



Alabama A&M and  
Auburn Universities

UNP-109

ALABAMA A&M AND AUBURN UNIVERSITIES

# Coccidiosis in Goats and Prevention

## Introduction

Coccidiosis is a gastrointestinal disease of farm animals. Coccidiosis is costly to livestock farmers due to high treatment expenses and a high mortality rate among animals after contracting this disease.

Coccidiosis is caused by *Eimeria spp*, also called *Coccidia spp*, and like *E. arloingi*, *E. christensenii*, and *E. ovinoidalis*, is highly pathogenic in kids. *Eimeria* are protozoa, a unicellular microorganism naturally found in the soil. *Coccidia* are host-specific, which means that *Coccidia* of cattle and chicken are specific to these species and do not cause disease in goats or vice versa. However, *Coccidia* of goats can affect sheep.

There are numerous species of *Coccidia* that are naturally found in the goat intestine. The infection occurs naturally by ingesting oocysts, a resistant form of the parasite, when grazing. Another form of infection is acquired with poor goat management practices that occur when feed and water supplies are contaminated with goat feces. Although the infection can occur in any goat herd raised under semi and intensive management practices, it is most frequently observed in kids 2 to 4 weeks postweaning.

Goats are born without *Coccidia* in the intestine. The infection occurs by ingesting the pathogenic sporulated oocyst (sporulated is a form of resistance of the *Coccidia*). Oocysts can be found in the water or in feed supplies contaminated with feces. Once ingested, oocysts penetrate the cells lining the intestine where they go through several stages of development

and cause inflammation and destruction of intestinal cells. Occasionally, oocysts reach a mature stage of development. They can multiply, generating thousands of new oocysts that will be passed through the feces to the environment in about 2 to 3 weeks. However, they must undergo a period of sporulation in order to be contagious to another host. This sporulation period occurs when there is adequate moisture and warm temperatures. Unfortunately, sporulated forms are highly resistant to ordinary disinfectants. Direct sunlight is the best disinfectant; therefore, goat housing should be dry and exposed to sunlight. Infective oocysts can be found in a contaminated environment for a long period of time.

Stress is the predisposing factor in kids during the postweaning period. Animals may die suddenly during this phase and without any warning. Outbreaks can occur during stressful conditions such as after shipping or when animals are relocated. Outbreaks can also occur during sudden weather changes, after a change in concentrated feed practices, when animals are recovering from a disease, or in worm burden cases. Although coccidiosis can occur year around, a higher incidence occurs during postweaning. It is common to find animals naturally resistant to coccidiosis.

## Signs of Coccidiosis

The intensity of clinical signs of disease depends on how many intestinal cells are damaged by invading organisms, the



*Figure 1. A typical sign of a kid with coccidiosis displaying scours and dehydration.*

susceptibility of the animal, and the body condition. Other signs of coccidiosis infection are:

- Watery diarrhea with or without mucus or blood
- Constipation
- Lack of appetite accompanied by fever
- Dehydration as a result of diarrhea
- Weakness
- Emaciation caused by weight loss

At necropsy (animal autopsy), a scientist may discover macroscopic changes in the intestinal mucosa. The inner layer of the intestine may reveal hemorrhaging or ulcerations in the intestinal wall.



*Figure 2. The intestine of a kid at necropsy, showing hemorrhagic, and ulcerations alterations with collection of mucus.*

## Diagnosis

Diagnosis depends on the herd history and signs of infection. A fecal examination using the McMaster technique can be an important diagnostic tool. It is common to find oocytes in fecal matter of kids or adult goats without the presence of disease. Coccidiosis is confirmed when the count reveals thousands to millions of oocytes per gram of feces. A differential diagnosis is also needed to exclude gastrointestinal infections caused by nematodes (worms) burden, bacterial and viral infections, and diarrhea caused by diet, including tender grass.



*Figure 3. Coccidia oocytes.*

## Treatment

Isolate from the herd animals displaying clinical signs of coccidiosis. Apply treatment as follows:

- Replace fluids as soon as possible. Administer liquid nutritional supplement orally by nipple bottle until the animal is rehydrated. Animals that have lost 5 percent of their body weight may require intravenous (IV) and/or electrolyte therapy. Treatment may include IV or subcutaneously (SC) fluid therapy with a physiologically balanced electrolyte such as Ringer's, Plasmalyte-A, or Normosol-R. Administer the solution (2 to 5 milliliters per pound) one to three times daily until the animal is rehydrated.
- Sulfas such as Albon, Sulmet, or Di-Methox, can also be mixed in the drinking water or as a drench for individual goats. An alternative is CORID (amprolium).

## Preventive Measures

The control of coccidiosis relies on management practices:

- Improve hygiene of facilities, pastures, pens, and feeding and water sources. Avoid moist areas without direct sunlight, such as under feed bunks and near water troughs.
- Avoid crowded pens and pastures.
- Quarantine before introducing new animals to existing herd.
- Minimize weaning stress. If needed, creep feed to adjust the kids to a new diet prior to weaning.
- Predict possible outbreaks during severe weather and postweaning.
- Add coccidiostat to concentrate as a feed additive. Coccidiostat suppresses the full development of the life cycle of the *Coccidia* and allows immunity to develop. Monensin acts as a coccidiostat and can enhance production performance.

- As an alternative, Decoquinatate (Decox) can be used as a feed additive in the feeding or mineral salt in a concentration.

Producers must follow feeding instructions as recommended by the feeding company on the feed tag. However, the herd manager should assess his/her feeding plan to determine if the regular feeding program will result in goats consuming enough feed to get the recommended daily dosage. You do not want to overfeed just to meet the daily medication rate. Perhaps a different treatment plan is warranted. For example, if producer regularly feeds 1 lb per day of feed and the feed tag suggests that goats be fed 3 lbs per day of the medicated feed, then the medicated feed may be economically unfeasible. An alternative treatment and prevention plan needs to be considered.

**NOTE:** Follow the manufacturer's guide to administer CORID (amprolium) and sulfas in the drinking water or when drenching. Be aware that prolonged treatment of three or more days with amprolium can cause goat polio.

## References

- Bessay, M., Le Vern, Y., Kerboeuf, D., Yvoré, P., & Quéré, P. (1996). Changes in intestinal intra-epithelial and systemic T-cell subpopulations after an *Eimeria* infection in chickens: Comparative study between *E. acervulina* and *E. tenella*. *Veterinary Research*, 27(4-5), 503-514.
- Campbell, W. C. (2008, August). History of the discovery of sulfaquinoxaline as a coccidiostat. *Journal of Parasitology*, 94(4), 934-945.
- Ibarra-Velarde, F. and Alcalá-Canto, Y. (2007, August). Downregulation of the goat beta-defensin-2 gene by IL-4 in caprine intestinal epithelial cells infected with *Eimeria* spp. *Parasitology Research*, 101(3), 613-618.
- Merck & Company, Incorporated. (2008). Coccidiosis of goats. In *The Merck Veterinary Manual*. Retrieved February 17, 2009, from <http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/21204.htm>.
- Ruiz, A., González, J., Rodríguez, E., Martín, S., Hernández, Y. I., Almeida, R., & Molina, J. M. (2006, October). Influence of climatic and management factors on *Eimeria* infections in goats from semi-arid zones. *Journal of Veterinary Medicine B., Infectious Diseases and Veterinary Public Health*, 53(8), 399-402.



UNP-109

**Maria Lenira Leite-Browning, DVM**, *Extension Animal Scientist*, Alabama A&M University

**For more information**, call your county Extension office. Look in your telephone directory under your county's name to find the number.

Trade names are used **only** to give specific information. The Alabama Cooperative Extension System does not endorse or guarantee any product and does not recommend one product instead of another that might be similar.

Published by the Alabama Cooperative Extension System (Alabama A&M and Auburn Universities) in cooperation with the U.S. Department of Agriculture. An Equal Opportunity Educator and Employer.

New March 2009; UNP-109

© 2009 by Alabama Cooperative Extension System. All rights reserved.