

Coccidiosis in Turkeys

Coccidiosis in turkeys follows the same basic disease principles as coccidiosis in chickens (see Coccidiosis). The amount of research invested in turkeys compared to chickens is minimal; the majority of research involving coccidiosis and turkeys is well over 50 years old and stems from work done by many of the founding fathers of cocci research. To make things even more difficult for turkey producers the number of anticoccidials and vaccines currently on the market for approved usage in turkeys is minute compared to that of chickens.

Eimeria are species specific which simply means that the species that infect chickens are different than the ones that infect turkeys[1]. Seven species of *Eimeria* have been shown to infect turkeys, of these only four are considered pathogenic. *Eimeria adenoeides*, *E. dispersa*, *E. gallopavonis*, and *E. meleagritidis* are the pathogenic species while *E. innocua*, *E. meleagridis*, and *E. subrotunda* are considered to be non-pathogenic.[2,3,4]. Table 1. Provides detailed information about each of the species associated with cocci infection in turkeys [4].

Table 1 Eimeria spp. that are Turkey specific

Species	Location	Pathogenicity	Lesion Appearance
<i>E. adeneides</i>	Ceca and Rectum	High	Watery to solid white caseous cecal contents
<i>E. dispersa</i>	Small Intestine, primarily mid-gut, cecal neck can occur	Low	No discrete lesions, serosal surface may appear cream-colored
<i>E. gallopavinia</i>	Yolk-sac to rectum	High	White or Pink ulcerations of ileal and(or) rectal mucosa. White caseous material may be found in the lower intestine and (or) ceca.
<i>E. innocua</i>	Anterior half of small intestine	None	None
<i>E. meleagridis</i>	Yolk-sac to rectum and maybe ceca	None	Cream colored serosal surface. Potential petechial hemorrhages in posterior small intestine
<i>E. meleagrimitis</i>	Middle intestine but may migrate throughout the small intestine	High	Thickened jejunum containing colorless to pink fluid. The remainder of the small intestine may be congested with petechial hemorrhages on mucosal surface
<i>E. subrotunda</i>	Anterior half of the small intestine	None	None

Symptoms of coccidiosis in turkeys include: mucoid diarrhea, ruffled feathers, rapid weight loss, loss of appetite, and droopiness. Bloody droppings are not associated with Eimeria spp. infestation in turkeys and can be a sign of another issue potentially exacerbated from the cocci infection. The period of time between infection with the parasite and the recovery of the oocysts within the feces is 4-6 days; this is referred to as the prepatent period. The oocysts will begin to sporulate within 1-2 days upon ingestion. Peak litter contamination from oocysts usually occurs around 4-6 weeks with full immunity ideally being reached by 10 weeks or within 3-4 cycles[2,3,4]. It is important to be aware that immunity to Eimeria spp. is species specific as well. Birds are susceptible to a cocci outbreak at any given time if they ingest oocysts from a species they have not developed immunity to. Unlike chickens that get distinct lesion development within the intestine, Eimeria spp. specific to turkeys do not leave highly distinct lesions. Also size and shape of the oocysts from different species are often indistinguishable. The

best form of diagnosis is to take mucosal scrapings from different regions throughout the intestine and use a microscope to distinguish the developmental stages[2,3].

As previously stated, *Eimeria* are species specific so overlapping between chickens and turkeys will not occur; interestingly, *E. dispersa* are the exception as the original host is bobwhite quail. Due to this ability to cross species there is controversy over the validity of *E. dispersa*[2]. It is important to note that wild turkeys are also infested by the same species responsible for coccidiosis in domestic turkeys and management practices should be employed to minimize potential cross contamination points[2,3]. To treat coccidiosis a producer may utilize anticoccidials, a vaccination program, or alternative methods. Ionophores are commonly used within the second and third feeds even though the duration of each diet is dependent on the complex or growers preference. Anticoccidials should be utilized in the starter feed unless antihistomonal drugs are being used in which these two drugs are not approved for usage together currently. The use of antihistomonals in the starter feed explains the usage increase of anticoccidials in the second and third diets as opposed to the first diet[2].

The concentration of the anticoccidial should be closely monitored as toxicity has been shown to occur. The recommended dosage should always be followed; in the case of a severe infection the largest recommended dosage can be utilized. Anticoccidial toxicity has been shown to result from calculation mishaps, inadequate mixing, and the use of anticoccidials designed for other species[2]. For instance, narasin and salinomycin are used in chickens and cause a severe toxicity in turkeys. While monensin is approved for use in turkeys, reports of toxicity have been documented due to excessive dosages[2,3]. Birds will refuse feed if toxicity has occurred resulting in decreased weight gain and feed conversion; breeder flocks may see cardiomyopathy, “knock down” syndrome, muscle myopathy and a decrease in egg production. Toxicity most often occurs due to an error at the feed mill in which turkey and chicken diets are commonly made in the same space[2].

Vaccinations programs are an alternative to using anticoccidials (See Vaccinations in Coccidiosis). They are particularly effective in situations in which drug resistance has occurred as their usage will make the drug resistant cocci parasites drug sensitive over time[3]. The cost effectiveness of both programs is a large point of contention; vaccinations are often sprayed on birds at the hatchery or given in an edible gel form while ionophores and synthetic drugs are provided through the feed or watering system and are usually implemented for 4+ weeks depending on the severity of the infection while immunity is gradually developed[1,2,3,4]. Due to the long growth period needed for turkey production the influence coccidiosis infection can have on performance and mortality can be extremely costly. Producers should be aware of cost effectiveness and implement management practices that will help capitalize on the effects provided from the use of products to help combat coccidiosis. The milder the infection and the sooner full immunity can be achieved the greater chance negative performance factors associated with coccidiosis can be overcome.

References:

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