Human Variation in Response to Food and Nutrients - Exploring a Path to Smart Eating for Personalized Health and Nutrition

Biography

Emeritus Prof. Richard Head is a Pharmacologist and is currently Emeritus Professor in the Division of Health Sciences, University of South Australia, Affiliate Professor in the Discipline of Pharmacology, The University of Adelaide, and Honorary CSIRO Fellow. Previously, he was the interim Director of the Future Industries Institute at the University of South Australia, the Deputy Vice Chancellor & Vice President: Research and Innovation for the University of South Australia, the Deputy Vice Chancellor & Vice President: Research and Innovation for the University of South Australia, the Deputy Vice Chancellor & Vice President: Research and Innovation for the University of South Australia, the Deputy Vice Chancellor & Vice President: Research and Innovation for the University of South Australia. Formerly, Prof. Head was the Director of CSIRO’s Preventative Health National Flagship and Chief of CSIRO’s Division of Health Sciences and Nutrition, and prior to that Chief of CSIRO’s Division of Human Nutrition. Prof. Head provided leadership in integrating CSIRO’s fundamental and applied research in human health into Australian health R&D. He is known for operating in translational health on a national scale with multidisciplinary programs.

Abstract

There has been a fascinating historic path from dietary customs to the more recent dietary guidelines for the promotion of health and wellbeing. Often associated with urbanisation, focus in public health was centred historically on infectious diseases and nutrient deficiencies. Nutritional sciences played a key role in determining the molecular essentials in diet that would offset malnutrition and this was effectively translated to advice at the population level.

With increasing human lifespan came an appreciation of the role of lifestyle and in more recent years an emerging exploration of the role of the human genome and related omics in chronic disorders. Focus in the Nutritional Sciences shifted to the Health Potential of Food, the role of diet in chronic disorders, and more recently an appreciation of the interplay of the omics and nutrition in human health. A major aspect of that change in focus was an evolution in thinking from a reductionist approach to a holistic or systems appreciation of nutrients in a dietary pattern (Shoa et al., 2017).

Concurrently there is a growing interest in intraindividual or personal responses from the standpoint of three considerations. Firstly, the advances in technology that now lead to the potential for enriched data characterisation at an individual level in health and nutrition (for example the genome, epigenome, microbiome, dietary behaviours, metabolic flexibility and lifestyle). Secondly the continued focus in developing biomarkers for as markers for the presence of the early onset of disease or as potential guides for disease retardation or prevention.
responses will require, I believe, the viewing of Nutritional Sciences through the lens of Complex Systems Sciences.

If one was to speculate on the future, I think you would see dietary recommendations and advice based on Nutritional Sciences continuing as a cornerstone in food and nutrition in populations. Randomized control trial-based experimentation will continue to provide a key platform for the evaluation of foods and nutrients for their health impact. However, understanding more comprehensively human variation in personal response to foods and nutrients in a holistic and systems approach may start to emerge with the ongoing refinement in the omics, the ability to handle large and disparate data and the ability to adopt the approaches of Complex Systems Science. This will be the essence of exploring the path to smart eating for personalized health and nutrition.