

Dairy Lipids and Human Health (DairyHealth)

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Aim and Description:

Lifestyle-related diseases are among the leading causes for early death. A western sedentary life-style with an access to easily digestible foods with a high energy and fat density is considered a key factor responsible for this development. Changes in dietary habits and lifestyles have resulted in an increase in obesity and the so-called metabolic syndrome. Milk products are major foods containing a large amount of long-chain saturated fat. These products are traditionally linked to increased risk of cardiovascular diseases (CVD). However, they also contain large amounts of short- and medium-chain fatty acids, which may have beneficial effects on human health.

The aim is to explore and understand the influence on health of short- and medium-chain fatty acids from milk fat on the metabolic syndrome. This project will address the issue by tailoring the saturated fat fraction to get improved insulin sensitivity and CVD risk profile. Structured lipids with short- and medium-chain fatty acids are produced from milk fat using advanced technology. The nutritional and physiological properties of the short- and medium-chain fatty acids will be investigated in animal models – from in vitro to in vivo (rodent and pig) models – to get direct and quantitative measures of their impact on insulin sensitivity, inflammation, lipid and glucose metabolism as well as on the mechanisms of action using metabolomics and molecular biological methods. The established hypothesis will be tested in human intervention studies. By covering the whole chain from thorough chemical and physicochemical characterization of structured milk lipids through animal and human intervention studies, we will contribute to the fundamental understanding of the mode of action of short- and medium-chain fatty acids. The research will create the basis for further product development and prevention of the metabolic syndrome.