



The matrix effect of food video

This video provides an explanation of a new approach in the field of nutrition that is shaking up the discipline. As nutrition science evolves, we are learning more and more about the food matrix effect and its importance in understanding the impact that food has on our health. The dairy matrix is one of the best researched examples of the food matrix effect, showing beneficial effects on cardiometabolic health and musculoskeletal health.

EDITORIAL

« The matrix effect of food: a new direction for nutrition »

For over half a century, the study of the relationship between diet and health has focused on individual nutrients in isolation: fats, carbohydrates, proteins and micro-nutrients. This reductionist approach linking a nutrient to a health effect is perfectly legitimate in the case of deficiency diseases; scurvy, for example, is linked to vitamin C deficiency and is remedied by eating citrus fruit.

But it seems unsuitable for addressing the multi-factorial and chronic diseases affecting the health of populations today. The role of the diet in the prevention and treatment of lifestyle diseases such as obesity, type 2 diabetes and cardiovascular disease cannot be reduced to one component or nutrient as either the culprit or solution. Furthermore, the nutritional value of a food is not limited to the sum of its nutrients; it varies according to the food structure, the combination of nutrients, and the interactions with other components within this food matrix. Ultimately, we eat food, not nutrients.

The 'matrix effect' sees food as more than the sum of the nutrients it contains and moves from a purely quantitative concept to a more holistic vision and thus creating a new paradigm in nutrition.

The effects of nutrients on health can be different when combined within the special structures formed by food matrices. This reflects the complexity of foods and takes into account the fact that the sum of the nutrients is not enough to explain all the effects of foods in terms of physiology and health. The presence of fibres, proteins, micro-nutrients and so on within a food matrix can generate interactions between the nutrients. In this way, foods with the same amount of a component will not necessarily be equivalent in terms of nutrition or health.

This approach is shaking up the reductionist vision of nutrition and the effect of food on health. Food can no longer be considered as the mere sum of its components, rather it's a complex physical structure which influences the digestive fate of the nutrients, their metabolic effects and, finally, their long-term effects on health.

The examples illustrating this approach are increasing, in particular for dairy products; a food group that possesses a rich composition of varied nutrients and the one that has been most researched.

A primary example of the matrix effect of dairy products is in the field of cardiovascular health with cheese. Due to the saturated fatty acid content, cheese could be expected to have a negative effect on cholesterol and cardiovascular risk. However, that does not appear to be the case. One explanation for this 'dairy matrix' effect is that in addition to saturated fat, cheese also contains calcium which binds fatty acids, leading to a reduction in the intestine's lipid absorption. This calcium/fatty acid interaction may partly explain why cheese does not have negative effects on the blood cholesterol level and cardiovascular risk. It is a perfect illustration of the matrix effect of a food: nutrients organised according to complex physical and chemical structures that interact with and adjust the effect on the metabolism and therefore, on health.

It is this effect that explains, at least in part, why epidemiological studies conclude an absence of any relationship between the consumption of dairy products and cardiovascular disease, and, if anything, a protective effect.

The same goes for bone health. Calcium, protein, phosphorus, vitamin K2 and vitamin D are all nutrients contained in milk and dairy products that have positive effects on bone. Studies show, however, that dairy food confers a greater protective effect than can be explained by the components considered individually. The concept of the dairy matrix effect for bone health is the positive interaction of these nutrients and other components working together.

This recent scientific progress helps explain our diet differently. It suggests that it is important to have a holistic vision of the nutritional and health value of food, in particular, when it comes to dietary recommendations. The matrix effect of food reflects the idea that it is necessary to move from a nutrient-based system of recommendations to a system based on a more global approach to food; an intersection between food science and human nutrition.

About EMF

'Milk, Nutritious by Nature' is an information initiative from the European Milk Forum (EMF) addressing science-based issues on dairy and health and engaging in a dialogue with health and nutrition professionals.

More information

www.milknutritiousbynature.eu