Current results 2024 (second half of the year)

AR19679638 "Scientific and practical basis for the use of collagen-containing concentrate in the production of specialized cottage cheese products for the nutrition of athletes"

Description section of the calendar plan	Timeframe for implementation	Brief description of the work done/results obtained	Information about possible applications
No. 5.2 Development of technological modes of introduction of collagen-containing concentrate and dietary supplements from vegetable raw materials into cottage cheese product	June-August 2024	On the basis of experimental studies technological modes of introduction of collagen-containing concentrate and dietary supplements from raw materials into cottage cheese product are established. Dry collagen-containing concentrate and dietary supplements from raw materials are introduced into the curd mass crushed on a colloid mill at a temperature of 35°C. The technology of curd product has been developed. The technological process of curd product production includes acceptance and purification of milk from mechanical impurities, separation to obtain skim milk, pasteurization of milk at a temperature of 76-78 ° C with 30-40 seconds, fermentation of milk rennet-acid method at a temperature of 30-32 ° C, fermentation of skim milk at a temperature of 30-32 ° C for 4-6 hours to achieve a titratable acidity of 71-73 °T, processing of the clot at a temperature of 35-40 ° C with exposure for 20-30 minutes, self-pressing of the clot at a temperature of 25-28 ° C for 30-40 minutes, pressing the clot under the same conditions for 1-2 hours to achieve a moisture content of 65-70%, grinding the resulting curd on a colloid mill to obtain a homogeneous mass, heating to 35 ° C and the introduction of dry collagen-containing concentrate (8%) and dietary supplements from vegetable raw materials (4%) with constant stirring. The finished product is cooled to 4-6 ° C, packed in airtight containers and stored at 0-2 ° C for no more than 96 hours.	The results of the research can be used for the development of specialized cottage cheese products enriched with collagen-containing concentrate and biologically active additives (BAA) from vegetable raw materials, intended for sports nutrition. The developed technology provides stability of structure, high water-holding capacity and improved organoleptic characteristics, which is provided by values of ultimate shear stress (135-138 Pa) and effective viscosity (53-55 Pa-s). Storage conditions (0-2 °C, not more than 96 hours) of the new cottage cheese product for sports nutrition are established. The obtained data can be used to create products with specified rheological and microbiological parameters.
No. 6 Study of structural and mechanical characteristics and quality indicators of cottage cheese product	August-September 2024	On the basis of experimental studies a comprehensive assessment of consistency and quality of cottage cheese product is given. The finished cottage cheese product has a homogeneous, tender, moderately dense consistency with a creamy texture. Ready curd product on microbiological indicators and the content of toxic elements corresponds to established sanitary norms. Based on the results of the study, two articles were published in the Science and Higher Education Quality Assurance Committee journal: 1) Zharykbasova K.S., Zharykbasov E.S., Kakimova J.H., Raimhanova G.N., Baikadamova A.M. Colla-	

		gen-containing concentrate in the production of dairy products for sports nutrition // Bulletin of Shakarim University. Series of technical sciences. - 2024. - № 1 (13). - https://doi.org/10.53360/2788-7995-2024-1(13)-15 2) Zharykbasov ES, Kakimov AK, Zharykbasova KS, Kakimova JH, Raimhanova GN Study of the effect of doses of collagen-containing concentrate on the quality indicators of cottage cheese product // Bulletin of Shakarim University. Series of technical sciences. - 2024. - № 2 (14). - https://doi.org/10.53360/2788-7995-2024-2(14)-27	
No. 6.1 Determination of shear stress and effective viscosity of curd product	August-September 2024	On the basis of experimental studies, the structural and mechanical parameters of curd product (ultimate shear stress, effective viscosity, moisture retention capacity) were determined. Indicators of effective viscosity (53-55 Pa*s) and ultimate shear stress (135-138 Pa) indicate form-stable and homogeneous structure of the curd product, free from granularity. High moisture retention capacity (83%) indicates moderately dense and stable structure of curd product. The finished curd product has a homogeneous, tender, moderately dense consistency with a creamy texture. The results of the study were accepted for publication in the proceedings of the International Scientific and Practical Conference: - Zharykbasova K.S., Silybaeva B.M., Kakimova J.H. et al. The influence of functional ingredients on the rheological parameters of soft curd product // Collection of the International Scientific and Practical Conference "Veterinary-sanitary expertise: problems and solutions to the quality and safety of livestock products", dedicated to the 70th anniversary of Doctor of Veterinary Sciences, Professor Sergazy Turlybekovich Dyusembayev, Semey, September 24, 2024. URL: https://shakarim.edu.kz/upload/science/events/document_1724413363.pdf	
No. 6.2 Study of organoleptic, physicochemical, microbiological and safety indicators of cottage cheese product	August-September 2024	On the basis of experimental studies determined quality indicators of cottage cheese product. According to organoleptic indicators, the finished cottage cheese product has a homogeneous, tender, moderately dense consistency with a creamy texture, characterized by pure sour milk taste and smell with a unique aromatic flavor, complemented by light spicy tones, which is due to the addition to the recipe of cottage cheese product BAA from plant raw materials. According to physical and chemical indicators, the mass fraction of fat in the finished curd product is 0.8%; mass fraction of protein - 18.4%; mass fraction of moisture - 81.0%; acidity 240 °T.	

		Ready curd product on microbiological indicators and the content of toxic elements corresponds to the established sanitary norms. The content of cadmium, arsenic, mercury in the finished curd product was not found. The content of lead in cottage cheese product amounted to 0.09 mg/kg and does not exceed the MAC level (3.0 mg/kg). The results of the study published in the Proceedings of the International Scientific and Practical Conference: - Zharykbasova K.S., Kakimova J.H., Zharykbasov E.S. Biotechnology of cottage cheese products for sports nutrition // Proceedings of the International Scientific and Practical Conference "Astana Biotech 2024", Astana, September 12-13, 2024, p. 121. URL: https://astanabiotech2024.biocenter.kz/wp-content/uploads/2024/09/Sbornik-trudov-AstanaBiotech2024-last.pdf The results of the study were accepted for publication in the proceedings of the International Scientific and Practical Conference: - Zharykbasova K.S., Silybaeva B.M., Kakimov A.K. et al. Study of quality indicators of functional cottage cheese product for sports nutrition // Collection of International scientific-practical conference "Veterinary and sanitary expertise: problems and solutions to the quality and safety of livestock products", dedicated to the 70th anniversary of Doctor of Veterinary Sciences, Professor Sergazy Turlybekovich Dyusembayev, Semey, September 24, 2024. URL: https://shakarim.edu.kz/upload/science/events/document_1724413363.pdf	
7-7.1 Study of changes in functional-technological properties during storage: determination of moisture-binding ability of collagen-containing curd product	October-November 15, 2024	On the basis of experimental studies functional and technological properties of curd product in the process of storage were determined. In the process of storage of finished curd product moisture-binding capacity, change in viscosity coefficient and mechanical stability coefficient were determined. In the course of research it was found that the temperature and duration of storage have a significant effect on the functional and technological properties of curd product. At the temperature of storage of curd product above 2 ° C for more than 96 hours observed a decrease in moisture-binding capacity from 83% to 76%, a significant increase in the coefficient of viscosity loss from 15.8% to 16.2%, a decrease in the coefficient of mechanical stability from 1.32 to 1.26, indicating deterioration of the structure of the product. On the basis of the conducted experimental studies	

		the terms and conditions of storage of the finished curd product were determined: temperature 0-2 °C not more than 96 hours in a sealed container.	