РЕЗЮМЕ

Исследование посвящено изучению гематологических, биохимических и минеральных показателей крови лошадей породы Жабе, зараженных параскаридозом, с акцентом на изменения после проведения лечебных мероприятий. Паразитарное заражение оказывает значительное негативное влияние на здоровье лошадей, вызывая снижение уровня гемоглобина и эритроцитов, а также дефицит минеральных веществ. В исследовании были рассмотрены три группы лошадей, одна из которых служила контрольной. Образцы крови отбирались до дегельминтизации и через 45 дней после лечения.

Результаты показали, что уровень гемоглобина у зараженных лошадей снижался на 23,5–36%, а количество эритроцитов уменьшалось на 13,2–34,2% в зависимости от зоны радиационного риска. После дегельминтизации эти показатели восстанавливались до нормальных значений. Биохимический анализ выявил снижение уровня общего белка и глюкозы, а также повышение уровней мочевины и билирубина, что свидетельствует о нарушениях обменных процессов и функциональных сбоях печени и почек. Также было зафиксировано значительное уменьшение содержания фосфора, магния, железа, натрия, калия и хлоридов, что указывает на расстройства минерального обмена.

Полученные данные подчеркивают ущерб, наносимый параскаридозом организму лошадей, и подтверждают эффективность лечебных мероприятий. Восстановление показателей крови после лечения свидетельствует о важности регулярного мониторинга и своевременной терапии для поддержания здоровья лошадей.

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BIOECOLOGICAL ANALYSIS OF GOAT HELMINTHS IN WESTERN KAZAKHSTAN REGION

ANNOTATION

In modern conditions of creation of different forms of ownership in rural areas, goat herds are concentrated in farmsteads, farms and peasant farms, the problems of combating helminthiasis have become particularly relevant.

Certain elements of the ongoing processes related to the reorganization in agriculture had a negative impact on the epizootic situation, the infection and death of animals from parasitic diseases increased, and serious omissions arose in matters of veterinary services in the industry.

The epizootic process in helminthiasis, as experts note, is a continuous chain of sequential transition of the pathogen from a sick animal, the source of the pathogen, to a healthy, susceptible animal.

The mechanism of transmission of the pathogen is carried out through pastures, watering sources, feed and increases depending on climatic, anthropogenic, man-made and economic processes, conditions for the introduction of animal husbandry, when veterinary and sanitary standards, elements of pasture prevention are violated.

The helminth fauna of goats in the West Kazakhstan region is represented by 17 species of helminths, of which 14 species of nematodes: Dictyocaulus filaría, Haemonchus contortus, Ostertagia

circumciancta, O. trifurcata, Nematodirus spathiger, N. oiratianus, N. filicollis, N. hervetianus, N. abnormalis, Marshalagia marshalli, Chabertia ovina, Trichostrongylus probolurus, T. skrjabini, Trichocephalus ovis, and 3 species of cestodes: Moniezia expansa, M. Benedeni, Thisaniezia giardi.

Key words: *helminths, goats, diseases, infestations, helminthiasis.*

Introduction. The production of goats for meat or milk is an attractive agricultural enterprise for Thai farmers because of the relatively low cost of breeding stock, their high reproductive rate, and their ability to thrive on native pasture or brushland that is unsuitable for crops [1,2].

In modern conditions of creation of different forms of ownership in rural areas, goat herds are concentrated in farmsteads, farms and peasant farms, the problems of combating helminthiasis have become particularly relevant.

Certain elements of the ongoing processes related to the reorganization in agriculture had a negative impact on the epizootic situation, the infection and death of animals from parasitic diseases increased, and serious omissions arose in matters of veterinary services in the industry [3].

The epizootic process in helminthiasis, as experts note, is a continuous chain of sequential transition of the pathogen from a sick animal, the source of the pathogen, to a healthy, susceptible animal.

The mechanism of transmission of the pathogen is carried out through pastures, watering sources, feed and increases depending on natural and climatic, anthropogenic, man-made and economic processes, conditions for the introduction of animal husbandry, when veterinary and sanitary standards, elements of pasture prevention are violated [4, 5].

All age groups of animals participate in the epizootic process of helminthiasis. Animals older than 1 year are most susceptible to intensive infection [6].

Goats make important contributions to human livelihoods in developing economies, since they are extremely hardy animals that can survive and reproduce under extremely high temperatures and low humidity with minimum available feed. Of the approximately 1 billion world goat population, 56 and 30% are located in Asia and Africa respectively [7].

Gastrointestinal parasitism is associated with economic losses, lowered productivity, reduced animal performance [8], mortality and morbidity [9].

In general, severe GIN pathogenesis has been attributed to the migration of the infective larvae after ingestion rather than the adult worms in the gut [10]. According to Risso et al. [11], goats infected with internal parasites show a rough dull-coat, weakness, diarrhea, apathy, tail rubbing, signs of hypo-proteinaemia, submandibular oedema (bottle jaw), loss of appetite and weight loss. In addition, some trichostrongyle nematodes cause anaemia due to their ability to remove red blood cells as well as proteins, which can lead to ill-thrift in animals.

Helminthiasis, especially strongylatoses, as the researchers note, are very often ignored, are not diagnosed, are not subjected to therapeutic and preventive treatments, therefore they cause great damage to the economy of the industry, cause enteritis, reduce productivity and breeding qualities of animals [12].

Helminthiasis of goats is widespread all over the world. In the Moscow region, according to the researcher, monesiosis caused by M. expansa, and in the Tver region M. expansa and M. benedeni are found everywhere.

The prevalence of invasion in young animals aged 2-8 months in the Moscow region was 27.0%, in the Tver region - 98.0%. In goats aged 1 year, 0.2% and 7.0%, respectively. No invasion was detected in female goats older than 1.5 years [13].

According to the researcher, sheep anoplocephalatoses caused by Moniezia expansa, M. benedeni, Thysaniezia giardi and Avitellina centripunctata are widespread in the Volgograd region (with an EI of 15.5 to 78.3%) and cause significant damage to sheep farming. The extent of invasion of sheep by cestodes depends on weather conditions and the age of the animals.

Lambs and young animals of one-year-old age are infected with cestodes by 37.5-83.3%, sheep - by 7.1-14.3% [14].

As a result of the conducted studies, 30 species of digestive tract nematodes were registered in domestic ruminants of Uzbekistan, including: 28 in sheep, 26 in goats [15].

In Tajikistan, scientists note that helminthiasis, and especially strongylatosis of the digestive tract of sheep, are the most common helminthiasis. Sheep are infected with strongylates of the digestive tract EI 29.0-68.0%, with AI 46-2800 copies [16].

52 species of helminths have been found in Azerbaijan. Of these, 6 species are indicated for the studied region for the first time. All the found species were registered in sheep, while only 32 species were found in goats, which are common with the helminth fauna of sheep.

These types of helminths can be considered permanent elements of the helminthofaunistic complex of small cattle in the studied region. It has been established that young sheep and goats are slightly infected with helminths.

The infection rate is higher in late spring - early summer and early autumn, 18 species of helminths are absent from the studied animals before driving to summer pastures, but they are noted upon their return to the winter quarters. Among the discovered helminths, 7 species have the greatest epizootological significance [17].

Along with regular deworming of sheep against strongylatosis, the authors recommend the regulation of diets with trace elements that are scarce in the region.

15 types of helminths have been identified in sheep and goats of Armenian farms: Haemonchus contortus, Nematodirus spathiger, Chabertia ovina, Trichocephalus ovis, Trichostrongylus spp., Dictyocaulus filaria, Mullerius capillaris, Cystocaulus nigrescens, Protostrongylus spp., Moniezia expansa, Cysticercus tenuicollis, Echinococcus granulosus, Dicrocoelium lanceatum, Fasciola hepatica, F. gigantica. Scientists note that the most widespread and dangerous helminthiasis requiring preventive measures can be considered dicticulosis, protostrongylidosis and fascioliasis [18].

Well-known scientists of Kazakhstan note that strongylatoses of the digestive tract are the most common helminthiasis of sheep in Kazakhstan. The authors determined that the infection of sheep with pathogens of strongylatosis ranges from 17.0-78.0%, with an AI of 30-2500 copies.

Fascioles, dicrocelia, moniesia, dicticauluses, bunostomes, hemonchuses, trichostrongiluses, nematodiruses, ostertagias, cooperias are often recorded among the pathogens, a total of 18 species.

Infection of goats with strongylates of the gastrointestinal tract in farms of Kazakhstan in all seasons of the year is high and amounts to 50-70%, dictyocules - varies from 26% in spring to 38% in winter [19].

According to another scientist, in farms and other farms in Kazakhstan, goats are affected by helminthiasis and other parasitic diseases by 40-100% of the helminth fauna of goats in the West Kazakhstan region of the Republic of Kazakhstan is represented by 17 species of helminths, of which 14 species of nematodes and 3 species of cestodes. Young goats are most susceptible to helminthiasis compared to adults [20].

Abroad, researchers studied the species composition, distribution, indicators of infection of sheep with helminthiasis pathogens, the occurrence of mixed invasions, as well as the organization of control measures.

Foreign researchers note the widespread spread of helminthiasis in different countries, continents (Iceland, France, North America) [21,22].

The purpose of this work is a comprehensive study of the helminth fauna of goats in the West Kazakhstan region.

Materials and research methods. The number of goats in the West Kazakhstan region has increased significantly over the past three years. Goats almost every sheep farm has 50-150 goats; in the private sector, there are from 5 to 80 goats per yard.

To clarify the helminthological situation, we examined all the livestock of goats and at least 20 sheep in those farms where we conducted the research.

Initially, according to the coproscopy data, we identified the percentage of infection of goats with helminths in the districts of the region, taking into account the average infection of goats in farms and the private sector.

Research results. For ease of analysis, the data are presented in Table 1, from which it can be seen that the infection of goats with strongylates of the gastrointestinal tract varies from 51.8 to 70.5%

against a higher infection of sheep - 92.3-99.2%; infection of goats and sheep with dictyocules was approximately the same - 27.2-40.0%.According to coproscopy, the percentage of infection of goats and sheep Monies were low, as well as infection with trichocephalus.At the same time, the infection rate of goats was lower than that of sheep, and at the same time, sheep and goats were simultaneously infected with several types of helminths, and rather an exception is when the eggs of only one type of parasite were found in an animal.Regarding the infection of goats with gastrointestinal strongylates, it can be noted that in the north and northeast of the region it increases slightly compared to the south.

This can be explained by the more arid climate of the southern regions of the region. Monieziosis, on the contrary, animals are heavily invaded in the Karatobinsk region.

Table 1 – Infection with helminths of goats and sheep in the West Kazakhstan region (according to helmintholarvoscopy)

Regions	Animals	Number	The extent of the invasion, %				
			Strongylate (GIT)	Including nematodes	dictyocules	moniesia	trichocephals
Karatobinsk	goats	480	51,8±4,9	18,3+1,2	27,2±3,2	19,1+1,9	7,3±0,8
	sheep	100	92,3+8,2	25,5+2,4	33,3+3,3	33,3+3,3	18,1+1,6
Chingirlau	goats	264	64,0±6,1	21,1+1,9	28,3±3,0	17,8±1,9	14,8+1,7
	sheep	120	99,2+9,2	29,4+2,7	31,7+3,2	15,2±1,5	23,4+2,2
Baiterek	goats	100	70,5+6,8	25,3±2,2	35,9±3,7	10,9±0,9	15,0±1,5
	sheep	33	95,6±9,0	30,6±2,9	40,0+4,0	15,5+1,5	25,5±2,2

The data on the helminthological autopsy of goats and sheep in the farms of each district were of interest. Table 2 shows that the helminthic fauna of goats and sheep in our area is quite monotonous and is mainly represented by different types of strongylates of the gastrointestinal tract, dictyocules, trichocephalians and cestodes. In no case were trematode infestations found in either goats or sheep.

From the strongylates of the gastrointestinal tract, trichostrongils, nematodes, hemonchs prevailed, from the strongylates of the lungs there were only dictyocules.

Cestodes were represented by three species, but with negligible intensity in both goats and sheep.

The intensity of invasion in goats varied widely from units to more than 1000 specimens. The highest AI is represented by trichostrongils 378.4-562.2 specimens in goats versus 1162.2-1192.3 specimens. in sheep, nematodes of the species Nematodirus spathiger and N. Oiratianus, respectively, 285.6-326.2 and 190.7-217.3 specimens. against 554.7-732.3 and 369.3524.2 copies in sheep, hemonchami - 181.5-322.7 vs. 267.3-882.2 copies, Marshalagia marshalli 6.6-28.2 vs. 14.7-88.3, dictyocaulae 3.3-6.3 vs. 10.2-15.9 copies and trichocephalic 9.5-14.3 in goats versus 19.5-29.2 specimens the sheep.

Other types of helminths were in small numbers. As for the intensity of infection of goats by districts, a slightly increased infection was noted in the Karatobinsky district, and a reduced one in the Baiterek district.

It should be noted that 5 species of nematodes were identified in both goats and sheep, but two species prevailed with a slight intensity of invasion.

Trichostrongils are also represented by two species, but Nematodirus spathiger and N. Oiratianus species largely predominated. Ostertagia are represented by two species with a low intensity of invasion.

Trichostrongyls are also represented by two species, but to a significant extent the species Trichostrongylus bolurus prevailed, and from the cestodes Moniezia expansa prevailed over M. Benedeni and Thisaniezia giardi.

In addition to common helminths, three sheep were found to have one cenureous bladder in the brain, one sheep had 8 bubbles with thin-necked cysticercus on the omentum of the bryzgeyka, two

more had echinococcal bubbles (one sheep had 1 bubble on the liver, the second had 1 bubble on the liver and 6 on the lungs).

We have not seen these infestations in goats.

We are unable to provide data on changes in the helminthofauna of goats due to the changed conditions of their detention, since no studies on goats in the West Kazakhstan region were conducted before our work.

Table 2 – The intensity of the invasion of goats and sheep according to the helminthological autopsy

№	Types of helminths	The average number of helminths per head					
		Chingirlau region		Karatobinsk region		Baiterek region	
		goats	sheep	goats	sheep	goats	sheep
1	Nematodirus spathiger	326,2 ±36,3	629.1 ±72.8	333,3 ±41,5	732,3 ±80,8	285,6 ±22,9	554,7 ±55,9
2	N. oiratianus	217,3 ±26,6	524,2 ±63,7	237,9 ±22,1	522,8 ±55,7	190,7 ±21,1	369,3 ±41,8
3	N. filicollis	36,2 ±4,1	94,0 ±10,0	24,2 ±2,5	57,0 ±5,5	23,9 ±2,4	42,3 ±4,5
4	N. helvetianus	72,5 ±7,8	181,2 ±19,7	48,3 ±4,7	115,7 ±12,3	168,1 ±17,9	294,3 ±31,7
5	N. abnormalis	22,8 ±3,3	90,7 ±10,2	49,7 ±5,8	199,9 ±22,7	11,3 ±2,0	28,8 ±3,7
6	Marshalagia marshalli	10,2 ±1,3	49,9 ±0,1	28,2 ±2,6	88,3 ±9,4	6,6 ±0,6	14,7 ±1,8
7	Ostertagia circumciancta	8,8 ±0,9	42,3 +4,5	12,4 ±1,4	49,9 ±5,3	7,2 ±0,8	26,3 ±3,4
8	O. trifurcata	3,3 ±4,0	31,3 ±3,4	3,9 ±4,2	38,9 ±4,2	6,5 ±0,7	23,4 ±2,6
9	Haemonchus contortus	315,4 ±32,6	788,5 ±81,2	322,7 ±33,6	882,2 ±89,3	181,5 ±20,3	267,3 ±27,1
10	Chabertia ovina	4,6 ±0,3	12,4 ±1,3	3,8 ±4,0	18,7 ±2,0	3,1 ±3,3	16,2 ±1,6
11	Trichostrongylus probolurus	562,8 ±57,4	1187,7 ±81,2	431,5 ±43,8	119,3 ±121,2	378,4 ±38,5	116,2 ±116,3
12	T. skrjabini	81,6 ±9,2	214,3 ±20,3	72,6 ±7,4	186,6 ±19,2	60,8 ±6,2	173,3 ±17,4
13	Moniezia expansa	2,8 ±0,3	3,4 ±0,2	2,9 ±3,1	4,1 ±0,4	3,2 ±0,4	4,3 ±0,4
14	M. Benedeni	1,8±0,2	2,9 ±0,3	1,7 ±0,2	3,2 ±0,4	1,2 ±0,1	3,3 ±0,3
15	Thisaniezia giardi	1,7 ±0,2	3,0 ±0,4	1,2 ±0,1	2,7 ±0,3	1,4 ±0,2	3,7 ±0,5
16	Dictyocaulus filaría	5,4 ±0,6	12,7 ±1,4	6,3 ±0,7	15,9 ±1,7	3,3 ±0,3	10,2 ±1,1
17	Trichocephalus ovis	10,2 ±1,1	27,8 ±3,1	14,3 ±1,5	29,9 ±3,3	9,5 ±0,9	19,5 ±2,2

As for the infection of goats in different seasons of the year, we summarized the data obtained in Table 3. For the study, 50 goats were selected from the flock in each period and helminthic larvoscopic studies were performed. It was found that goats were infected with helminths during the year by 74-82%, including strongylates of the digestive tract by 50-70%; dictyocaulae by 26-38%; trichocephalus by 6-18%, cestodes by 12-18%.

At the same time, infection of goats with strongylates of the gastrointestinal tract in all seasons of the year was approximately the same and high, infection with dictyocules was lowest in the spring and gradually increased by winter.

The invasion of trichocephals was kept at about the same level, but it was higher in the autumn-winter period. Cestodoses were also at the same level with a slight increase by winter.

Thus, goats are most intensively infected in the autumn period, in other seasons the infection rate is about the same, but the percentage of infection is lower.

Table 3 – Infection of goats with helminths by season

Indicators	spring		summer		autumn		winter	
	Number of goats	**EI,%**	Number of goats	EI,%	Number of goats	EI,%	Number of goats	EI,%
Total goats examined	**50**		**50**		**50**		**50**	
Some of them are infected with helminths	**39**	**78**	**38**	**76**	**41**	**82**	**37**	**74**
Including: strongylates of the gastrointestinal tract	**26**	**52**	**25**	**50**	**35**	**70**	**26**	**52**
Dictyocules	**13**	**26**	**15**	**30**	**17**	**34**	**19**	**38**
Trichocephalic	**3**	**6**	**7**	**14**	**8**	**16**	**9**	**18**
Cestodes	**6**	**12**	**7**	**14**	**9**	**18**	**8**	**16**

An analysis of the results shows that of the three ages of goats, goats up to two years of age are most susceptible to helminthiasis (Table 4). Young sheep under 1 year old, from 1 to 2 years old, sheep over 2 years old are infected with helminths with different indicators, both in terms of species composition of pathogens, and in terms of intensity and intensity of infestation.

Dynamics of age specifics of sheep infestation is connected with different conditions of keeping the livestock. If lambs are kept in the hospital and fed with green mass from favorable lands, they will be dewormed.

If ewe-mamas with lambs are grazed in spring on unfavorable pastures, they will be infected with helminths already in the middle of May, from the moment of their contact with green mass along with mother's milk. Infection of age groups of sheep, including lambs, in spring depends on overwintering of invasive larvae.

Therefore, it should be noted that the dynamics of age indicators of animal infestation is closely related to the peculiarities of biology, ecology of both pathogens and helminth hosts, environmental conditions on pastures and significantly from the anthropogenic factor.

Table 4 – Helminth infestation of goats of different ages according to coproscopy data

Age group	Animals were examined		Extensinvasiveness, %			
	In total	Including infected	Strongylata (GIT)	Dictyocaulus	Trichocephals	Cestodes
Baby goats up to 1 year old	50	18	16	8	6	24
Baby goats up to 2 years old	50	23	50	22	36	40
Goats over 2 years old	50	6	12	0	20	4

Conclusion. The helminth fauna of goats in the West Kazakhstan region is represented by 17 species of helminths, of which 14 species of nematodes: Dictyocaulus filaría, Haemonchus contortus, Ostertagia circumciancta, O. trifurcata, Nematodirus spathiger, N. oiratianus, N. filicollis, N. hervetianus, N. abnormalis, Marshalagia marshalli, Chabertia ovina, Trichostrongylus probolurus, T. skrjabini, Trichocephalus ovis, and 3 types of cestodes: Moniezia expansa, M. Benedeni, Thisaniezia giardi.

According to helminthic larvoscopic studies, the infection of goats in three districts of the West Kazakhstan region with strongylates of the gastrointestinal tract varies from 51.8 to 70.5%, against 92.399.2% in sheep, dictyocaulae 27.2-35.9% versus 31.7-40.0%, trichocephalus 7.3-15.0% versus 18.1-25.5%.

The intensity of goat invasion according to the helminthological autopsy is the highest represented by trichostrongils 378.4-562.8 specimens versus 1162.2-1192.3 specimens in sheep, nematodes of the Nematodirus spathiger and N. oiratianus species, respectively, 285.6-326.2 and 190.7-217.3 specimens against 554.7732.3 and 369.3-524.2 copies, hemonchs 181.5-322.7 against 267.3-882.2 copies, marshallagias 6.6-28.2 against 14.7-88.3, dictyocules 3.3-6.3 against 10.2-15.9 copies and trichocephalic 9.5-14.3 versus 19.5-29.9 copies the sheep.

In all seasons of the year, infection of goats with strongylates of the gastrointestinal tract was high and amounted to 50-70%, infection with dictyocules in spring was the lowest 26%, and by winter it gradually increased to 38%, similarly, infection with trichocephals increased from 6 to 18%.

Infection with cestodes varied from 12 to 18%, at the autumn peak. Goats under the age of two are most susceptible to helminthiasis in comparison with adult livestock.

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ТҮЙІН

Ауылда меншіктің әртүрлі нысандарын құрудың қазіргі жағдайында ешкі басы аулаларда, фермаларда және шаруа қожалықтарында шоғырланған, гельминтозбен күресу проблемалары ерекше өзекті болды.

Ауыл шаруашылығында қайта ұйымдастырумен байланысты болып жатқан процестердің жекелеген элементтері эпизоотиялық жағдайға теріс әсер етті, жануарлардың паразиттік аурулардан жұқтыру және өлімі артты, салаға ветеринариялық қызмет көрсету мәселелерінде елеулі олқылықтар пайда болды.

Мамандар атап өткендей, гельминтоздар кезіндегі эпизоотиялық процесс - бұл қоздырғыштың ауру жануардан - қоздырғыштың көзінен сау - сезімтал жануарға дәйекті ауысуының үздіксіз тізбегі.

Қоздырғыштың берілу механизмі жайылымдар, суару көздері, жем арқылы жүзеге асырылады және табиғи-климаттық, антропогендік, техногендік және шаруашылық процестерге, ветеринариялық - санитариялық нормалар, жайылымдық профилактика элементтері бұзылған кезде мал шаруашылығын енгізу жағдайларына байланысты күшейтіледі. Батыс Қазақстан облысындағы ешкілердің гельминтофаунасы гельминттердің 17 түрімен ұсынылған, оның ішінде нематодтардың 14 түрі: Dictyocaulus filaría, Haemonchus contortus, Ostertagia circumciancta, O. trifurcata, nematodirus spathiger, N. oiratianus, N. filicollis, N. hervetianus, N. abnormalis,

Marshalagia marshalli, Chabertia ovina, Trichostrongylus probolurus, T. skrjabini, Trichocephalus ovis, және цестодтардың 3 түрі: Moniezia expansa, M. Benedeni, Thisaniezia giardi.

РЕЗЮМЕ

В современных условиях создания на селе разных форм собственности поголовья коз сосредоточены в подворьях, фермерских и крестьянских хозяйствах, проблемы борьбы с гельминтозами приобрели особую актуальность.

Отдельные элементы происходящих процессов, связанные с реорганизацией в сельском хозяйстве, негативно отразились на эпизоотической ситуации, увеличилась зараженность и падеж животных от паразитарных болезней, возникли серьезные упущения в вопросах ветеринарного обслуживания отрасли.

Эпизоотический процесс при гельминтозах как отмечают специалисты – это непрерывная цепь последовательного перехода возбудителя от больного животного - источника возбудителя, к здоровому - восприимчивому животному.

Механизм передачи возбудителя осуществляется через пастбища, источники водопоя, корм и усиливается в зависимости от природно-климатических, антропогенных, техногенных и хозяйственных процессов, условий введения животноводства, когда нарушаются ветеринарно - санитарные нормы, элементы пастбищной профилактики.

Гельминтофауна коз в Западно-Казахстанской области представлена 17 видами гельминтов, из которых 14 видов нематод: Dictyocaulus filaría, Haemonchus contortus, Ostertagia circumciancta, O. trifurcata, Nematodirus spathiger, N. oiratianus, N. filicollis, N. hervetianus, N. abnormalis, Marshalagia marshalli, Chabertia ovina, Trichostrongylus probolurus, T. skrjabini, Trichocephalus ovis, и 3 вида цестод: Moniezia expansa, M. Benedeni, Thisaniezia giardi.

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