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**A. M. Namet¹, N. P. Ivanov¹, D. M. Bekenov², M. B. Bazarbayev¹,
E. K. Ospanov¹, F. A. Bakieva¹, R. S. Sattarova¹, N. Zh. Akmyrzaev¹**

¹“Kazakh Scientific Research Veterinary Institute”, Almaty, Kazakhstan,

²LLP “ERPCBayserke-Agro”, Almaty, Kazakhstan.

E-mail: ainamet@mail.ru, akademik-vet@mail.ru, unpcbayerke-agro@mail.ru,
ergan_68@mail.ru, flurachka-78@mail.ru, rano_mail.ru@mail.ru, nurlan.90.92@inbox.ru

EPISOOTOLOGICAL MONITORING OF CATTLE MORAXELLOSIS

Abstract. Infectious keratoconjunctivitis (IKC) of moraxella etiology, according to the literature, is registered in many countries of the world, including in the Republic of Kazakhstan. Monitoring of infectious keratoconjunctivitis of moraxella etiology in the Republic of Kazakhstan shows that the disease was detected in 9 areas and 11,738 head of cattle of the breed Aberdeen-Angus were infected, the incidence averaged 39.98%.

In the economic entities of the Republic of Kazakhstan, where cattle were imported from far abroad, in all cases the presence of the disease, as well as all links of the epizootic process, i.e. the source of the pathogen, the transmission mechanism of the infectious agent (transmission factors - non-living objects and vectors - insects), as well as susceptible animals.

One of the main reasons for the appearance of the disease is the import of imported breeding stock, among which there were sick animals, and the movement of infected livestock without appropriate anti-epizootic measures led to a wide spread of the disease and an increase in the number of unfavorable items.

Infectious keratoconjunctivitis in cattle of moraxella etiology is clinically characterized by a lesion of the eye from inflammation until complete loss of vision and is manifested by staging.

Moraxellosis of cattle is manifested mainly in the spring-summer period of the year, more often in the warm season, in the period of mass activity of insects.

Animals of all ages get sick, but more often animals up to 2 years of age, regardless of gender, and hot and sunny weather, high dustiness of indoor and pasture air, as well as insects contributed to its wide and rapid spread and clinical manifestation in the herd.

On the basis of the conducted studies, it can be concluded that in the fight against moraxellosis of cattle it is necessary to conduct a full range of these anti-epizootic measures that require dynamic improvement depending on the biological properties of the pathogen, antibacterial resistance, clinical manifestations of the disease, as well as feeding conditions and content.

Key words: infectious keratoconjunctivitis, moraxellosis, epizootological monitoring, cattle.

Research objective. To conduct epizootological monitoring of cattle moraxellosis in the context of epizootological units of economic entities of the Republic of Kazakhstan.

Material and methods. The studies were carried out within the framework of the program “Ensuring veterinary and sanitary safety and epizootic well-being on cattle moraxellosis”. Epizootological, clinical, pathologic-anatomical and bacteriological methods for diagnosing animal moraxellosis were used in the performance of research work.

Relevance. One of the most common diseases that manifest themselves in damage to the organs of sight in cattle is infectious keratoconjunctivitis (ICH), caused by bacteria of the Moraxella genus, which is registered in many countries around the world, including the Republic of Kazakhstan.

Thus, in the United States of America, the ICC of cattle of moraxella etiology annually affects about 10 million animals, causing economic damage of more than \$ 150 million (Hansen, 2001).

In some of the far abroad countries, the ICC of the large horn cattle reaches 45.4%, and the economic damage caused by the disease is reduced by the live weight of the animal, and the milk production is reduced, the milk is reduced, the decrease in production is reduced by 45.4%.

Results and analysis of the data. Monitoring of cattle disease with infectious keratoconjunctivitis in the Republic of Kazakhstan shows that one of the main causes of the disease is the import of imported breeding livestock, among which sick animals took place, and the movement of infected animals throughout the regions of the Republic of Kazakhstan without corresponding antiepidemiological measures led to widespread disease and an increase in the number of dysfunctional business entities [2].

According to the data of the Meat Union of Kazakhstan sent to us, mores among the cattle are noted mainly among the imported stock of Aberdeen-Angus breed (table, figure 1).

Table 1 – Information on the distribution of moraxellakeratoconjunctivitis among the Aberdeen-Angus breed imported to the Republic of Kazakhstan

Name of regions	The number of imported livestock animals for 2012-2018 / the presence of patients		
	Aberdeeno-Angus		
	Delivered	Got sick	
absolute amount		percent	
Akmola	7355	2942	40,00
Aktobe	2382	952	39,96
Almaty	4811	1924	39,99
Atyrau	–	–	–
East Kazakhstan	1103	441	39,98
Zhambyl	503	201	39,96
West Kazakhstan	–	–	–
Karaganda	–	–	–
Kostanay	6646	2658	39,99
Kyzylorda	–	–	–
Mangystau	–	–	–
Pavlodar	2347	938	39,96
North Kazakhstan	3572	1428	39,97
South Kazakhstan	637	254	39,87
Total	29 356	11 738	39,98

As shown in table and figure 1, the disease was detected in 9 regions of the Republic of Kazakhstan, where 11,738 heads of cattle were infected, with an average incidence rate of 39.98%.

Epizootological monitoring in respect of moraxellosis of cattle, carried out by us in the economic entities of the Republic of Kazakhstan, this year allowed us to identify the characteristics of the occurrence, development and manifestation of the disease, as well as to establish the extent of its spread.

The first cases of the disease among cattle were registered by us during an epizootological survey of the beef herd of productivity in Bayserke-Agro LLP.

During epizootological examination of separately contained groups of animals in Bayserke-Agro LLP (Kumtobe mountain distant site), we found that eye disease in cattle was observed mainly in animals of the Aberdeen-Angus breed. In a clinical examination of 274 heads of cattle, we noted in 16 animals the characteristic features of moraxellosis.

The animal disease manifested initially in the form of swelling of the conjunctiva and tearing and covered 5.8% of the population. At the initial stage, a serous outflow from the medial angle of the eye appeared, and later a congestion of mucous and purulent exudates was observed. Palpation revealed eyelid tenderness, increased local temperature. Later, a more or less pronounced corneal clouding appeared and on the 6–10th day erosion about 1 mm in diameter developed at its center, which soon turned into an ulcer. The stage of ulceration was accompanied by strong anxiety of animals, relatively high body

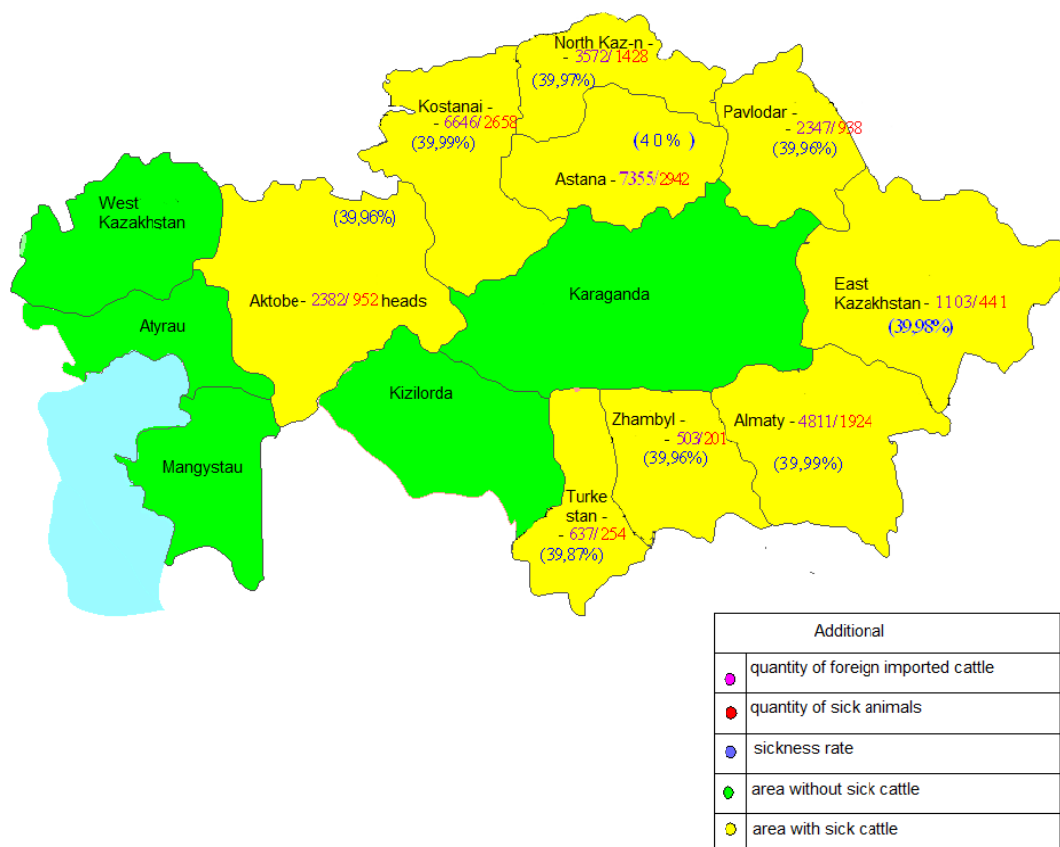


Figure 1 – Mapping (zoning) of the territory of the Republic of Kazakhstan into zones according to the extent of the spread of morax cough infection among cattle for 2012-2018

temperature, reaching up to 41 ° C and refusal of food. Corneal opacification quickly spread in all directions from the ulcer. Over the next 10-15 days, the development of the vascular network appeared at the edge of the lesion, and in some particularly severe cases, it surrounded the entire cornea along the periphery, forming a red rim. These changes led to a thickening of the cornea and a loss of its transparency. Cases have been observed where the vessels germinated toward the center of the cornea and formed an elevation in the shape of a nipple. Subsequently, the blood supply was stopped, and the bright color of the vascular plexus assumed a pale hue. Within 25–50 days, vascular induction decreased in size and completely disappeared. Among animals and especially young animals of 6-10 months of age, the deformation of the eyeball was observed. In 2% of 6-8-month-old calves, all layers of the cornea perforated as a result of its ulceration and the vitreous flowed out. As a result, one- or two-sided blindness occurred. Defeat was usually observed in one eye, and if in both - then at a different stage of the course.

These features of the development of animal diseases. In “Baiserke-Agro” LLP we were also noted when examining the livestock of cattle (mainly aberdine-angus breed) and in other regions of the Republic of Kazakhstan, which was confirmed by clinical manifestations of the disease.

In the dynamics of the development of the disease, we can conditionally note five stages that go smoothly into one another:

- catarrhal conjunctivitis with photophobia, serous lacrimation, hyperemia of the peripheral tissues of the eyeball and blepharospasm is possible, figures 2, 3;
- parenchymal keratitis, corneal edema, figures 4, 5;
- beginning purulent keratitis, keratocele, corneal ulcer, corneal opacity, figure 6;
- purulent keratoconjunctivitis, corneal perforation, figure 7;
- purulent panophthalmia, blindness, figure 8.

These stages of the disease were detected by us during the examination of the livestock of cattle in all regions of the country.



Figure 2 – Serous tearing, hyperemia of peripheral tissues of the eyeball



Figure 3 – Catarrhal Conjunctivitis with photophobia



Figure 4 – Parenchymal keratitis



Figure 5 – Corneal Edema

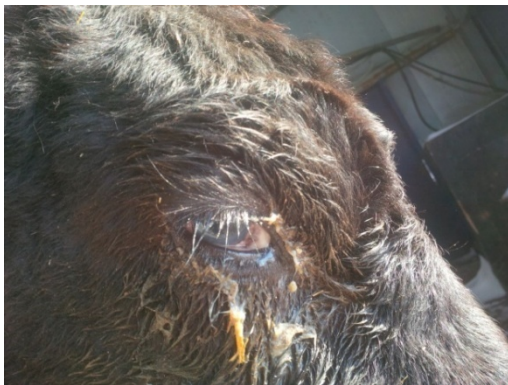


Figure 6 – Starting purulent keratitis



Figure 7 – Corneal Perforation



Figure 8 – Purulent anoftalmia, blindness

Figures 2–8 show photographs of the clinical manifestations of all keratoconjunctivitis stages we have found in cattle.

In the center of the cornea appears a center of dark gray opacities, which turns into a lighter, gray-blue spot. From the edge of the cornea, capillaries grow into the zone of diffuse opacification, thereby creating a narrow pink hyperemic strip (ring) around the zone of turbidity. In some animals, swelling of the clouded part of the cornea and the development of ulcers leading to blindness are observed. With delayed treatment, recovery is delayed for a long time (weeks, months) or is not achieved at all.

Sick animals are anxious and kept in the shadows, their appetite and productivity decrease, and animals that have completely lost their eyesight can eat only after they feed them directly in a container.

Trying to find out the alleged source of the pathogen and possible ways of bringing the disease, we found that the emergence of animal diseases is associated with the importation from the foreign countries (Canada, Australia) of pedigree cattle of the Aberdeen-Angus breed. In the future, the epizootic process intensified in the summer period of time, which may be due to the presence of pathogen carriers, which can be stinging insects, and as a result of increased pathogenicity as a result of the passage of the pathogen when it is transmitted from an infected animal to a healthy one.

Observations have established that the causative agent of the disease can be transferred by means of transmission factors (not living objects), and also insects can be probable carriers. Auxiliary factors affecting the course and clinical manifestation of the disease are also eye injuries, hot weather, wind and dust. And moving an infected livestock carrier of a pathogen from one farm to another is a direct path to a significant spread of the disease. Consequently, the continuity of the epizootic process was ensured, which caused the emergence of new outbreaks of the disease.

There are observations of the employees of the Kazakh SRVI on the availability of the disease among some other breeds, in particular, Hereford and Kazakh white-headed. Obviously, there is a potential possibility of further expansion of the specified disease among other breeds of CRC contained in the territory of the Republic of Kazakhstan.

In the Republic of Kazakhstan, despite the wide spread of infectious keratoconjunctivitis of moraxella etiology, the issues of microbiology and immunology of the disease have not been studied. The reason for this is that moraxellosis of cattle in our country is a new, poorly studied disease, and its early diagnosis in our country has not yet been developed. Therefore, in the absence of proper antiepidemiological measures, there is a potential danger of further spreading it to other species of animals that are kept together.

Based on the above, it is very important to develop methods for the isolation, conditions for the cultivation of bacteria of various species, including *Moraxella bovis* and *Moraxella bovoculi*. Requires the study of the biological properties of pathogens circulating among animals in the territory of the Republic of Kazakhstan. It is very important to determine the role of different types of moraxella in the etiology of the disease and on this basis the development of diagnostic methods, specific prevention, and the implementation of antiepidemiological measures.

On the basis of the conducted research, it can be concluded that in the fight against moraxellosis in cattle it is necessary to carry out the full range of these antiepidemiological measures [3,4], which require dynamic improvement depending on the biological properties of the pathogen, antibacterial resistance, clinical manifestations of the disease, and feeding conditions and content.

**А. М. Намет¹, Н. П. Иванов¹, Д. М. Бекенов², М. Б. Базарбаев¹,
Е. К. Оспанов¹, Ф. А. Бакиева¹, Р. С. Саттарова¹, Н. Ж. Ақмырзаев¹**

¹Қазақ ветеринария ғылыми-зерттеу институты, Алматы, Қазақстан,

²«Байсерке-Агро ББҒӨ» ЖШС, Алматы облысы, Қазақстан

ІРІ ҚАРА МАЛМОРАКСЕЛЛЁЗЫНЫҢ ІНДЕТТАНУЛЫҚ МОНИТОРИНГІ

Аннотация. Ірі қара малморакселлөзіне жүргізілген індеттанулық мониторинг аурудың этиологиясын, ауру қоздырушысының бастауын, ауру тетігінің берілу факторын анықтауға, індетке қарсы шараларды жетілдіру үшін алынған деректерді талдауға мүмкіндік берді.

Түйін сөздер: инфекциялық кератоконъюнктивит, моракселлөз, індеттанулық мониторинг, Ірі қара мал.

А. М. Намет¹, Н. П. Иванов¹, Д. М. Бекенов², М. Б. Базарбаев¹,
Е. К. Оспанов¹, Ф. А. Бакиева¹, Р. С. Саттарова¹, Н. Ж. Ақмырзаев¹

¹ТОО «Казахский научно-исследовательский ветеринарный институт», Алматы, Казахстан,

²ТОО «УНПЦ Байсерке-Агро» Алматинская область, Казахстан

ЭПИЗООТОЛОГИЧЕСКИЙ МОНИТОРИНГ МОРАКСЕЛЛЁЗА КРУПНОГО РОГАТОГО СКОТА

Аннотация. Проведен эпизоотологический мониторинг моракселлёза крупного рогатого скота, который позволил выявлять этиологию заболевания, определить источник возбудителя болезни, установить факторы передачи заразного начала, провести анализ полученным данным с целью разработки противоэпизоотических мероприятий.

Ключевые слова: инфекционный кератоконъюнктивит, моракселлёз, эпизоотологический мониторинг, крупный рогатый скот.

Information about authors:

Namet Aidar Myrzakhmetuly, chief researcher, doctor of veterinary sciences, Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; ainamet@mail.ru; <https://orcid.org/0000-0001-9639-4208>

Ivanov Nikolai Petrovich, chief researcher, doctor of veterinary sciences, professor, academician of the National Academy of Sciences of the Republic of Kazakhstan; Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; akademik-vet@mail.ru; <https://orcid.org/0000-0003-1964-241X>

Aliyev Murat Ashrafovich, doctor PhD, General Director of Baysyerke-Agro LLP, Almaty region, Kazakhstan; baysyerke-agro.kz@mail.ru; <https://orcid.org/0000-0002-4439-9565>

Bekenov Dauren Maratovich, director, master of natural sciences and biotechnology, “UNPTs Baysyerke-Agro” LLP Almaty, Kazakhstan; unpcbaysyerke-agro@mail.ru; <https://orcid.org/0000-0003-2244-0878>

Bazarbayev Marat Bazarbayevich, chief researcher, doctor of veterinary sciences, Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; bazarbaev48@mail.ru; <https://orcid.org/0000-0001-5609-1544>

Ospanov Erzhan Kalimoldinovich, senior researcher, candidate of veterinary sciences, Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; ergan_68@mail.ru; <https://orcid.org/0000-0001-6903-3570>

Bakieva Flyura Albertovna, senior research scientist, Candidate of Veterinary Sciences, Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; flurachka-78@mail.ru; <https://orcid.org/0000-0003-0627-2608>

Sattarova Rano Saitomarovna, senior researcher, candidate of veterinary sciences, Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; rano_mail.ru@mail.ru; <https://orcid.org/0000-0001-9105-4415>

Akmyrzaev Nurlan Zharylkasynuly, junior researcher, Kazakh Scientific Research Veterinary Institute LLP, Almaty, Kazakhstan; nurlan.90.92@inbox.ru; <https://orcid.org/0000-0001-8896-3482>

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