Abstract

Designing biofunctional dairy foods:
matrix structure of dairy products in relation to lipaemia

The worldwide, increasing incidences of lifestyle-related diseases such as metabolic syndrome, hypertension and obesity call for a better understanding of how to design novel foods targeted at counter-acting dietary contribution to disease risk. Consumers are conservative in food habits and reluctant to change their dietary pattern dramatically. Hence, it is relevant to optimize or modulate existing foods, which constitute an important part of the Western diet to attenuate the food-specific contribution to lifestyle-related disease risks. Evidence has emerged that the postprandial responses are especially fundamental for understanding how the diet contributes to development of lifestyle-related diseases such as the metabolic syndrome.

The project aim is to evaluate the relationship between the food matrix structure of dairy products and bioavailability/uptake of nutrients and metabolic responses. Our objective is to obtain an understanding of how uptake of lipids is affected by modifications of the dairy structure and texture in iso-energetic meals, where macronutrient components are kept the same.

This project presents a novel and new interdisciplinary initiative, where the relations between structural attributes of four dairy food matrices with identical protein:fat ratio and the nutrient uptake from test meals with identical macronutrient composition with emphasis on postprandial lipaemia will be explored in detail for the first time. This is achieved by preparation of a variety of dairy samples with Cheddar cheese as reference, in comparison to dairy structures where protein network and/or lipid droplets are altered to provide differences in structures and textures of dairy matrices of identical nutrient composition. The impact of food matrix structure on postprandial lipaemia and the uptake of nutrients are examined in a human randomized cross-over study with integrated metabolomics studies to enable a detailed characterization of the kinetics of the postprandial absorption and interlinked pathways regulating the postprandial metabolic response.