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ANALYSIS OF EPIZOOTOLOGICAL FEATURES OF EIMERIOSIS IN GOATS ACCORDING TO AGE AND SEASONAL FACTORS IN THE NAKHCHIVAN AUTONOMOUS REPUBLIC

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АНАЛИЗ ЭПИЗООТОЛОГИЧЕСКИХ ОСОБЕННОСТЕЙ ЭЙМЕРИОЗА У КОЗ ПО ВОЗРАСТНЫМ И СЕЗОННЫМ ФАКТОРАМ В НАХЧЫВАНСКОЙ АВТОНОМНОЙ РЕСПУБЛИКЕ

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Abstract. The age and seasonal dynamics of goat infestation with parasites of the genus *Eimeria* in the Nakhchivan Autonomous Republic are analyzed. Observations conducted on farms in the Republic revealed that the highest level of infestation with Eimeria was recorded in the autumn months (51.4%), while the lowest was in the summer season (15.0%). Six species were recorded in the winter, spring, and autumn seasons, while only three species (*E. absheronica, E. yolchijevi*, and *E. ninakohlyakimovae*) were recorded in the summer season. The increase in the number of infestations in the autumn months is mainly due to humid and mild weather, as well as the fact that animals are kept indoors for certain periods. Under these conditions, increased contact between animals accelerates the transmission of infection. At the same time, moderate temperatures and humidity create favorable conditions for the formation of spores and the development of Eimeria oocysts in the external environment. The decline in infection rates during the summer months is explained by goats grazing more on open pastures and frequently changing grazing locations. Exposure to sunlight, especially ultraviolet radiation, high temperatures, and dry soil, leads to the destruction of oocysts, reducing the intensity of infection. It has also been established that young goats are more susceptible to eimeriosis, and the infection rate decreases with age.

Аннотация. Анализируется возрастная и сезонная динамика заражения коз паразитами рода *Eimeria* в Нахчыванской Автономной Республике. В результате наблюдений, проведенных на фермах Республики, было установлено, что самый высокий уровень заражения эймериями был зафиксирован в осенние месяцы (51,4%), а самый низкий — в летний сезон (15,0%). В зимний, весенний и осенний сезоны было зарегистрировано 6 видов, а в летний сезон — только 3 вида (*E. absheronica, E. yolchijevi, E. ninakohlyakimovae*). Увеличение числа заражений в осенние месяцы в основном обусловлено влажной и мягкой погодой, а также тем, что животные содержатся в помещении в течение определенных периодов. В этих условиях усиленный контакт между животными ускоряет передачу инфекции. В то же время умеренные температуры и влажность создают благоприятные условия для спорообразования и развития ооцист эймерий во внешней среде. Снижение числа заражений в летние месяцы объясняется тем, что козы больше пасутся на открытых пастбищах и часто меняют место выпаса. Влияние солнечного света, особенно ультрафиолетового излучения, высоких температур и сухости почвы приводит к разрушению ооцист, что снижает интенсивность заражения. Установлено также, что молодые козы более восприимчивы к эймериозу и уровень заражения снижается с возрастом.

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Keywords: Eimeria, Eimeriosis, goats, invasion, seasonal dynamics.

Ключевые слова: Eimeria, эймериоз, козы, инвазия, сезонная динамика.

There is various research data in the literature on the invasion of goats with Eimeria in relation to age characteristics and seasons of the year [1–5].

Research work was carried out on the farms named after Y. Mammadaliyev in the Ordubad district of the Nakhchivan Autonomous Republic, and in the Babek and "Galabeh" farms in the Babek district. The research covered all seasons of the year. Research conducted by M. A. Mammadova determined that 6 species of *Eimeria* parasitize goats: *E. absheronica, E. arloingi, E. africiensis, E. yolchijevi, E. ninakohlyakimovae*, and *E. tunisiensis* [2].

Materials and methods of the study

As a result of observations conducted on farms, it was determined that the highest level of infection with Eimeria was recorded in the autumn months (51.4%), and the lowest level was recorded in the summer season (15.0%). In the studied areas, six species were recorded in the winter, spring, and autumn seasons, and only three species (*E. absheronica, E. yolchijevi, E. ninakohlyakimovae*) in the summer season (Table 1).

Table 1

ANALYSIS OF SEASONAL INFECTION RATES OF GOATS WITH EIMERIA

Seasons	*Number of goats*		*Extensiveness of infestation (%)*	*Mp (%)*	*Number of oocysts*	*Type of collected oocysts*
	Were studied	*infected*				
Winter	32	14	43,4	8,7	76	6
Spring	23	9	31,6	10,1	44	6
Summer	20	3	15,0	7,9	8	3
Autumn	35	18	51,4	8,4	109	6
Total	110	44	40,0	4,6	237	6

The results of the conducted studies show that the level of infection of goats with Eimeria varies by season. In the winter season, 14 out of 32 animals were infected, the extensiveness of the infection was 43.4%, and the average intensity index (MP) was 8.7%. In the summer months, 3 out of 20 animals were infected, the extensiveness was 15%, and the MP was 7,9%. In the summer season, the level of infection decreased to a minimum, invasion was detected in only 3 out of 20 animals (15.0%), MP was 7.9%. In the autumn, the highest indicator was recorded, 18 out of 35 animals were infected, the extensiveness was 51.4%, MP was 8.4%. In total, Eimeria was detected in 44 out of 110 animals (40.0%).

The age-dependent change in goats' Eimeria infection was analyzed separately (Table 2). Observations showed that the extensiveness of the invasion decreases with increasing age. Thus, the infection rate in animals aged 1–6 months was 63.6%, in animals aged 7–12 months it was 43.2%, and in the age range of 1–5 years it was 22.5%. The intensity of the invasion also tended to decrease with age and was 7.6; 5.1 and 3.3, respectively. Analysis conducted by the age groups showed that the prevalence of eymeriosis directly depends on the age of the animals.

Among goats aged 1–6 months, invasion was recorded in 21 out of 33 animals, the extensiveness of the infection was 63.6%. In this group, the average parasite load (mp) was 8.3%, and the intensity of the invasion was 7.6. The total number of oocysts detected was 138.

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Among animals aged 7–12 months, 14 out of 37 animals were infected, the extensiveness was determined at 43.2%. In this age group, mp was 8.1%, the intensity of the invasion was 5.1, and the total number of oocysts was 72.

Table 2

ANALYSIS OF AGE-DEPENDENT INFECTION RATES IN GOATS WITH EIMERIA

Age of the goats	*Number of the goats*		*Extensiveness of infestation, %*	*Mp, %*	*Total amount*	*Intensity of invasion*
	Studied	*Infected*				
1-6 months	33	21	63,6	8,3	138	7,6
7-12 months	37	14	43,2	8,1	72	5,1
1-5 years	40	9	22,5	6,6	27	3,3
Total	110	44	40,0	4,6	237	6,5

Among goats aged 1–5 years, the infection rates were lower. Thus, invasion was determined in 9 out of 40 animals, the extensiveness was 22.5%, mp 6.6%, and the intensity was 3.3. The total number of oocysts detected in this group was 27.

In total, 44 out of 110 goats were diagnosed with eymeriosis, with an average prevalence of 40.0% and an average intensity of 6.5. Studies have shown that both the prevalence and intensity of infection tend to decrease with age. In particular, animals aged 1–6 months are characterized by higher infection rates, which can be explained by the incomplete formation of their immune system. This age group can be considered the main source of infection, as it secretes more oocysts into the external environment.

Discussion and Conclusion of the Study

The results of the conducted studies show that the level of infection of goats with *Eimeria* varies by season. The obtained results show that the level of infection is directly related to seasonal and environmental factors. The increase in infection in the autumn months is mainly due to humid and mild weather, as well as the fact that animals are kept indoors for certain periods. In these conditions, increased contact between animals accelerates the transmission of the infection. At the same time, mild temperatures and humidity create favorable conditions for the sporulation and development of Eimeria oocysts in the external environment [6, 7].

The decrease in infection in the summer months is explained by the fact that goats graze more in open areas and often change their location. The influence of sunlight, especially ultraviolet radiation, high temperatures, and dryness of the soil leads to the destruction of oocysts, which reduces the intensity of the infection.

Thus, the conducted studies prove that the spread of Eimeria in goats significantly depends on both seasonal and age characteristics. Young animals are more susceptible to infection, and infection rates are higher in this group. Based on the results, it is considered appropriate to strengthen preventive and control measures against eimeriosis, especially in the autumn and winter months.

Conclusion

1. As a result of the conducted studies, it was determined that eimeria in goats in the Nakhchivan Autonomous Republic is one of the widespread parasitic diseases, its prevalence directly depends on both seasonal and environmental factors and the age characteristics of animals, and the highest rates of invasion are recorded in the autumn months, especially among young animals aged 1–6 months.

2. The results obtained show that for more effective implementation of preventive and epizootological control measures against eimeria, it is important to improve sanitary and hygienic

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conditions in farms, optimize the maintenance and feeding regime of animals, as well as strengthen preventive measures in the autumn and winter seasons, especially among young animals.

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