SEAE 54P ELECTROFRACTIONATION OF PROTEIN MINERAL COMPLEXES OBTAINED BY ELECTROPHYSIAL WHEY PROCESSING

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Whey proteins are well structured proteins with secondary and tertiary stable structures. It is known that whey proteins make up about 20% of milk proteins. Four major whey protein components: β-lactoglobulin (β-Lg), α-lactalbumin (α-La), bovine serum albumin (BSA), and immunoglobulin (Ig), make up 90% of the whey proteins: The remaining 10% are such proteins as lactoperoxidase, serum transferrin, lactoferrin, lactolin, and proteo-peptone fraction.

β-Lg makes up 50% of the whey proteins and 12% of the total protein content of milk. The β-Lg molecule consists of an α-helix, β-sheet and random coil structures represented in a ratio of 10 to 15%, 43% and 47%, respectively [1].

α-La makes up 20% of bovine milk whey proteins. It is a small globular whey protein found in all milk studied to date. It consists of 123 amino acid residues with a molecular mass of 14.2 kDa. It is a regulatory protein of the enzyme complex lactose synthetase, and lactose concentration in milk is directly related to the concentration of α-La

BSA is not synthesized in the mammary glands but gets into milk being passively transported from the bloodstream. It contains 17 intermolecular disulfide bonds and one thiol group in the rest of 34 amino acid residues (Fox, 1989). It is characterized by a low tryptophan and methionine content and a high content of cysteine and charged amino acids (glutamic and aspartic acids, lysine and arginine) (Peters, 1985). The secondary structure of BSA is represented predominantly by an alpha-helix structure (67%). The rest of the polypeptide chain consists of curves (turns) and flexible extensive regions between domains without beta structures.

The electrophysical processing of whey after the manufacture of the granulated cottage cheese „Grăuncior" and that after the manufacture of the "Cottage cheese", 2% fat content, in electrolizer EDP-2, with a uniform flow in the cathode cell, at a current density of j=20 mA/cm^2, and an electrophoretic analysis of the samples collected each 5 minutes with the gel SDS-PAGE 15%, as well as the isolation of soluble proteins with the phosphate-citrate buffer (Me Ilvane) 0.5 M NaCl, 0.5 mM EDTA (0.04% NaN_3), pH 5.6, made it possible to identify many protein fractions that are various depending on the energy consumption, volume of the processed whey, duration of processing and variations of pH. In order to determine the quantity of the major fractions in the PMCs, the obtained results were scanned through the HP Scanget 3800 with the software Microsoft Photo Editor, and analyzed with the Phoretix 1D Advans[2]

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