



Hot, Wet Summer Ideal for Goat Coccidia

By Jackie Nix

This summer has been unusually wet, hot and humid for many parts of the United States. I know that here in Montgomery, Alabama even on the days that it doesn't actually rain, the dew never really dries off the grass. These are ideal conditions for the development and transmission of coccidia. Given the current conditions, it is of no wonder that goat producers are reporting record problems with coccidia this year.

What are Coccidia?

Coccidia are single-celled protozoan parasites that live in the intestines of goats. All adult goats contain coccidia in their gut, even healthy goats; therefore, fecal samples indicating that coccidia are present do not necessarily mean that disease is present. There are many species of coccidia (*Eimeria*) that infect goats. Coccidia are species-specific meaning that coccidia from one species do not infect another (i.e. chicken coccidia cannot infect goats or vice versa). At one time it was believed that sheep coccidia might be able to infect goats, but now that theory is largely discounted.

Coccidian Lifecycle

In order to manage the impact of coccidia in your goat herd, it is necessary to understand the coccidian lifecycle. The coccidian lifecycle begins when goats consume infective sporulated oocysts (infective coccidia eggs). Once inside the goat, coccidia are released from the oocyst and invade intestinal cells. Rapid multiplication occurs resulting in the destruction of intestinal cells and increased numbers of coccidia. In roughly 21 days, oocysts (coccidia eggs) are formed and passed in the feces. Oocysts are not immediately infective once they are shed into the environment. Proper moisture, temperature and oxygen levels are required for oocysts to become infective. In general, the warmer the weather, the faster the development into infective oocysts. When conditions are right, this process can occur in as little as 24 to 48 hours. Once oocysts become infective they are very hardy and can remain viable in the environment for up to a year; however, 2 to 3 months is the norm. Infective oocysts survive best in moist, shaded areas and can even survive freezing temperatures. When a goat consumes an infective oocyst the process starts over again.

What is Coccidiosis?

Coccidiosis is the disease that results from uncontrolled infection of coccidia. Disease symptoms are directly related to destruction of cells of the intestinal lining and ruptured blood vessels. Coccidiosis symptoms can be either subclinical or clinical. Subclinical cases result in decreased feed intake, reduced weight gain and unthrifty appearance and are difficult to detect due to an

absence of diarrhea. Undiagnosed subclinical cases of coccidiosis are quite common. If left untreated, subclinical cases can develop into clinical disease. Clinical coccidiosis can vary in severity. Some goats experience a slight loss of appetite and decreased weight gain along with light, short-term diarrhea. Severe cases of coccidiosis can result in copious amounts of dark, bloody, foul smelling diarrhea, diarrhea containing mucous and blood, persistent straining in an attempt to pass feces, loss of weight, rough hair coat, dehydration, and, in some cases, death within 24 hours of the first symptoms.

What Animals are Most at Risk?

Young, sick and stressed goats are most susceptible to development of coccidiosis symptoms. Kids less than 5 months of age are particularly susceptible since their immune system is often still developing and they are prone to stress. Stresses that can induce a coccidiosis outbreak include: weaning, drastic weather changes, rapid feed changes, transport and rough handling.

Continuous exposure to a particular species of coccidia stimulates an immune response that results in limited protection against that particular species of coccidia. This is why adult goats tend to be resistant to the development of coccidiosis. Also, kids raised in pasture conditions will often develop immunity on their own. However, severe challenge or stress can depress the goat's natural immunity to the point that disease is induced.

Goats that survive usually become immune; however, they may be permanently unthrifty and stunted due to extensive scarring and damage to the intestinal lining. The damaged intestinal lining is unable to effectively absorb nutrients needed for production.

What Causes Coccidiosis?

The three most common factors contributing to a coccidiosis outbreak are: 1. A severely contaminated environment. 2. Stress-related depression of immunity 3. Pathogenicity (ability of the parasite to do harm) of the coccidia species involved. Some coccidia are non-pathogenic (non-harmful); others range from mildly to severely pathogenic.

A Plan of Attack

The extremely hot and wet conditions this summer have resulted in perfect conditions for oocysts to rapidly become infective. This has resulted in severely contaminated environmental conditions. Unfortunately, during years like this, prevention of disease may not be possible. A more realistic expectation may be to minimize outbreaks and reduce the stresses that result in compromised immune function. Some management practices that may help accomplish this include:

- Provide proper nutrition so that the goats can better resist the effects of coccidiosis
- Avoid feeding goats on the ground – use raised feeders and clean them often
- Design feeding and watering areas so as to minimize fecal contamination
- Try to avoid forcing goats to graze within a canopy of 4 to 6 inches from the ground
- House kids separately from older goats if possible to help minimize transmission
- Expose pens and stalls to sunlight whenever possible
- Maintain good sanitation –regularly remove built up manure
- Consider use of foot baths (bleach solutions, etc) for your boots before traveling from pasture to pasture or pen to pen to help minimize transmission
- Minimize occurrence of damp, shady areas as much as possible

- If possible, rotate pastures so as to minimize exposure to infective oocysts
- If possible, graze different species such as horses or cattle on a pasture after removing goats to minimize transmission of infective oocysts
- Eliminate or minimize overcrowding, especially in pens containing kids
- Handle goats as calmly and gently as possible when working (avoid excessive yelling and hitting)
- Try to handle animals during the coolest periods of the day (typically early morning)
- Minimize the amount of time that goats go without feed or water when transporting long distances
- Use drugs strategically

Use of Coccidiostats

Coccidiostats are drugs that inhibit the development of coccidia. Remember that these do not kill coccidia. Normally, use of coccidiostats prior to anticipated susceptible periods are an effective management tool in preventing and controlling coccidiosis. Coccidiostats that are presently labeled for use in goats include monensin (Rumensin[®]) and decoquinate (Deccox[®]). However, use of coccidiostats alone may not provide adequate control under the present environmental conditions this summer. Contact your veterinarian for recommendations for strategic use of these and other drugs in the control of coccidiosis.

How Nutrition Affects Immunity

It is known that goats fed a properly balanced diet are better able to mount an immune response and recover from parasitic challenge than animals that are deficient in one or more nutrients. Proper nutrition involves providing adequate amounts of protein, energy, water, minerals and vitamins. Antibodies, which fight parasitic invaders, are composed of protein. Energy is needed to drive the metabolic functions involved in mounting an immune response. Proper hydration is absolutely necessary for metabolic function. Several minerals and vitamins are directly involved in the immune response. While all are important, a few are more likely to be deficient in the diet than others. The minerals and vitamins most likely to be deficient and/or most likely to produce benefit by supplementation include: phosphorus, copper, selenium, zinc, vitamin A and vitamin E.

Phosphorus is an essential component in energy metabolism and is vital to cell wall integrity. Copper is needed for the formation of antibodies and white blood cells in addition to the production of antioxidant enzymes that protect cell membranes. Selenium is an antioxidant that works in conjunction with vitamin E to protect cell membranes. Zinc is essential for the maintenance of epithelial cells as well as the production of antioxidant enzymes. Vitamin A also has a role in the maintenance of epithelial cells that help keep out invaders.

Summary

In summary, wet weather conditions this summer have resulted in ideal conditions for development of coccidiosis. Coccidiosis is a potentially fatal and economically significant disease of goats caused by an intestinal protozoan. Kids up to weaning age are most susceptible to coccidiosis. Control of coccidiosis involves a combination of drugs and management practices that limit exposure of goats to infective oocytes and minimize stress. Consult your veterinarian for recommendations for strategic use of drugs in response to coccidiosis outbreaks and to help prevent future outbreaks.

Sweetlix[®] offers several supplement products designed to help bridge the nutritional gap between available forages and a goat's nutritional needs. Times of high parasitic challenge can increase the nutritional requirements of goats. All Sweetlix[®] supplement products for goats deliver a complete mineral and vitamin package specially designed for the nutritional needs of goats. Several formulations are available, including: **Sweetlix[®] 16:8 Meat Maker[™] with Rumensin[®]**, a medicated mineral supplement for goats designed to deliver necessary minerals and vitamins and help prevent coccidiosis. When used as directed, **Sweetlix[®] 16:8 Meat Maker[™] with Rumensin[®]** will help prevent coccidiosis caused by *Eimeria crandallis*, *Eimeria christensenii* and *Eimeria ninakohlyakimorae*. Visit your local Sweetlix[®] dealer, go online at www.sweetlix.com or call 1-87SWEETLIX for more information.

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August 2005