және ауру жұқтыру деңгейі арасында байланыс бар. Бұл жабайы және үй жануарларының санын бақылау мен реттеуге кешенді көзқарастың қажеттілігін растайды.

РЕЗЮМЕ

Исследование фокусируется на анализе эпизоотической ситуации, связанной с гельминтозами сайгаков в Западно-Казахстанской области, особенно в контексте миграционных путей, пересекающихся с территориями фермерских хозяйств. В условиях роста численности сайгаков и плотности сельскохозяйственных животных, необходим тщательный мониторинг для предотвращения распространения инвазии, которые могут затронуть как дикую, так и домашнюю фауна. Исследование охватывает период с 2021 по 2024 годы, а целью является выявление наиболее распространенных гельминтозов, а также оценка эпизоотического процесса с использованием современных методов анализа, включая геоинформационные системы (ГИС).

Основное внимание уделено миграционным путям сайгаков в Казталовском и Жанибекском районах Западно-Казахстанской области, где были собраны данные о заражении гельминтами и зарегистрированы неблагоприятные точки. Результаты показали стабильность заболеваемости с преобладанием определенных видов паразитов. Особое внимание было уделено зонированию территорий по степени опасности, что позволяет эффективно планировать профилактические и противоэпизоотические мероприятия. Установлена зависимость между плотностью сельскохозяйственных животных и уровнем заражения, что подтверждает необходимость комплексного подхода к контролю и регулированию численности как диких, так и домашних животных.

UDC 619:616.993.192. ***DOI 10.52578/2305-9397-2024-4-1-86-95***
IRSTI 68.41.55

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EPIZOOTIC SITUATION AND ECONOMIC DAMAGE FROM BOVINE THEILERIOSIS IN THE SOUTH OF KAZAKHSTAN

ANNOTATION

Blood-parasitic diseases of cattle in the region of southern Kazakhstan have long attracted the attention of researchers, who made an invaluable contribution to the study and development of measures to combat piroplasmidosis. As a result, the species affiliation of cattle piroplasmidosis pathogens was determined, which turned out to be Th.annulata, P.bigeminum, Babesia bovis. As for vectors of pyroplasmids, three species of ticks of genus Hyalomma (H.anatolicum, H.detritum, H.asiaticum) - vectors of the causative agent of theileriosis of cattle and genus Boophilus (B.calcaratus) - vector of

P.bigeminum, B.bovis (Fr.colchica) were found in the territory of the south of Kazakhstan. The presence of triad of invasion: pathogen, ticks - vectors and susceptible animals - has long been responsible for the stationary unpreparedness of the territory of Turkestan region for blood-parasitic diseases of cattle.

According to the vetoreports of Turkestan region for the last 5 years, 34630 animals fell ill with piroplasmidosis, of which pirplasmosis and babesiosis - 10133, teileriosis - 14497. Waste amounted to 3318, of which from piroplasmosis and babesiosis - 1419 and from theileriosis - 1899 animals.

The most unfavorable were Saryagash, Sairam, Baidi-Bek and Ordabasin districts, where up to 85-96% of livestock from the number of susceptible animals were annually infected. At the same time, more than 75% of them, diseased with piroplasmidosis in the oblast, were in Saryagash and Sairam districts. This situation is explained by the fact that in these two districts against the background of intensive development of irrigated farming, manifestation of all necessary environmental conditions (optimal temperature, humidity, availability of a large area of floodplain pastures) for the development of disease vectors there was concentrated a large number of imported and improved cattle, highly sensitive to piroplasmidosis.

Key words: *Bovine Theileriosis, ixodes, Hyalomma ticks, Babesia bovis, Th.annulata, P.bigeminum.*

Introduction. Ticks are a major vector of animal diseases [1], with about nine species, including the brown ear tick, known to be the main vector of the parasite teileria, which causes East Coast fever, also known as bovine teileriosis [2]. The disease is fatal in cattle and has been reported in 11 countries in East, Central and Southern Africa [3]. It is estimated that the direct economic losses associated with theileriosis are enormous, with more than 1.1 million cattle dying from the disease each year [4].

The life cycle consists of four developmental stages: egg, larva, nymph and adult. Adult activity peaks during the rainy season, while the larval and nymphal stages peak during the dry season [5]. In areas with sufficient rainfall, up to three generations of ticks can occur in a single year [6]. Only larvae and adults can transmit infections such as East Coast fever, and only larvae and nymphs can become infected. Ticks feed on three different hosts. Although this results in a change in host, the host species does not usually change [7]. However, ticks can feed on various groups of ruminants including sheep and goats, but their preferred hosts are cattle, buffalo and large antelopes. Their favourite feeding sites are the ears and anal region [8]. Their occurrence has been reported mainly in forested areas or wooded savannahs, in areas where annual rainfall is at least 24 inches [9].

Theileriosis caused by Theileria annulata is a serious economic impediment to improved milk production in the coastal regions of Kazakhstan and leads to carcasses and reduced productivity, especially in highly susceptible taurine breeds and their littermates. Farmers are discouraged from renewing their local cattle due to the perceived high risk of theileriosis infection, and cattle of existing breeds are largely reared through frequent application of acaricides. However, this approach has failed to make a significant impact on tick control as it is considered impossible to eradicate ticks and tick-borne diseases [10]. Selection of acaricide-resistant ticks and alternative tick hosts has also significantly reduced the effectiveness of this control method [11].

Immunisation of cattle against theileriosis using the infection and treatment method [12] offers the prospect of less costly and more effective control of this disease without continued reliance on expensive acaricides. The resulting immune response, combined with low levels and constant natural load, protects the animal for the rest of its life [13, 14]. However, the risk associated with other tick-borne diseases such as anaplasmosis and babesiosis limits the use of more stringent tick control methods.

Materials and methods. The work was conducted during 2023-2024 in the laboratory of the National Veterinary Reference Center, in farms of Turkestan, Kyzylorda and Zhambyl regions. Based on the well-known position that knowledge of details of epizootic situation in a certain area is the basis for the implementation of therapeutic and prophylactic work, we determined as the first task - to detail, taking into account the literature data, the epizootic situation on theileriosis in the most unfavorable zones of southern Kazakhstan, where our main work on the prevention of piroplasmidosis, especially on bovine theileriosis. These zones include the territories of Turkestan, Kyzylorda, Zhambul and part of Almaty oblasts.

The above-mentioned was the reason for the fact that in our research, along with analyzing the epizootic situation in farms on the territory of the republic in general, we first of all paid attention to the regions of newly developed lands.

In accordance with the planned tasks, the number of cattle from year to year should have increased due to the importation of pedigree gene pool and young stock. However, a significant brake in the development of cattle breeding in this zone was the loss of animals from piroplasmidosis. It is enough to note that according to the official statistics data only for 10 years (1963-1972) 14143 heads of cattle with piroplasmosis and babesiosis were diseased with piroplasmosis and babesiosis in the farms of the region, 16% of which died, 18% of animals diseased with theileriosis 17586 died.

As it was noted, in Makhtaaral and Shardara districts for the last quarter of the last century, virgin and fallow lands for crops were developed on the vast territory of the plain part, many new cotton-growing state farms with large livestock complexes were established. Intensive agro-reclamation works, irrigation of developed lands have significantly changed natural-climatic and economic conditions of the new irrigation zone, having a favorable impact on the development of flora and fauna, including parasitic arthropods. In the old irrigation zone of Turkestan province, the fauna and bioecology of ixodid ticks were studied by Karabaeva et al. These studies were of a private, expeditionary nature, which did not allow to have sufficient information on the dynamics of ixodid distribution in the region. There were no reports in the literature on the infestation of new areas by ticks, while outbreaks of cattle piroplasmidosis started to be registered in these areas.

All this was the justification for our studies on the range, bioecology and phenology of ixodid ticks both in the new and old irrigation zone of the oblast.

Results and discussion. These studies were of a private, expeditionary nature, which did not allow to have sufficient information on the dynamics of ixodid distribution in the region. There were no reports in the literature about tick infestation of territories of new areas, while outbreaks of cattle piroplasmidosis started to be registered in these areas.

All this was the justification for our studies on the areal, bioecology and phenology of ixodid ticks in both new and old irrigation zones of the oblast.

As a result, it was determined that 11 species of ixodid ticks parasitise cattle in these areas. The predominant species in our collections were H. detritum (34.8), B. calcaratus (30.8%), H. anatolicum (28.4). H. asiaticum, H. plumbeum followed in descending order; the other species were found in small amounts from 0.05 to 0.08% of the total collection. Of 5 species of the genus Hyalomma - H. asiaticum, H. plumbeum, H. punctata, H. detritum, H. anatolicum, and of the genus Boopillus - B. calcaratus, the last three are the main vectors of blood-parasitic diseases of cattle in the region (table 1).

Table 1 – Ixodes ticks parasitising cattle in farms of Turkistan oblast for 2023-2024.

Types of mites	Total collected	% of total collection
1. Boophilus calcaratus	19496	30,8 ± 0,38
2. Hyalomma detritum	22035	34,8 ± 0,15
3. Hyalomma anatolicum	18031	28,4 ± 0,18
4. Hyalomma asiaticum	896	1,4 ± 0,05
5. Hyalomma plumbeum	730	1,1 ± 0,04
6. Hyalomma scupense	98	0,15 ± 0,01
7.Dermacentor marginatus	153	0,2± 0,04
8.Rhipicephalus bursa	709	1,1 ± 0,04
9.Haemphysalis sulcata	45	0,07 ± 0,02
10.Haemphysalis punctata	561	0,8 ± 0,01
11. Dermacentor daghestanicum	538	0,85 ± 0,01
Total	63292	

It should be noted that detected ixodids are not equally distributed in different districts of the region. Thus, 11 species of ticks were found in Makhtaaral, Saryagash and Shardara districts, while Arys, Kazygurt, Ordabasin, Sairam districts registered up to 6 - 9 species. In other districts (Suzak,

Turkestan, Tulkibas and Tulebiy) up to 6 - 8 species of ticks were found.

As for the first three species (H.detritum, H.anatolicum and B.calcaratus) - the main vectors of blood-parasitic diseases, they were found on animals in all 13 surveyed districts of the oblast (table 2).

The analysis of materials on this zone showed that simultaneously with the settlement of the territory, the emergence of peasant farms of various forms of ownership, as well as livestock farms, epizootic foci of pyroplasmidosis were formed, because ticks - vectors of pathogens, the source of which were either ticks themselves (pyroplasmosis and babesiosis) or overdosed animals (theileriosis), were introduced with cattle. Over time, ticks adapted to new conditions and in the following years became mass ectoparasites of cattle. In the old irrigation zone (territory of Saryagash, Sairam, Turkestan, Ordabasinsk districts), the vector of piroplasms and babesia parasitises cattle en masse in April, July and September, when more than a thousand ticks in different phases of development could be collected on each animal.

Typical habitats for B. calcaratus in the old irrigation zone are lowland-tugai pastures, river valleys and vicinity of various water bodies, much less in foothill areas, this mite is absent in the desert zone. In newly organised farms and districts biotopes for this mite species are strips of land with different vegetation around and between crops, as well as part of undeveloped land near settlements.

Depending on the climatic conditions of the year, B.salsaratus ticks become active in March or April and parasitise animals until deep autumn with the following maximum tick infestation periods: April - May, July - August, September - October. During this period, two to three generations of ticks develop. They overwinter mainly in the larval phase.

The areal of endoglobular parasites, the ratio of individual species depending on the season of the year, as well as their epizootic significance for the regions of Makhtaaral and Shardara steppes in the conditions of intensive development of virgin and fallow lands and formation of many new farms and districts remained unstudied, which significantly affected the effectiveness of anti-pyroplasmidosis measures.

Carrying out special studies in this direction, we found that 4 species of blood parasites of cattle were registered on the territory of Makhtaaral and Shardara districts. The most frequently found Th.annulata - 56,6%, followed by P.bigeminum - 23,5%, B.bovis - 8,6%, mixed invasions in various combinations - 7,3% and A. marginale - up to 4,0%.

The first three species of pathogens and their combinations were registered in all farms of Saryagash, Sairam, Makhtaaral and Shardara districts. And in other districts (Baidibek, Turkestan, Tulkibas, Ordabasy, Tulebiy, Kazygurt) Th. annulata is more frequently found. Other species of piroplasmids are detected much less frequently.

The data on the ratio of piroplasmidosis pathogens depending on the season of the year are of considerable interest.

Thus, the data in table 2 show that in the two districts in spring the most diagnosed piroplasmosis pathogen was P.bigeminum (42.0%), Th.annulata was detected in 28.6%, B. bovis - 13.9%, mixed infestations - 12.2%, A.marginale - 3.3%.

In summer and autumn outbreaks, Th.annulata (72.8% and 53.4%, respectively), followed by P.bigeminum (14.5 and 19.4%), B.bovis (4.4 and 13.8%), mixed infestations (4.3 and 10.6%) and A.marginale (4.0 and 2.8) were the most recorded theileriosis pathogen.

Table 2 – Seasonal dynamics of individual pyroplasmid species in farms of Turkestan region

Season of the year	Number of smears analysed	Of which detected (in %)				
		Th. annulata	P. bigeminum	B. bovis	Mixed infestation	A. marginale
Spring	845	28,6	42,0	13,9	12,2	3,3
Summer	1536	72,8	14,5	4,4	4,3	4,0
Autumn	404	53,4	19,4	13,8	10,6	2,8
Total	2785	56,6	23,5	8,6	7,3	4,0

However, in the same districts, the seasonal dynamics of individual piroplasmid species is very ambiguous.

Thus, in Makhtaaral district in spring P. bigeminum was found in 47% of cases, Th. annulata - 28.4%, B. bovis - 10.8%, mixed infestations - 10.8% and A. marginale - 3%. In summer and autumn, Th.annulata was found more in 69.9% and 54.0%, respectively, followed by P. bigeminum in 19.7% and 12.6% and B. bovis in 4.0% and 14.8%. The remaining cases are due to mixed infestation and A.marginale.

In Saryagash district in spring, the piroplasmosis pathogen P.bigeminum was detected more frequently - 53.1%, then Th.annulata - 22.8% and less frequently B.bovis - 9.3%. Mixed infestations were Dianoscis dianoscis - 12.5% and A.marginale - 2.8%.

In summer, the causative agent of theileriosis Th.annulata was registered more (59.4%) and P.bigeminum less (20.6%), B.bovis was detected in only 6.6%, mixed infestations and A.marginale were detected in the same number.

In autumn, P.bigeminum and mixed infestation were most frequently detected (33.3% each), Th.annulata - 29.1%. The B. bovis pathogen was found in only 4.3% of cases, the rest being A. marginale.

Similar regularity in detection of piroplasmidosis pathogens in sick animals was observed in farms of Makhtaaral and Shardara districts.

On the contrary, in farms of Tulebyi, Tulkibas, and Kazygurt districts, located in the foothill-mountain part of the region, as well as located in semi-desert and desert zones, where H. anatolicum is more widespread, the ratio of piroplasmids was different.

In spring, summer and autumn, the causative agent of theileriosis was diagnosed significantly more (from 60.0 to 94.1), while P. bigeminum and B. bovis were detected relatively little (from 1.3 to 36.8%).

The ratio of the average number of piroplasmids detected in Saryagash, Makhtaaral, Shardara, Sairam, Ordabasin and Baidibek districts was revealed from the number of piroplasmids in per cent Th. annulata - 54.1 ± 9.5 in spring, 79.8 ± 5.5 in summer, 61.5 ± 10.4 in autumn; P. bigeminum - 24.9 ± 8.4, 10.2 ± 3.7, 15.0 ± 6.5; B. bovis - 6.9 ± 1.2 3.6 ± 0.7 6.7 ± 1.9, respectively.

Reliability of the obtained data is confirmed by Student's criterion, so with a probability higher than 95% it can be stated that the average value of the detected piroplasmid species will be within the limits indicated in the tables.

The following can be said about the nature of distribution of piroplasmids by seasons of the year. Based on the statistical analysis, for the species Th.annulata no significant difference in the registration of their number in spring and autumn is found. The difference is significant and reliable only for spring-summer seasons, and this difference is characterised by an increase in the number of piroplasmids.

As for vectors of theileriosis, the most widespread in the conditions of Turkestan oblast is Hyalomma detritum, which is mainly found in the valleys of rivers and sai. This species of mite inhabits mainly riparian areas and lowlands in the floodplain part of the Syrdarya with abundant vegetation. Biotopes for it can also be animal houses, frame and earthen walls, etc. It is relatively more difficult to detect this mite species in the foothill zones, and it is absent also in the territory of undeveloped steppe.

H. detritum, having a wide range in the old irrigated zone, is currently found, though in comparatively smaller numbers, everywhere in the territory of the new irrigated zone.

Parasitisation of sexually mature stages on animals starts from May to August, with maximum ticking in June-July. Single specimens occur in September and October. Larvae attack livestock in autumn in September-October and develop into well-fed nymphs. In warm autumn, some nymphs fall off and overwinter in the external environment, outside the host, while the bulk of the nymphs remain on animals in a state of torpor and fall off in the spring of the following year. The main host for them is cattle, but mites, especially in the larval and nymphal stages, can parasitise other animal species.

Hyalomma anatolicum is found in fairly significant numbers on animals in all farms of Arys, Tulkibas, Tulebia, Turkestan, Kazygurt and Otrar districts. In the new irrigation zone this tick species is registered mainly on private livestock in farms of Saryagash, Makhtaaral, Shardara and Sairam districts.

H.anatolicum adults parasitise animals for quite a long time (from april to october), and larvae and nymphs - from July to november. In warm winters, ticks attack animals even in January, February and march. In some farms, in the presence of optimal conditions for development, this species of mite is of greater epizootological importance than H.detritum, because their parasitic season is longer.

In this regard, early spring, late autumn and winter cases of theileriosis are the result of

parasitisation mainly by H.anatolicum ticks.

H.asiaticum is registered mainly in desert zones with ephemeral and xerophytic vegetation. Under experimental conditions, proved that nymphs and adults of the tick H. asiaticum are able to transmit the causative agent of theileriosis, but their role in the transmission of theileria in spontaneous conditions is very insignificant, since larvae and nymphs feed on wild animals [17-20].

We do not dwell on other mite species in detail, as their numbers in our collections are small and they are not important in the epizootology of pyropasmidosis.

The presence of triad of invasion: pathogen, ticks - vectors and susceptible animals - has long been responsible for the stationary disadvantage of the territory of Turkestan region on blood-parasitic diseases of cattle.

The most unfavourable were Saryagash, Sairam, Baidibek and Ordabasinsk districts, where up to 85-96% of the susceptible animals were annually infected. At the same time, more than 75 per cent of them, diseased with piroplasmidosis in the oblast, were in Saryagash and Sairam districts. This situation is explained by the fact that in these two districts against the background of intensive development of irrigated farming, manifestation of all necessary environmental conditions (optimal temperature, humidity, availability of a large area of floodplain pastures) for the development of disease vectors, a large number of imported and improved cattle, highly sensitive to piroplasmidosis, were concentrated.

The main part of the territory of Kazygurt, Tulebia and Tulkibas districts, which are livestock-breeding districts in the region, belongs to the zones of semi-desert, foothills and mountains. Here vectors of piroplasmosis and babesiosis occur ‘mosaically’ in plain places, around saisons and other water reservoirs, and in this connection rare cases of disease are observed.

In the new irrigation zone, piroplasmosis and babesiosis have been recorded on both public and private sector livestock, and outbreaks are more likely to be sporadic.

Enzootic piroplasmosis and babesiosis of cattle in Makhtaaral and Shardara steppes follows a two-vertex curve with peaks of invasion in April and July. As a rule, there is no big outbreak in autumn, but sometimes mass cases of the disease are observed, and depending on climatic conditions of the year it can last until November-December.

The fact is that, according to the data of a number of researchers and our long-term observations, about 90% of the territory of the south of Kazakhstan can be classified as unfavorable for theileriosis, where vector ticks are common, animals sick and ill with theileriosis are a source of invasion in nature. The importation of animals from the theileriosis-safe zones of the country to this territory, of course, was fraught with consequences, because all imported animals, as well as their offspring, were highly sensitive to theileriosis and, as a rule, in the first season of contact with invaded ticks, they became ill with theileriosis with a very high percentage of waste.

Methods of disease prevention were developed, which essentially amounted to vector control. However, the experience of the fight has shown that anti–tuberculosis measures aimed at combating vector ticks by treating animals with pesticides once 7 days in spring, summer and autumn, transferring livestock to stable maintenance and other measures to some extent reduce the incidence of animals. The use of an I% chlorophos solution in the fight against pyroplasmidosis vector mites contributed to the emergence of resistant tick races to this drug. As for dairy cows, their processing is prohibited.

The existence of guidelines according to which animals should be treated weekly with pesticides during the pyroplasmidosis season required an average of 25 animal treatments per year in the conditions of southern Kazakhstan. The appearance of cases of theileriosis by the management was regarded as a consequence of violation of instructions by specialists and was punishable. It was completely ignored that even regular treatment of animals does not guarantee them from infection with taileriosis. The consequence of this situation was the biased statistical data, which did not reflect the true picture of the epizootic situation for theileriosis. The modern area of blood parasites, the ratio of individual species of pathogens depending on the season of the year, epizootological significance of animal diseases caused by them for different natural-ecological zones of the south of Kazakhstan taking into account intensive land development and formation of new types of farms are insufficiently studied.

We registered four species of blood parasites of cattle Babesia bigemina, Babesia bovis, Theileria annulata and Anaplasma marginale in the south of Kazakhstan. Theileria annulata (72.9% of the total number) was the most frequently observed pathogen in the blood smears examined; pyroplasmids of B. bigemina species were observed in 21.1%, B. bovis - 6.3% and Anaplasma marginale - 3.2% of cases.

The ratio of piroplasmidosis pathogens depending on the season of the year is of considerable interest (table 3). In the southern region as a whole, babesiosis was more frequently diagnosed during the spring outbreak. In summer and autumn outbreaks, Th.annulata was significantly more frequently diagnosed.

Table 3 – Ratio of blood parasites of cattle depending on the season of the year

Periods of the year	Detected blood parasites, as a % of the number of trials			
	Theileria annulata	Babesia bigemina	Babesia bovis	Anaplasma marginale
Spring	30.1	48.2	18.7	4.0
Summer	81.3	9.6	5.4	5.7
Autumn	65.4	19.3	9.1	6.2

Mixed infestations (B.bovis or Th.annulata + B.bigemina or Th.annulata + B.bovis) were also observed. However, such endoglobular parasite communities were found in less than one per cent of the animals examined.

Th.annulata, B.bigemina and B.bovis and their combinations were observed in areas with intensive irrigation of lands (Makhtaaral, Saryagash Sairam and Shardara districts). In foothill steppe zones Th.annulata and A. marginale were observed more often, the causative agents of babesiosis were registered very rarely.

Table 4 – The ratio of pyroplasmids depending on the season of the year in the context of individual districts of Turkestan region

Districts	Time of year	Pathogen detected (%)		
		Theileria annulata	B.bigemina	Babesia bovis
Baidibek	spring	28,4	47,0	10,8
	summer	69,9	19,7	4,0
	autumn	54,0	4,0	14,8
Makhtaaral	spring	22,8	53,1	9,4
	summer	59,4	20,6	6,6
	autumn	29,1	33,3	4,4
Tulkibas	spring	60,0	18,8	8,2
	summer	76,9	14,1	2,9
	autumn	72,7	11,1	9,1
Ordabasinsky	spring	69,3	8,9	4,2
	summer	91,2	1,4	2,1
	autumn	86,3	2,5	3,1
Saryagash	spring	81,4	2,7	3,0
	summer	94,1	1,3	2,2
	autumn	90,0	2,0	3,2
	spring	62,5	18,7	6,2
	summer	87,5	3,7	3,7
	autumn	36,8	36,8	5,3
On average by region	spring	54,1 ± 9,5	24,9 ± 8,4	6,9 ± 1,2
	summer	79,8 ± 5,5	10,2 ± 3,7	3,6 ± 0,7
	autumn	61,5 ± 10,4	15,0 ± 6,5	6,7 ± 1,9

The results of studies have shown that the first three species of pathogens and their combination are registered both in irrigated and steppe zones. However, their range is not identical.

Thus, in the irrigated zone in the spring outbreak, B.bigemina was diagnosed more often - 51.2%, then Th.annulata - 27.4%, B.bovis - 14.1%.

In summer and autumn outbreaks, Th.annulata was more frequently detected 72.1% and 54.4%, followed by B.bigemina - 26.1% and 16.4%.

Conclusion. In the south of Kazakhstan there is a persistent unfavourable epizootic situation on cattle piroplasmidosis, causing serious damage to livestock production in the region. In co-operative and private farms of Turkestan region four species of piroplasmidosis pathogens were found in cattle: Babesia bigemina, B. bovis, Theileria annulata and Anaplasma marginale. The dynamics of diseases caused by them by seasons of the year depended on the location of farms in the natural-economic zones of the region. Thus, in the irrigated zone, enzootics caused by B. bigemina prevailed in spring, in summer and autumn - by Th. annulata. In the steppe zone, Th.annulata was the predominant causative agent of piroplasmidosis in all mentioned seasons.

Acknowledgments: The work was carried out within the framework of the grant project of the Ministry of Science and Higher Education of the Republic of Kazakhstan for 2024-2026 Study of the role of blood-sucking insects in the spread of arbovirus infection of farm animals in the southern regions of the Republic of Kazakhstan (State registration «AP23489181»).

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ТҮЙІН

Оңтүстік Қазақстан өңіріндегі ірі қара малдың қан паразиттік аурулары пироплазмидоздармен күресу шараларын зерделеу және әзірлеу проблемасына баға жетпес үлес қосқан зерттеушілердің назарын көптен бері аударып келеді. Нәтижесінде Th.annulata, P.bigeminum, Babesia bovis болып шыққан ірі қара малдың пироплазмидоз қоздырғыштарының түрлері анықталды. Пироплазмидті тасымалдаушыларға келетін болсақ, Қазақстанның оңтүстігінде Hyalomma (H. anatolicum, H. detritum, H. asiaticum) тұқымдас кенелердің үш түрі – ірі қара мал тейлериозының қоздырғышы және Boophilus (B. calcaratus) тұқымдасының тасымалдаушысы – P. bigeminum, B. bovis (Fr.colchica). Инвазия триадасының болуы: қоздырғыш, тасымалдаушы кенелер және сезімтал жануарлар – ұзақ уақыт бойы Түркістан облысы аумағының ірі қара малдың қан – паразиттік аурулары бойынша стационарлық қолайсыз аймаққа айналды. Соңғы 5 жылда Түркістан облысының ветеринариялық есеп беруімен 34630 жануар пироплазмидозбен ауырды, оның ішінде пирплазмоз және бабезиоз - 10133, тейлериоз – 14497. Қалдықтар 3318 құрады, оның ішінде пироплазмоз бен бабезиоздан – 1419 және тейлериоздан – 1899 жануар ауырған.

Сарыағаш, Сайрам, Байдибек және Ордабасы аудандары ең қолайсыз болды, оларда жыл сайын сезімтал жануарлардың ішінен малдың 85-96% - ы ауруға бейім болды. Бұл ретте облыста пироплазмидозбен ауырғандардың 75% - дан астамы Сарыағаш және Сайрам аудандарына тиесілі болды. Бұл жағдай осы екі ауданда суармалы егіншіліктің қарқынды дамуы, барлық қажетті экологиялық жағдайлардың көрінісі (оңтайлы температура, ылғалдылық, жайылмалы жайылымдардың едәуір аумағының болуы) аясында ауру тасымалдаушылардың дамуы үшін пироплазмидозға өте сезімтал импортталған және асыл тұқымды малдың көп мөлшері шоғырланғандығымен түсіндіріледі.

РЕЗЮМЕ

Паразитарные болезни крови крупного рогатого скота в регионе Южного Казахстана давно привлекали внимание исследователей, которые внесли неоценимый вклад в изучение и разработку мер борьбы с пироплазмидозом. В результате была определена видовая принадлежность возбудителей пироплазмидоза крупного рогатого скота, которыми оказались Th.annulata, P.bigeminum, Babesia bovis. Что касается переносчиков пироплазмид, то на территории юга Казахстана обнаружены три вида клещей рода Hyalomma (H.anatolicum, H.detritum, H.asiaticum) - переносчики возбудителя тейлериоза КРС и рода Boophilus

(B.calcaratus) - переносчик P.bigeminum, B.bovis (Fr.colchica). Наличие триады инвазии: возбудителя, клещей – переносчиков и восприимчивых животных – издавна обуславливало стационарное неблагополучие территории Туркестанской области по кровепаразитврным заболеваниям крупного рогатого скота.

Поданным ветотчетности Туркестанской области за последние 5 лет, пироплазмидозами заболело 34630 животных, из них пирплазмозом и бабезиозом - 10133, тейлериозом – 14497. Отход составил 3318, из них от пироплазмоза и бабезиоза – 1419 и от тейлериоза – 1899 животных.

Наиболее неблагополучными были Сарыагашский, Сайрамский, Байди-бекский и Ордабасинский районы, в которых ежегодно переболевало до 85-96% скота из числа восприимчивых животных. При этом более 75% из них, заболевших пироплазмидозами в области, приходилось Сарыагашский и Сайрамский районы. Такая ситуация объясняется тем, что в этих двух районах на фоне интенсивного развития поливного земледелия, проявлении всех необходимых экологических условий (оптимальная температура, влажность, наличие значительной территории пойменных пастбищ) для развития переносчиков заболеваний было сконцетрировано большое количество завозного и улучшенного скота, высокочувствительного к пироплазмидозам.

UDC 636.8.045 ***DOI 10.52578/2305-9397-2024-4-1-95-102***
IRSTI 68.41.53.

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USE OF THE ANTIVIRAL DRUG «ARBIMECTIN» IN THE TREATMENT REGIMEN FOR CALICIVIRUS IN CATS

ANNOTATION

The article discusses the possibility of using the antiviral drug "Arbimectin" in the treatment regimen for cats suffering from a viral disease - calcivirus. Data are presented confirming the effectiveness of Arbimectin in all forms of calicivirus in cats. Some issues of the pharmacodynamics of Arbimectin in the treatment of intracellular viruses are considered. The given treatment regimen makes it possible to increase the effectiveness of calcivirus therapy in sick animals.

The use of Arbimectin, which has the ability to penetrate into affected cells and block the synthesis of viral ribonucleic acid, significantly reduces the duration of the disease and mortality among cats. Arbimectin promotes a more complete release of the body from the virus, which is confirmed by a reduction in the time it takes for the viral antigen to be released from the body of animals. Studies have shown that the inclusion of Arbimectin in the treatment regimen for various forms of calcivirus significantly increases the percentage of recovery, with the exception of the nervous form, in which the drug is not effective. Thus, Arbimectin is recommended for use in complex therapy of feline calcivirus to improve its outcomes.

***Key words**: Feline calcivirus, Arbimectin, therapy, complex use, effectiveness.*

Introduction: Relevance of the study: Currently, felinology of various cat breeds is intensively developing in Kazakhstan. Thus, according to data from the leading felinological organization of