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Coccidiosis

You have probably heard of the term coccidiosis before and know that medications are often added to the feed to prevent coccidiosis. Do you know what exactly is coccidiosis and why is it important to know and watch for signs of it? This short information sheet will answer some of these questions.

What is Coccidiosis?

Coccidiosis is a term that refers to a parasitic infection of the gut that causes clinical signs of disease. The parasites referred to are coccidial species (*Eimeria*). The clinical signs mentioned may include but are not limited to the following: reduced feed consumption, increased water consumption, ruffled feathers, watery feces, dehydration, reduced weight gain, increased feed conversion, bloody droppings and/or mortality. The latter two signs (bloody droppings and mortality) are often associated with clinical coccidiosis where signs of this disease are obvious. The other signs listed are more common but often go un-noticed in a flock which can have negative effects on performance. This group of less obvious signs may be better described by the term subclinical coccidiosis. Subclinical coccidiosis is far more common today because feed medications are used to successfully prevent clinical coccidiosis.

Coccidial species

The parasitic species which cause coccidiosis (coccidia) belong to the genus *Eimeria* and there are many different species which can infect the different types of poultry that we deal with.

Coccidial species in broilers -7 recognized, 3 of primary importance (figure 1)

- *Eimeria acervulina* – infect upper intestinal tract
- *E. maxima* – infect middle intestinal tract
- *E. tenella* – infect ceca (lower intestinal tract)

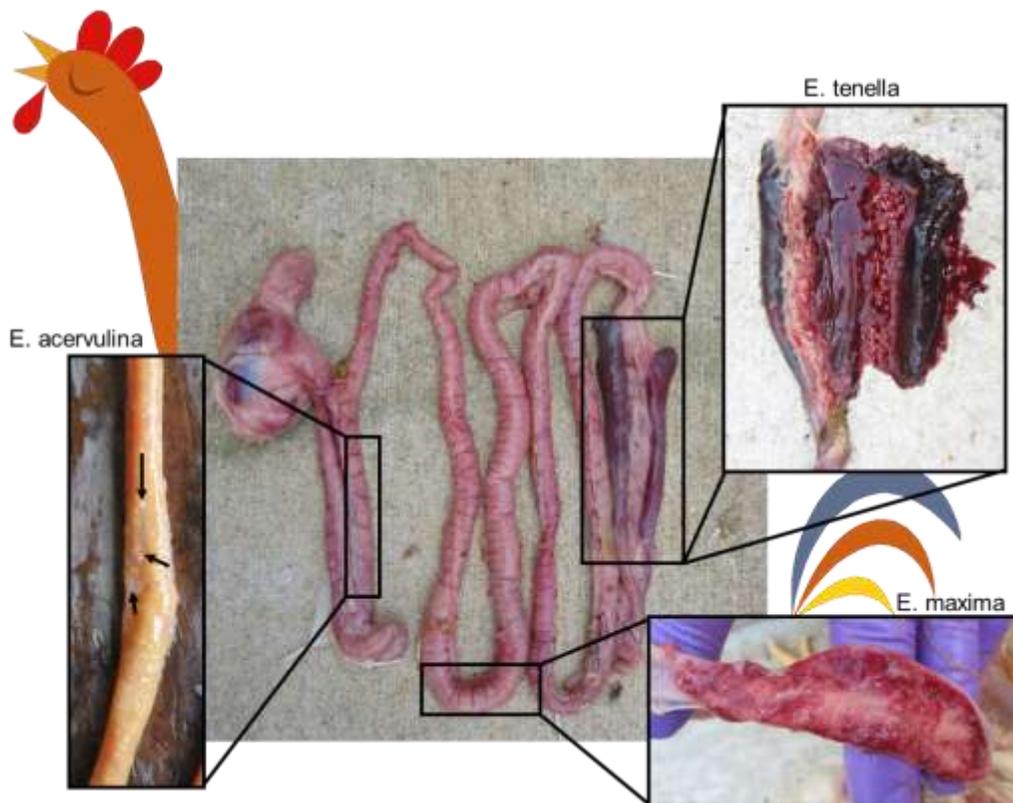
Coccidial species in broiler breeders -7 recognized, 4 of primary importance

- *E. acervulina* – infect upper intestinal tract
- *E. maxima* – infect middle intestinal tract
- *E. tenella* – infect ceca
- *E. necatrix* – infect middle intestinal tract and ceca

Coccidial species in turkeys -7 recognized, 4 of primary importance

- *E. adenoides* – infect ceca and lower intestine
- *E. meleagrimitis* – infect midgut
- *E. gallopavonis* – infect lower intestine +/- ceca
- *E. dispersa* – infect upper, middle and lower intestine

Figure 1: Coccidial species of importance in broiler chickens



Picture courtesy of PHS

Coccidial Life cycle

Coccidial organisms are ingested by poultry species and upon infection of the gut they replicate increasing in number. Once a cycle of replication is complete new oocysts are passed in the fecal matter from an infected bird. Oocysts that are passed in fecal matter are initially non-infective. Once environmental conditions are appropriate (requires the right amount of oxygen, heat and moisture) the oocysts can become infective and once consumed by the corresponding species of poultry the cycle repeats. The non-infective form of coccidial organism is extremely resistant to destruction and it is for this reason that we will continue to deal with coccidial infection in poultry species. No matter how good a cleaning and disinfection process is it is not possible to completely get rid of all these parasites.

When does coccidial infection become subclinical or clinical coccidiosis?

The answer to this question is tricky and depends upon two main factors; the number of infective eggs present and the frequency of consumption of infective eggs. All poultry at some point in production will be exposed to coccidial species but not all poultry will develop clinical or subclinical coccidiosis. Some low grade cycling of coccidial parasites in a flock is even considered normal or unavoidable depending on what preventative or control programs are implemented.

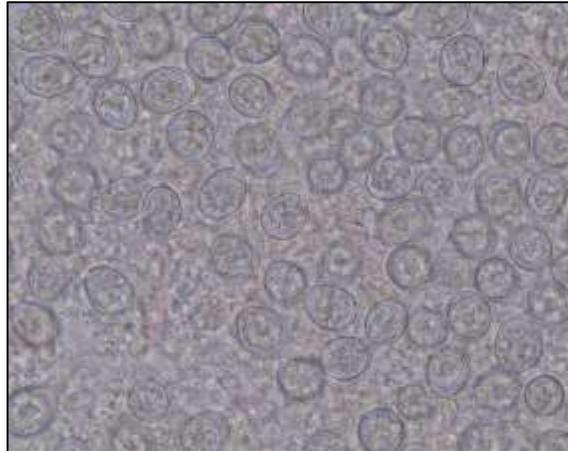
Some of the factors which impact the number of infective eggs present in a poultry environment are

- temperature
- oxygen
- moisture
- barn clean out
- bird density
- litter quality
- feed availability
- coccidial control programs
- other disease challenges
- Etc.

Making a diagnosis of clinical coccidiosis (bloody droppings and/or mortality) is far easier than making a diagnosis of subclinical coccidiosis primarily because the symptoms of a clinical infection are far more visible. A diagnosis of subclinical coccidiosis requires examination of 'normal' birds from a given flock. To further complicate matters many of the coccidial species that parasitize birds cannot be observed with the naked eye and microscopic examination is used for detection of these species (figure 2). Knowledge of the factors listed above is also important in the interpretation of findings, understanding why a flock is affected with clinical or subclinical coccidiosis, and in preventing the same problem in subsequent flocks.

Figure 2:

Microscopic image of coccidia



Picture courtesy of PHS

How is coccidiosis controlled?

Control of clinical or subclinical coccidial infection is an integrated process. It relies on the use of anticoccidial medications or vaccination and management of the flock and flock environment. Anticoccidial medications are often divided into two categories; ionophores and synthetic (or 'chemical') products. Vaccination is an alternate method of control which relies on controlled exposure to coccidial parasites to stimulate a protective immune response. Coccidial vaccination also serves to repopulate the environment with coccidial strains which are less tolerant to the anticoccidial medications often employed. Along with the use of these different products, management of the flock and flock environment can play an important role in the success of the overall program. Limiting temperature and oxygen would be a means of limiting coccidial cycling, however, this is not possible in the presence of live birds. Controlling moisture level is one example of a key area that can have a huge impact on the success or failure of a given coccidial control program. Too much moisture can encourage excessive coccidial cycling, even in the face of medications. Too much or not enough moisture can also negatively impact cycling of vaccine strains of coccidial organisms.

How is coccidiosis treated and what do I do if I think my flock has coccidiosis?

The products used for the treatment of coccidiosis are different from those used to control coccidial cycling. Treatments are implemented in response to clinical coccidiosis or when subclinical coccidiosis is detected and having an impact on the flock. There are several treatment options available for coccidial infection and they include products such as amprolium (Amprol), sulfa medications (such as Sulfaquinoxaline) or potentiated sulfa medications (Quinnoxine S). Depending on the type of infection a flock is experiencing, one of these medications may be a better option than the others as each has optimal effect in specific locations of the gut. For example, coccidiosis due to *Eimeria tenella*, which results in bloody fecal droppings, is best treated with Amprol. Amprol has a greater effect against this parasite in the ceca compared to other coccidial species in other regions of the gut. If you suspect your flock may be affected with coccidiosis it is wise to consult with a veterinarian. Proper diagnosis of the infection as well as identification of the species responsible helps to ensure the correct treatment is selected and that factors which may have contributed to the disease are investigated.



This article was written by the veterinarians of Poultry Health Services Ltd. Poultry Health Services is a private veterinary practice providing diagnostics for Alberta poultry producers as members of the Poultry Health Centre of Excellence (PHCE). Bird submissions can be submitted to the PHCE via Government offices in Edmonton, Airdrie and Lethbridge. Please call 403-948-8577 if you have a mortality problem or want help making a submission.

References/Further reading

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