

# Coccidiosis in Backyard Chickens



Understanding the basics of common poultry diseases is critical for backyard poultry keepers across Mississippi because it gives small flock owners the ability and knowledge to treat and, hopefully, prevent future disease outbreaks. Intestinal coccidiosis is a common protozoal gastrointestinal (GI) disease that primarily affects young chickens. Clinical signs of the disease include bloody diarrhea, dehydration, anemia, listlessness, ruffled feathers, poor growth, and possibly death. In addition, coccidiosis in laying hens often results in a drop in egg production. There are hundreds of types of organisms in the class coccidia, but only nine affect chickens. In contrast, seven different species can infect turkeys. **Coccidiosis is one of the most devastating of all poultry diseases.**

## Cause

Coccidia have specific hosts, and each species produces its own type of coccidiosis. The actual clinical disease is dependent on which species of coccidia are present and in what quantities they exist. Coccidia that are capable of infecting the chicken are all in the genus *Eimeria*. Coccidiosis is **spread by unicellular bodies known as oocysts**. These are shed in the fecal droppings but are not infectious when shed. To become infectious, the **oocysts must first sporulate**, a process that takes place when conditions of moisture, air, and temperature are ideal in the environment. Sporulation requires 2 to 4 days to complete. After this time, if the sporulated oocyst is ingested by a chicken and finds its way to the intestinal tract, a series of multiplications and divisions take place. This leads to more oocysts being produced, most of which are eventually expelled from the body in the feces, and the life cycle is complete. Depending on the coccidia species involved, time from ingestion to expulsion ranges from 4 to 7 days.

Interestingly, **each coccidia species is unique** both immunologically (i.e., exposure to one species does not offer protection against other species) and in its ability to infect a specific portion of the GI tract. In addition, each species causes slightly different pathological and clinical signs. For example, *Eimeria maxima* causes bleeding in the middle of the small intestine and is considered moderately pathogenic. In contrast, *Eimeria tenella* causes severe inflammation of the cecum and is considered highly pathogenic. No anticoccidial medication is considered effective against all species of coccidia; therefore, species identification can be helpful for treatment and control. However, this may require the assistance of a diagnostic laboratory to confirm the actual species affecting your flock.

Coccidia, being protozoan parasites, live in the epithelial tissues of the intestinal tract where they damage the intestinal wall. One oocyst in the intestinal tract will only destroy a few epithelial cells. As a result, the extent of damage to the intestinal wall is closely related to the number of oocysts present in the GI tract. Unfortunately, as the coccidia reproduce, there eventually will be millions of oocysts present at the height of the disease, although not all will be sporulated. However, as the chicken continues to ingest more sporulated oocysts, increasing amounts of cell tissue will be destroyed.

Coccidial oocysts are found in fecal-contaminated environments. Chickens become infected as they **pick up and swallow the oocysts from the ground**. When the oocysts reach the intestine, the eggs develop and

eventually infect the cells of the chicken's GI tract. After reaching the epithelial cells of the GI tract, the coccidia transform into a new sexual stage and reproduce; they eventually kill the epithelial cell. As a result of the reproduction process, the ingestion of a single oocyst can eventually lead to the infection and destruction of millions of intestinal cells. As increasing numbers of intestinal cells are destroyed, clinical signs such as bloody diarrhea and decreased growth become more evident. Coccidia from infected chickens are shed in the feces and eventually sporulate in the soil, where they can remain viable for months. Once ingested by another chicken, the life cycle starts over.

Coccidia are common in any poultry environment. Their presence does not necessarily mean that you are a poor manager or exhibit poor animal husbandry practices. In fact, a little exposure to coccidiosis is not necessarily bad for your chickens. If chickens are exposed to no more than low or moderate numbers of oocysts in their environment, it can actually be a good thing. Given time, **chickens will generally develop immunity to the species of coccidia** they are exposed to. You can help maintain low to moderate numbers of coccidia in your poultry environment by keeping the ground or litter material dry.

## Transmission

The only **method of transmission is for a chicken to consume sporulated oocysts**. This goes on constantly in your backyard pen or chicken coop, where birds have access to each other's fecal material and are continuously consuming oocysts. In addition, transfer from one location to another is possible by mechanical means. In the active stage, millions of oocysts will be present in a teaspoonful of fecal material. These oocysts can be easily transferred to a new site by boots and shoes, rodents, pets, wild animals, crates or pens, and vehicles. After arrival at a new location and once sporulated, the oocysts can then cause an outbreak of coccidiosis at that site.

Chickens, much like their human caretakers, are **more susceptible to disease if they have a compromised immune system** resulting from stress or disease. Intestinal coccidiosis may predispose your birds to other intestinal infections such as necrotic enteritis or salmonellosis. Also, sexually immature chickens that have been exposed to the immunosuppressive infectious bursal disease (IBD) are more likely to become infected after being exposed to coccidia. Therefore, it is important to **maintain a dry, healthy environment** for your backyard flock.

## Diagnosis

Unfortunately, many symptoms of one poultry disease are often similar to those of several other diseases, making an accurate diagnosis more difficult. Appearance of the bird, along with intestinal lesions present upon necropsy, are sometimes enough to confirm coccidiosis in many outbreaks. However, many backyard producers may not be comfortable conducting a necropsy or may not recognize symptoms or lesions. In that case, a laboratory diagnosis is the only way to accurately confirm your suspicions. Scrapings are made of the infected area of the intestinal tract, and a microscopic examination is made for the presence of coccidia.

## Prevention and Control

**Prevention of disease is always more desirable than treatment.** This is certainly the case with coccidiosis and is especially true for backyard chickens. Certain chemicals, known as **coccidiostats, suppress or disrupt the life cycle of protozoa**. Coccidiostats are usually added to feed at a designated percentage. If you purchase medicated feed at the feed store or co-op, the feed tag will list the coccidiostat included and at what level. However, not all coccidiostats have the same ability to suppress all *Eimeria* species. Coccidiostats reduce or eliminate the shedding of oocysts in the fecal material, thereby reducing or preventing oocyst contamination of the pen or yard area. Some coccidiostats are very specific for certain species of *Eimeria* and may completely suppress one species but have little or no effect on the others. As a result, because there are nine different types of *Eimeria* that affect chickens, you might be using a coccidiostat against one type while an outbreak is developing from another type.

Most coccidiosis outbreaks are produced by **three *Eimeria* species**:

1. *E. tenella*
2. *E. necatrix*
3. *E. acervulina*

A good coccidiostat should be specific for these three *Eimeria* species, and perhaps additionally for *E. brunetti* and *E. maxima*. Any good coccidiostat should:

- prevent infection from as many species of *Eimeria* as possible.
- make it possible to dilute the dosage so as to develop natural immunity.
- not interfere with reproduction (egg production and fertility).
- not be electrostatic or hygroscopic.

- be nontoxic, palatable, and stable.
- be economically feasible to use.

There are a few simple preventive measures that should be used by all backyard poultry keepers to reduce coccidia in the environment and lessen the risk of infection to your chickens. Prevention measures should include these:

- **Control moisture** in the pen and coop area. Keeping things dry is critical to controlling many diseases, not only coccidiosis.
- **Periodically move your pen and coop area** if possible. Any area that has manure on it for extended periods of time will eventually have a high load of bacteria, viruses, and parasites such as coccidia. Moving chickens around and letting previously used areas rest for weeks or months at a time will be effective at reducing the pathogen load in your backyard environment.
- Using **medicated feed** containing a coccidiostat should prevent clinical infections. This is extremely important during the first 4 to 6 weeks of a chick's life because the chick's immune system is not yet fully developed. Full immunity is not reached in chickens until approximately 7 weeks of age.
- **Practice good biosecurity!** This is good advice not only for coccidiosis but any disease that may threaten your flock.

**Amprolium** given in the drinking water for 3 to 5 days is a common treatment for coccidiosis. Amprolium has been around for many years and is still effective as a treatment. Realize, however, that no anti-coccidial is effective against all the different strains of coccidia and that, over time, coccidia can become resistant to anti-coccidial drugs. Therefore, do not overuse any anti-coccidial drug. Use anti-coccidials only to treat an affected flock and not as a periodic preventive measure.

Although coccidiosis is also a common parasitic problem for most mammalian species, **you are not at risk of catching coccidiosis from your chickens**. There are species of coccidia that can infect people, but the species that infect chickens are not infective to people. But be aware that there are other diseases that chickens may carry that can make people sick, such as Salmonella. Therefore, always wash your hands after working around your chickens.

## Sources of Help

Here are some sources of help if you are concerned about coccidiosis in your backyard:

- Your local county Extension agent
- Your local veterinarian
- Mississippi Board of Animal Health (601-359-1170)
- Mississippi State University Poultry Science Department (662-325-3416); ask for a poultry Extension specialist
- Mississippi Veterinary Research and Diagnostic Laboratory (601-420-4700)

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