Matrix effect and health:
the example of dairy products

Press release

European Milk Forum

« Beyond nutrients: health effects of the dairy matrix »

Madrid, 06 September 2018. Arguments for a link between the "matrix effect" of milk and dairy products on health were presented during a satellite symposium which brought together over 200 health professionals during the 40th ESPEN (European Society for Clinical Nutrition and Metabolism) Congress on 4th September in Madrid.

Hosted by the European Milk Forum's members (EMF), this scientific symposium brought together two scientific experts, Prof. Luc J.C. van Loon (Maastricht University Medical Centre - The Netherlands) and Prof Arne Astrup (Department of Nutrition, Exercise and Sports - University of Copenhagen) who gave a greater insight into the 'food matrix' and highlighted that the effects of milk and dairy foods on health extends beyond the individual nutrients they contain.

Dairy matrix effects on T2 diabetes and cardiometabolic health

Prof Arne Astrup from the University of Copenhagen explained "The effects of dairy foods such as yogurt and cheese on body composition, diabetes and CVD risks can be attributed to the food matrix with the interaction of nutrients including protein, calcium, SCFA (short chain fatty acids) from fermentation, and perhaps peptides and phospholipids. The effects are different to what would be expected solely on the basis of the nutritional content. Cheese is a good example, despite its saturated fat and salt content, the majority of studies report that cheese consumption does not increase the risk of CVD and may, in fact, be beneficial. A diet including yogurt and cheese, in reasonable quantities, should be recommended for everyone to prevent and manage type 2 diabetes and cardiovascular disease. The low-fat version of these dairy foods might by helpful for non-diabetic overweight and obese individuals, whereas emerging evidence suggests the full-fat versions are optimal for people who already have type 2 diabetes."

Protein ingestion and muscle contraction stimulate muscle protein synthesis

A food matrix effect is also apparent in muscle protein synthesis, impacting, for example, the digestion and absorption of protein, which is important in helping to reduce age-related muscle loss or loss linked to immobilisation.

According to Prof. Luc J.C. van Loon from the University of Maastricht in the Netherlands "a period of muscle disuse due to sickness or injury can lead to substantial loss of muscle mass and strength in otherwise healthy individuals with serious adverse consequences for health".

To help mitigate muscle loss, physical activity is required where possible and enough protein should be consumed, including before going to bed to maximise the opportunity for muscle synthesis overnight. The quality of the proteins is key, with animal proteins being the most effective, in particular, those in dairy products, which combine rapidly digestible proteins and proteins which are digested slowly over an extended period.

This complementarity within the dairy matrix may be part of the explanation for the greater effect of milk and milk protein on muscle protein synthesis compared to soy protein and soy drink.

The matrix effect: a new paradigm revolutionising nutrition

Recent scientific advances in nutrition and food sciences allow us to analyse our diet differently. Food is no longer considered simply as the sum of its components, but as a complex physical structure which influences the digestive fate of the nutrients, their metabolic effects and ultimately, their long-term effects on health. It is no longer a question of considering nutrition using solely the nutrient approach, which is reductionist, but from a new holistic perspective, at the interface of food science and human nutrition.

Additional research is underway to further investigate the health effects of the dairy matrix and to unravel the mechanisms and pathways through which the different components work together.

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