

Coccidiosis in Goats and its Management

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[DO:10.5281/Vettoday.14709848](https://doi.org/10.5281/Vettoday.14709848)

Introduction

Several types of protozoan parasites called *Eimeria* causes coccidiosis in goats. Kids get coccidiosis when they ingest feed or water contaminated with infected animals' faeces. One major source of infection in a herd can be contaminated bedding. The problem of coccidiosis in goats is complicated and multifaceted. Disease is influenced by environment, level of contamination, exposure to infection. For indoor goats older than 4 weeks, it is the most frequent cause of diarrhea with or without blood.

Goat coccidiosis is a global problem. *E. alijeivi*, *E. aspheronica*, *E. arloingi*, *E. caprina*, *E. caprovina*, *E. christenseni*, *E. gilruthi*, *E. hirciee*, *E. jolchijeivi*, and *E. ninakohlyakimovae* (most pathogenic) are among the seventeen species that have been identified. The goat kids are frequently infected by multiple species simultaneously. All goat *Eimeria* species are thought to be host specific and do not spread from goats to sheep. Coccidial infections may occur simultaneously when raising animals outdoors.

Up to 100% of goats between the ages of 4 and 10 weeks may affect with coccidiosis, this is depend upon the type of housing, the farm's distribution and hygienic conditions, the animals' immune systems, and the weather. This condition can cause up to 50% of kids to die, and those who survive they are severe stunting, which leads to large financial losses.

ETIOLOGY

An intestine protozoan parasite belonging to the genus *Eimeria* is the cause of caprine coccidiosis. One of the most common parasite disorders affecting goats is caprine coccidiosis, which is brought on by protozoa of the genus *Eimeria*. The economically significant parasitic disease known as coccidiosis is caused by obligate intracellular parasites of the intestinal epithelium called protozoa of the genus *Eimeria*. *Eimeria ninakohlyakimovae* and *Eimeria arloingi* are the primary species that infect goats.

The hot and wet season is ideal for oocyst survival and sporulation. Serious goat infections include species such as *E. christenseni*, *E. arloingi*, *E. caprina*, and *E. ninakohlyakimovae*. Small kids are considerable danger due to the asymptomatic nature of the disease in adult goats.

RISK FACTOR

The danger of contracting *Eimeria* spp. is very high for goats raised in intensive production systems. Around the world, coccidiosis is one of the most common parasite infections affecting goats. Because of its high death and morbidity rates, low growth, and expensive treatment costs, this disease causes economic losses. Particularly in young or stressed goats under inadequate farm management, coccidian parasites of the genus *Eimeria* induce an intestinal disease with a high goat kids mortality rate.



CLINICAL SIGNS AND SYMPTOMS

The majority of clinical signs happen between weeks 5 to 8 of age. The majority of goats have undetectable infections. The typical symptoms of acute or subacute infections include decreased appetite, rough coat, poor fecal pellet formation (pasty feces), and decreased weight gain. More severe acute cases include anorexia, weight loss, dullness, diarrhea with or without blood, and sometimes tenesmus. Severe issues result in diarrhea that appears quickly and frequently includes blood, tenesmus, abdominal pain symptoms, weakness, recumbency, and mortality.

Along with an increasing loss of body weight, pale mucous membranes, weakness, staggering, dyspnea, dehydration, and recumbency, the sudden acute diarrhea with foul odors and stools that contain mucus and blood are the first clinical symptoms of an *Eimeria* infection. Other clinical signs of acute *Eimeria* include appetite, dullness, and mild pyrexia.

The intestinal mucosa is typically acutely invaded and destroyed by protozoa, which also damage intestinal cells, causing blood and electrolyte loss and poor food absorption. Diarrhea, which can be severe and include blood in the feces, is the most common indication of infection. Reduced weight, anorexia, bloody or non-bloody diarrhea, and anemia are the most typical clinical manifestations of an Eimeriosis infection.

PATHOGENESIS

Goat kids that have early infections with *E. ninakohlyakimovae* or *E. caprina* are characterized by hemorrhagic enteritis. *E. apsheronica* causes the production of white nodules in the mucosa that are visible from the serosal surface, whereas *E. arloingi* infections can result in polyps in the small intestine. Infection severity is correlated with the quantity of oocysts the animal consumes and the parasite's position in the intestinal epithelial lining, genus of *Eimeria*, age, immunological state, and developmental phases of the different intestine sections. Coccidia alter the intestinal mucosa of infected animals, resulting in atrophy and localized bleeding, which reduces intestinal absorption.

DIAGNOSIS

A modified McMaster technique was used to quantify the number of coccidian oocysts per gram (OPG) after the coccidial infection of each fecal sample was assessed using the flotation technique with saturated saline. In order to

identify the oocysts, fecal samples were incubated for two to five days at room temperature in 2.5% (w/v) potassium dichromate. Based on the oocyst and sporocysts' morphological characteristics, identification was made.

The diagnostic test used to determine the quantity of oocysts in each goat's feces was the McMaster method to enumerate oocyst per gram (OPG) of feces. Centrifugal flotation with a saturated sodium chloride solution was used to concentrate the oocysts. Oocyst measurements were made using a compound microscope with a 40X objective.

TREATMENT

Goat coccidiosis can be effectively treated and managed using amprolium and toltrazuril. Neem leaf powder was discovered to be an inexpensive, practical, and cost-effective alternative for treating and managing caprine coccidiosis, although it was not always successful. Goats naturally afflicted with coccidiosis were treated with toltrazuril, amprolium, and neem leaf powder; toltrazuril was shown to be more successful. Goat feed with monensin (20 and 16 g/ton), toltrazuril (20 mg/kg BW as a single oral dose), and diclazuril (2 mg/kg BW as a double oral dose) is recommended. Amprolium in feed (100 mg/kg BW for 21 days), among the treated group of goats with monensin, toltrazuril, and amprolium, the percentage reduction in the number of fecal oocyst in the toltrazuril- treated group was found to be observed the highest (92%).

MANAGEMENT

Since there is currently no vaccine, prevention primarily focuses on herd management, including hygienic practices. A key component of disease prevention is the removal of stressors such as dietary changes, severe weather, crowding, frequent shipping, animal grouping, and exposure to other disease pathogens. Ensuring proper anticoccidial medication use and proper nutrition are crucial. For newborn ruminants, colostrum intake is crucial because it shields them from infections.

Maintaining good hygiene and reducing environmental risk factors are crucial components of coccidiosis control measures. Troughs for water and feed should be high enough to avoid significant fecal contamination. Avoid feeding animals on the ground, especially if they are crowded. Coccidial infection control will be aided by the routine pasture rotation used to control parasites.

CONCLUSION

The current study's helminths and *Eimeria* spp. prevalence were 21.95% and 39.27%, respectively, which is regarded as a high infection rate. Young animals had the highest prevalence of parasite infection, which the authors believe was caused by a decline in disease resistance and a decrease in the necessary immunity. The prevalence was higher in females than in males. The authors ascribed the increased infection rate in females to a hormonal imbalance that occurred during both pregnancy and lactation.

The majority of parasitic infections occurred during the summer, which may be because of the ideal temperature, humidity, and oxygenation required for oocyst sporulation and GIT parasites; In order to check the parasite population in small ruminants, it is necessary to run extension programs to educate farmers about the right use of anticoccidial and to implement regular monitoring as well as well-thought-out control methods.

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