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ARTICLE

Prevalence and Epizootiological Characteristics of Helminth Infections in Cattle and Sheep in Selected Districts of Surkhandarya and Kashkadarya Regions, Uzbekistan

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Abstract

Helminth infections remain among the major parasitic diseases affecting livestock productivity by reducing animal health, growth performance, and the quality of meat and milk production. This study evaluated the prevalence and species composition of helminth infections in cattle and sheep from selected districts of the Surkhandarya and Kashkadarya regions of Uzbekistan. A total of 402 animals, including 182 cattle and 220 sheep, were examined using the Fülleborn flotation technique, sequential sedimentation method, and the modified Baermann–Orlov technique. Helminth infections were highly prevalent in both animal species, both animal species, with overall prevalence rates of 76.81% (169/220) in sheep and 71.97% (131/182) in cattle. Gastrointestinal strongyle infections predominated in both species. In cattle, the principal helminthoses included gastrointestinal strongylosis, fasciolosis, marshallagiosis, nematodirosis, monieziosis, and paramphistomosis, whereas sheep were mainly infected with gastrointestinal strongylosis, marshallagiosis, fasciolosis, and nematodirosis. Infection prevalence increased with animal age, reflecting prolonged exposure under local grazing conditions. These findings demonstrate that helminth infections remain widespread in livestock of southern Uzbekistan and highlight the need for continuous epidemiological surveillance, strategic anthelmintic treatment, and integrated parasite control programs to improve animal health and productivity.

Keywords: cattle, helminths, helminth infections, fasciolosis, monieziosis, gastrointestinal strongylatoses, marshallagiosis, nematodirosis, prevalence.

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1 Introduction

Livestock production plays a significant role in ensuring food security and supporting the agricultural economy of Uzbekistan. However, parasitic diseases, particularly helminth infections, continue to limit the productivity of cattle and sheep by reducing growth performance, reproductive efficiency, and the quality of animal products. Therefore, understanding the prevalence and epizootiological characteristics of helminth infections is essential for developing effective regional control strategies.

In Uzbekistan, studies have shown that helminth

infections are widely distributed among livestock, especially in the southern regions, where climatic conditions favor the development and transmission of parasitic diseases. Preventive measures based on regular monitoring and strategic deworming have been recommended to reduce their economic impact [1].

The epidemiology of gastrointestinal helminths is determined by the interaction between parasite biology, host susceptibility, grazing management, and environmental factors. Among these parasites, gastrointestinal strongyles are regarded as the most economically important helminths affecting small ruminants because of their pathogenicity and widespread occurrence [2].

Epidemiological investigations from different countries have confirmed the high prevalence of helminth infections in both cattle and sheep. Studies conducted in Colombia demonstrated that gastrointestinal parasites are common in grazing livestock and that mixed infections frequently occur under traditional production systems [3]. Likewise, research from Ethiopia reported that environmental conditions and livestock management significantly influence the prevalence and distribution of gastrointestinal helminths in cattle [5].

Recent studies have further highlighted the importance of epidemiological surveillance for livestock parasitoses. Investigations in endemic areas have demonstrated that ecological and management factors strongly affect the transmission dynamics of parasitic infections [4]. In Kazakhstan, gastrointestinal helminthiasis remains highly prevalent in sheep, emphasizing the need for regular monitoring and effective parasite control programs [6]. Similar findings have been reported from Myanmar, where conventional and molecular diagnostic methods confirmed widespread gastrointestinal parasite infections in cattle [7].

Studies in India have identified gastrointestinal nematodes as the predominant helminths affecting sheep and demonstrated considerable variation in host resistance to infection [8]. Although recent research from Yemen focused primarily on bacterial diseases of small ruminants, it also highlighted the importance of continuous disease surveillance for maintaining livestock health under field conditions [9].

Despite these findings, comprehensive information regarding the prevalence and epizootiological characteristics of helminth infections in cattle and sheep from the Surkhandarya and Kashkadarya regions of Uzbekistan remains limited. Therefore, the present study was undertaken to evaluate the current distribution of helminth infections and provide epidemiological evidence for improving regional parasite prevention and control programs.

2 Materials and Methods

The study was conducted in the Kumkurgan, Shurchi, Oltinsoy, and Denov districts of the Surkhandarya Region, and the Kitab and Guzar districts of the Kashkadarya Region, Uzbekistan. A total of 402 animals, including 182 cattle and 220 sheep, were examined. Fresh fecal samples were collected individually and subjected to parasitological analysis to determine the prevalence of helminth infections.

Helminth eggs were detected using the Fülleborn flotation technique and the sequential sedimentation (washing) method, whereas helminth larvae were identified using the modified Baermann–Orlov larvoscopic technique developed by the Veterinary Research Institute (VRI) of Uzbekistan. The prevalence of helminth infections was calculated as the percentage of infected animals relative to the total number of examined animals.

3 Results and Discussion

The results of the present study demonstrated that the prevalence of helminth infections in cattle and sheep varied among the selected districts of the Surkhandarya and Kashkadarya regions. The distribution of helminth infections in the examined animals is presented in Table 1. As shown in Table 1, the prevalence of helminthiases differed considerably between sheep and cattle. These variations may be attributed to several factors, including the age of the animals, seasonal changes, climatic conditions, grazing and management practices, as well as the effectiveness of preventive and anthelmintic treatment programs implemented in the study areas.

According to the results of the helminthological examination of cattle raised on livestock farms and in household holdings of Guzar District, Kashkadarya Region, a total of 35 cattle of different age groups (calves up to 6 months of age, young cattle aged 1–2 years, and adult cattle over 3 years old) were examined. The examination revealed that 5 animals (14.28%) were infected with *Marshallagia* spp., 3 (8.57%) with *Nematodirus* spp., 19 (54.28%) with other gastrointestinal strongylates, 6 (17.14%) with *Fasciola*

Table 1. Prevalence of Helminth Infections in Sheep and Cattle from Household and Livestock Farms in Guzar District, Kashkadarya Region

Helminth infections	Cattle ($n = 35$)		Sheep ($n = 65$)	
	No.	%	No.	%
Marshallagiosis	5	14.28	35	53.84
Nematodirosis	3	8.57	28	43.07
Other gastrointestinal strongylatoses	19	54.28	41	63.07
Fasciolosis	6	17.14	21	32.30
Monieziosis	3	8.57	3	4.61
Overall prevalence	**22**	**62.85**	**48**	**73.84**

Table 2. Prevalence of Helminth Infections in Sheep and Cattle Raised in Household Holdings and Livestock Farms of Kitab District, Kashkadarya Region

Helminth infections	Cattle ($n = 40$)		Sheep ($n = 45$)	
	No.	%	No.	%
Marshallagiosis	3	7.5	20	44.44
Nematodirosis	–	–	12	26.66
Other gastrointestinal strongylatoses	32	80.0	28	62.22
Fasciolosis	3	7.5	6	13.33
Monieziosis	2	5.0	6	13.33
Overall prevalence	**35**	**87.5**	**38**	**84.44**

spp., and 3 (8.57%) with *Moniezia* spp.

The overall prevalence of helminth infections in cattle reached 62.85%, with gastrointestinal strongylatoses, particularly infections caused by *Ostertagia* spp., *Trichostrongylus* spp., and *Cooperia* spp., representing the predominant parasitic diseases.

In sheep, gastrointestinal strongylatoses were the most common helminth infections, affecting 63.07% of the examined animals, followed by marshallagiosis with a prevalence of 53.84%.

These findings highlight the necessity of developing effective prevention and treatment measures specifically targeting these helminth infections. Furthermore, they emphasize the importance of conducting further research to identify and develop effective locally produced anthelmintic agents for their sustainable control.

Table 2 presents the results of the helminthological examination of cattle and sheep raised on livestock farms and in household holdings of Kitab District, Kashkadarya Region.

Helminthological examination of 20 Simmental cattle from the "Charos Bogi" cattle farm in Kitab District showed that 1 animal (5.0%) was infected with *Marshallagia* spp., 17 animals (85.0%) with gastrointestinal strongylates, 3 animals (15.0%) with *Fasciola* spp., and 2 animals (10.0%) with *Moniezia* spp.

In the "Chirkay" farm of Kitab District, 20 indigenous cattle were examined. The helminthological examination revealed that 2 animals (10.0%) were infected with *Marshallagia* spp., while 15 animals (75.0%) were infected with gastrointestinal strongylates. Overall, of the 40 cattle examined in Kitab District, 35 animals were found to be infected with one or more helminth species, resulting in an overall prevalence (extensity of invasion) of 87.5%.

Among the sheep examined in Kitab District, *Marshallagia* spp. were detected in 20 animals (44.44%), *Nematodirus* spp. in 12 animals (26.66%), other gastrointestinal strongylates in 28 animals (62.22%), *Fasciola* spp. in 6 animals (13.33%), and *Moniezia* spp. in 6 animals (13.33%).

A total of 75 cattle and 110 sheep were examined in Kashkadarya Region. Helminthological examination revealed that 77.29% of the animals were infected with one or more helminth species, demonstrating a high overall prevalence (extensity of invasion) of helminth infections in the region.

In Surkhandarya Region, a total of 107 cattle and 110 sheep from the Kumkurgan, Shurchi,

Table 3. Prevalence of Helminth Infections in Cattle and Sheep in Surkhandarya Region Based on Coprological Examination

Helminth infections	Cattle ($n = 107$)		Sheep ($n = 110$)	
	No.	%	No.	%
Marshallagiosis	15	14.01	32	29.09
Nematodirosis	11	10.28	28	25.45
Other gastrointestinal strongylatoses	27	25.23	30	27.27
Fasciolosis	18	16.82	56	50.90
Monieziosis	6	5.60	5	4.54
Paramphistomosis	7	6.54	–	–
Overall prevalence	**74**	**69.15**	**83**	**75.45**

Table 4. Overall Prevalence of Helminth Infections in Sheep and Cattle from Household Holdings and Livestock Farms in Selected Districts of Surkhandarya and Kashkadarya Regions

Helminth infections	Cattle ($n = 182$)		Sheep ($n = 220$)	
	No.	%	No.	%
Marshallagiosis	23	12.63	87	39.54
Nematodirosis	14	7.69	68	30.90
Other gastrointestinal strongylatoses	78	42.85	99	45.00
Fasciolosis	27	14.83	83	37.72
Monieziosis	11	6.04	14	6.36
Paramphistomosis	7	3.84	–	–
Overall prevalence	**131**	**71.97**	**169**	**76.81**

Oltinsoy, and Denov districts were examined using helminthocoprological methods. According to the obtained results (Table 3), 32 of the 110 examined sheep (29.09%) were infected with *Marshallagia* spp., 28 animals (25.45%) with *Nematodirus* spp., and 30 animals (27.27%) with other gastrointestinal strongylates. In addition, 56 sheep (50.90%) were infected with *Fasciola* spp., while *Moniezia* spp. infection was detected in 5 sheep (4.54%).

Helminthological examination of 107 cattle of different age groups (calves up to 6 months of age, young cattle aged 1–2 years, and adult cattle over 3 years old) in Surkhandarya Region revealed that 15 animals (14.01%) were infected with *Marshallagia* spp., 11 animals (10.28%) with *Nematodirus* spp., 27 animals (25.23%) with other gastrointestinal strongylates, 18 animals (16.82%) with *Fasciola* spp., 6 animals (5.60%) with *Moniezia* spp., and 7 animals (6.54%) with *Paramphistomum* spp. Overall, the combined prevalence of helminth infections in the examined cattle and sheep in Surkhandarya Region was 72.35%.

The overall analysis of the surveys conducted in the Kumkurgan, Shurchi, Oltinsoy, and Denov districts of Surkhandarya Region and the Kitab and Guzar districts of Kashkadarya Region showed that, of the 220 sheep examined using helmintho-ovoscopic techniques, 169 animals were infected with one or more helminth species, corresponding to an overall prevalence (extensity of invasion) of 76.81%.

Helminthological examination of 182 cattle revealed that 131 animals were infected with one or more helminth species, corresponding to an overall prevalence of 71.97%.

A total of 402 livestock animals, including cattle and sheep, were examined. Helminthological examination revealed that 300 animals were infected with one or more helminth species, resulting in an overall prevalence of 74.62%.

4 Conclusions

Helmintho-ovoscopic examinations conducted in the selected districts of Surkhandarya and Kashkadarya regions demonstrated that the prevalence of helminth infections in sheep and cattle increased progressively with advancing age.

In Kashkadarya Region, the overall prevalence of helminth infections in cattle reached 76.0%, with gastrointestinal strongylatoses and fasciolosis representing the predominant parasitic diseases. In

Surkhandarya Region, the corresponding prevalence of helminth infections in cattle was 69.15%.

In the selected districts of the Surkhandarya and Kashkadarya regions, helmintho-coprological examination demonstrated an overall prevalence of helminth infections of 76.81% in sheep (169/220) and 71.97% in cattle (131/182), indicating a high level of helminth infection among livestock in the study area.

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