

Brief information about the project

Name of the project	AP19676645 «Biotechnology of obtaining biologically active peptides from whey proteins of mare's milk».
Relevance	Whey is a by-product of the production of cheese, curds, casein and lactose and contains about 50% of milk's nutrients: proteins, lactose, minerals and vitamins. Due to its high protein content and nutritional value, whey can be processed and used in the production of sports, medical and baby food. The main function of milk proteins is to provide the body with essential amino acids, which are also considered a source of biologically active peptides. Biologically active peptides have a significant impact on the regulation of the immune response, preventing various diseases and improving the quality of life. The relevance of the project lies in the production of biologically active peptides of mare's milk whey proteins (lactoferrin and immunoglobulins), used in functional products, as well as food additives in the food industry.
Purpose	The goal of this project is to obtain biologically active peptides for use in functional products, as well as food additives in the food industry by processing whey proteins of mare's milk.
Objectives	<ul style="list-style-type: none">- Sampling of mare's milk with low contamination level is an indicator that characterizes the level of hygiene of production, transportation, storage of raw milk and processed products by microbiological methods.- Conducting physico-chemical analysis of mare's milk samples.- Isolation of whey proteins of mare's milk, carrying out enzymatic hydrolysis to obtain biologically active peptides.- Study of antioxidant, chelating (Ca^{2+}, Zn^{2+}, Fe^{2+} and Cu^{2+}) and antimicrobial properties of lactoferrin-derived and immunoglobulin-derived peptides.- Preparation of dried biologically active peptides, study of their physico-chemical parameters, antimicrobial and antioxidant activities;- Preparation of an application and obtaining a patent of the Republic of Kazakhstan and a Declaration of Conformity with the Technical Regulations of the Customs Union.
Expected and achieved results	The results of the scientific research carried out within the framework of the project will be: <ul style="list-style-type: none">- methods of determining bacterial contamination will be applied and a procedure for obtaining milk with low contamination, which characterizes the level of hygiene of manufacturing, transportation, storage of raw materials and end products by microbiological methods, will be developed;

	<ul style="list-style-type: none"> - Analyses for physical and chemical characteristics of the quality of mare's milk according to the regulatory requirements have been conducted; - Whey proteins of mare's milk have been isolated and enzymatic hydrolysis is performed to obtain biologically active peptides; - Antioxidant, chelating (Ca²⁺, Zn²⁺, Fe²⁺ and Cu²⁺) and antimicrobial properties of lactoferrin-derived and immunoglobulins-derived peptides have been studied; - Biologically active peptides in a dry powder form are obtained and their physicochemical parameters, antimicrobial and antioxidant properties have been studied; - The application has been filed and the patent of the Republic of Kazakhstan and the Declaration of Conformity with the Technical Regulations of the Customs Union will be received. <p>Based on the results of the work, following publications will be published:</p> <ul style="list-style-type: none"> - at least three (3) articles and/or reviews in peer-reviewed scientific journals indexed in the Science Citation Index Expanded database of the Web of Science and (or) with a CiteScore percentile in the Scopus database of at least thirty-five (35); - Based on the project materials, 1 patent of the Republic of Kazakhstan and a Declaration of Compliance with the Technical Regulations of the Customs Union will be filed and received."
<p>Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles</p>	<ol style="list-style-type: none"> 1. Narmuratova Meiramkul Khudretovna, кандидат Biological Sciences, Associate Professor, H-Index – 7, Researcher ID ABF-9887-2021; ORCID: 0000-0002-4030-0513, Scopus author ID: 15136733500. 2. Serikbaeva Asiya Demeukhanovna, Doctor of Biological Sciences, Professor, Hirsch Index – 7; Researcher ID; ORCID: <u>0000-0003-4632-7343</u> , Scopus Author ID: 57194223527. 3. Meldebekova Aliya Abdugapparovna, Candidate of Biological Sciences, Hirsch Index – 3; Researcher ID <u>N-9689-2014</u>, ORCID: <u>0000-0003-2770-5142</u>, Scopus Author ID: 34872971800. 4. Ukibaev Dzhandos Kozhakhovich, Master of Chemistry, H-Index – 2; Researcher ID: AEZ-1545-2022, ORCID: <u>0000-0002-0354-3604</u>, Scopus Author ID: 56951158300. 5. Aralbaev Nurbek Amanovich, PhD, H-index – 1; ORCID: 0000-0003-4507-0056, Scopus Author ID: 57211602834. 6. Narmuratova Zhanar Bakhytovna, master, H-index – 3; Researcher ID: <u>ABE-8883-2021</u>, ORCID: <u>0000-0003-1641-4753</u>, Scopus Author ID: <u>57216731811</u> 7. Kuanysheva Asem, bachelor

List of publications with links to them	
Patents	-