

Rethinking food and nutrition science

*Effective governance for food
and nutrition science in Australia*

Theo Murphy
High Flyers
Think Tank
2017

Effective governance for food and nutrition science in Australia

Working group: Associate Professor Gina Ambrosini, Dr Jose A Caparrós-Martín, Dr Karin Clark, Dr Jorja Collins, Dr Kacie Dickinson, Professor Danielle Gallegos, Dr Shelley Gorman, Dr Katherine Kent, Dr Rebecca Lindberg*, Dr Christina Pollard*

*Group Leaders

Executive summary

Effective governance is needed to achieve the aims of the decadal plan for nutrition science in Australia. Nutrition science has the potential to significantly improve human and planetary health, yet strong political and commercial forces undermine achievements in this area. Avoidable, nutrition-sensitive diseases are reaching epidemic proportions with adverse social, economic and environmental consequences.

Nutrition science is the study of food systems including nutrients, foods and dietary patterns, as well as their interactions within and between biological, social and environmental systems. It is complex and continuously changing. The nutrition science vision is to achieve and sustain a food system that ensures food and nutrition security for all Australians as a fundamental human right.

Although good governance is increasingly called for in all areas of nutrition science, clear definition of what constitutes good governance, as well as the development and refinement of principles and mechanisms for implementation, is needed. The growing complexities and contested nature of food and nutrition policy, practice, and research make it necessary to clarify where and how decision making occurs within the food and nutrition system. It is also essential to establish the processes that support effective governance from paddock to plate.

This paper discusses the new nutrition science paradigm, priorities and challenges for the next decade in Australia. It critically explores major challenges—including the neoliberal political order; commercial conflicts of interest exacerbated by the role of technology, social and other media; and limited research infrastructure and resources. It also proposes a model for effective governance, including a recommendation for a peak nutrition science body to help meet the challenges and ensure the pathway for a healthier Australia by 2027 and beyond.

Table of contents

Executive summary.....	1
Context and scope	3
The new nutrition science	4
Priorities and achievements of food and nutrition science	4
Food safety	4
Food security	5
Diet quality, population health and wellbeing.....	5
Environmentally sustainable food supply—minimising food waste and environmental impact ..	5
Challenges to food and nutrition science	6
Political environment and external forces	6
Technology and new media	7
Research infrastructure and funding	7
The way forward for effective governance	7
Collaboration.....	8
Engagement	8
Regulation and persuasion.....	8
Independent agencies and expert bodies	9
Adaptive policies, resilient structures and foresight.....	9
Out of the box.....	9
References	10
Acknowledgements	12
About the 2017 Theo Murphy High Flyers Think Tank: Rethinking food and nutrition science	13

Context and scope

Nutrition science, which includes agricultural, ecological, biological, animal, human, clinical, environmental, political, and social sciences, is a fundamental driver of food and nutrition security for Australia. Food security means that food is available and appropriate (safe, nutritious, in sufficient amounts and reliable supply), accessible (distribution systems enable it to get to where it is needed) and affordable (available at prices people can afford to pay, and people have adequate incomes and are free from poverty). Good nutrition is the desired outcome, so consumption and all the demand-side factors that influence it must be included in all considerations, and food production should support the environment to ensure future food supplies.

‘The ultimate aim... [of] ...food security is to arrive at a healthy and well-nourished population that can take on, to the maximum of its capacities, the development of its own community, area or country’ (Roetter and Van Keulen 2008)

Australia is considered to be food secure. Australian food producers provide 90% of the domestic food supply for around 25 million people, and export enough food to feed an additional 40 million people (Turner et al. 2017).

Nutrition science is an integrated science encompassing the biological, social and environmental sciences to meet future the circumstances of the twenty-first century (Beauman et al. 2005 p.697). The health and welfare of people and the planet are at its heart. The *2004 Giessen Declaration* stated that the overall principles guiding nutrition science ‘are ethical in nature and should also be guided by the philosophies of co-responsibility and sustainability, by the life-course and human rights approaches, and by an understanding of evolution, history and ecology’ (Beauman et al. 2005).

As nutrition science informs all aspects of the food system, including the type, amount, quality, safety, marketing, promotion and distribution of food and beverages available in Australia and their impact on the environment, today and in the future, there is need for strong governance to manage the potentially conflicting and diverse interests of the food and nutrition system.

Governance is:

‘...the sum of the many ways individuals and institutions, public and private, manage their common affairs. It is a continuing process through which conflicting or diverse interests may be accommodated and cooperative action may be taken. It includes formal institutions and regimes empowered to enforce compliance, as well as informal arrangements that people and institutions either have agreed to or perceive to be in their interest’ (World Health Organization 1995, p.4).

Although the need for effective nutrition science governance in Australia has been called for or assumed, it has not been defined or well described. Researchers attending the Theo Murphy Re-Thinking Food and Nutrition Sciences Think Tank in July 2017 identified a need to describe and critically explore the nature of effective governance for nutrition science and the requirements for positive achievements in Australia over the next decade and into the future. This discussion paper provides a starting point for those deliberations.

The new nutrition science

Think Tank participants were concerned that food systems are failing to protect public health and are contributing to unsustainable economic, societal and environmental burdens. For example, conservative estimates are that Australia's contemporary unhealthy dietary pattern will result in productivity and health costs of at least A\$3 billion in the year 2025 (Turner et al. 2017).

These concerns are not new, after exploring the evolution of nutrition science, its achievements and limitations a decade ago, 'thought' leaders in the field expanded the definition of nutrition science to meet emerging challenges. The working definition of nutrition science includes:

'... the study of food systems, foods and drinks, and their nutrients and other constituents; and of their interactions within and between all relevant biological, social and environmental systems and called for a unified science across the food system' (Beauman et al. 2005).

Ethical principles, guided by philosophies of co-responsibility, sustainability, life-course and human rights approaches and with an understanding of evolution, history and ecology, form the basis of the new nutrition science approach (Beauman et al. 2005).

Priorities and achievements of food and nutrition science

Food safety, food security, diet quality, and an environmentally sustainable food supply are key food system and nutrition science priorities (Allison et al. 2015). The agreed vision of leading Australian health authorities is for '...a safe, nutritious, affordable, accessible and environmentally sustainable food supply now and into the future for health and prosperity' (Public Health Association of Australia 2011; Queensland University 2013). Although the Australian Government asserts that Australia has a clean, safe [from foodborne illness] and affordable food supply (Department of Agriculture 2014), further focus and action is needed to address the public health, economic, and societal impacts related to the consequences of an unhealthy dietary pattern. The evidence to inform policy action must be underpinned and informed by timely and high quality nutrition science.

Food safety

Australia's record is exemplary in the area of protecting the public against foodborne illness (food safety) as Food Standards Australia and New Zealand (FSANZ) delivers a comprehensive policy and regulatory system with the main objective of protecting public health and safety, primarily focusing on this area (FSANZ, 2017). However, it is unclear whether the system is equipped to meet the current and future challenges of the food supply relating to improving nutrition and preventing overweight and obesity and subsequent non-communicable diet-related disease (NCD). Dietary risk factors are the leading contributors to the global burden of disease (Abajobir et al. 2017). In recognition of this, 'Supporting the public health objective to reduce chronic disease related to overweight and obesity' is one of the three FSANZ's priorities for 2017–21 (Food Standards Australia and New Zealand 2017).

Commercial vested interests assert undue influence to directly compete with public health objectives in the areas of improving food and nutrition security to prevent NCDs. There is increasing recognition of the need to ensure transparency, rigor and public scrutiny of government food and nutrition policy, regulatory and norm-setting activities to ensure they are adequately protected from

undue commercial interest (Brown, K et al. 2015). There is an urgent need for strong governance throughout nutrition science research to inform decision making in policy and practice to strengthen action.

Food security

Australia is considered to be food secure, yet there are population subgroups, including Aboriginal and Torres Strait Islander people, people who are disadvantaged due to their socioeconomic circumstances, and those living in remote geographic areas, who experience higher levels of food insecurity than the rest of the community. Australians with the least wealth experience the poorest health, in part due to their poor diet (Australian Institute of Health and Welfare 2012). Vulnerable population subgroups have higher rates of both forms of malnutrition—under- and over-nutrition—leading to nutrient deficiency and overweight and obesity, and avoidable diet-related diseases (for example, Type 2 diabetes, cardiovascular diseases and some cancers). Participation of food-insecure citizens in the development of programs and policies that affect them is an important issue for scientists, highly relevant to governance and merits consideration within the decadal plan. As well, research to explore the social determinants of food insecurity and effective policy options to mitigate its impact are warranted.

Food insecurity at a global level requires a coordinated political policy response and Australia has many neighbouring low- to middle-income countries with high levels of food insecurity. In recent times, the Australian Government has lowered the priority of its international food security donations and partnerships with vulnerable countries.

Diet quality, population health and wellbeing

The National Health and Medical Research Council's Australian Dietary Guidelines provide scientifically based advice on a dietary pattern for health and wellbeing and to reduce the risk of avoidable diet-related disease (NHMRC 2013). Very few Australians regularly consume diets that adhere to the recommendations of the Australian Guide to Healthy Eating, Australia's food selection guide (ABS 2011-12). Poor diet quality across the life-course results in a significant social and economic burden for Australia. The burden of disease attributable to diet is substantial and increasing (Forouzanfar et al. 2015), and when combined with the burden associated with obesity, represent the highest preventable risk and burden for Australia.

Changes across the food supply have contributed to the poor dietary pattern and epidemic proportions of excess body weight. Shifting dietary patterns towards those that are more nutritious is a major nutrition science priority. Identifying and actioning an evidenced-based suite of food and nutrition policy options within a national food and nutrition policy framework and governance structure is an identified Theo Murphey Think Tank priority.

Environmentally sustainable food supply—minimising food waste and environmental impact

Food and nutrition sciences have helped to advance the production of an abundant food supply in many parts of the world, but this has had significant ramifications for planetary health. Creating and maintaining an environmentally sustainable Australian food supply is an ongoing and increasingly urgent priority for the science. 'Grow. Make. Prosper. The decadal plan for Australian Agricultural

Sciences' (2017) describes the major achievements of Australian agriculture and highlights areas for improvement. A healthy diet is largely a more environmentally sustainable diet, therefore public health nutrition and environmental sustainability are interconnected and share common dietary causes and solutions (Lawrence et al. 2015). A fundamental principle of nutrition science and its governance (informed by the overarching goals set by Think Tank participants) is a priority to create ways to improve the environmental sustainability of the food system, including minimising food waste and mitigating environmental impact.

Challenges to food and nutrition science

Arguably, nutrition science is one of the most contested sciences due to the influence of political structures, commercial vested interests, and overall influence of food industry, media and community perceptions. Despite the value of food and nutrition science, funding and infrastructure to support research and innovation is increasingly difficult and potentially complicated by industry and commercial funders.

Political environment and external forces

Neoliberalism is a political ideology that promotes deregulation, privatisation of public assets, a smaller role for government and free-market economic principles (Western et al. 2007).

Neoliberalism aims to reduce the state's role and promotes free trade (McKeon 2015). In Australia, and most high-income countries, this ideology dominates and has significant ramifications for nutrition (Caraher and Coveney 2003).

For example, food and nutrition policy and programs are increasingly made and implemented via a collaborative public–private approach. Conflicts of interest in the funding, scope and accountabilities have been identified and both the risks and benefits of this approach are being explored (UK Health Forum 2016). While governments have the overall responsibility for public health and protecting public policies from conflicts, the wider and more distributed networks of actors in the policy process means that the roles of governments are more complex (Kraak et al. 2012).

Three related factors have the potential to reduce the impact of nutrition science to protect and promote public health and food and nutrition security. Firstly, the globalisation of food systems has reduced the traditional governance policy space within which national governments operate (Swinburn et al. 2015). Secondly, and at the same time, the power of commercial vested interest in food policy decision-making in Australia is significant and largely uncontested, and nutrition advocates have limited access to decision makers (Cullerton et al. 2016). And thirdly, there is evidence of the undue influence of commercial vested interest on research funding and outcomes (Rowe et al. 2009).

The emphasis on the free market and the importance of food as a commodity are additional challenges for nutrition science. The emphasis on primary industries to benefit the Australian economy is sometimes at odds with the priorities for new nutrition-related sciences such as increasing environmental sustainability and effective land and water management.

Technology and new media

Emerging technologies have also significantly influenced nutrition science, particularly the conducting of research and the dissemination of information. Technology use for communication has dramatically changed how nutrition experts operate. For example, people searching for health information is a key use of the internet, and nutrition interventions and information is increasingly being delivered via the web (Pollard et al. 2015) and other social and digital media, allowing people to form connections and selectively access information through multiple channels (Hajkowicz et al. 2012). Evidence-based nutritional information that is tailored, credible, reliable and practical is needed, and at present this type of information is difficult to discern from less reliable and often disreputable sources. Social media is a key source of nutrition information and disruptor of evidence-based nutrition communication; as always, everyone has an opinion about nutrition, however through social media the dissemination of misinformation is immediate and has unprecedented reach.

Research infrastructure and funding

Research infrastructure is often fragmented with funding limited or focused on clinical practice and medical innovation. There are benefits from industry partners and additional resources to support research. However, the research domain is also made complex with ethical challenges, as professional bodies and universities are faced to negotiate the complexities and conflicts of interest that arise with funding offers from food processing and related industries.

An agreed research interaction framework and a deeper understanding of the profit-maximising agenda of companies with commercial interest in unhealthy food commodities has been called for, highlighting the need for clear governance principles in this area (Moodie et al. 2016). Australia has led the way in nutrition science and has established some key institutions and strategies (e.g. CSIRO Nutrition Flagship, and The Australian 2020 Summit). The strength of evidence of effective nutrition intervention is also increasing (Hawkes et al. 2016, Queensland University 2013). Yet governments fail to appreciate, act on and resource a comprehensive food and nutrition policy response to key nutrition challenges. There is a need to establish an independent nutrition science-based body to provide leadership in promoting optimal nutrition for all Australians.

The way forward for effective governance

The fundamental governance challenge is how to make effective decisions, and create effective processes and policies for science across the food and nutrition system. Effective governance is needed to:

‘... improve capacities for effective collective action and to solve problems as diverse as ending hunger, malnutrition and poverty; minimizing climate change; enabling transition to sustainable agriculture and sustainable use of natural resources; ensuring the health and safety of food and agriculture systems; and contributing to peace through food security’ (Food and Agriculture Organization, 2017).

One of the key messages of the FAO is that ‘Governance work is problem-driven, context-specific and people-centric. It seeks to clarify the political nature of a problem, identify the primary issue(s) and involve all relevant stakeholders to arrive at workable solutions.’ (FAO, 2017).

Effective governance for nutrition sciences in Australia over the next 10 years or so should be informed by nutrition science principles of:

- co-responsibility and environmental sustainability
- a life-course and human rights approach
- evidence base drawn from an understanding of evolution, history and ecology.

Effective governance processes for nutrition science should be created drawing from the World Health Organization's smart health governance in the 21st Century (Kickbusch and Gleicher 2012) whole-of-government and whole-of-society approaches. These include:

- collaboration
- engagement
- mixing regulation and persuasion
- independent agencies and expert bodies
- adaptive policies, resilient structures and foresight.

Collaboration

Collaboration requires clear governance in its process and design, including the design to build communication, trust, commitment and understanding; the choice of tools and mechanisms; and for transparency and accountability.

Engagement

Participation, transparency and accountability should become the engines for innovation within the new, complex relations between state and society. For gains across the food system, nutrition science will rely even more on cross-sector partnerships and, as always, citizen engagement. True coproduction and engagement requires governance based on ethics and transparency. Tertiary education approaches will need to build inter-sectoral engagement opportunities across the nutrition science continuum.

Regulation and persuasion

The power of commercial vested interest in food and nutrition is evidenced by the global trade, production, supply, distribution, marketing and promotion of food that, in Australia, as in most countries, encourages the consumption of an unhealthy dietary pattern across the population with detrimental health and economic impacts. There is a need to govern with a mixture of hard and soft power and policies to achieve nutrition science outcomes. In the area of food and nutrition, the power and influence of the food industry is one reason 'harder' approaches to food and nutrition policy are not pursued by governments (Swinburn et al. 2015). Governments need improved 'hard' regulatory mechanisms to ensure private sector accountability, and non-regulatory mechanisms (e.g. quasi-regulatory, political, market-based, and public and private communications) are underutilised (Swinburn et al. 2015). On the other hand, 'soft' approaches in the form of voluntary food reformulation and industry self regulation are common..

Independent agencies and expert bodies

Federal agencies, commissions, regulators and auditors play vital roles in providing evidence, watching ethical boundaries, extending accountability and strengthening democratic governance in health. There is a clear role for an independent, high-level nutrition science body to engage with government, across agriculture, health, ecology, and other relevant areas. In line with calls from public health authorities in Australia, the establishment of an independent, high level, nutrition science body for Australia is recommended to ensure a workable and effective approach going forward. A national food and nutrition policy, implementation strategies and a monitoring and evaluation system would be an immediate focus for this body. Pathways to protect nutrition science from the undue power and influence of commercial vested interest are being described and must be strengthened (Cullerton et al. 2016a,b, c; Pulker et al. 2017).

Adaptive policies, resilient structures and foresight

Interdisciplinary systems approaches are essential for analysis, for initiatives to improve health and wellbeing, and to prevent future health, social, political or environmental crises. Innovation in nutrition science will create the paradigm shift required to greatly improve food and nutrition security for all in Australia. The momentum is growing and the demand for fit-for-purpose solutions to global problems is increasing. Not only can we better manage major challenges to public health nutrition in Australia, we can make a positive and substantial difference to health across the globe. A governance priority is to continue to support a credible, reliable nutrition science workforce to develop and implement the decadal plan on nutrition science. We need to continue to build an appropriately qualified, adequately skilled, well-resourced and connected nutrition science workforce across all food system sectors in order to achieve an innovative and sustainable approach to food and nutrition security that protects the health of the population and our planet.

Out of the box

Some other aspects that require further thought and development:

How do we best work with the food industry? A synergistic working relationship with the food industry requires effective governance and agreed guidelines and procedures to achieve public health and industry outcomes. For effective governance it is recommended that the food industry does not hold a seat at the policy decision-making table, but are engaged in implementing desired actions.

How do we develop the workforce to meet the current and future nutrition-science challenges? Inter- and intra-disciplinary tertiary education are needed develop an adequately sized and appropriately skilled workforce, with governance of nutrition science a priority competency.

How do we support evidence-based nutrition science dissemination through media, including social media, and communications? Engagement with the public and other sectors requires good governance.

References

- Abajobir, A.A., et al., (2017) Global, regional, and national comparative risk assessment of 84 behavioural, environmental and occupational, and metabolic risks or clusters of risks, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, 390(10100): p. 1345-1422.
- Allison, D. B., et al. (2015). Goals in Nutrition Science 2015–2020. *Frontiers in Nutrition*, 2(26). doi:10.3389/fnut.2015.00026
- Australian Bureau of Statistics (ABS). (2016) 4364.0.55.012 - Australian Health Survey: Consumption of Food Groups from the Australian Dietary Guidelines, 2011-12 . [cited 2017 11 July]. Available: <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.012main+features12011-12>. [Accessed 19 Oct 2017].
- Australian Institute of Health and Welfare (AIHW). (2012). Social distribution of health risks and health outcomes: preliminary analysis of the National Health Survey 2007–08. Information Paper. Cat. no. PHE 165.Canberra: AIHW.
- Beauman, C., et al. (2005). The principles, definition and dimensions of the new nutrition science. *Public Health Nutrition*, 8(6a), 695-698.
- Brown K, Rundall P, Lobstein T, Mwatsana M, Jeffery B. (2017) Open letter to WHO DG candidates: keep policy and priority setting free of commercial influence. *The Lancet*. 389(10082):1879.
- Caraher M, Coveney J. (2004) Public health nutrition and food policy. *Public Health Nutrition*. 7(5):591-8.
- Cullerton K, Donnet T, Lee A, Gallegos D. (2016a) Playing the policy game: A review of the barriers to and enablers of nutrition policy change. *Public Health Nutrition*. 19(14):2643-53
- Cullerton K, Donnet T, Lee A, Gallegos D. (2016b). Exploring power and influence in nutrition policy in Australia. *Obesity Reviews*. 17(12):1218-25.
- Cullerton K, Donnet T, Lee A, Gallegos D. (2016c) Joining the dots: the role of brokers in nutrition policy in Australia. *BMC Public Health* 17(1):307.
- Department of Agriculture. (2014). *Australian Food Statistics 2012-13*. Canberra: Commonwealth of Australia.. Available: <http://www.agriculture.gov.au/ag-farm-food/food/publications/afs>. [Accessed 9 Aug 2017].
- Food and Agriculture Organization (FAO). (2017) Available: <http://www.fao.org/policy-support/governance/en/>. [Accessed 10 Sept 2017].
- Food Standards Australia and New Zealand (2017) Annual Report 2016-2017. Available: <http://www.foodstandards.gov.au/publications/annualreport201617/Documents/FSANZ%20Annual%20Report%202016-17.pdf>. [Accessed 11 November 2017].
- Forouzanfar MH, Alexander L, Anderson HR, Bachman VF, Biryukov S, Brauer M, et al. (2015). Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*. 386(10010):2287-2323.
- Hajkowicz SA, Cook H, Littleboy A. (2012). Our Future World: Global megatrends that will change the way we live. The 2012 Revision. CSIRO, Australia.

- Hawkes C, Jewell J, Allen K. (2013) A food policy package for healthy diets and the prevention of obesity and diet-related non-communicable diseases: the NOURISHING framework. *Obesity Reviews*. 14 Suppl 2:159-68.
- Kickbusch, I and Gleicher, D. (2012). *Governance for Health in the 21st Century*. World Health Organization. Available: http://www.euro.who.int/_data/assets/pdf_file/0019/171334/RC62BD01-Governance-for-Health-Web.pdf. [Accessed 25 Sept 2017].
- Kraak VI, Harrigan PB, Lawrence M, Harrison PJ, Jackson MA, Swinburn B. (2012) Balancing the benefits and risks of public–private partnerships to address the global double burden of malnutrition. *Public health nutrition* 15(3):503-17.
- Lawrence MA, Friel S, Wingrove K, James SW, Candy S. (2015) Formulating policy activities to promote healthy and sustainable diets. *Public Health Nutrition*. 18(13):2333-40.
- McKeon N. (2015). Food security governance: Empowering communities, regulating corporations. London: Routledge.
- Moodie R, Stuckler D, Monteiro C, Sheron N, Neal B, Thamarangsi T, Lincoln P, Casswell S, Group LNA. (2013) Profits and pandemics: prevention of harmful effects of tobacco, alcohol, and ultra-processed food and drink industries. *The Lancet*. 381(9867):670-9.
- National Health and Medical Research Council (NHMRC). (2013). *Australian Dietary Guidelines* [press release]. Canberra: National Health and Medical Research Council.
- Pollard CM, Pulker CE, Meng X, Kerr DA, Scott JA. (2015) Who uses the internet as a source of nutrition and dietary information? An Australian population perspective. *J Med Internet Res* 17(8):1-7.
- Public Health Association of Australia (PHAA). (2011) Future for Food 2. Healthy. Sustainable. Fair. PHAA, Canberra.
- Pulker C, Trapp G, Scott J, Pollard C. (2017) What are the position and power of supermarkets in the Australian food system, and the implications for public health? A systematic scoping review. *Obesity Reviews*, in press.
- Queensland University of Technology. (2013) Scoping study to inform development of the National Nutrition Policy for Australia. Department of Health and Ageing. Available: [http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/\\$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF](http://www.health.gov.au/internet/main/publishing.nsf/Content/D309AF86C0D09DBDCA257F7F0077E0CE/$File/1%20-%20Final%20Report%20-%20National%20Nutrition%20Policy%20Scoping%20Study%20%28Report%20and%20Appendices%29.PDF) [Accessed 10 September 2017].
- Rowe S, Alexander N, Clydesdale F, Applebaum R, Atkinson S, Black R, et al. (2009). Funding food science and nutrition research: financial conflicts and scientific integrity. *Nutrition Reviews*. 67(5):264-72.
- Swinburn B, Vandevijvere S, Kraak V, Sacks G, Snowdon W, Hawkes C, Barquera S, Friel S, Kelly B, Kumanyika S, et al. (2013) Monitoring and benchmarking government policies and actions to improve the healthiness of food environments: a proposed Government Healthy Food Environment Policy Index. *Obesity Reviews*. 14 Suppl 1:24-37.
- Swinburn B, Kraak V, Rutter H, Vandevijvere S, Lobstein T, Sacks G, et al. (2015). Strengthening of accountability systems to create healthy food environments and reduce global obesity. *The Lancet*. 385(9986):2534-45.

- The Australian Academy of Science. *Grow. Make. Prosper.* 2017. Available: <https://www.science.org.au/support/analysis/decadal-plans-science/decadal-plan-agricultural-sciences-2017-2026>. [Accessed 29 July 2017].
- The Food Standards Australia New Zealand (FSANZ). (2017) Available at: <http://www.foodstandards.gov.au/Pages/default.aspx>. [Accessed 9 Sept 2017].
- The Commission on Global Governance. (1995). *Our Global Neighbourhood*. Oxford: Oxford University Press.
- Turner, GM, Larsen, KA, Candy, S, Ogilvy, S, Ananthapavan, J, Moodie, M, et. Al (2017) Squandering Australia's Food Security— the Environmental and Economic Costs of our Unhealthy Diet and the Policy Path We're On. *Journal of Cleaner Production*.
- UK Health Forum. (2016). Improving health through better governance – Strengthening the governance of diet and nutrition partnerships for the prevention of chronic diseases Meeting report April 2016. The Bellagio Meeting. Available: http://nhfshare.heartforum.org.uk/RMAssets/PUBLIC_BellagioNutritionGovernanceMeetingReport_FINAL.pdf. [Accessed 1 Sept 2017].
- Western M, Baxter J, Pakulski J, Tranter B, Western J, van Egmond M, et al. (2007). Neoliberalism, inequality and politics: The changing face of Australia. *Australian Journal of Social Issues*. 42(3):401-18.

Acknowledgements

Our working group would like to thank the Australian Academy of Science for the opportunity to participate in the Theo Murphy Think Tank, and in particular we acknowledge the leadership of Professor Stephen Simpson and Dr Sandra Gardam. All working group members helped to develop the outline for this discussion paper. The paper was drafted by Dr Christina Pollard and Dr Rebecca Lindberg.

About the 2017 Theo Murphy High Flyers Think Tank: Rethinking food and nutrition science

The Australian Academy of Science has been hosting annual High Flyers Think Tanks on nationally important topics since 2002. These two-day events bring together outstanding early- and mid-career researchers with expertise in a broad range of disciplines to discuss novel applications of science and technology, and to identify gaps in knowledge that need to be addressed.

The 2017 Think Tank, *Rethinking food and nutrition science*, was held in Perth on 26-28 July with participants examining the field from four perspectives:

- Critical evaluation of nutrition science
- Key control points for healthy, equitable and sustainable food and nutrition
- Essential goals for achieving effective solutions
- Tools for change

Following the event, participants continued to work together to develop a series of discussion papers, of which this is one. The discussion papers are designed to create a productive dialogue and contribute to the consultation process during the development of a decadal plan for the discipline of nutrition.

The 2017 Think Tank was generously supported by the Theo Murphy (Australia) Fund, which is administered by the UK Royal Society.

The Think Tank and the subsequent drafting of discussion papers was overseen by the National Committee for Nutrition, The Theo Murphy High Flyers Think Tank Steering Committee and the following experts:

Professor Jennie Brand-Miller AM, University of Sydney

Professor Frank Dunshea, University of Melbourne

Professor Mike Gidley, Centre for Nutrition and Food Sciences, University of Queensland

Professor Paul Griffiths, University of Sydney

Professor Anne-Marie Grisogono, Flinders University

Dr Brooke Harcourt, Murdoch Childrens Research Institute

Professor Ian Hume AO FAA, University of Sydney

Professor David Le Couteur, University of Sydney

Professor Amanda Lee, Australian Prevention Partnership Centre, Sax Institute

Professor Manny Noakes, CSIRO

Professor David Raubenheimer, Charles Perkins Centre, University of Sydney

Dr Gyorgy Scrinis, University of Melbourne

Professor Stephen Simpson AC FAA FRS, Charles Perkins Centre, University of Sydney

Professor Helen Truby, Monash University