

Formation, isolation, and functional characterization beta-casein fragments in milk (BETAFRAG)

Period: April 2017 - Marts 2020
Budget: 3.996.000 DKK
Funding: The Danish Milk Levy Fund
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Aim

In the present project we will focus creating reliable methods enabling examination of when and where large β -casein fragments are formed in milk and during the processing.

Description

Bovine β -casein is a major protein without much secondary structures and is therefore prone to proteolysis, mainly by plasmin. Plasmin is a central endogenous protease in bovine milk and predominantly cleaves three plasmin-sensitive peptide bonds of β -casein and releases following peptides; PP8 fast/slow, PP5, gamma-1, 2 and 3. The proteolysis of β -casein can have either a favourable or a disadvantageous effect on the texture and flavour of dairy products. In cheese, the degradation of protein can help develop desirable flavours and texture during ripening, whereas in pasteurized-, UHT-milk, and Non-Fat Dried Milk proteolysis causes undesirable gelation and precipitation. However, casein-derived peptides have been reported to have functional, nutritional and health-promoting properties, which leave a great potential for commercial exploitation. In the present project we will focus creating reliable methods enabling examination of when and where large β -casein fragments are formed in milk and during the processing. Substantial amounts of each fragment will be isolated allowing detailed functional, chemical and physical investigations to be performed. In the end, potential bioactivities will be studied. This innovative project has widespread relevance and may open new doors for the dairy industry to keep high returns.