Attachment 1

Education and Training: Supporting a Professional Workforce

Nutrition science is a multi-level and multi-component discipline. By its definition as a science, it is not static and evolves over time. In contrast to medical models for treatment of a specific disease, food—the primary vehicle for nutrition—is consumed by all, and exists in a complex system that begins with agriculture and the environment, and continues through food processing, the supermarket, to the home and catering industries. An individual's food choices are influenced by a multiplicity of factors: taste preferences, cost, and a host of social and economic considerations such as food availability, marketing, and an individual's nutrition knowledge, cooking skills, cultural and religious beliefs, attitudes and motivations.

Within the context of the global burden of disease, poor dietary patterns are responsible for more deaths than any other modifiable risk factor in non-communicable disease, excluding smoking. High body mass index and metabolic conditions such as hyperglycaemia and hypertension can also be prevented and treated through optimising dietary patterns and increasing physical activity. Certain life stages such as pregnancy and early life are critical windows of opportunity where nutritional interventions can have a huge and lasting impact both on an individual's health and broader economic prosperity. Despite this influence of dietary patterns on health outcomes, evidence of the public's low adoption of an optimal 'dietary pattern for health' indicates that the communication of nutrition science is not yet succeeding[1].

A key component of a decadal plan for nutrition science is therefore the responsibility of educating all nutrition scientists regarding the place of food within this broader system. Communicating the dynamic nature of the system to the public must also be a core component, understanding that nuanced messaging from individual to population levels is required. The workforce needs to understand all aspects of the food chain and have the ability to engage with stakeholders at all levels. As nutrition professionals may not deal with all of these levels (e.g. a laboratory scientist will not have to give individual dietary advice), it is critical that these levels and systems are understood to ensure nutrition science is adaptive and reactive where necessary and misinformation can be combatted.

We must educate nutrition scientists to conduct research of the highest quality and to be capable of translating findings into protocols. Capacity building must include education in skills needed for both interdisciplinary and multidisciplinary work (e.g. health economists evaluating outcomes of nutrition intervention), and also recognise that nutrition scientists must be credible communicators capable of empowering consumers to make informed decisions on food and nutrition.

Complexity and Communication

Nutrition is a complex science; outcomes from dietary patterns are intertwined with an individual's physiological and genetic traits, so 'one size does not fit all'. Communicating the intricacies of nutrition science is challenging. Added to this complexity is the issue of those with no nutrition training using social media and other channels to give advice and guide the public towards inappropriate diets. Those groups and individuals who do not follow a

[1] See, for example: https://doi.org/10.1016/S0140-6736(17)32366-8

code of ethical practice and are not bound by evidence-based paradigms must be countered by credible, consistent messages guided by robust ethical practice and scientific evidence. Currently, nutrition science communication is crowded by messages from many and varied groups with vested interests who provide a 'cacophony of noise' from which consumers have to synthesise the 'truth'. Consumers are confused and nutrition science needs to regain their trust through consistent and credible communication.

Any consideration of nutrition education and communication must include:

- An understanding of the limitations of nutrition research at each level of the food and nutrition system. For example, a laboratory model may not directly translate to a human diet, and associations found in a cohort study of a population may not translate to individualised care. While each nutritionist will not necessarily have skills across the breadth of the food and nutrition system, they must understand where their work fits and recognise and network with other parts of the nutrition professional system.
- A requirement for knowledge and skills in communication of evidence-based science.
- A review of regulatory systems intended to protect the general public from poor advice from unqualified individuals, or those which overreach a scope of practice within the differing parts of the nutrition workforce.
- The development of recognised professionalism within the nutrition science workforce.

A possible strategy

Production of a workforce capable of implementing the decadal plan vision will require creating a relevant nimble and well-educated professional workforce with an extraordinarily wide range of different skills. This will include nutritional generalists plus those with specialist competencies. Nutrition scientists and professionals may scaffold their competency-based framework from generalist to advanced levels. Nutrition professionals must complement each other across the food and nutrition system, while recognising that the various parts of the system require different and sometimes very specific specialist competencies. It is unrealistic to believe that a new army of nutritionists can be developed rapidly, so leveraging from other disciplines and embedding nutrition training into existing professions that impact on the food and nutrition system may be part of this strategy.

Structures are required to attract and educate a workforce capable of meeting the many different challenges required by a systems approach. The complexity of nutrition science, along with the need for translation of research into individual behaviour change as well as whole population shifts in food consumption supported by effective policy, results in multi-faceted workforce competencies. By adopting a systems approach to education, Australia can position itself to produce nutritionists with the necessary underpinning knowledge and skills. Concepts taught at Bachelor level must be developed further to Honours and Masters levels for speciality areas of expertise. Skills learnt at these higher levels must enable practitioners and researchers—public health and implementation specialists, dietitians and food and nutrition security and sustainability experts—to effectively engage with the numerous food system stakeholders and connect with individuals and the broader population. Further training at the doctoral and post-doctoral level will be needed to lead innovative research in food and nutrition as well as providing sufficient appropriately credentialed and experienced nutritionists for the food industry and government.

As well as traditional nutrition scientists and practitioners, other professionals may play a critical role in educating the public to improve health literacy and minimise the proliferation and acceptance of misinformation. These professions include medical doctors, nurses

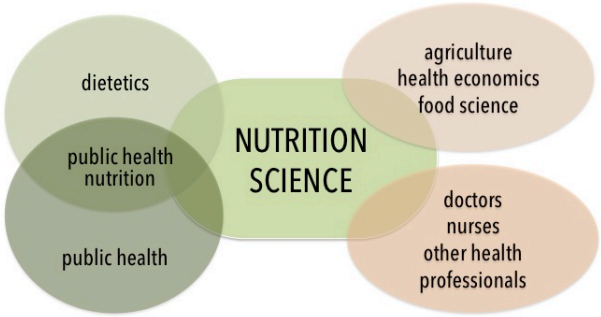
and allied health professionals (pharmacists, physiotherapists, occupational therapists, speech and language therapists, exercise physiologists and clinical psychologists), early childcare workers and teachers (primary and secondary). A plan for nutrition science education therefore operates at all levels, and nutrition scientists must take responsibility for providing education to those in other professions to promote evidence-based nutrition in their particular areas of work.

Current Australian Qualifications Framework

With respect to nutrition scientists, it is helpful to consider the context of the Australian Qualifications Framework.

Level	Descriptor	Potential elements for nutrition science
7 (Bachelor)	Graduates at this level will have broad and coherent knowledge and skills for professional work and/or further learning	Background in a relevant science discipline (including chemistry, biology, biochemistry, physiology, food science which includes nutrition science). Should include general understanding of food systems and advocacy for evidence-based practice. Additional education in psychology, business, health economics, technology and social sciences will broaden the skill base.
8 (Honours, Graduate Diploma, Graduate Certificate)	Graduates at this level will have advanced knowledge and skills for professional work and/or further learning	As above, with additional specialisation in a relevant area of nutrition science such as laboratory science, implementation science, advocacy, education practice, dietetics. Must include basic skills in nutrition science communication.
9 (Masters)	Graduates at this level will have specialised knowledge and skills for research and/or professional practice and/or further learning	As above, with additional specialised nutritional knowledge such as dietetics, public health nutrition/advocacy, focussed discipline specific research skills or systems approaches.
10 (Doctoral)	Graduates at this level will have systematic and critical understanding of a complex field of learning and specialised research skills for the advancement of learning and/or for professional practice	As above, with additional high-level research skills, which may be applied to different nutritional issues including problem solving and innovation in practice.

A conceptual model such as the figure below can illustrate the interface between existing professions and nutrition science. It remains critical to recognise that all nutrition scientists, regardless of background, must have minimum levels of scientific and communication skills, appreciate the importance of an evidence base, and understand the broader food system. These experts can then provide education to other professions in health and education to promote nutrition science literacy.



Competency-based education

Competency-based education (CBE) is an outcomes-based approach to education program design, implementation, assessment, and evaluation, using an organising framework of competency standards. Competencies can be defined as the array of abilities across multiple domains or aspects of performance in a certain context[2]. Statements about competence require descriptive qualifiers to define the relevant abilities, context, and stage of training. Competence is multi-dimensional and dynamic—it changes with time, experience, and setting. Some elements, such as critical thinking, can be inferred from observable actions. Since competence is observable, it can be measured and assessed to ensure acquisition of a given competency standard. Competencies can be assembled like building blocks to facilitate progressive development from entry level or generalist through to advanced or specialist skills.

The dietetics profession has operated on a range of competencies determined by the Dietitians Association of Australia since 1989, with the latest review in 2015. The competencies underpin a rigorous course accreditation and credentialing program to ensure graduates are of a standardised minimum quality that is not subject to the attributes and specialisations of different programs. Graduates from these degrees are eligible to apply for individual credentialing as an accredited practising dietitian.

In 2017, the Nutrition Society of Australia released competencies for nutrition science, intended to ensure that programs teach sufficient basic nutrition science. The registration process for individuals to seek voluntary registration as a 'nutritionist' currently relies on an individual's educational attainment, rather than being competency-based. There is currently no accreditation of nutrition science programs in Australia, although the Association for Nutrition, based in the UK, can accredit internationally. This enables graduates to apply for registration as a nutritionist in the UK and Europe. Critical to this registration is a professional code of conduct, which supports and regulates professional behaviour and ensures public safety and confidence.

To ensure minimum standards of education for nutrition graduates, minimum competencies must be embedded in nutrition science curricula and low level (e.g. knowledge and assessment of evidence) competencies should be included in all health professional and education curricula.

[2] (*Frank et al (2010) Competency-based medical education: from theory to practice. Medical Teacher 32: 638–645)*

Detailed discussion questions

Questions that may give rise to recommendations relating to education and training include:

1. Should competency standards underpin all undergraduate degrees and include knowledge of food and nutrition systems, evaluation of evidence-based nutrition, skills in communication plus knowledge of other professionals that may make up multidisciplinary teams?

2. How important is the professionalisation of nutritionists? Can this be underpinned by robust credentialing and statutory regulation of title? Would regulation assist to regain the public's trust in the science of nutrition and in those who communicate this science?

3. How can 'nutrition scientists/professionals' most effectively scaffold their competency from basic to advanced levels? Some may do this via additional higher degrees or acquire specialist competencies that enable them to operate in a particular part of the food and nutrition system. What is best way to recognise that all nutrition professionals have complementary skills that enable change and impact across the continuum of the food and nutrition system?

4. What is the best way to encourage nutrition professionals to take responsibility for expanding the nutritional capabilities of students in relevant areas of tertiary education where there is impact on the food and nutrition system, or a capacity to improve the health literacy of the population? This would include agriculturalists, environmentalists, climate change experts, water engineers, lawyers, architecture and design (built environment), psychologists and behavioural scientists, food policy and public health, doctors and all health professions.

5. Should school teachers receive basic nutrition education to improve food literacy of their students?

6. Would improving our capacity for multidisciplinary learning opportunities support a workforce capable of solving multi-systems problems?

7. Would opportunities for work-integrated learning as placements, internships and exchanges in food industry, government and non-government agencies responsible for nutrition practices and policy implementation, serve to develop a shared understanding of the actions in the food and nutrition system and their operations?

8. How important is building capacity to support food and nutrition systems for groups where these is an identified immediate need and who are currently marginalised in Australia and the Asia Pacific region? This includes supporting Indigenous health and nutrition workers and empowering Indigenous Australians to manage their food and nutrition security.

9. What role does promotion play in building the profession of nutrition as a science and a worthwhile career pathway with a range of job opportunities across the continuum of the system from discovery science through to public health implementation? In particular, is there a gap around structured post-doctoral career pathways in food and nutrition systems thinking? Should we invest in upskilling academics to create leaders with advanced capabilities and lead the desired changes in thinking and in education?