



PILLAR 3

PRECISION AND PERSONALISED NUTRITION

Targeted responses to foods and diets

Executive summary

Nutrition is a central determinant of individual health and wellbeing, directly impacting quality of life and mental and physical productivity.

Targeted dietary solutions are a potentially cost-effective public health strategy for stimulating workplace and economic productivity by reducing the burden of malnutrition.

Optimising nutrition requires understanding how individual and group differences influence health and nutrition outcomes.

Context, challenges and opportunities

The benefits of human nutrition extend across the whole lifespan by promoting wellness and productivity and preventing major non-communicable conditions and diseases including obesity and diabetes.

- Despite being a wealthy country with high agricultural productivity and food quality, Australia is listed as being on track to achieving just two of the nine nutrition targets in the 2018 Global Nutrition Report.¹

Targeted adjustments of dietary patterns via personalised and precision nutrition offer cost-effective strategies for alleviating economic and social burdens of non-communicable diseases and unlocking the productivity benefits of enhanced performance in Australia.

- Food and nutrition are central to overcoming challenges and realising opportunities across health, social welfare, industry and agriculture sectors.
- Reducing healthcare costs, developing integrated welfare strategies, promoting productive lives and supporting the agrifood sector and development of a nutritech industry would result in direct and tangible benefits for the Australian economy across all scales.

Understanding how individual and group differences in genotype, age and environment influence nutritional and health outcomes enables:

- personalised nutrition – delivery of more specific and effective nutritional guidance, products and services
- precision nutrition – delivery of more tailored and cost-effective interventions, products and services across groups and populations.

Harnessing data and analytics enabled by new technologies provides new ways for professionals and the community to connect nutritional requirements to dietary solutions and lifestyle change.

- Collaboration with the burgeoning nutritech sector presents opportunities for growing the industry in Australia, to enhance individual and population health outcomes.
- Nutritech start-up opportunities aimed at fostering innovation by developing new tools, products, programs and services can deliver better health outcomes for Australians.

Recommendations and actions needed

Recommendation 1: (a) Incorporate nutritional genomics into a national nutrition policy framework; (b) incorporate nutritional genomics and precision nutrition in nutrition, health professional and medical training within educational institutions; and (c) research the cost-effectiveness of nutritional genomics and precision nutrition

Integration of precision nutrition and health genomics into the national healthcare system would unlock new, cost-effective strategies for disease prevention and management for Australians, and stimulate innovations in the Australian nutritech sector. Harnessing these opportunities requires developing a national nutrition policy framework which addresses the capacity, capability and infrastructure needed, and is coordinated across state and Commonwealth jurisdictions.

Recommendation 2: Increase literacy in the nutrition data science and technology skills needed to realise the public health benefits of personalised and precision nutrition

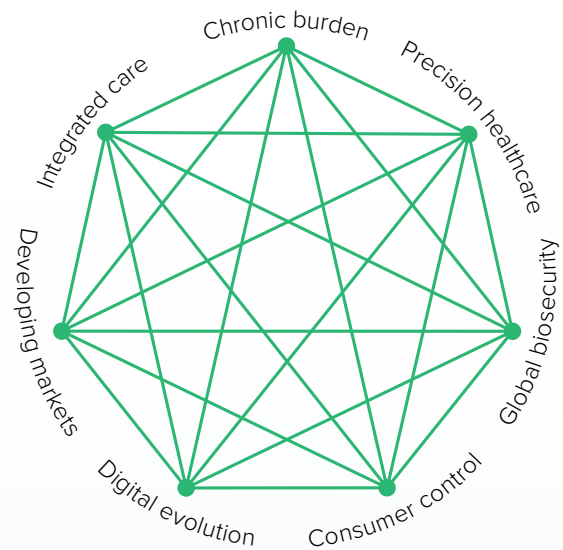
Synthesising the plethora of health and nutrition informatics data (including genetic, biological and phenotypic) into cost-effective strategies for treatment, disease prevention and health optimisation would improve Australians' health and wellbeing and reduce the economic and social burdens of diet-related disease. This requires enabling nutrition researchers to develop innovative methods and tools in data analytics, research design, health informatics and bioinformatics, and applying an integrated approach to training, through:

- i. increasing literacy in the use of the tools of information technology (such as the Internet of Things, artificial intelligence and machine learning) in nutrition and health education programs
- ii. increasing literacy in genetics, genomics and bioinformatics from secondary education onwards
- iii. incorporating nutritional genomics as a core subject in tertiary nutrition health professional programs.
- iv. fostering cross-disciplinary research with areas such as computer science, information science and technology, engineering and health economics.

Recommendation 3: Develop and maintain frameworks for ethical, legal and socially just precision and personalised nutrition solutions

A high level of research, practitioner and consumer literacy in the ethics and privacy issues of precision and personalised nutrition, supported by robust ethical and legal frameworks, fosters trust and engagement in self-health management by consumers and patients and is key to a highly democratised health system. Realising effective multidisciplinary and public collaborations, supporting individuals to take greater control and make informed decisions relating to their health and wellbeing and developing responsive law and policy regarding emerging technologies requires:

- i. ensuring that researchers and ethical boards prioritise keeping abreast of technological shifts in digital tools and genomics to maintain the ability to guard privacy and confidentiality and maintain trust
- ii. encouraging researchers to actively engage the public in precision and personalised research and discourse
- iii. developing professional policies regarding human-subject research, data privacy, clinical practice standards and public health goals in precision and personalised nutrition
- iv. embedding cross-disciplinary ethical analysis (for example, between law, social science, humanities, political science and the public) into collaborations from inception.



A personalised and integrated approach to public health.

Recommendation 4: Cultivate evidence-based responsible research and innovation in precision and personalised nutrition to best serve public safety and health

Establishing Australia as a global leader in evidence-based, rapidly growing precision and personalised nutritech products would improve individual and public health and safety in both domestic and international markets and capture the economic benefits for Australia.

Capitalising on private investment in individual and population health and wellness technologies requires fostering a culture of collaboration across diverse stakeholder groups by:

- i. fostering training and research in precision and personalised nutrition
- ii. ensuring ongoing independent evaluation and synthesis of commercial precision and personalised nutritech products
- iii. promoting commercial and science partnerships to foster innovation in evidence-based precision and personalised nutritech products
- iv. developing sustainable and independent precision and personalised nutrition science platforms that assess and synthesise data on an ongoing dynamic basis
- v. ensuring researcher transparency by disclosing conflicts of interest of all involved parties
- vi. ensuring decisions are informed by scientific evaluation of the available evidence in cases where insurance coverage of precision and personalised nutrition products services is proposed.

Reference

- 1 Development Initiatives, 2018. 2018 Global Nutrition Report: Shining a light to spur action on nutrition. Bristol, UK: Development Initiatives. https://globalnutritionreport.org/documents/352/2018_Global_Nutrition_Report.pdf