

RESEARCH OF MILK PROTEINS COAGULATION BY ACTIVE COMPLEX OF *PLANTAGO MAGOR L.*

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Abstract

In the technology of milk-protein concentrates it is very relevant as a coagulant to use plantain juice (*Plantago major L.*), which also is a source of enzymes - proteases and organic acids. The aim of the research was to research the process of milk proteins coagulation by an active complex of *Plantago major L.*, and to assess the influence of technological parameters (temperature, duration of milk proteins coagulation, determination of the rational amount of plant coagulant) on the use degree of milk solids and the quality indicators of milk protein-herbal clots.

Milk protein-herbal clots obtained by milk proteins coagulation by plant coagulant - *Plantago major L.* juice in an amount of 6 - 10% with coagulation conditions: temperature 50 - 65 °C with a duration from 50 to 90 min. were used for research. A full-factor experiment has been used in order to determine the optimal conditions for the milk proteins coagulation by the *Plantago major L.* juice. The Box-Wilson on cube method of mathematical modeling has been used to optimize the enzymatic coagulation process of milk proteins by *Plantago major L.* juice. Moisture mass fraction has been determined by drying the sample to constant weight. Active acidity of all samples has been measured on a PB-20 Sartorius potentiometric pH meter; protein mass fraction in normalized milk was determined by the formalin titration method, and water-retaining capacity milk protein-herbal clots by the method Grau-Hamm, modified by Alekseeva [16].

Analytical dependencies in the form of adequate regression equations for calculating the temperature effect of milk proteins coagulation, duration of the coagulation process, and the amount of *Plantago major L.* juice on the use degree of milk solids and quality indicators of milk protein-herbal clot – water-retaining capacity, moisture mass fraction have been obtained. The optimal amount of coagulant addition is $8 \pm 0.5\%$ to the milk mass and carrying out the process at 55 ± 2 °C during 70 ± 3 min. The change in quality indicators of the milk protein-herbal clots has been researched during 72 storage hours at a temperature of 4 ± 2 °C. The use of *Plantago major L.* juice as a coagulant does not impair the quality indicators of milk protein-herbal clots - active acidity is 6.28 ± 0.17 , and water-retaining capacity is $61.02 \pm 7.33\%$.

The conditions of milk proteins coagulation by an active complex of *Plantago major L.* contribute to the active technological action of coagulant.

Key words: Milk proteins coagulation, Milk protein-herbal clot, *Plantago major L.*, Quality indicators.