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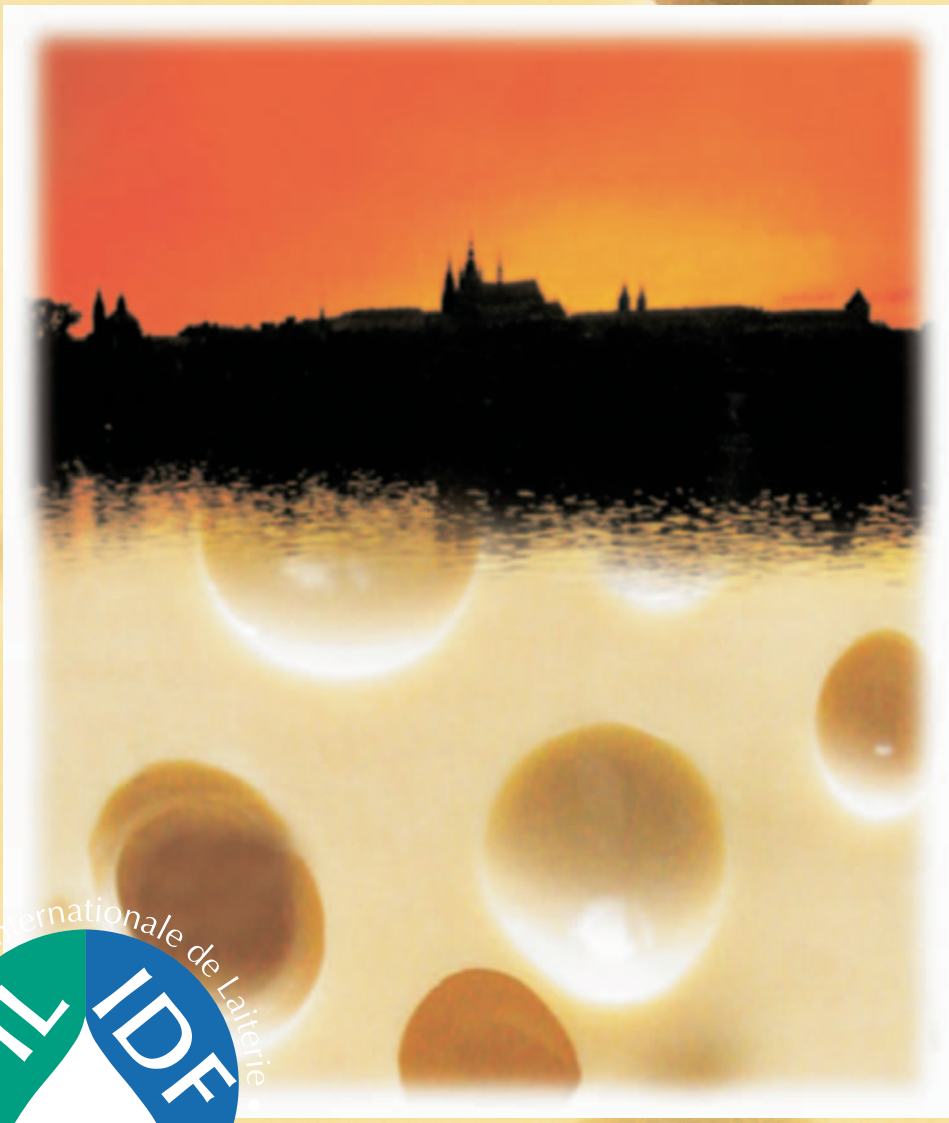

Ripening, Characterization & Technology

Book of Abstracts

P188 INFLUENCE OF GENETIC POLYMORPHISM ON THE TECHNOLOGICAL PROPERTIES OF CHEESE-MILK

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During recent years there have been several studies reporting effects of genetic protein polymorphism on the technological properties of cheese-milk. Milk protein variants are responsible for both milk clotting properties as well as the cheese yield. In this study, the influence of genetic polymorphism of β-casein, κ-casein and β-lactoglobulin, on protein distribution between curd and whey during cheese making is going to be analysed. Furthermore, the impact of the different genetic variants of milk proteins on the rheological properties of chymosin induced milk gels will be studied.

Cows from the university experimental herd were genotyped for β-casein and κ-casein using the PCR-based Pyrosequencing® method, while Fast Protein Liquid Chromatography (Äkta® FPLC) was used for β-lactoglobulin genotyping. Milk samples from individual genotyped animals were clotted using a solution of chromatographically pure chymosin and subjected to syneresis to form a „micro fresh cheese". The whey fractions and the curd will be analysed, both after clotting and after syneresis, for concentrations of α_{s1}-, α_{s2}-, β-, κ-casein, β-lactoglobulin and α-lactalbumin, using Äkta®FPLC and Capillary Zone Electrophoresis. Any correlation between the concentrations of individual proteins and milk protein genotype will be studied. HPLC will be used to detect and monitor proteins and protein degradation products. So far the rheological properties of milk gels have been analysed using a Bohlin VOR Rheometer. The course of coagulation was monitored after adding a solution of chromatographically pure chymosin to the milk samples.

The preliminary results indicate that milk containing κ-casein AE/β-casein A1A2 has negative and the κ-casein BB/κ-casein A1B positive impact on the coagulation start time and elastic module G'. However, these results are yet to be confirmed on a larger number of animals and analysed for the impact of the genetic variants of β-lactoglobulin.

Keywords: genetic polymorphism, milk proteins, milk clotting properties, cheese yield

P189 EXOPOLYSACCHARIDE PRODUCTION BY *LACTOBACILLUS ACIDOPHILUS* FOR POTENTIAL APPLICATIONS IN FRESH CHEESE

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Many strains belonging to the group of lactic acid bacteria (LAB) produce exopolysaccharides (EPS). The ability of EPS to act as viscosifying, stabilizing, and/or water-binding agents in various foods makes it an effective natural alternative to commercial synthetic stabilizers, so it may play an important role in the dairy industry. In fact, EPS-producing LAB are not only important in manufacture of yoghurt and fermented milks, but also in cheese production. Recent research efforts have shown that EPS cultures are useful to increase moisture retention and improve functional properties of low-fat Mozzarella cheese and whey cheese. In this work, the ability of *Lb. acidophilus* to produce EPS, and the performance of two different methods for EPS isolation was investigated.

Fermentations were carried out in a Braun Biostat B 2-L fermentor, filled with 1.5 L of MRS broth containing 20 g/L lactose. The yield of the EPS isolation method was tested by adding xanthan gum to the medium. The experiments were carried out at 37 °C, 150 rpm, pH 5.5 under an N_2 atmosphere. A 50 mL/L standard inoculum was prepared from a subculture of *Lb. acidophilus*, previously grown in the corresponding medium for 20 h at 37 °C, and was used to start-up every fermentation batch. Fermentation batches took 48 h, and samples were taken periodically. Growth was monitored spectrophotometrically and by plate enumeration. To optimise EPS isolation, cells and residual polypeptides were removed by centrifugation (4000 rpm for 20 min) upon precipitation via two different processes: addition of pronase E solution and one volume of 20 % trichloroacetic acid, or precipitation with 20 g/kg 5-sulfosalysilic acid. The EPS was precipitated by three volumes of cold ethanol and was collected by centrifugation. The weight of isolated and dried polymers was measured, and the total amount of carbohydrates was determined by the phenol-sulphuric method. Exponential growth took place for ca. 12 h, and EPS was produced mainly during the stationary phase.

Keywords: exopolysaccharides, *Lb. acidophilus*, lactic acid bacteria