

Dairy Council for Northern Ireland Nutrition Lecture 2015 **‘The changing frontiers of nutrition research’**

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It is now well recognised that diet can have both positive and negative consequences for human health. At the beginning of the last century the main problem for nutritionists was the issue of deficiency, particularly the lack of micronutrients. While malnutrition remains a major problem at a global level in many developing countries, overnutrition has become the predominant problem for developed countries and is now also an increasing concern for countries undergoing economic transition.

The problem of overnutrition emerged during the middle part of the last century, particularly in the USA, where the overconsumption of saturated fats was associated with heart disease. The epidemiological studies which followed led to the broadly accepted public health advice adopted world-wide that saturated fats are bad for cardiovascular health. More recent epidemiological studies have raised questions over the simplicity of the high fat story.

While epidemiology remains an important barometer of diet and health relationships, used to guide public health at a population level, a key area for contemporary nutrition research is how to improve our understanding of the bioactivity of dietary components that will lead to the development of both healthier and more sustainable food products, leading to dual benefit for the food industry and for public health.

An area of resurgent interest is in the gut. Over the past decade the contribution of the microbial ecosystem of the gut to our health has become an important new frontier of nutrition research. The bacteria that inhabit the gut play a crucial role in both metabolism and immunity. There appears to be real potential to develop new and efficacious probiotics, or to modulate the gut microbiome, for a range of health benefits. However, there is also a pressing need to distinguish the hype from the reality. The gut is also a critical site of action for bioactives involved in the control of appetite and other health indices, which could be important to help address the problem of overconsumption underlying the issue of obesity and nutrition related health more generally. Food products with satiating properties are currently being developed and marketed, yet the mechanisms of action are still poorly understood.

Another important frontier of nutrition research is the area of epigenetics, which provides a mechanism through which certain dietary constituents can have long lasting, even trans-generational, effects of our physiology and behaviour. Finally, perhaps a surprising area of emerging interest is chrononutrition. Biological rhythms pervade our lives, and it has become clear that the way we respond to diet is different depending upon time of the day. Given our modern lifestyles, where the boundaries between night and day have become blurred this provides an important new consideration when assessing the relationship between diet and health.