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DURATION OF ACARICIDAL ACTION OF THE DRUG «KENEM» AND ECONOMIC JUSTIFICATION FOR THE PROTECTION OF CATTLE FROM IXODIC MITES

Abstract

The scientific article presents the duration of acaricidal effect of «Kenem» drug, and its economic feasibility for protecting cattle against ixodic ticks. As a result of the study, the acaricidal efficacy and the duration of the residual acaricidal effect of drugs are important components in the planning of anti-tick measures. From a practical point of view, the economic feasibility of treating cattle against ixodic ticks in the presented conditions of acaricides in the southern regions is considered important. Despite the fact that the cost of the drug per 100 head exceeds the cost of a similar drug by 1 788.15 tenge, the frequency of its use is less, and additional installations are not required. This is due to the long duration of residual acaricidal effect of Kenem, which is 30 days, which allows to reduce the number of therapeutic measures.

When calculating the economic feasibility for the use of acaricides to protect cattle against ixodic ticks, the most convenient way to prevent the sucking of ixodic ticks to animals is the local application of Kenem, which does not require special equipment and special skills of technical staff. Drug duration is 30 days, therefore the cost of its use for the entire season of active ticks per 1 animal is 44% cheaper, compared to veteran, i.e. 1,421.4 tenge.

Key words: ixodic ticks, Kenem drug, acaricides, economic feasibility, treatment measures, epizootological peculiarities, theileriosis, carrier, prevalence, intensity of invasion, anisocytosis, anemia, hemoglobinuria

Introduction

Ectoparasites, including ixodic ticks, have a negative impact on animal health; moreover, they are agents of many natural focal diseases. In addition to mechanical damage to the skin ectoparasites cause allergic reactions, have a toxic effect, and are carriers of infectious agents (plague, brucellosis, pasteurellosis, pseudotuberculosis, bartonellosis, listeriosis, pyroplasmosis, babesiosis, etc.) [1].

Their veterinary importance is related to their blood-feeding, from which both their direct and indirect pathogenicity originates. Some tick species can act as vectors of pathogens causing a number of tick-borne diseases (TBDs). Ixodid ticks, which may be infected with tick-borne pathogens, likeAnaplasma spp., Borrelia spp., Babesia spp., Anaplasma, Rickettsia/Coxiella, and tick borne encephalitis virus. More than 20 tick species and subspecial were identified which actively participated in transmission of Babesia infection [2].

When implementing the food program, special attention is paid to producers who produce and sell meat products. The demand of the Kazakh population for meat products exceeds the supply of local livestock breeders. Today the region produces only 80% of the required volume of meat products, and this is mainly beef [3]. It is necessary to provide special veterinary protection for beef cattle grazing in most cases in pasture biogeocenoses, taking into account the peculiarities of their maintenance. In the grazing season in Almaty region, a significant variety of parasites has an intense effect on the animal organism.

Of all 70 species of ixodic ticks found in Kazakhstan, 23 species are carriers of 18 species of pathogens of animal piroplasmidosis. This determines the complex epizootic situation observed

during the formation of various foci; their classification is the basis for both creating a map of pathogens spread in different zones and their vectors, and for planning and carrying out effective control measures of them [2,4]. In the epizootic chain of blood parasitosis, it is important to know what is the type of transmission of the pathogen through the tick: transphasal (within the first generation of ticks) or transovarial (to the next generation through infected eggs) [5,6].

In animals prone to invasive diseases, its pathogens are transmitted through the mouth, skin through, carriers and direct contact, as well as in combination infected [7].

In view of the large number of diseases arising from ectoparasites, one of the important tasks is to create new effective means to combat against ixodic ticks and prevent the disease

Among the protozoal diseases in farm animals, the most important for South Kazakhstan are pyroplasmidosis of cattle. To combat this disease, foreign and domestic scientists have proposed many schemes and methods, and also used separately integrated drugs. However, changes in the market situation today require a large number of searches and experiments, i.e, therapeutic chemoprophylaxis of new chemotherapeutic pyroplasmidosis, effective economically justified preventive measures, destruction of tick-carriers [8, 9].

The problem with ectoparasites in farm animals is much more voluminous than the acrology science. In recent years, it has taken on a distinct epidemiological, social, epizootic, economic and ecological character. This problem is very acute in certain regions of Kazakhstan, including in the south and in the southeast regions.

More than a billion heads of cattle and sheep and goats become infected with ixodic ticks, lose weight gain, and milk production [9].

So, in Kazakhstan, ixodic ticks are the cause of spread of 20 infectious animal diseases, and some species carry dozens of pathogens of various infections [10, 11, 12]. Ixodic ticks are carriers and reservoirs of many natural focal diseases in animals and humans, subdivided into the "tick-borne infections" group.

From this point of view, we considered it reasonable to create modern, cost-effective drugs for use in fight against ixodic ticks, consider their feasibility in the farm and laboratory as one of the urgent problems, and also present our researches.

Materials and methods of research

Research work was carried out in the period 2018-2019 in Almaty region at «Turap» Farm and in the «Antiparasitic Biotechnology» Laboratory of the Kazakh National Agrarian Universityin the Republican state institution on the right of economic management «Institute of Zoology». To identify the residual acaricidal effect of Kenem, the drug was applied to the cattle skin, after which hungry ticks were placed on the animal's body every day. For this purpose, ticks (10 females and 10 males) were placed in a bag made of dense material, from the edges of which the ticks could get out, the bag was tied to the area treated with the drug. After 24 hours and 48 hours, the number of adherent and surviving ticks was recorded. At the same time, the untreated animal was monitored.

The ticks were placed on the animal's body within 30 days, as long as the residual acaricidal effect of the drug remained. Residual acaricidal effect was determined based on the percentage of tick death during observation.

The results were taken into account before checking and treating of treated and untreated animals, and 1 day after treatment by counting the number of live ticks. The optimal effective concentration of the drug and duration of its residual effect were established by calculating the ratio of the number of ticks in experimental and control animals.

To determine the economic damage from ixodidosis in cattle, we took into account the cost of depreciation of the equipment used, labor costs, efficiency, dosage, method of administration, frequency of repeated treatments, concentration, and consumption of the drug based on the duration of the residual acaricidal effect of the combined preparation from Veterin and Kenem.

The development of integrated measures to combat blood-sucking ticks was carried out by establishing schemes for treating animals and the optimal timing of anti-tick treating, taking into account the epizootological data, biological characteristics of ticks, characteristics of tick components and characteristics of their biotopes.

Statistical analysis of the results obtained was carried out according to the Student's method using the Microsoft Office Excel 2007 software package.

Description and composition of the main active ingredient of the veterinary drug «Kenem». solution for external use. For treatment of insectoacaricides in agricultural animals (cattle, horses, sheep). The main property, the following active substances are in the composition of 1 ml of KENEM: fipronil - 5 mg, esfenvalerate - 50 mg, alphacypermethrin - 50 mg, methoprene - 50 mg, as well as auxiliary substances: benzyl benzoate - 40 mg and polyethylene glycol - 400 - up to 1 ml. Storage conditions: store at temperatures from +0°C to +24°C in a dark place. Kenem refers to the combined insectoacaricidal drugs. Active ingredients of the drug have an effect on the preimaginal and imaginal phases of fleas *(Ctenocephalides canis, Ctenocephalides felis),* lice *(Linognatus setotus),* chewing lice *(Trichodectes canis),* sarcoptoids *(Sarcoptes canis, Sarcoptes vulpis, Notoedres cati, Otodectes cynotis, Psoroptes cuniculi)* and ixodic ticks *(Ixodes ricinus, Rhipicephalus sanguineus, Dermacentor reticulatus, Ixodes scapularis, Dermacentor variabilis).*

Results of the research

In the course of the research, first of all, we studied the dynamics of ixodic ticks distribution in Almaty region.

To do this, 187 ixodic ticks were tested for various types of ticks in several areas of Almaty region. The results are shown in Table 1 and Figure 1. In the collected ticks the number of females was 139 specimens, which corresponded to 74.4%.

The number of males was 33 heads or 17.6%. The total number of nymphs was 11, i.e., 5.9%. The number of tick larvae was minimal-4 pieces or 2.1%.

When the percentage of species analyzed, *Dermacentor marginatus* exceeded and was 45.5%. Among the collected composition, *Dermacentor pictus* is the second most abundant species, accounting for 33.7%.

Hyalomma plumbeum ticks are also common, accounting for 12.3%. *Boophilus calcaratus* were the rarest type of ticks, accounting for 8.5%.

Together with the most common ticks of *Dermacentor marginatus,* the share of the female stage was 81.18%, significant advantages over the female stage were noted, their share was only 23.81%; the total number of nymphs was 6.35%; the number of tick larvae reached 2.35%.

The proportion of female stages in the collection of the *Dermacentor pictus* tick was 68.25%; the number of male stages was 14.12%; the total number of nymphs was 2.35%; the number of larval stages reached 1.59% (Table 1 and Figure 1).

Table-1. Species composition of ticks collected in Almaty region

№	Type of ticks	Total	Tick stage				Species percentage of ticks, %
			Quantity of female /%	Quantity of male /%	Quantity of nymphs /%	Quantity of larval %	
1	*H. plumbeum*	23	16/69,57	3/13,04	3/13,04	1/4,35	12,3
3	*D. pictus*	63	43/68,25	15/23,81	4/6,35	1/1,59	33,7
4	*D. marginatus*	85	69/81,18	12/14,12	2/2,35	2/2,35	45,5
5	*B. calcaratus*	16	11/68,75	3/18,75	2/12,50	-/0,0	8,5
Total/%:		187/100,0	139/74,4	33/17,6	11/5,9	4/2,1	100,0

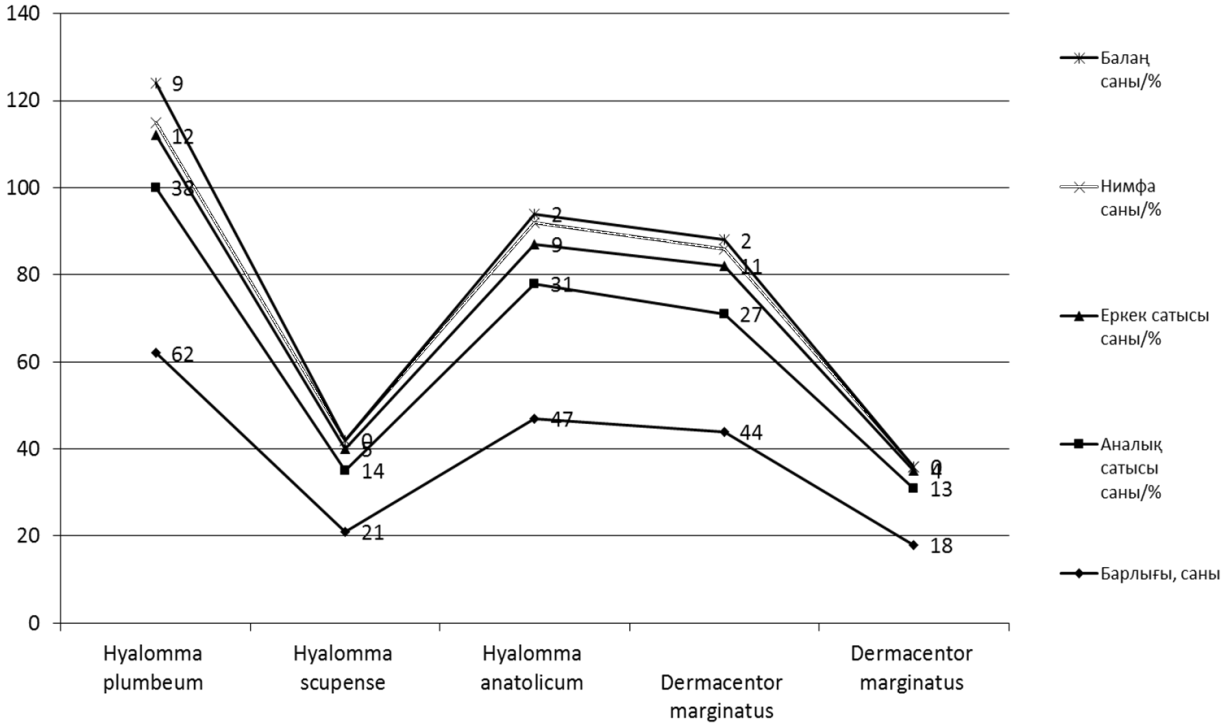

Figure-1. Species composition of ixodic ticks collected in Almaty region

The proportion of female stages in the collection of Hyalomma plumbeum tick species was 69.57%; the number of paternal stages and the total number of nymphs was 13.04%; the number of tick larvae reached 4.35%.

The proportion of female stages in the collection of the *Boophilus calcaratus* tick species was 68.75%; the number of female stages was 18.75%; the total number of nymphs was 12.50%; no individuals of larval stages were found in the research.

In Karasay district of Almaty region, 12 tested horses were infected with ticks, which was 44.4%. Ticks were found mainly in the udder and groin area.

In the research of the fauna of ixodic ticks collected, six species of four genera Ixodes identified in this paragraph (**table 2 and figure 2**):

Table - 2. Species composition of ixodic ticks in Karasay district of Almaty region

№	Type of ticks	Quantity/%		Stages				MO, specimen /head.
		quantity, specimen	%	imago		nymphs		
				quantity	%	quantity	%	
1	*Rhipicephalus rossicus*	15	31,25	13	86,67	2	13,33	3,8
2	*Ixodes ricinus*	17	35,41	14	82,35	3	17,65	
3	*Hyalomma marginatum*	2	4,17	2	100,0	-	0,00	
4	*Hyalomma scupense*	3	6,25	2	66,67	1	33,33	
5	*Hyalomma anatolicum*	5	10,42	2	40,00	3	60,00	
6	*Dermacentor marginatus*	6	12,50	3	50,00	3	50,00	
	Total:	48	100,0	36	75,00	12	25,00	

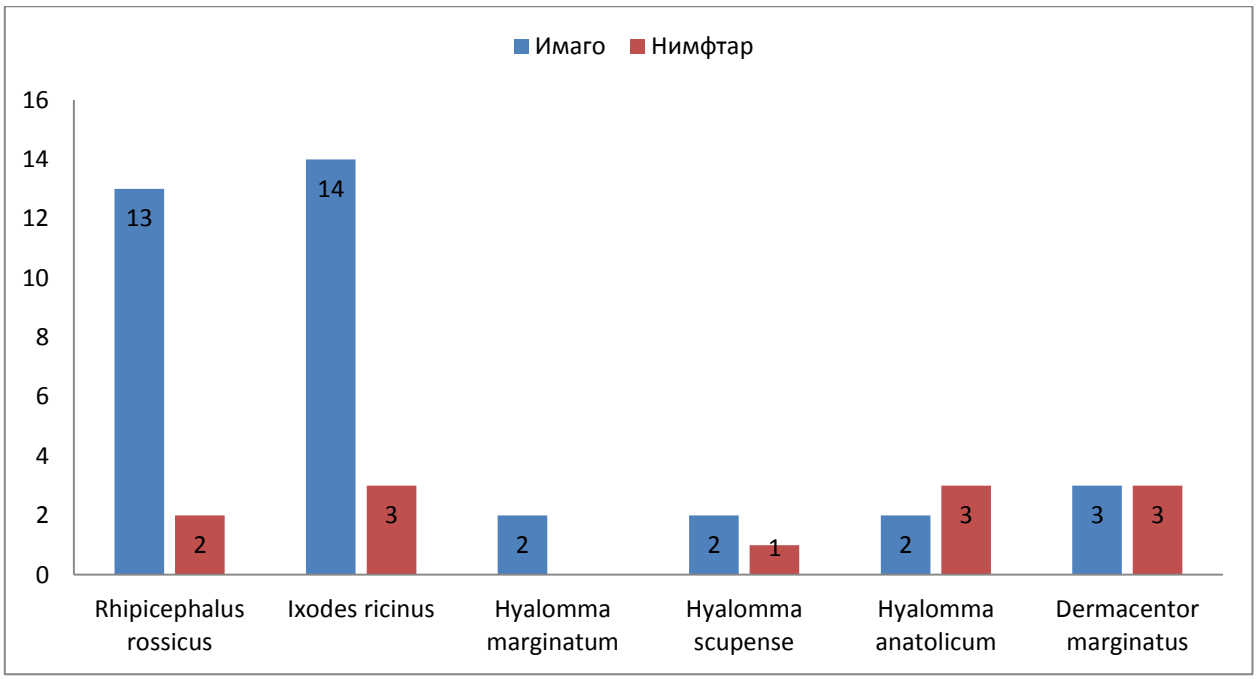

Figure-2. Species composition of ixodic ticks in Karasay district of Almaty region

Table 2 and figure 2 show that in the set of ticks there were 36 pieces of puberty stages (imago), which was 75.00%, and 12 pieces of larval stages (nymphs) - 25.00. A total of 48 pieces of ixodic ticks were collected. The Abundance Index (AI) was low at 3.8 units.

Thus, the species *Ixodes ricinus* (35.41%) prevails in the study area; then the species *Rhipicephalus rossicus* (31.25%); *Hyalomma* ticks formed separate populations (from 4.17% to 10.42%); *Dermacentor marginatus* is relatively rare (12.50 %).

In the course of epizootological researches at «Turap» farm, 2 thin blood smears were taken from the peripheral blood vessels, i.e. from the tip of the ear, which were dried at room temperature, fixed in 96% ethyl alcohol and stained by the Romanovsky - Giemza method. A total of 150 blood smears were prepared, and the stained blood smears were examined under a microscope. Parasitemia was determined by counting the damaged red blood cells in 1, 10, 100 viewing platforms of the microscope.

In the course of our research, a complete anamnesis was collected, from which we learned from the veterinarian and the economic entity in «Turap» farm - 19 heads of cattle were brought to the farm from South Kazakhstan in order to improve the breed, after 5 days, 4 imported animals showed clinical signs of the disease. Initially, the farm had 113 heads of cattle. The animals were subjected to a clinical examination with an emphasis on increased body temperature, enlarged lymph nodes, yellowing of the visible mucous membranes, decreased appetite, and the presence of hemoglobinuria.

To confirm the clinical diagnosis, a microscopic examination of thin blood smears taken from peripheral vessels was performed. The blood parasites encountered were measured using an eyepiece-micrometer, differentiated to a species based on morphological features, the size of the parasites, the nature of their location in the red blood cell, the shape and nature of the chromatin concentration in the parasite body, the presence of forms characteristic of each parasite species. At the same time, different samples and inaccuracies in the color of the smears were differentiated. In the research of blood smears, attention was paid to changes in the size and morphology of blood cells.

The distribution of blood parasites among cattle showed that Theileria was damaged by the annulata pathogens in our research.

Due to the fact that the seasonal dynamics of bovine theileriosis in «Turap» farm is associated with the parasitic survival of ixodic ticks, the survey identified ticks belonging to the genus

Hyalomma, *Dermacentor*, and the culmination of the spread of the disease was recorded in the spring and autumn months.

This is due to the biological characteristics of ixodic ticks, mainly belonging to the genus *Hyalomma* and *Dermacentor*, which are specific biological carriers of teileria, the season of activity. The activity of ticks are most pronounced in the studied farm in the spring and autumn periods, and in the summer, there is a diapause. The research results of the seasonal dynamics of bovine theileriosis in the researched farm are presented in **Table 3.**

Table-3. Seasonal dynamics of bovine theileriosis in «Turap» farm

Total number of identified cattle	Spring		Summer		Autumn		Winter	
	quantity	%	quantity	%	quantity	%	quantity	%
38	19	50,0	4	10,52	13	34,21	2	5,2

Thus, as can be seen from Table 3, the seasonality of the incidence of theileriosis in cattle at «Turap» farm corresponded to April-May and September and differed in two ups, i.e., in spring-50.0%, and in autumn-34.21%.

As a result of the research conducted, the epizootological situation of bovine theileriosis in the conditions of «Turap» farm was clarified. It was found that there was a tendency to increase the extent of invasion of animals with theileriosis. While the clinical signs mainly showed signs of enlarged lymph nodes, mucosal jaundice, and hemoglobinuria, the studied farm had 2 peaks in the seasonal dynamics of bovine theileriosis: in spring and autumn. The epizootic situation for theileriosis tends to change in the direction of improvement or deterioration, depending on the climatic conditions of the year, temperature factor, humidity regime, the presence of favorable conditions for the development of carriers, the degree of influence of the anthropogenic factor.

The economic imbalance in the country influenced domestic agricultural producers and made adjustments to their ability to plan and conduct veterinary activities. Today, it is important more than ever to make rational use of existing potential of enterprises in achieving import substitution goals. Ixodic ticks are dangerous not only for animals, but for humans as well. During active attack of ticks, cattle not only lose a large amount of blood, but their milk and meat productivity decreases, respectively, by 18-20 and 12%, in addition, the quality of leather raw materials deteriorates. The massive onset of ticks can cause ixodidosis and even lead to death of the animal, and one bite of this parasite is enough for invasive initiation. Veterinary drugs are widely represented on the market, however, it is a very difficult task for breeders to choose the most effective, convenient for use and cost-effective drug. For this purpose, it is necessary to take into account the effective concentration, consumption, stability during use, duration of the residual acaricidal effect of the drug, and also compare their costs.

During the research, the results obtained from the production test of acaricides made it possible to determine the most effective drug. To introduce them into practical application, it is necessary to know the frequency of treatment using them, which requires a study of the residual acaricidal effect of these acaricides.

In order to determine the duration of the residual acaricidal effect of the drugs from 3 experimental groups, the tests were continued on animals of the 1st and 2nd groups, on which the drugs were used. Studies were conducted by placing hungry imago ticks *Hyalomma anatolicum* within 30 days on each animal.

For this purpose, ticks (10 females and 10 males) were placed in a bag made of dense material, from the edges of which the ticks could get out, the bag was tied to the area treated with the drug. Every day, after 24 hours, the number of dead, paralyzed, adherent and surviving ticks were recorded **(Figures 3, 4).**

Figure 3. Collecting ticks from animal bodies

Figure 4. Ixodic ticks collected

The ticks were placed on the animal's body as long as the residual acaricidal effect of the drug persisted. Residual acaricidal effect was established based on the percentage of tick death during observation.

Table 4. Residual acaricidal effect of Kenem and Veterin drugs

Drug-treated groups	After 24 hours, %	Ticks dying-off after ... weeks of placing them on the animals' bodies where various acaricides were applied, %			
		Week 1	Week 2	Week 3	Week 4
Group 1- Kenem	100	100	100	100	100
Group 2 - Veterin	100	76,6	0	0	0

As indicated in the table, the longest residual acaricidal effect was recorded in Kenem, which was 30 days. And ticks attached to the animals' bodies treated with Veterin, starting from the Day 18, stuck to the animal's body and sucked out the blood.

The data obtained make it possible to conclude that the tested combined drug Kenem has a pronounced acaricidal effect against ixodic ticks. When their number increases in nature, in particular from the beginning of the grazing season to the end of May, from the second decade of August to the end of the grazing season, the proposed acaricides must be used to prevent the invasion of ixodids.

It was found that in comparison with the used drug Veterin, the residual acaricidal effect of the combined drug Kenem proposed by us persists for one month.

And on the animals' bodies where Veterin was used, after one week, it was observed that the placed ticks stuck to the skin and began to suck blood, and the residual acaricidal effect of the drug disappeared after 7 days completely. 75% of placed ticks on the Day 5, and 55% of those placed on the Day 6 (on Week 1 on average 76.6%) stuck to the skin and began to parasitize. The residual acaricidal effect of the drug proposed by us lasts for a long time, in connection with which it is possible to reduce the frequency of treatment of animals against ixodides.

Since our next study consisted in the economic feasibility of the use of acaricides when protecting the cattle against ixodic ticks, the studied acaricidal efficacy and duration of the residual acaricidal effect of the drugs are important components in planning anti-tick measures.

From a practical point of view, the economic feasibility of cattle treatment against ixodic ticks in the presented conditions of acaricides in the south regions was considered an important point.

The tests of acaricidal compositions carried out in production conditions allowed to determine their efficiency against ixodic ticks, and also to establish the duration of their residual acaricidal effect.

The calculation of the economic feasibility for the use of acaricides during the period of ixodides activity was carried out by us taking into account the cost of depreciation of the equipment used, labor costs, efficiency, dosage, method of application, concentration, as well as the consumption of the drug based on the duration of residual acaricidal effect of the combined drug from Veterin and Kenem.

The data obtained were the basis for calculating the cost of acaricidal treatment of cattle in the conditions of the south regions at the established prices of 2020.

Table 5. Economic feasibility for use of acaricides when protecting the cattle against ixodic ticks

Indicators	Units	Veterin	Kenem
Cost of drug l/vial	tenge	2,904.6	1,000
Consumption of the drug for acaricidal treatment of 1 animal	ml	6.25	36
Consumption of the drug per herd (100 head)	ml	625	3,600
Cost of acaricidal drug consumed per treatment	tenge	1,811.85	36,000
Duration of season of invasion of ixodic ticks on animals	days	116±5.36	
Duration of residual acaricidal effect	days	4	30
Processing frequency	unit	29.0±3.13	1
Consumption of the drug for the whole season	l/ml	18.125	108
Cost of the consumed drug in one season	tenge	52,543.37	3,000
Cost of caricide spraying equipment	tenge	20,304	-
Spaying equipment needed	pcs	2	-
Spraying device depreciation cost for 1 season (100%)	tenge	40,608	-
Spraying device depreciation cost per 1 treatment (100%)	tenge	1,400.41	-
Cost of 1 hour of acaricidal treatment	tenge	4,230	4,230
Service staff salary	tenge	8,910	8,910
Salary of all-season service employees	tenge	245,340	16,140
Cost of a single treatment of 100 head of cattle	tenge	11,672.54	108,000
Prime cost of acaricidal treatments in one season	tenge	338,503.78	124,140
Prime cost of preventive measures per 1 animal	tenge	3,385.04	1,421.4

The data given in the table show the change in the prime cost of acaricidal treatments within significant limits. The main factor in the choice of acaricides was the method of its application on animals, and duration of the residual acaricidal effect. A simple application that requires minimal labor costs is a spraying method in an average volume of animals, to which a minimum dose of the finished acaricidal emulsion is applied. Therefore, it takes little time to complete it, and in this regard, labor costs are reduced. Despite these advantages, the disadvantage of this method is the high concentration of the finished emulsion, which increases the amount of acaricide used and increases the operation of expensive equipment.

Despite the fact that the cost of the drug we offer per 100 head exceeds the cost of a similar drug by KZT 1,788.15, the frequency of its use is less, and the additional devices are not required. This is due to the long duration of the residual acaricidal effect of Kenem, which is 30 days, that makes it possible to reduce the number of therapeutic measures.

When calculating the economic feasibility for the use of acaricides to protect cattle against ixodic ticks, the most convenient way to prevent ixodic ticks from sticking to animals is the local application of Kenem, which does not require special equipment and special skills of service staff, the duration of the drug is 30 days. In this connection, the cost of its use for the entire season of tick activity per 1 animal as compared to Veterin is 44% cheaper, i.e, amounted to 1,421.4 tenge.

Having calculated the cost of using two drugs, taking into account the peculiarities of their use and duration of the residual acaricidal effect, we recommend using Kenem to combat the invasion of ixodic ticks.

Conclusion

In conclusion, it should be noted that in the research of ixodic ticks for the presence of pathogens of theileriosis, the seasonality of the incidence of theileriosis in cattle at "Turap" farm corresponded to April-May and September and differed in two climaxes, i.e., in spring-50.0%, and in autumn-34.21%. During the examining of the animal`s body, ticks belonging to the genus of Taylerian carriers Hyalomma, Dermacentor were identified.

Summing up the results, it was found that the duration of the residual acaricidal effect of Kenem is 30 days.

When calculating the economic feasibility for the use of acaricides to protect cattle against ixodic ticks, the most convenient way to prevent ixodic ticks from sticking to animals is the local application of Kenem, which does not require special equipment and special skills of service staff, duration of the drug is 30 days. In this connection, the cost of its use for the entire season of tick activity per 1 animal as compared to Veterin is 44% cheaper, i.e, amounted to 1,421.4 tenge.

However, the use of acaricides cannot make up for all the shortcomings that exist in the complex system of measures aimed at the destruction of ixodic ticks. In biotopes, it is necessary to create unfavorable conditions for ticks, and to destroy them on the animal's body. In our studies, anti-tick measures are aimed at the planned systematic treatment of animals. Acaricidal treatment of animals is especially effective in the fight against ixodic ticks in domestic animals, since the entire cycle of parasites occurs on the body of a domestic animal, and the probability of destruction of parasites from larvae to imago is sufficient.

As a result of the therapeutic and prophylactic measures against ixodidosis in cattle, it became possible to reduce both monetary costs and emissions into the environment. At the same time, it is necessary to take into account that there are no natural enemies of ixodids in the natural environment, the anthropogenic factor is the main regulator of ixodids only. Mass infection with ixodids causes great harm to animals: condition worsens, immunity weakens, and a large number of simultaneously feeding ixodids may lead to the death of animals.

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«КЕНЕМ» ПРЕПАРАТЫНЫҢ АКАРИЦИДТІК ӘСЕР ЕТУ МЕРЗІМІНІҢ ҰЗАҚТЫҒЫ ЖӘНЕ ІРІ ҚАРА МАЛДЫ ИКСОДИД КЕНЕЛЕРІНЕН ҚОРҒАУ КЕЗІНДЕГІ ЭКОНОМИКАЛЫҚ НЕГІЗДЕМЕСІ

Аңдатпа

Ғылыми мақалада, «Кенем» препаратының акарицидтік әсер ету мерзімінің ұзақтығы және ірі қара малды иксодид кенелерінен қорғау кезіндегі экономикалық негіздемесі келтірілген. Зерттеу нәтижесінде акарицидтік тиімділік және препараттардың қалдық акарицидтік әсерінің ұзақтығы кенеге қарсы іс-шараларды жоспарлауда маңызды компоненттер болып табылды. Практикалық тұрғыдан маңызды сәт болып оңтүстік аймақтарда ұсынылған акарицидтер жағдайында ірі қара малды иксодид кенелеріне қарсы емдеудің экономикалық негіздемесі саналды. Препараттың өзіндік құны (бағасы) 100 басқа есептегенде салыстырмалы препарат бағасынан 1 788,15 теңгеге артық болғанымен оның қолдану жиілігі кем және қосымша қондырғылар қолдануды талап етпейді. Бұл «Кенем» препаратының қалдық акарицидтік әсерінің ұзақ кезеңіне байланысты, ол 30 күнді құрады, бұл емдеу шараларын жүргізу санын азайтуға мүмкіндік берді.

Ірі қара малды иксодид кенелерінен қорғау кезінде акарицидтерді қолданудың экономикалық негіздемесін есептей отырып, иксодид кенелерінің малға жабысуының алдын алудың ең қолайлы әдісі – бұл «Кенем» препаратын жергілікті қолдану, ол арнайы жабдықтар мен техникалық қызмет көрсету персоналының дағдыларын қажет етпейді,

препараттың ұзақтығы 30 күн, осыған байланысты оны бүкіл кенелеу маусынында 1 малға қолдану құны ветеринмен салыстырғанда 44%-ға арзан, яғни 1 421,4 теңгені құрады.

Кілт сөздер: иксодид кенесі, «Кенем» препараты, акарицидтер, экономикалық негіздеме, емдеу шаралары, эпизоотологиялық ерекшеліктер, тейлериоз, тасымалдаушы, инвазия экстенсивтілігі, инвазия қарқындылығы, анизоцитоз, анемия, гемоглобинурия.

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ДЛИТЕЛЬНОСТЬ АКАРИЦИДНОГО ДЕЙСТВИЯ ПРЕПАРАТА "КЕНЕМ" И ЭКОНОМИЧЕСКОЕ ОБОСНОВАНИЕ ПРИ ЗАЩИТЕ КРУПНОГО РОГАТОГО СКОТА ОТ ИКСОДОВЫХ КЛЕЩЕЙ

Аннотация

В научной статье приведены продолжительность акарицидного действия препарата «Кенем», а также его экономическое обоснование при защите крупнорогатого скота от иксодовых клещей. В результате исследования акарицидная эффективность и продолжительность остаточного акарицидного действия препаратов являются важными компонентами в планировании противоклещевых мероприятий. С практической точки зрения важным моментом считается экономическое обоснование лечения крупнорогатого скота против иксодовых клещей в представленных условиях акарицидов в южных регионах. Несмотря на то, что стоимость препарата в расчете на 100 голов превышает стоимость аналогичного препарата на 1 788,15 тенге, частота его применения меньше, а также не требуется использование дополнительных установок. Это связано с длительной продолжительностью остаточного акарицидного действия препарата «Кенем» которая составляет 30 дней, что позволяет сократить количество проведения лечебных мероприятий.

При расчете экономического обоснования применения акарицидов для защиты крупнорогатого скота от иксодовых клещей самым удобным способом предотвращения присасывания иксодовых клещей к животным является местное применение препарата «Кенем», который не требует специального оборудования и специальных навыков технического обслуживающего персонала, продолжительность действия препарата 30 дней, в связи с чем стоимость его применения на весь сезон активности клещей на 1 животное в сравнении с ветерином дешевле на 44%, то есть составляет 1 421,4 тенге.

Ключевые слова: иксодовые клещи, препарат «Кенем», акарициды, экономическое обоснование, лечебные мероприятия, эпизоотологические особенности, тейлериоз, носитель, экстенсивность инвазии, интенсивность инвазии, аноцитоз, анемия, гемоглобинурия.