

CONTROL OF COCCIDIOSIS OF FARM BREEDING SHEEP**Ivan PAVLOVIC¹, Jovan BOJKOVSKI², Violeta CARO-PETROVIC³, Aleksandra TASIC¹,
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Abstract

Infection with *coccidia* is one of the most common and damaging sheep diseases, particularly young lambs and economically important diseases of sheep. Coccidiosis is caused by parasitic protozoa in the genus *Eimeria*. Coccidial infection is virtually universal in sheep and large numbers of oocysts may be found in the faeces of clinically normal animals. Usually it is presented at animals at 4-10 weeks. Lamb and kids infection had moderate morbidity and low mortality rate. Environmental contamination and resulting clinical disease is generally influenced by local weather conditions and the grazing management practices of the flock. In our paper, we present measures to control coccidiosis in sheep kept in frame breeding conditions.

Key words: coccidiosis, lambs, sheep, control

Breeding of sheep represents a significant branch of livestock production. The reason for this lies not only in tradition, but also because the production of wool and milk, as well as lamb meat, is a highly sought-after item on the world market. Based on research in the world, diseases of parasitic etiology dominate in sheep both in terms of prevalence and incidence, accompanied by significant morbidity and moderate mortality (Kusiluka and Kamarage, 1996, Pavlovic et al., 2009, Bojkovski et al., 2010, Altaf and Hidayatu, 2014).

Coccidiosis in sheep is parasitic infection caused by protozoa in the genus *Eimeria* (Levine, 1985, Foreyt, 1987, Bangoura and Bardsley, 2020). Historically, some *Eimeria* spp were thought to be infectious and transmissible between sheep and goats, but the parasites are now considered host-specific (McDougald, 1979). Numerous data from world literature support the fact that coccidiosis is the most common parasitic disease of sheep in herds (O'Callaghan et al., 1987, Gregory, 1990, de Silva et al., 2008, Chartier and Paraud, 2012, Almeida 2013, Ibrahim and Afsa, 2013).

All over the world, an extremely large number of older animals are infected with protozoa, which are involved in the etiology of this disease (Gregory and Catchpole, 1989, de la Fuente et al. 1993, Platzer et al., 2005, Wang et al., 2010). It is of even greater importance that the infection of the young that occurs already in the first months of life (Ozidal et al., 2009)

Based on existing data, the prevalence of coccidiosis is highest in environments where the most intensive keeping is in stable conditions () Unlike helminths, which need free grazing areas for biological development, protozoan infections are related to stable housing, where there is a permanent microclimate, especially temperature and humidity (Wright and Coop, 2007, bakunzi et al., 2010, Ibrahim and Afsa, 2013).

In addition, a large number of animals of different ages in a relatively small space leads to population pressure that favors the development of protozoa and thus infections. The main goal of the control program of sheep coccidiosis is to raise the health status of sheep in the Republic of Serbia (Pavlovic et al., 1995, 2013, 2019, 2021a, b).

By preventing the occurrence and spread of coccidiosis by undertaking certain biotechnical and health measures that have the role of reducing the prevalence of parasites, which achieves higher growth and better production results from sheep. The application of this integrated concept of coccidiosis control required systematic monitoring of infection on farms before and after the applied measures and required the involvement of all

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relevant entities, primarily veterinary services, starting from farms to animal workers.

MATERIAL AND METHOD

Coccidiosis control measures were applied to nine test farms raising sheep in herds of more than 50 animals, from January 2014 to March 2015.

In order to establish the prevalence of parasitic infections and the biodiversity of the causative agent in the investigated sheep herds, samples of feces of all categories of animals were collected. On each of the farms, 30 samples of feces were sampled, 10 from each production category - lambs/kids at teats (from 0 to 28 days of age), rearing animals (before the first release) and breeding animals.

Collected faeces samples were examined using routine coprological methods (Soulsby, 1977, Taylor, 1995, Pavlović and Anđelić-Buzadžić, 2010). Despite the general relationship between clinical coccidiosis and oocyst excretion, no threshold for treatment has been established, though a fecal oocyst count of >20,000 OPG of a pathogenic species is considered characteristic of coccidiosis in lambs. Determination of oocidia was performed by morphological characteristics (Levine 1985, Foreyt, 1987, Eckert et al., 1995).

RESULTS AND DISCUSSION

Our examination revealed coccidiosis in 139 animals (23.61%).

Lambs most often showed clinical symptoms of the disease and they were present in 39.37% of the affected individuals. There was no gender difference in the prevalence and incidence of coccidiosis.

In adult animals, the results showed that 57.70% of sheep were infected and had subclinical coccidiosis. Adult female sheep were significantly ($P < 0.05$) more infected (82.2%) than adult rams (40%).

In the overall finding, *E. ovoidalis* was the most represented species, found with 87.1%, followed by *E. faueri* (63%), *E. ovina* (53%), *E. granulosa* (31%), *E. parva*, (25%), *E. intricata* (19%) and *E. pallida* (8%),

Infections with two or more *Eimeria* species were detected in 78%. The number of excreted oocysts was higher in lambs (18325 +/- 23383 OPG) than in adult sheep (2597.3 +/- 12373 OPG).

After diagnosing coccidiosis, all animals in the herd were treated with Toltrazuril (20 mg/kg, PO, once), whose metabolite toltrazuril-sulfone

(ponazuril) significantly reduces the number of cysts (Platzer et al. 2005).

After the therapy, hygienic measures were carried out in the facilities where the sick animals were. All clinically affected lambs should be separated from their mothers and placed in a clean, disinfected pen with plenty of straw. Other animals should be moved to less contaminated areas of the facility to ensure food and water sources are free of feces.

Control management of coccidiosis is a delicate balance between ensuring that lambs are exposed to infection and thereby acquire immunity, and preventing them from developing clinical disease. Management plays a key role in prevention by ensuring that all areas used by sheep, especially lambs, are thoroughly cleaned and disinfected, ensuring that pens are not overcrowded and that kids are kept in small groups of the same age.

Management can help prevent disease by reducing the size of the number of individuals in the facility, thereby reducing fecal contamination from sheep or lambs. All feed and water troughs should be raised off the ground and faecal contamination prevented (Bojkovski et al., 2010, Altaf and Hidayatu, 2014, Bangoura and Bardsley, 2020). All troughs inside and out should be placed in well-drained areas. Regular transfer of lambs to other segments of the facility prevents excessive accumulation of oocysts.

After that, a control examination was performed in the herds. The total number of excreted oocysts in lambs was 11892 +/- 10584 OPG, while in sheep it was 10017 +/- 9747 OPG.

These measures achieved the goal of controlling coccidiosis in sheep/lambs in two ways - by creating primary immunity in lambs after subclinical infection, which achieves lifelong immunization that prevents clinically manifest diseases, and by preventive therapy that is used when they are due to population pressure and environmental factors (Gregory and Catchpole, 1989). Conditions created predisposing conditions for the breakthrough of immunity and the emergence of clinically manifest infections. This refers primarily to the winter period, when a critical amount of oocysts per unit area is reached in the pens and the possibility of infection.

The second is timed and targeted preventive treatment. Because occurrence of coccidiosis under these management systems often becomes so predictable, coccidiostats should be administered prophylactically for 28 consecutive days beginning a few days after lambs are

introduced into the environment (Platzer et al.2005).

CONCLUSIONS

Sheep coccidiosis was of great importance to health status of lambs and its performances. Lambs infection had moderate morbidity and low mortality rate. Consequence is significant increase of lamb accrescence, its weakens and less growth. The best preventive measure a lamb producer can take is to use a feed with a coccidiostat added. With careful management and sound preventive measures, the losses associated with this disease can be reduced to minimal levels. By preventing the occurrence and spread of coccidiosis by undertaking certain biotechnical and health measures that have the role of reducing the prevalence of parasites, which achieves higher growth and better production results from sheep. The application of this integrated concept of parasite infection control required systematic monitoring of infection on farms before and after the applied measures.

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