Project name: IRN AP19576848 - Development of dry, waterproof, full-ration extruded feed based on a symbiotic recipe to increase fish productivity and assess the quality of fish products

Relevance: Currently, one of the main tasks of the agro-industrial complex is to meet the needs of the population in high-quality fish products, which is impossible without increasing the productivity of fish. Recently, scientists have begun to use symbiotics, probiotics in feeding fish. Numerous works of foreign and Russian scientists on testing symbiotics in fish farming have shown the possibility of their successful use as an additive to feed. There is reason to hope that the use of symbiotic preparations in feeding fish can have a significant positive effect. Previous studies in this direction can be characterized as fragmentary and do not provide sufficient information on the rationale for the use of symbiotics in the composition of fish feed, especially in Kazakhstan.

Purpose: To develop dry waterproof full-ration extruded feeds based on a symbiotic recipe to increase the productivity of fish and give a veterinary and sanitary assessment of the safety and quality of fish products when using them.

Expected and achieved results: As a result of the project implementation, the following will be published:

- at least 2 (two) articles and (or) reviews in peer-reviewed scientific publications in the scientific direction of the project, indexed in the Science Citation Index Expanded of the Web of Science database and (or) having a CiteScore percentile in the Scopus database of at least 35 (thirty five);
- at least 1 (one) article or review in a peer-reviewed foreign or domestic publication recommended by the CCIS;
- at least 1 (one) article or abstract in the materials of the international conference;
- 1 (one) recommendation on the use of developed feed based on a symbiotic recipe will be prepared;
- 1 (one) patent of the Republic of Kazakhstan will be obtained based on the results of research;
- 2 (two) dry water-resistant complete extruded feeds based on a symbiotic recipe will be developed to increase the productivity of tilapia and African catfish, with a scientific justification for each component of the recipes;
- a veterinary and sanitary assessment of the quality and safety of the developed feed will be carried out by assessing the overall toxicity using biological research methods;
- an assessment will be made of the effectiveness of the developed feed on the productive qualities of tilapia and African catfish when grown in a recirculating water supply system;
- an assessment will be made of the effectiveness of the developed feed on the productive qualities of tilapia and African catfish when grown in a recirculating water supply system;
- 1 seminar or round table with SHTP will be held;
- at least the 1st final master's work will be prepared.

Project Leader - Paritova Assel Yerzhanovna, PhD, acting associate professor of the department "Veterinary Sanitation" S.Seifullin KazATIU

Hirsch index - 3, Researcher ID P-2121-2017, ORCID 0000-0001-7036-1037, Scopus Author ID 55929080200.

Study group members:

Grzegorsz Zwieshchowski – co-executor and foreign consultant highly qualified scientist, PhD, associate professor of the Department of Biochemistry, biologist, livestock specialist at the University of Warmia and Mazury in Olstein (Poland), postdoc of the Department of Agriculture, Food and Dietology, University of Alberta (Edmonton, Canada).

Hirsch index - 9, Researcher ID - Researcher ID - C-8621-2018, ORCID 0000-0003-1051-7591, Scopus Author ID 55552592200.

Kuanchaleev Zhaksygali Batyrgaleevich - PhD, Senior Lecturer of the Department of "Hunting and Fisheries" S.Seifullin KazATIU. Hirsch index - 1, Researcher ID - ORCID 0000-0001-9032-6861 Scopus Author ID 57211712283.

Issabekova Saltanat Aitymovna - candidate of agricultural sciences, acting associate professor of the department "Technologies for the production of livestock products" S. Seifullin KazATIU.

Hirsch index - 1, Researcher ID-ORCID 0000-0002-0401-6443, Scopus Author ID 57201503199.

Zhanabaeva Dinara Kabdullaevna - PhD, Senior Lecturer of the Department of Veterinary Sanitation, S. Seifullin KazATIU.

Hirsch index - 1, Researcher ID 0-4822-2017, ORCID 0000-0001-7499-347X, Scopus Author ID 57245651569.

Murzakayeva Gulmira Kalikhanovna - PhD, Senior Lecturer of the Department of Veterinary Sanitation, S. Seifullin KazATIU.

Hirsch index - 1, Researcher ID - ORCID 0000-0002-0282-8747, Scopus Author ID.

Aitkozhina Botagoz Zhanbyrshevna - PhD, Senior Lecturer, Department of Veterinary Sanitation.

Also, 2 undergraduates and 1 student are involved in the project as technical staff. The theme of their dissertations and theses is directly related to the theme of the project.

Information for potential users:

According to a review of the literature of Kazakh authors in the Republic of Kazakhstan, studies were previously conducted to study the effect of various feeds based on phytobiotics for fish, but there are no studies on the effect of feeds based on symbiotics. Although the use of feed based on symbiotics for fish has long been practiced abroad, excellent results have been obtained in increasing the productivity of fish, in improving the intestinal microflora of fish, which has a positive effect on increasing immunity to various infectious diseases. At present, feed and feed additives for fish based on symbiotics are not being developed in the Republic of Kazakhstan. To carry out such tasks, knowledge and skills in the field of fish farming, animal husbandry, veterinary and sanitary examination of fish products, as well as a basis for conducting experimental studies on feeding the

developed feeds and feed additives to fish are necessary for the subsequent study of their impact on fish biological indicators, the productive qualities of fish.

Similar works on the development of new fish feeds based on symbiotics and their impact on the physiological state of fish and their productivity are currently being studied by many foreign researchers, including Russian scientists. Therefore, the topic of the project is still relevant and its significance on a national and international scale is beyond doubt.

Additional Information:

In the process of performing research work, innovative patent of the Republic of Kazakhstan will be issued in co-authorship with the research group, while the patent holder will be NJSC S. Seifullin KATIU.