a hospital employs a dietitian who is not an APD, they are responsible for ensuring that they follow a code of ethics and maintain their continuing professional development. The NSA has developed a code of conduct for its members but again not all nutrition graduates become NSA members. The scope of practice needs to be established that includes professions within and outside nutritionists – embracing all who deliver evidence-based nutrition advice and ethical practice should ensure nutrition professionals work within their scope. The scope of practice of graduates could be extended, provided practitioners are adequately trained. Mandatory regulation of the nutrition profession may be required.

There remains a cacophony of non-evidenced based nutrition content on social media that needs to be countered by professionals.

Small numbers of nutrition scientists and nutrition professionals engage effectively with the media, and media training within institutions and professional organisations occurs. Research monitoring the quality of social media posts has been undertaken¹⁶. Opportunities

for media training are offered to some HDR students and EMCRs. However, the funding situations for such training are highly variable depending on institution and circumstance.

Responsible use of the media is not always evident among some scientists when preliminary findings are presented to the public too soon (e.g. of in vitro or animal studies with no human tests). Advocacy for science and science communication needs to continue and be strengthened among the public, and the proposed Alliance for Nutrition Science Australia will be a mechanism for communicating with a unified, amplified voice to government. Training within all degrees and professions for media usage has been included in the Implementation plan. Some additional government regulation of nutrition supplements has eventuated since the publication of the decadal plan. For example, the TGA now has a social media advertising guide that includes nutritional supplements.

Food and nutrition are included in some form in school curricula¹⁷; however, it is unclear if this has advanced in recent years. It has been announced by the Australian Curriculum, Assessment and Reporting Authority that food and nutrition education in schools will be overhauled in 2024 and 2025, to remove content that could contribute to the development and relapse of eating disorders. In the Early Childhood Education and Care (ECEC) sector, TAFE and other tertiary sectors, training and policies are inconsistent. The Australian and state governments and philanthropic programs have funded specific initiatives such as Stephanie Alexander's Kitchen Garden Program, Crunch & Sip and Food Ladder to encourage healthy eating. It is acknowledged that curricula are full, with competing needs, but as the population's diet quality is not improving it's clear that education is needed as one of many initiatives to improve diet. Progress in food and nutrition literacy programs led by academics have advanced the position of nutrition science in education but committed funding from education and/or health authorities are needed. As this often falls to the states, the consistency of the government response is problematic.

Evidence-based teaching, including societal determinants and the ethics of precision and personalised nutrition, as core competencies in all accredited and professional development courses is occurring in dietetics degrees and some nutrition degrees but not all, as some nutrition science majors in some degrees have limited public health or social sciences included.

16 Denniss E, Lindberg R, Marchese LE, McNaughton SA. #Fail: the quality and accuracy of nutrition-related information by influential Australian Instagram accounts. *International Journal of Behavioral Nutrition and Physical Activity*. 2024, 14;21(1):16. doi: [10.1186/s12966-024-01565-y](https://doi.org/10.1186/s12966-024-01565-y). PMID: 38355567; PMCID: PMC10865719.

17 Australian Curriculum, Food and Wellbeing, <https://www.australiancurriculum.edu.au/resources/curriculum-connections/portfolios/food-and-wellbeing/#:~:text=The%20Australian%20Curriculum%20Connection%3A%20Food,context%20in%20core%20learning%20acros>

The need for further education has been noted in the Implementation plan. Incorporation of commercial determinants of food and nutrition and understanding of conflicts of interest are now voiced by the profession but were not articulated in the original decadal plan.

Career pathways and opportunities in research, public health and advocacy roles exist within training institutions in the degrees offered, but pathways after graduation must be established. Data from the NHMRC, ARC, MRFF and NHF (National Heart Foundation) are indicators of growth in career pathways in nutrition research. For example, NHMRC Investigator grants at all levels, ARC DECRA and Futures, MRFF fellowships, NHF fellowships and data specific to nutrition could be interrogated. Public health pathways have developed via the traditional nutrition and dietetics degrees as well as in schools of population health, and the Public Health Association of Australia has an active nutrition special interest group. Positions in government and advocacy require further development but there are some training positions offered in public health and policy (e.g. NSW Health has such a program).

No universal knowledge of such a framework of competency from basic to advanced levels in line with these career pathways exists. DA has attempted this with a pathway from entry level through to advanced practice and then fellowship. The NHMRC and ARC have researcher frameworks that begin with early-career fellowships (up to 10 years post-doc) through mid-career such as Futures Fellow (up to 15 years post-doc) and then established researchers.

Most universities have standards from level A through to level E of what the expectations for research performance are and research institutions follow similarly. For fellowship holders training is offered, but for others mentoring, supervision and training is dependent on institutions. Training may be for a traditional path, industry path or policy and practice.

NSA working groups and other researchers have invested considerable efforts into researching and developing employment opportunities at post-bachelor level. DA advocates for dietetic workforce development in newer areas such as disability, aged care and mental health. Some concern has been expressed about the large numbers of PhD students having limited opportunities for employment in nutrition practice and research following graduation.

Leadership programs are becoming more widespread and accessible to a broad range of professionals, alongside greater focus on governance within and between organisations. There is greater awareness of stepping stones in leadership and ways to demonstrate leadership 'at all levels'. However, the level and intensity of 'imposter syndrome' and other similar hesitations among the workforce is also increasing, meaning that more work is needed to overcome the barriers to genuine leadership that results in improvements to Australia's nutrition. Additional existing programs offered include NSA mentoring and the Boden research conferences.





DEVELOPING ISSUES

Evolving issues such as food security, sustainability, processing, and awareness of the social issues that impact nutrition literacy are now more prominent in the nutrition science sector than previously. While the initial pillars and enabling platforms in the decadal plan remain relevant, these additional aspects need consideration as implementation progresses.

Moreover, little regard was given to the disparity experienced by Aboriginal and Torres Strait Islander peoples and the impact that a lack of food security and nutritional literacy is having on the health of these populations. Fundamentally, the problem is a lack of access to healthy and nutritious foods, and a lack of intervention that is appropriate for the cohort. Significant steps are needed to address these issues so that nutrition science can work towards improving the health and nutrition outcomes that disproportionately affect the Indigenous population of Australia. While community awareness of the need for direct consultation with Aboriginal and Torres Strait Islander communities and the avoidance of inappropriate research practices is now greater than five years ago, this is still an area the nutrition science community can work towards improving.

Food security and sustainability have emerged as key themes in society related to nutrition science and food chains. These issues were tangentially mentioned across pillars, however, if the decadal plan were written today, it is likely they would command their own focused pillars. The release of the EAT-Lancet report, the impacts of the COVID-19 pandemic on food chains and individual circumstances and the rise in the cost of living in Australia all highlight the importance of these factors.

The classification of processed foods, for example as per the NOVA criteria, has also emerged as an area of research interest and controversy. This issue is captured under nutrition mechanisms; however, five years ago, the language in this space was less explicit. The role of processing also links to food security, and to the call for beneficial collaboration between stakeholders in public health and the food industry. Limited engagement took place with food science, technology and food industry associations (e.g. the Australian Institute of Food Science and Technology (AIFTS), which plays a significant role in the food and agribusiness sectors, and as such the current plan has limited avenues for collaborative growth and could potentially exacerbate an adversarial approach.

CONCLUSIONS AND GENERAL COMMENTS

It is acknowledged that the 2019 decadal plan involved significant efforts from the nutrition science community to develop, and it was a necessary first step to achieving the collective vision for nutrition science in Australia. The plan identified important issues for the nutrition science community in Australia and benchmarked the aspirations of the community, with a focus on the academic community.

Progress has been made in some areas, but there are also key areas where progress has been limited and new issues and areas are evolving. In particular, the upheaval of the COVID-19 pandemic limited progress in implementation via the National Committee for Nutrition. The ongoing evolution of context, growth and uncertainty means that, like all decadal plans, the plan should be treated as a living document that needs to be revisited, modified, updated and continually reframed in context. The efforts of the NCN and contributing EMCRs in collaboratively creating implementation plans need to be acknowledged. These contributions and the ongoing evolution of context should particularly be kept in mind in the formation of the next decadal plan.

The mid-term review has shown that the responsibility for achieving specific goals needs to be clearly identified and that recommendations should, whenever possible, include agreed specific targets. Advocacy for governmental priorities to be defined for nutrition science also remains paramount to the success of the plan and the field more broadly. In the meantime, the hope for the nutrition science community is that this mid-term review will promote re-engagement with the decadal plan, participation in established implementation working groups, and a stronger commitment to driving the recommendations of the plan, as well as lay some foundations for writing the next decadal plan. Nutrition science underpins areas of critical interest for Australia including those related to health, sustainability, security and economics, and supports multiple desirable outcomes in the current context. This review has highlighted the need to continue to progress the recommendations of the decadal plan in a consultative and collaborative manner.

The opportunities provided by the nutrition science community can only be realised with appropriate recognition of its role in responding to developing areas of interest from the government and research sectors. This must be paired with infrastructure and resourcing to support excellence and capability for the research that underpins many solutions to contemporary challenges, and to ensure high-quality education and training to equip the next generation of Australians with nutritional knowledge needed for future health and economic prosperity.

