

QUADRAM INSTITUTE - WRITTEN EVIDENCE (FDO0075)

Quadram Institute, Norwich Research Park, UK.

1. The [Quadram Institute](#) is a national science capability strategically funded by UK Research and Innovation (UKRI) through the Biotechnology and Biological Sciences Research Council (BBSRC).
2. The Quadram Institute brings together scientists, academics and NHS clinicians to help address global challenges in human health, food and disease and the institute's mission is to deliver healthier lives through innovation in food, gut health and microbiology. The four partners in the Quadram Institute are Quadram Institute Bioscience, the Norfolk and Norwich University Hospitals NHS Foundation Trust, the University of East Anglia, and BBSRC.
3. This response was prepared by Professor Martin Warren, Chief Scientific Officer at the Quadram Institute, research group leader in the Food, Microbiome and Health science programme, and Co-Director of the UK Biofortification Hub hosted by the Quadram Institute and the John Innes Centre. Professor Warren has no conflicts of interest to declare.
4. We would be delighted to welcome committee members to visit the Quadram Institute and Norwich Research Park to meet scientists and clinicians working in the field of food, nutrition, and health.

Key trends

5. The story of the UK over the past 50 years in relation to food, diet and obesity can be summarised as something of a pyrrhic victory. We have seen the triumph of unprecedented access to cheap, energy dense food but we are also living with the consequences of food overly rich in calories and often low in nutritional quality.
6. The malnutrition problem now facing our society is not driven by a lack of calories but by an excess of them, and a concerning deficit of key micronutrients. The increasing proportion of the population, across all ages, who are overweight or obese presents the NHS with obvious major challenges in terms of cancers, cardiovascular disease, type 2 diabetes, mental health problems, and musculoskeletal conditions.
7. Our research at the Quadram Institute suggests there is another problem at play and that is hidden hunger. Hidden hunger is a paradoxical form of malnutrition where we get more than enough energy from our food but also a shortage of vital micronutrients, ranging from dietary fibre to Vitamin B12, Vitamin D, Folate and

Iron. These micronutrients are essential to good physical and mental health.

Primary drivers of obesity

8. Food, diet and obesity is not just a medical problem. Food is fundamentally a social problem. The drivers of obesity are complex and multifactorial and include ready access to cheap and energy dense food, more sedentary lifestyles, a move away from the ability to cook meals from scratch, and poverty more generally.
9. The mechanics of obesity are not entirely clear but hidden hunger may play a role as deficiency in micronutrients may also drive over consumption of food as the body seeks to obtain the nutrients it needs (the Nutrient Deficiency Theory of Obesity). A poor diet may also contribute to inflammation in the gut, further reducing absorption of micronutrients, adversely affecting the gut microbiome, and creating something of a vicious circle in terms of poorer health.

Impacts of obesity on the health of children and adolescents

10. Obesity is now the second biggest preventable cause of cancer in the country and obesity costs the NHS around £6.5 billion a year, projected to rise by £2 billion a year by 2030. Of the 13 million children in the UK, 2.5 million are overweight or obese with 1.2 million seriously obese enough to warrant metabolic surgery.
11. The health complications of obesity on children are considerable and affect mortality, disability and psychology, but there is also limited evidence around best clinical practice to treat children. We do know, however, that the burdens placed on children and young people with obesity limit both their life chances and their life expectancy.

Definition of a) ultra-processed food (UPF) b) and high fat sugar and salt (HFSS)

12. We can say, broadly, that certain ultra-processed foods are bad for our health. What we do not fully understand is the why and the how behind the processes at play that result in damage to health, and there remain problems associated with the very broad definition of ultra-processed food.
13. The definition of UPF were originally designed to enable a general classification of foodstuffs to quantify the effects of consuming intensely processed foods on health in large scale mechanistic studies. The definitions do not specifically take into

account nutritional factors known to be deleterious to health such as high fat, salt and sugar content. However, the work has highlighted potential mechanisms which require further, more detailed mechanistic studies. These include structure/texture, lack of micronutrients, HFSS and presence of additives/contaminants to name but a few.

14. The outcomes from a recently published [Government Office for Science rapid project](#) on UPF the Quadram Institute contributed to highlights that this broad definition contains such a diverse range of foods, some of which have been designed and processed to address health issues in a positive way, i.e. low energy density, high in micronutrients, reduced or eliminated additives etc. It suggested that we need to look at the foods within the UPF category and subcategorise those based on their known health impact.
15. Food is processed to help preserve it, make it safer, and to make it more palatable and food processing plays an important role in ensuring a growing world population can be fed. We also know that not all ultra-processed foods are bad for us, and we really need to understand much more about the mechanistic role food structure and processing has on nutrition and human health.
16. It is also important to understand that the impact of food on health is highly complex. It is not black and white in that a food is neither "healthy" or "unhealthy". Many foods will contain different ingredients of properties which have positive or negative impacts. Furthermore, the net health impact will also be dependent on how much is consumed. For example, moderate consumption of fruit juice can have clear health benefits in terms of micronutrients and fibre, but overconsumption can result in high sugar intake.

Consumer recognition of UPF and HFSS and role of labelling and marketing

17. To an extent, the more scientific sounding term "ultra-processed food" (UPF) has picked up from where the longstanding term "junk food" left off. How much help the term UPF is to consumers is as much a moot point as the term junk food. People will have some sense of what junk food means but it's poorly defined. UPF is also relatively poorly defined.
18. In terms of high fat, sugar and salt (HFSS) there is a general recognition that these components of our food can be bad for our health and need to be limited. Food labelling in the UK readily

presents HFSS information to consumers but purchasing decisions are rarely made on the basis of nutritional labelling.

19. The Quadram Institute is home to the UK's [Food and Nutrition National Bioscience Research Infrastructure](#) (F&N NBRI) which manages and maintains the UK's only national composition database of foods eaten in the UK, published as McCance and Widdowson's Composition of Foods (hard copy) and as the [Composition of Foods Integrated Dataset \(CoFID\)](#).
20. This database is widely used in nutrition research and clinical practice to calculate actual nutrient intakes and underpins the National Diet and Nutrition Survey rolling programme which provides key information on the diet and nutritional status of the population and informs public health policy.
21. Updates to the database are currently funded on an ad hoc basis with the current analytical survey targeting beef, lamb, turkey, chicken and dairy products which were last updated in the 1990s. Given the pace of change (through product fortification and/or reformulation) and expansion (to include novel food categories such as plant-based meat products) of the UK food market, the composition database is at risk of becoming outdated. This threatens our ability to monitor nutrient intakes and food consumption for research, clinical and public health purposes.
22. A long-term strategic funding plan would avoid this and support expansion of this national database to include additional nutrient information such as comprehensive amino acid data which would allow us to assess protein quality of diets - which will become increasingly important as people move towards plant-based diets. A strategic funding plan would also allow us to react faster to evaluate policies which impact the nutritional composition of foods (and subsequently public health) such as the sugar tax and the possible future policy on the fortification of wheat flour with folic acid.
23. In terms of consumer nutritional labelling there are some changes we would like to see, Fibre content is not included, and we know that 90 per cent of the adult population is not eating enough dietary fibre which has a significant effect on our gut microbiome and our digestive health.
24. Our view is that the food labelling system also really ought to address nutritional content by portion size and should relate to the nutritional content of cooked food, where appropriate.

The role of the food and drink industry

25. Food, diet and obesity are a societal problem. It is a complex set of issues, and the food and drink industry will certainly need to be part of the solution as most of the population depend on processed foods for the majority of their diet. The fact that we face a very significant public health challenge also means that a systemic response will be needed across government in order to leverage the right responses and to encourage the food industry to utilise the latest research to improve the health impact of the foods they produce.

Effectiveness of Government planning and policymaking

26. Henry Dimbleby's National Food Strategy provided an excellent systemic analysis of the problems we are facing but the Government's response has not adequately set out a road map to solve what continues to be a very considerable challenge for the nation.
27. This is an epidemic that will continue to take a very heavy toll on the public purse, on the quality of millions of people's lives, and on the overall productivity of the UK as more people become economically inactive. This is as much an economic problem as it is a public health problem.
28. Concerted action, and policy intervention will be required across our society. It will also require political will to address issues which are growing in seriousness and will continue to cause considerable harm to the economic and physical health of the nation.

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