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Satellite Symposium hosted by European Milk Forum

Exploring the role of dairy foods in the protein transition: does the food matrix matter?

Introduction to the food matrix concept: implications for the protein transition
Professor Michelle McKinley, Queen's University Belfast

Dairy matrix effects: the case of protein transition and micronutrient bioavailability
Professor Ian Givens, University of Reading

Beyond protein content to optimise musculoskeletal health: interactions in the dairy matrix
Dr Oliver Witard, King's College London

Overview

Exploring the role of dairy foods in the protein transition: does the food matrix matter?

A protein transition entails a shift in the production and consumption of protein sources away from animal proteins, including dairy, to more plant-based and alternative protein sources. The symposium examines the role dairy foods have in such a dietary shift and explores the impact that the food matrix, in particular the dairy food matrix, has on this.

By definition the protein transition focuses on a single macronutrient, protein, yet foods are much more than their protein content. In dairy's case there are several nutrients that go along with the protein including calcium, iodine, vitamin B12 and riboflavin. Many of these nutrients are already in short supply in European diet for some groups – e.g., calcium, iodine, riboflavin for teenage girls and women of child-bearing age. A shift away from dairy foods is likely to have a further negative impact on this.

Moreover, it is increasingly recognised that the nutritional and health effects of a food go beyond individual nutrients and are the result of a food's structure and nutrient composition and how these interact with each other - the so-called food matrix effect.

The matrix concept is that food is more than the sum of its parts, and does not necessarily have the health effect predicted from nutrient content alone. Cheese is a good example of the matrix effect. Although cheese contains saturated fat, the majority of studies report that cheese consumption does not increase the risk of cardiovascular disease and may, in fact, be beneficial. Interactions of the components and structure of the cheese matrix including calcium, phosphorus, magnesium and the milk fat globule membrane modulates the effect that the fat it contains has on blood lipids levels.

Examining this further with respect to the role of dairy foods in the protein transition includes food matrix effects on nutrient bioavailability. Bioavailability is an important intermediate between food intake and nutrition and health status. The nutrient content of a food is only one part of the story - if little of the nutrient is absorbed and utilised it will not have the same effect. Consideration of calcium in food matrices is important for enabling optimal utilisation of dietary calcium. For dairy and calcium bioavailability, calcium as part of the casein micelle (a complex structure designed 'by nature' for calcium absorption) is beneficial. Similarly, for other micronutrients, milk and dairy products generally contain enhancers of nutrient absorption and bioavailability. Therefore, through both nutrient content and bioavailability, dairy foods have an important role in micronutrient adequacy in the protein transition.

The quantity and quality of protein in foods is important in the protein transition - the dairy food matrix is rich in high-quality protein - especially critical at key life stages notably in the young, during pregnancy and in older people. But even beyond protein quantity and quality, the dairy matrix can have a positive effect to optimise musculoskeletal health. There is emerging research that the impact of protein on muscle differs depending on the food matrix it is in e.g., interactions with other nutrients in the food matrix may augment the effect. In addition, other aspects of the food matrix and dairy food matrix all have an effect including the structure (solid, liquid, gel forms of the product), preparation (cooking, heating etc.), processing (e.g., fermentation). These should be taken into account when assessing the impact of a protein-containing food. Again, the food matrix is an important consideration for dietary guidelines for protein and for food-based dietary guidelines more generally in the protein transition.

Biographies

Professor Michelle McKinley

Michelle McKinley is Professor of Public Health Nutrition at the Centre for Public Health, School of Medicine, Dentistry and Biomedical Sciences, Queen's University Belfast.

Michelle's research investigates the ability of dietary interventions to modify nutritional status and risk of chronic disease, particularly diabetes and cardiovascular disease. Her expertise in dietary interventions includes examining the effect of individual nutrients through to studies exploring interventions with whole foods, food groups and whole dietary patterns. Michelle's research also explores novel approaches to encouraging and supporting diet and lifestyle behaviour change and weight management throughout the life course including in the school-setting; before, during and after pregnancy; and for people with type 2 diabetes.

Biographies

Professor Ian Givens

Professor Ian Givens has a background in biochemistry and nutrition, is a UK Registered Nutritionist, a Fellow of the Royal Society of Biology and was recently awarded an honorary doctorate in food science by the University of Helsinki.

He is currently Emeritus Professor of Food Chain Nutrition in the Institute for Food, Nutrition and Health at the University of Reading UK. He is also a staff member of the Nutritional Science PhD programme inf the University of Milan.

His research focuses on the nutrient supply and health consequences of consuming animal-derived foods with current work on associations between branched chain amino acids and diabetes risk and on vitamin D status and immune function in ethnic minority groups. He is also working on the potential of millets to reduce several highly prevalent diet-responsive diseases in young women and children in India.

Biographies

Dr Oliver Witard

Dr Oliver Witard is a Senior Lecturer in Nutrition and Exercise Metabolism in the Faculty of Life Sciences and Medicine at King's College London, UK. His multi-disciplinary research spans two research groups within King's: (i) Muscle: Form and Function in the Centre for Human & Applied Physiological Sciences, and (ii) Diet and Cardiometabolic Health in the Department of Nutrition. Oliver's research focus is healthy ageing. He is interested in understanding the physiology that underpins why we lose muscle mass and quality with age. His research also explores the role of exercise and novel nutritional interventions – primarily protein and omega 3 fatty acid nutrition – to offset age-related perturbations in muscle metabolism. He has extensive expertise in stable isotopic tracer methodology for measuring in vivo muscle protein turnover in humans, and also applies these techniques to athletic populations to optimise training adaptations, body composition and performance.

Recently, Oliver has delivered invited talks at international symposiums and industry events, including FENS, The Physiological Society, The British Society for Research in Ageing (BSRA), and Bridge2Food. Oliver is a former board member of the Nutrition Society (Scottish section) and a member of the Royal Society of Edinburgh Young Academy of Scotland. Oliver also provides nutrition consultancy for Scottish Ballet.

About EMF

The European Milk Forum (EMF) is a collection of national and regional dairy organisations from ten European countries - Austria, Belgium, Denmark, Germany, France, Ireland, Netherlands, Northern Ireland, Norway and Switzerland.

The organisations work together through EMF to build a clearer understanding of the role of milk and dairy products in healthy, sustainable diets across Europe and of dairy as part of European sustainable food production systems.

This includes science-based information initiatives on dairy, health and sustainability, and engaging in a dialogue with health and nutrition professionals.

Find more about EMF here
www.milknutritiousbynature.eu/home/