

The dairy matrix:
a new approach
to understanding
the health effects of food

Symposium

30th October 2017

Hilton Hotel, Belfast



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#dairymatrix



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Symposia
October-November 2017

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**Belfast
Programme**

Programme

**Food matrix effects: is it time to rethink
how we evaluate the health effects of food?**
Prof Ian Givens (University of Reading)

**Muscle, bones and body fat: the dairy matrix effects on body
composition.**
Dr Emma Feeney (University College Dublin),
or Dr Michelle McKinley (Queen's University Belfast).

Metabolic health: the impact of the dairy matrix.
Prof Arne Astrup (University of Copenhagen)

- **Den Haag** The Netherlands
3rd October: 11:30 to 14:30
- **Copenhagen** Denmark
4th October: 10:00 to 14:00
- **Brussels** Belgium
11th October: 09:00 to 12:00
- **Belfast** Northern Ireland
30th October: 17:30 to 19:30
- **Dublin** Ireland
1st November: 17:00 to 20:00

- 16:45 Arrival and light refreshments
- 17:30 Prof Barbara Livingstone
Nutrition Innovation Centre for Food and Health (NICHE), Ulster University
Chairperson's introduction
- 17:40 Prof Ian Givens
Institute for Food, Nutrition and Health, University of Reading
The food matrix: is it time to rethink how we evaluate the health effects of food?
- 18:10 Dr Michelle McKinley
Centre for Public Health, Queen's University Belfast
Muscle, bones and body fat: dairy matrix effects on body composition
- 18:40 Prof Arne Astrup
Department of Nutrition, Exercise and Sports, University of Copenhagen
Metabolic health: the impact of the dairy matrix
- 19:10 Panel discussion
- 19:30 Close

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notes

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Professor Barbara Livingstone

Barbara Livingstone [BEd, MSc(Biology), MSc(Human Nutrition),PhD] is Emerita Professor of Human Nutrition, School of Biomedical Sciences, Ulster University and has been a member of staff at Ulster University since 1980.

Her research interests include: dietary and lifestyle risk factors for obesity and mechanisms of control of appetite, satiety and food intake following bariatric surgery. She has published over 100 peer-reviewed research papers and has attracted over £9 million in research grant income.

In 2012 she was appointed adjunct Professor of Human Nutrition at Monash University, Melbourne and awarded a Senior Distinguished Research Fellowship by the University of Ulster. She is currently a Scientific Governor of the British Nutrition Foundation, a member of the Scientific Advisory Committee for the Food Safety Authority of Ireland (FSAI) Public Health Nutrition Sub-committee and has chaired the Data and Research Advisory Group of the N Ireland Obesity Prevention Steering Group (2009-2012).



The European Milk Forum with NZO Dutch Dairy Association, www.nzo.nl / Vlam, www.vlam.be / Danish Dairy Board, www.danishdairyboard.dk /
The National Dairy Council, www.ndc.ie / The Dairy Council for Northern Ireland, www.dairyCouncil.co.uk / Cniel, www.cniel.com

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Professor Ian Givens

Professor Ian Givens has background training in biochemistry and nutrition and is currently Professor of Food Chain Nutrition and Director of the Institute for Food, Nutrition and Health at the University of Reading.

His research interests focus on food chain nutrition with emphasis on the relationship between consumption of animal-derived foods across the key life stages, nutrient supply and chronic disease risk with particular emphasis on vascular disease and dairy foods, saturated, trans and n-3 fatty acids. Current work includes meta-analysis of prospective studies on the association between dairy food consumption and cardiometabolic diseases (CMD) and research on lipids and proteins in milk and dairy products and their influence on risk factors for CMD.

Work also includes factors linked to primary production that for e.g. alter the fatty acid composition and concentrations of nutrients including iodine, selenium and vitamin D in foods. A study on the form of dietary vitamin D on vitamin D status is also ongoing.

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abstract

The food matrix: is it time to rethink how we evaluate the health effects of food?

Professor Ian Givens

Institute for Food, Nutrition and Health,
University of Reading, UK

Foods consist of a large number of different nutrients contained in a complex matrix structure. Traditionally evaluation of a food's impact on human health has been based on the content of individual nutrients such as proteins, fats, carbohydrates, etc. However, recent research shows that the health effects of a food product cannot be determined simply on the basis of the individual nutrients it contains. The food must be evaluated as a whole, together with other foods eaten at the same time. The nature of the food structure and the nutrients therein (i.e. the food matrix) will determine nutrient digestion and absorption, thereby altering the overall nutritional properties of the food. As a result, the food matrix can lead to a different relationship with health indicators than would be interpreted from the single nutrients studied in isolation. An effect of the matrix is seen in a number of foods but the evidence for a dairy matrix effect is now convincing, notably for cheese, although common processing methods may also enhance interactions between nutrients in the dairy matrix and this may modify the metabolic effects of dairy consumption. In the future, diet assessment should consider the evidence on whole food effects alongside the evidence for individual nutrients.

In September 2016, a panel of 18 experts in epidemiology, food, nutrition and medical science were brought together for a workshop on dairy matrix issues, organised by the University of Copenhagen in collaboration with the University of Reading. The findings and conclusions of this workshop have been published in:

Thorning, T. K., Bertram, H. C., Bonjour, J-P., de Groot, L., Dupont, D., Feeney, E., Ipsen, R., Lecerf, J-M., Mackie, A., McKinley, M. C., Michalski, M-C., Rémond, D., Risérus, U., Soedamah-Muthu, S., Tholstrup, T., Weaver, C., Astrup, A. and Givens, D. I. (2017). Whole dairy matrix or single nutrients in assessment of health effects: current evidence and knowledge gaps. *American Journal of Clinical Nutrition* 105:1033–1045.

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Dr Michelle McKinley

Michelle McKinley is a registered Public Health Nutritionist in the UK and is a Reader in Nutrition working within the Centre for Public Health in the School of Medicine, Dentistry and Biomedical Sciences at Queen's University Belfast. Before moving to Queen's in 2005, she was Nutrition Manager at The Dairy Council in London for three years.

Dr McKinley's research investigates the ability of dietary interventions to modify nutritional status and risk of chronic disease, particularly diabetes and cardiovascular disease, as well as exploring novel approaches to encouraging and supporting diet and lifestyle behaviour change and weight management throughout the life course.

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Muscle, bones and body fat: the dairy matrix effects on body composition

Dr Michelle McKinley

Institute for Global Food Security (Centre for Public Health)
Queen's University Belfast, UK

It is well established, through national dietary surveys, that milk and dairy foods make a large contribution to the overall dietary intake of European consumers. They provide significant quantities of high quality protein, minerals and many vitamins and have the widest nutritional diversity of all natural foods. However, the benefit of milk and dairy foods extends beyond simply helping people to reach their nutrient recommendations. Each of the individual nutrients found in milk and dairy foods has an important function in the body; however, we don't eat individual nutrients, we eat foods that contain multiple nutrients in varying quantities and proportions and the combination of nutrients found in dairy foods may interact to have specific benefits for health.

In relation to milk and dairy foods, the holistic concept of the dairy matrix proposes that the unique combination of physical and chemical structures that compose the dairy matrix work together to promote health, with the combined effects of the matrix extending beyond the sum of the individual parts. The overview presented here will explore how evidence from trials to date supports an effect of the dairy matrix on body composition.

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Professor Arne Vernon Astrup

Arne Vernon Astrup heads the Department of Nutrition, Exercise and Sports at the University of Copenhagen, Denmark, and is senior Consultant at Clinical Nutrition Research, Herlev-Gentofte University Hospital.

He has over 30 years' clinical research experience, with his main areas of research focusing on physiology and pathophysiology of energy and substrate metabolism, with special emphasis on the aetiology and treatment of obesity. Dr Astrup is past President of World Obesity Federation, and founding editor-in-chief of Obesity Reviews. He is Associate Editor of American Journal of Clinical Nutrition, and a member of the editorial committee of Annual Review of Nutrition. He was the recipient of the International Association for the Study of Obesity Willendorf Award 2014.

He is author/co-author of over 600 original, review and editorial scientific papers (H-index: 77, Google Scholar H-Index: 99), and more than 1000 other academic publications such as abstracts, textbook chapters and scientific correspondence. He has supervised 32 PhD students to date. Astrup was created Knight of the Order of Dannebrog in 1999, and Knight of the First Order of Dannebrog in November 2012.

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abstract

Metabolic health: the impact of the dairy matrix

Professor Arne Astrup

Department of Nutrition, Exercise and Sports
University of Copenhagen, Denmark

Evidence from large observational studies and meta-analyses indicates an inverse association between dairy and body weight, body fat mass, type 2 diabetes and cardiovascular disease. The findings are supported by randomised controlled trials (RCT). However, although several of the reported RCT's show beneficial effects of dairy for cardio-metabolic effects, the mechanisms by which dairy influences metabolic health are not entirely clear.

There are several reasons for that:

- The re-assessment of the role of saturated fat for cardio-metabolic diseases has clearly shown that overall total intake of saturated fat is not associated with type 2 diabetes or cardiovascular disease.
- The effect of a saturated fatty acid is heavily dependent on its chain length, and the saturated fatty acids in dairy seem to exert a neutral to slight positive effect on type 2 diabetes and cardiovascular disease.
- Dairy cannot be viewed as one entity, and particular positive health effects are exerted by the fermented dairy e.g. yoghurts and cheese.
- Most importantly, the dairy matrix i.e. the total interaction by different fatty acids, minerals like calcium, proteins and bioactive peptides produce unpredictable biological effects, which have generally turned out to exert important health effects. Therefore, research needs to distinguish between different dairy products and the health effect.
- Recent evidence shows that whether low-fat or high-fat dairy are preferred, the health effects entirely depends on the glycemic status of the individual e.g. normoglycemic individuals may achieve the best weight control by normal to low fat dairy whereas type 2 diabetics may benefit more from higher fat dairy.

In conclusion, a high intake dairy is a natural part of a nutrient dense diet that provides benefits for weight control, and the prevention of type 2 diabetes and cardiovascular disease. Future research and recommendations for the public need to observe differential health impacts of different dairy products due to the matrix effect, and personalized nutrition will be key to selecting low or high fat dairy.



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