

Rethinking food and nutrition science

Empowering food choices

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Empowering Food Choices

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Executive summary

Empowering consumers to meet their food, nutrition and health goals, primarily through knowledge, autonomy and self-efficacy, poses a considerable challenge for nutrition science. Traditionally, nutrition science has utilised a reductionist approach and has been slow to embrace situating the consumer and the context in which they live their everyday lives at the centre of empowerment research.

A new paradigm requires nutrition science to realign with the consumer as a focus and be complemented by efforts to improve food environments and the social determinants that powerfully shape food choices. Empowering consumers to make quality food choices is exceptionally complex and requires the implementation of elements from the other Think Tank discussion papers in this series.

Acknowledging this, we propose four areas for further consideration and debate:

1. adopting food literacy as a central premise
2. investigating the potential of life course approaches
3. involving consumers as research partners
4. communicating nutrition science research.

Together, the suggested platforms above offer new possibilities to critically engage and empower consumers to make quality food choices in their everyday lives.

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Context and scope

The rapidly evolving global food system, along with significant demographic, scientific, social and technological changes, continually challenges consumers' interaction with food and nutrition. Nutrition science plays a critical role in providing evidenced-based principles for achieving and maintaining optimal nutritional health of consumers. One of the key platforms for achieving optimal nutritional health of consumers has been empowerment. Given the rapidly changing context, and the limitations of targeting people at the individual level, scholars have called for a radical rethinking of how we might understand and approach empowerment and have called for a paradigm shift in food and nutrition sciences (Cannon and Leitzmann 2006).

This discussion paper examines how nutrition science might work towards empowering consumers to make quality food choices. Significant attention must be paid to the broader social, economic and physical structures that produce the conditions in which 'quality choices' are both thought about and made (Lowe 2014); any emphasis on empowering consumers must be addressed alongside moves to ensure that environments support and enable quality food choices. This paper sits within the context of the four other models and discussion papers that emerged from the Theo Murphy High Flyers Think Tank run by the Australian Academy of Science on the environment, nutrition science resourcing, governance and the knowledge hub.

Focus of this paper

This paper explores the concept of empowering consumers to make quality food choices and outlines some of the challenges facing nutrition science. Then, taking seriously the call from the Theo Murphy High Flyers Think Tank to embrace these challenges with blue-sky thinking, the paper proposes areas for further investigation. These areas aim to elicit responses from the research community which improve the quality of consumer food choices.

Empowering quality food choices

Empowering consumers to become food and nutrition literate so that they can make quality food choices is complex, and even more so with the increasing intricacies of the food and nutrition landscape. Empowerment has a long history in the fields of health promotion and health education and is a popular way to frame and mobilise action. Despite this, empowerment remains poorly understood as a concept. It often has different meanings in health promotion literature, with little clarification about what it means and how to best achieve it (Tengland 2007). This is because empowerment can be seen as a means to an end and an end in and of itself. For the purposes of this discussion, empowerment refers to an individual's ability to meet their health goals primarily through knowledge, autonomy and self-efficacy, as well as the removal of barriers that prevent an individual's freedom to meet their health goals.

Nutrition science needs to consider the role of empowerment in working towards fulfilling a new vision for the field. In stating this we turn to some of the critiques of empowerment that have emerged over time. These critiques remind us that an individual's freedom to choose is constrained by the broader environments in which they live (Cruikshank 1999; Lowe 2014). Any effort directed towards empowering consumers must place the individual, and the context in which they operate, at the centre of the new paradigm and be complemented by efforts to improve food environments and the social determinants that powerfully shape food choices. To focus simply on empowering consumers would render our efforts ineffective and find us advocating for a program that contradicts what we have long known about the complexities that shape people's food choices in their everyday lives and how they interact with aspects of nutrition science.¹

Challenges facing nutrition science and empowerment approaches

Nutrition science allows us to understand the significance of nutrients and food and their interaction with growth, development, health and disease. The science has evolved from the identification of nutrients and deficiencies to providing a nutrition evidence base for a range of health states and diseases (Penders et al. 2017). To maintain relevance with the fast-paced advances in science, medicine and technology, along with evolving food and social systems, nutrition science needs to examine the challenges and create new research frameworks to address the new nutrition issues faced by consumers (Fardet & Rock 2014; Jacobs & Tapsell 2013; Penders et al. 2017).

Reductionism has long been prevalent in food and nutrition science with the majority of research efforts directed to the impact of nutrient imbalances on health and disease (Fardet & Rock 2014; Messina et al. 2001). While this approach has led to advances in the prevention and management of nutrient deficiencies, it has led to somewhat disappointing efforts in the prevention and management of chronic diseases (Fardet & Rock 2014; Jacobs & Tapsell 2013; Messina et al. 2001). Further, this approach focuses on disease and fails to encompass nutrition for general health and wellbeing. This approach is now shifting to become top-down with a focus on food synergy and holism (Fardet & Rock 2014), due to the recognition of the complex nature of food and eating behaviours referred to by some as the society-behaviour-biology nexus (Glass & McAtee 2006). The large volume of reductionist food and nutrition research is still strongly influencing modern-day evidence-based practices and messages and fails to encompass how the consumer interacts with, and eats, food. The science is also encouraged by food companies and producers to continue the reductionist approach (Chartres, Fabbri & Bero 2016). As a result much of the food and nutrition knowledge remains too 'scientific' and is therefore only made accessible by the gatekeepers, notably health professionals (Fardet & Rock 2014; Jacobs & Tapsell 2013).

¹ See other Theo Murphy High Flyers Think Tank discussion papers: Food system; Critical Evaluation of Food and Nutrition Science – An Australian Perspective; Effective Governance for Food and Nutrition Science in Australia; and the Australian Food and Nutrition Knowledge Hub.

Empowering consumers to improve their food and nutrition literacy and make quality food choices requires significant understanding of the complexity of individual food choices and health behaviour change within the context or environment in which they operate. While health behaviour theories do provide a framework for conceptualising behaviour change, to plan and evaluate nutrition science intervention outcomes we need to recruit other disciplinary perspectives. For example, contextual food frameworks such as food literacy offer a platform for understanding behaviours regarding utilisation and transformation of food into meals and dietary patterns (Vidgen & Gallegos 2014). Increasingly there is an emphasis on integrating behavioural and psychological interventions with dietary changes in appropriate food contexts, with the recognition that information delivery alone is insufficient to produce significant changes in health behavior (Michie et al. 2011; Shaw et al. 2005; Vidgen & Gallegos 2014). Opportunities exist to focus nutrition science efforts to empower consumers at this nexus of diet, contextual food frameworks and health behaviour theories. As consumers are at the centre of this nexus, involving them as collaborators in nutrition science is crucial to gain a deeper understanding about the individual experience and develop relevant strategies for nutrition science research (Horsfall et al. 2007).

In taking up an individual perspective, rapid changes influencing the food system, from climate change to labelling to technological advances in science (such as nutrigenomics), leave consumers to operate within a diverse and fragmented nutrition science landscape. Social and digital technology has enabled an abundance of conflicting nutrition information and disinformation to be disseminated through a variety of sources including the scientific community, the food and nutrition industry, the media and others who profit from the growing healthcare market. Unfortunately, consumers are left confused by the overwhelming volume of inconsistent nutrition messages, resulting in disempowerment and negative impacts on food and nutrition literacy and subsequent dietary behaviour (Spiteri Cornish & Moraes 2015). This creates a disconnect between trust and reliability of sources where consumers rely on sources they do not trust to inform their food choices or trust sources that have little scientific merit (Tonkin et al. 2016; Willcox et al. 2015).

Critically for nutrition science, and science in general, there is a dissolution of trust in its relevance, integrity and reliability (Chartres, Fabbri & Bero 2016; Korthals 2016; Mozaffarian 2017). Criticism may be levelled at nutrition and health ‘gurus’ and the food industry for their reach and influence, or research institutions for isolated media reports of discoveries. While research suggests that nutrition science collectively does not provide a trusted, credible source of information, an opportunity exists, in a new paradigm, to provide a research platform for more accessible and effective synthesis and reporting of nutrition science evidence.

The World Economic Forum (2016) has identified widespread digital misinformation, which is spread largely via social media, as one of the main threats to society. Misinformation, once released online, is hard to control (Del Vicario et al. 2016). In a recent example, the findings of an Australian study demonstrating that niacin supplementation during gestation prevented malformations and miscarriage in mice (Shi et al. 2017) were reported widely in the general media causing a rush of conversation on social media among pregnant women and those who had experienced miscarriage. Subsequently, Media

Watch (Australian Broadcasting Commission 2017) and Professor Claire Roberts' analyses of the study (Roberts 2017) and the media coverage found that the media did 'little or no critical analysis before trumpeting the news' (Australian Broadcasting Commission 2017) and that 'media reports, and the research institution itself, have made claims not supported by the science' (Roberts 2017). This is only one of many examples. To ensure credibility and relevance, nutrition science has the responsibility to provide an accessible and trusted source of information interpreting the science and relating it to the context of consumers.

A brave new world

The opportunity now exists for nutrition science to take up the challenge and forge new conceptual and research frameworks coupled with innovative approaches, in working towards creating food and nutrition security for all Australians. To enact this, we need to firstly locate and understand the individual in their environmental and social context—*their everyday*—and place them at the centre of a new nutrition science paradigm. This will allow research to meet the needs of consumers and to more successfully work towards empowering quality food choices.

We propose four areas for discussion: food literacy; life course approaches; consumers as research partners; and nutrition science research communication. These do not encompass the complexities in research of empowering quality food choices but signal key areas for consideration and debate.

Food literacy as a central premise for nutrition science research

Positively influencing individual food and nutrition behaviours has moved beyond conventions based only on nutrient knowledge to broader conceptual frameworks such as 'food literacy' which has been more recently defined (Benn 2014; Vidgen & Gallegos 2014). The food literacy paradigm provides a contextual framework that facilitates the utilisation and transformation of food into meals and dietary patterns in environmentally responsible ways. It can be defined as a scaffold that seeks to empower consumers, households, communities and/or nations to protect diet quality through change and strengthening dietary resilience over time (Vidgen & Gallegos 2014).

The value of this paradigm is that it encompasses theoretical constructs from a) food, nutrition and health b) agriculture, environment and ecology and c) social development and equity (Bellotti 2010). These theoretical constructs have been traditionally researched across academic disciplines (Bellotti 2010) but in a new paradigm require that we embrace multidisciplinary and transdisciplinary approaches. This, in part, addresses the previous concerns outlined related to the hyper-individualisation that have tended to characterise empowerment approaches previously.

The framework is composed of a collection of interrelated knowledge, skills and behaviours required to plan, manage, select, prepare and eat food to meet needs and determine intake. It is underpinned by four broad components consisting of 1) planning and management 2) selection 3) preparation; and 4) eating (Figure 1) (Vidgen & Gallegos 2014).

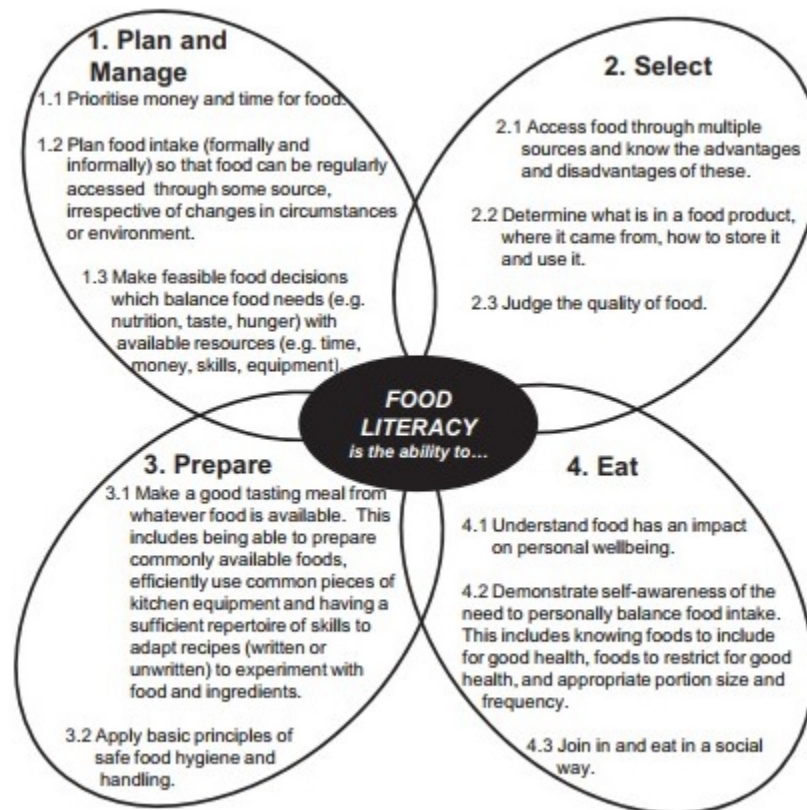


Figure 1: The four components of food literacy (Vidgen & Gallegos, 2014)

We propose that the concept of food literacy is situated at the centre of a new nutrition science paradigm focusing on empowering consumers (alongside efforts to produce quality food environments). This concept includes food and nutrition behaviours and skills within environmental and social contexts and provides a framework for action (Cullen et al. 2015). Early evidence suggests that increasing empowerment through greater food literacy influences an individual's dietary intake, and the inclusion of a greater number of food literacy components is associated with healthier dietary practices (Cullerton, Vidgen & Gallegos 2012; Vaitkeviciute, Ball & Harris 2015). More research is required to define food literacy gaps and opportunities in nutrition research and practice.

We recommend the establishment and resourcing of expert multidisciplinary and transdisciplinary food literacy research centres to provide a focal point for the field and an opportunity to harness expertise from diverse disciplines to tackle challenging issues in food literacy across different locations. High-level thinkers and researchers could come from food, nutrition and health, agriculture, environment, ecology,

business and social development and equity disciplines. These centres would be charged with establishing conceptual dimensions and research models of food literacy, resourcing of nutrition science researchers and professionals, and advocating for food literacy.

These centres could expand the concept of food literacy and synthesise multidisciplinary theoretical approaches by providing thought and research leadership in food literacy. They could provide direction on the most effective components of food literacy models by mapping and evaluating the outcomes of simple and multifaceted food literacy interventions. They could also construct general analytical models and guiding templates for use in nutrition science research, including evaluation models and resource analysis. For example, the development of validated individual and population food literacy measures, reflecting the food literacy skill set, is required to provide a common analysis tool across nutrition research and nutrition practice. These literacy measures could be used gauge changes in population food literacy with the associated research agenda.

A key mandate for these centres would to be a focal point for researcher and practitioner resources and training in food literacy. This would encourage the dissemination and use of evidence-based food literacy practices and interventions. The centres could also advocate for food literacy at the community, research, policy and funding levels. For example, advocacy for the incorporation of food literacy measures into state or federal surveys so that food literacy status, and limits to achieving food literacy, can be monitored on an ongoing basis (Perry et al. 2017).

Reframing with a life course approach

Nutrition science has been criticised for not researching topics that are important to consumers or contexts where consumers may be most influenced (Penders et al. 2017). For example, consumers may view, and be motivated by, nutrition from a life course perspective (pregnancy, childhood, adulthood, family, aging) (Devine 2005; Sobal & Bisogni 2009), whereas the reductionist view of nutrition science focuses on disease prevention and treatment.

Life course perspectives provide frameworks for understanding how food choices develop in temporal, social and historical contexts (Devine 2005; Devine et al. 1998). This perspective, along with theories of health behavior change, focus on empowering individuals at periods of transition or turning points in their lives (Kaiser, Kaiser & Barry 2009; Wethington 2005). It suggests that intervening during a transition might be successful because individuals may be more open to adopting new habits (Kaiser, Kaiser & Barry 2009; Wethington 2005). The embracing of a life course philosophy may go even further to also allow a refocus from weight, body mass index, nutrient intake and other reductionist markers and allow a move towards healthy equity (Braveman 2014). The new non-clinician nutrition influencers have understood the individual's quest for wellness over the life course and are filling a gap for consumers. There is clearly a need for evidence-based practitioners to provide reliable information on nutrition that applies over an individual's life course.

We suggest that a life course approach is integral to moving forward, and call for a scoping study of contemporary 'conditions of possibility' that might enable nutrition science to have the most impact on

empowering consumers within the context of their lives. A resulting framework for investigating, understanding and influencing the factors shaping food intake and dietary patterns at individual and community levels could inform the development of a national research strategy or road map. Learning from the USA's National Institutes of Health (2016), opportunities and research themes could be proposed based on population impact, feasibility, emerging scientific opportunities, advances in research knowledge and capacity, and consumer engagement opportunities. If nutrition science is to provide thought leadership and markedly influence the positive food choices of consumers in this complex landscape, we will need to look to brave and innovative solutions. It is acknowledged that communication alone will not influence behaviour change and that novel and broad environmental interventions coupled with individual skills development will need to be part of the process.

Consumers as research and paradigm-shifting partners

Community members have long conducted their own research and provided others with support to empower quality nutrition choices. Volunteer breastfeeding support organisations and disease support groups offer some examples. New technologies are allowing consumers to further this research. The Crohnology website (crohnology.com) is an example of a patient-centred information-sharing network for people with chronic medical conditions—Crohn's disease and ulcerative colitis in the this instance (Ahrens 2017). Consumers map treatments that they find helpful in controlling their disease. There exists an opportunity to harness the untapped potential of consumers as research collaborators.

A new paradigm for nutrition science should actively involve consumers from the community in research focused on empowering consumers to make quality food choices. The importance of including consumers from the community as collaborators in research is acknowledged by the National Health and Medical Research Council (2016). This involvement has the potential to improve the quality and relevance of research and enhance consumer outcomes (Horsfall et al. 2007). It may also widen nutrition science's knowledge, provide deeper understandings about the individual experience and stimulate novel and relevant strategies for research (Horsfall et al. 2007).

Consumer involvement in research can be defined in three levels: consultative, collaborative, and user-led (Rose 2003). Research has traditionally confined participation to the first stage of consultation (O'toole et al. 2003). Nutrition science research needs to develop processes and systems to incorporate and support sustainable and meaningful consumer and community involvement across the three levels. Group model building, where consumers participate in planning new systems, is one example of a research framework utilised to include the community in user-led nutrition public health research and ensure relevance for individual communities (Allender et al. 2015; Vennix 1999). Design methods is another example of a framework that engages the public in problem solving (Lupton (in press)), offering consumers an opportunity to consider current and future food and nutrition problems and creatively co-design solutions.

Given the complexity of forming meaningful partnerships with consumers and learning from their experiences, nutrition science partnership leaders are required to guide the research community. Investment in community engagement nutrition science research centres would allow relevant models

to be developed and tested and build the capacity of researchers, research institutions and the community through training and mentoring. These centres could be guided by similar existing organisations such as the Victorian Health Issues Centre (Health Issues Centre 2017) aim to foster partnerships between health consumers and the Victorian health sector. Through training and support, they encourage consumers and health organisations to include consumer participation and collaboration in contributing to a better health system.

A nutrition science voice targeting consumers

It has long been acknowledged that science, including nutrition science, has the responsibility to communicate findings and interpretations to the community (Goldberg & Sliwa 2011; Weigold 2001). Currently many reputable nutrition science consumers and organisations (academics, practitioners, scientific institutions, not-for-profit organisations, advocacy groups, governments, scientific journals) compete with each other for favourable attention in the media, which is a key performance indicator for research studies and services. In turn, nutrition science also competes in the public mind with non-scientists who have gained traction with the advent of social and digital media. The inconsistent and competing messages generate consumer confusion regarding nutrition information and have a negative impact on the way nutrition science is viewed. This impacts on the success of empowerment efforts.

If the nutrition science community is interested in efforts to empower people, it needs to be seen as a key source of evidence-based food and nutrition information. The community needs to take a proactive role in providing accessible, consumer-facing nutrition science translation. These efforts may take the form of coordinated responses, or increased individual ownership of the popular communication space by experts in the field. For example, guidelines for ethical and effective communication of nutrition science outcomes could be developed.

While a unified voice for nutrition science outcomes may be unrealistic and limit academic discourse in the short term, a consumer nutrition science translation platform could synthesise global nutrition research data and provide translatable outcomes to the public. Further, this platform could be a focus for interactive consumer education in all aspects of food literacy aiming to empower positive food choices and helping consumers recognise and counter misinformation. The platform could also provide a focal point for researchers, media and industry to collaborate on consistent nutrition-based information reporting. This approach could not only focus on the provision of information but also measure the reception, implementation and translation of information (Kristal, Beresford & Lazovich 1994).²

At a minimum, a digitally accessible food and nutrition fact checking service could provide a focal point for assessing nutrition media or misinformation. RMIT University and the Australian Broadcasting

² Refer to 2017 Theo Murphy High flyers Think Tank discussion paper: the Australian Food and Nutrition Knowledge Hub.

Commission's digital Fact Check service (Royal Melbourne Institute of Technology University 2017) could provide a suitable working model.

However, given that communicating information alone will not empower consumers, a nutrition science interaction hub would provide services beyond information and be the 'go to point' on all aspects of community food literacy.

The evolution of digital media and the 'internet of things' compels the nutrition science community to provide food literacy information and interaction across multiple digital platforms to maximise engagement with the community. Coupling digital platforms with 'bricks and mortar' food and nutrition community centres could provide a combined action research and food literacy education model in a nutrition science hub platform.

Conclusion

The way forward for empowering consumers to make quality food choices will require brave and bold initiatives. A food literacy model of thinking emphasises the contexts in which consumers interact with food and nutrition. An opportunity exists to move beyond the reductionist concept of focusing on nutrients, single foods and disease and reimagine avenues that contribute to producing the conditions of possibility that actually enable quality food environments and choices.

Involving communities in science and consumer-generated data and research initiatives are also integral to empowerment and need to be embraced in this proposed direction for nutrition science. In discussing and acting on the challenges in these areas, we believe nutrition science may have the most impact and relevance for empowering quality food choices in the community.

Out of the box

We suggest a number of out-of-the-box ideas that are worthy of discussion in pushing the boundaries of nutrition science research. We look forward to further debate on these novel ways to empower consumers.

- The hosting of a transdisciplinary think tank, utilising design methods approaches resulting in novel solutions for empowering consumers.
- Food literacy thought leaderships research centres to drive research and action agendas
- Consumers as full partners in research and harnessing the new world of citizen science
- Fully integrated nutrition science and nutrition education centres allowing nutrition researchers to fully immerse in the consumer food experience.
- Large-scale partnerships with 'internet of things' technology companies to explore agile and scalable technology solutions.
- Exploration of a range of public pedagogies and digital food cultures that critically engage the public in the dynamics of the food system e.g. exploring the nexus of art and food science.

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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.

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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
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Professor Mike Gidley, Centre for Nutrition and Food Sciences, University of Queensland
Professor Paul Griffiths, University of Sydney
Professor Anne-Marie Grisogono, Flinders University
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