

Name of project: Individual Registration Number №AP09259983
"Development of a rapid test for the diagnosis of *Salmonella* abortion in horses based on monoclonal antibodies."

Relevance: Horse breeding in the Republic of Kazakhstan is the most important branch of animal husbandry; currently, the number of horses is more than 3 180 000 heads. *Salmonella* abortion of mares is an infectious disease, accompanied by abortion and the birth of an unviable fetus. The economic damage consists of the loss of reproductive capacity of mares, lack of offspring, reduced productivity of mares and the expenses of veterinary drugs and disinfection. In this regard, the most important measures for the development of this area of animal husbandry are to ensure the health of animals and increase the efficiency of diagnosis of diseases. The main diagnostic method is bacteriological, but it is not sensitive enough, time-consuming and highly dependent on the quality of the material. According to the OIE recommendations, PCR can be used, however, its use is difficult due to the high cost of equipment and test systems. ELISA can be used in mass research, but does not allow differentiation of the pathogen.

This project provides for the development of a domestic immunochromatography test for the detection and simultaneous differentiation of the causative agent of *Salmonella* abortion in horses. The test will allow analysis outside the laboratories and get the result within 15 minutes. The test can be used for monitoring studies instead of labor-intensive bacteriological analysis. The developed test can be in demand not only in Kazakhstan, but also in the CIS countries, where this infection is also widespread. Currently, there are no analogues in the Republic of Kazakhstan.

The purpose of the work: development of a domestic rapid test based on monoclonal antibodies for the diagnosis of *Salmonella* abortion in horses, which will allow for the rapid and accurate identification of infected animals.

Expected and achieved results:

The genomes of 6 *Salmonella enterica* isolates obtained from pathological material (abortion fetuses) and biological material from mares were sequenced. According to the results of genotyping at 7 classic MLST loci, the isolates belong to the ST251 sequence type.

Recombinant *S. abortus equi* OmpX antigens were obtained and used for immunization of Balb/c mice in order to obtain immune splenocytes. As a result of the fusion of myeloma cells with cells of immune lymphocytes, ten hybrid clones producing antibodies to *S. abortus* OmpX proteins were obtained. The selection and cultivation of the four most active positive clones producing monoclonal antibodies was carried out.

Based on the use of the obtained antibodies, a rapid test will be developed to detect the causative agent of *Salmonella* abortion in horses in biological and pathological material. The test can be used to assess the quality of meat products (horse meat) in terms of contamination with *Salmonella spp.*

Based on the results obtained, an article was published in the journal Science Bulletin of the Kazakh Agrotechnical University named after S. Seifullin and two theses in the materials of international conferences.

Three articles will be published in peer-reviewed scientific journals, and one patent of the Republic of Kazakhstan will be received. Scientific and technical documentation for the production and use of the ICA test for express diagnostics of *Salmonella* abortion in horses will be developed.

Target consumers of scientific products: "Republican Veterinary Laboratory" of the Ministry of Agriculture of the Republic of Kazakhstan, regional and district laboratories; "National Reference Center for Veterinary Medicine"; business entities engaged in horse breeding.

Research team members:

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Members of research group:

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Information for potential users:

The domestic express test for the diagnosis of *Salmonella* abortion in horses will be developed, which allows outside laboratory conditions, to analyze biological and pathological material and obtain reliable results within 15 minutes. The use of the test in veterinary practice will make it possible to monitor this infection directly on farms and replace the lengthy and laborious bacteriological analysis. In addition, the test can be used to quickly and reliably assess the quality of horse meat for contamination with microbes of the genus *Salmonella*.