

## **DEVELOPMENT OF DAIRY-BASED NUTRITION SOLUTIONS WITH IMPROVED LIPID DIGESTION EFFICIENCY IN CONCENTRATED LIQUID OR POWDER FORM**

Present research has been carried out to develop a prototype base product for premature babies and/or individuals who are having difficulties with uptaking foods orally. Ultimate aim of the research was to obtain a concentrated or powdered base product with defined high lipid digestion efficiency. For this purpose, two different experiments were designed. In the first experiment, lipid digestion efficiencies of the milks homogenized under different homogenization pressures were evaluated. In the second experiment, milk cream and non-fat milk serum was separated and the cream was subjected to homogenization under the same conditions as experiment 1. Then homogenized and heat treated cream was mixed with pasteurized non-fat milk phase. In each experiment, lipid digestion efficiency by human pancreatic lipase was investigated under *in vitro* conditions.

As expected, with the increase in homogenization pressure, the average particle size of the lipids decreased and zeta potentials of the lipids changed. Heat treatment after homogenization led to decrease in lipid digestion efficiency but this was not found to be related with the adsorption/interaction of major milk proteins with fat globules. Digestion efficiency of milk lipids was affected by digestion pH. Digestion at pH 6 yielded higher total free fatty acids than that of pH 2, indicating higher lipid digestion efficiency in the former case.

Concentrated or powdered milks were prepared using milks homogenized at the selected pressure conditions from the experiments 1 and 2. The purpose of this step was to find out the most suitable end-product form for those who are suffering from pancreatitis. The evaporated or powdered products were evaluated for their lipid digestion efficiencies. The lipid digestion efficiencies of these products were compared with UHT processed milk as reference. Evaporated milk with 35% total solids yielded higher lipid digestion efficiency than UHT milk and instant whole milk powder. Spray drying decreased the lipid digestion efficiency. Regarding lipid digestion efficiency, concentration of milk was decided to be a more suitable way of producing specific nutrition product designed for target-specific consumers.

