

Intestinal and Tracheal Parasites of Poultry¹

Gary D. Butcher and Michael A. Davis²

A parasite is defined as an animal or plant that derives sustenance and/or protection by living in or on another animal or plant called the host. Intestinal and tracheal parasites of poultry are commonly referred to as “worms,” although this term is technically not correct. These parasites can cause chickens in a flock to appear unthrifty, which often leads to secondary complications. In some cases, the parasites can cause mortality in the flock. Frequent inspection of the flock for signs of illness is the best management tool for identifying when these parasites are a problem.

Roundworms

Roundworms, also called ascarids, are the most common intestinal parasite found in poultry. These worms are species-specific, so there is little chance of cross infection among poultry species or from poultry to pets or humans.

Life Cycle and Pathogenesis

The life cycle of roundworms is relatively simple and may take as little as 35 days to complete. Adult female worms lay eggs that pass out of the host’s intestinal tract with the feces. While in the litter of the house, these eggs develop to the larval stage. Optimum temperature for development of the roundworm egg is 90°F–93°F. A new host ingests the developed eggs in the infected litter. The larvae are released from the egg and then make their way to the intestinal tract where they develop in the intestine’s mucosal lining. Larvae return to the lumen of the intestine where they become adults. Worms are sexually mature 35 days after hatching,

and they begin to lay eggs of their own, thus perpetuating the cycle.

Young poultry are particularly susceptible to infestation by roundworms. Birds will typically develop immunity from low-level exposure by the time that they are 2–3 months old. Birds that are not immune and are infested with significant numbers of roundworms become unthrifty because the damage to the intestinal lining reduces the birds’ digestive and absorptive capabilities. If the infestation is severe, there may even be intestinal blockage due to a large quantity of worms.

Diagnosis and Control

Diagnosis is based on necropsy of suspect birds and finding significant numbers of worms along with damage to the intestinal lining and loss of body condition.

Examining feces and finding a large number of ascarid eggs in unthrifty chickens also suggests an infestation. Simply finding small numbers of worms on necropsy or small numbers of eggs on feces examination does not confirm a problem with ascarids.

The only approved drug for treatment of roundworms in poultry is Piperazine. Follow the recommendations of the drug manufacturer in regards to dosage and withdrawals before consuming meat or eggs. A number of extra-label drugs have been used successfully. These are drugs that are not approved by governmental regulatory agencies for treatment of a specific disease and/or in a particular species

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2. Gary D. Butcher, DVM, PhD, professor, College of Veterinary Medicine; and Michael A. Davis, PhD, agricultural Extension agent II, UF/IFAS Extension Baker County; UF/IFAS Extension, Gainesville, FL 32611.

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of animal; however, they may have been shown to have efficacy and have been used in an extra-label capacity. A drug manufacturer will not apply for permits to use a drug in minor species or for rare diseases since a significant market to justify the expenses does not exist. Because this worm is transmitted via contaminated litter, replacement of litter and disinfection of premises should be performed if an outbreak has occurred.

Cecal Worms

Heterakis gallinarum is commonly referred to as the cecal worm. These worms are not believed to adversely affect performance to any degree, except when there are rare, severe infestations. These worms are found in the cecal pouches; especially in tufts in the tips of the cecal pouches. The main concern with cecal worms is that they serve as carriers of the parasite *Histomonas meleagridis*, which causes blackhead, which is primarily in turkeys but also in chickens.

Life Cycle and Pathogenesis

Like the roundworm, the cecal worm is spread by ingesting mature eggs from contaminated litter. If the worms come into contact with *H. meleagridis*, then they may incorporate that organism into their eggs, and the histomonads may cause major issues within a flock. The cecal worm eggs provide a welcoming environment and a vehicle for the fragile histomonad protozoan. Without the protection of the *Heterakis* egg, the histomonad has a very short lifespan in the environment. Earthworms frequently are carriers of the cecal eggs in contaminated environments, which increases the likelihood of ingestion since poultry readily consume them.

Diagnosis and Control

Diagnosis is based on necropsy of suspect birds and finding worms in the ceca or examining feces and finding *Heterakis* eggs. There are no approved drugs for the treatment of cecal worms. A number of extra-label drugs have been used successfully. Because this worm is transmitted via contaminated litter, replacement of litter and disinfection should be performed if disease has occurred.

Gapeworms

Gapeworms, *Syngamus trachea*, are found in poultry's trachea or windpipe. It is commonly called the gapeworm because affected poultry display open-mouthed breathing referred to as "the gapes." The incidence of this parasite has decreased to a low level in small flocks in recent years.

Life Cycle and Pathogenesis

Most birds become infected when they consume eggs in the litter that contain the larval stage of the worm. However, earthworms, snails, and slugs can also be carriers of the eggs containing the larvae. Mature female worms lay eggs in the trachea. These eggs are coughed up and swallowed and then make their way to the feces. Signs of infestation include weakness, open-mouthed breathing, grunting caused by labored breathing, and shaking of the head. In severe infestations, the trachea can become blocked leading to asphyxiation and death. These worms are red and are easily seen during necropsy in the trachea's lumen. They may also be found during physical examination of the trachea in live poultry.

Diagnosis and Control

Diagnosis is based on clinical signs and the presence of the distinct red worms within the trachea. There are no approved drugs for the treatment of gapeworms. A number of extra-label drugs have been used successfully. Earthworms and other carriers should be eliminated from the rearing area, if possible.

Capillaria Worms

There are seven species of worms from the genus *Capillaria* that can infect poultry and gamebirds, with *Capillaria obsignata* being the most common. These worms can be found in many areas of the digestive tract, including the crop, esophagus, small intestine, and ceca. Untreated birds with significant infestations are unthrifty and typically become culls.

Life Cycle and Pathogenesis

The *Capillaria* worms can complete their life cycle with or without an intermediate host, depending on the species. Like most other worms, poultry are infested by ingesting litter that contains mature worm eggs. The most common intermediate host is the earthworm. Signs of infestation include diarrhea, emaciation, hemorrhagic enteritis, decreased performance, mottled egg yolks, and death.

Diagnosis and Control

Tentative diagnosis is based on clinical signs. Definitive diagnosis is confirmed by finding large numbers of worms on necropsy; however, this is difficult due to the worms' small size. Finding a large number of eggs in the poultry's feces with typical clinical signs is also strongly suggestive of infestation. There are no approved drugs for the treatment of capillarid worms. A number of extra-label drugs have

been used successfully. Earthworms and other carriers should be eliminated from the rearing area, if possible. Replacement of litter and disinfection of premises is suggested following an outbreak.

Tapeworms

Tapeworms, or more correctly cestodes, are flattened, ribbon-shaped, and segmented worms. These worms can be very short ($\frac{1}{8}$ inch) or very long (12 inches). As the tapeworms grow, they add segments. As these segments mature, they break off the end of the tapeworm and are passed out of the body with feces into the litter. The segments' appearance is often described as grains of rice in the feces.

Life Cycle and Pathogenesis

After segments have matured, they are sloughed off the end of the tapeworm and passed out of the intestine. The segments and the eggs within are then ingested by an intermediate host. All tapeworms that infect poultry have an indirect life cycle, which means they must have an intermediate host. Examples of these hosts include snails, slugs, beetles, earthworms, grasshoppers, flies, and other insects. Once ingested by the intermediate host, the larvae in the segment mature into the infective stage. However, they must be ingested by the primary host (poultry) to complete their life cycle. This occurs when the intermediate host, the insect, is consumed by the primary host, the bird. Tapeworms then attach themselves to the intestine's interior wall. They absorb nutrients from the contents of the intestine but cause no visible lesions or damage to the intestine except at the attachment site. Affected poultry are unthrifty and lose weight. However, they maintain their appetite. High levels of infestation may be associated with a loss of feed efficiency. Typically, tapeworms do not cause severe lesions or mortality. However, it has been reported that when very large numbers of tapeworms are present, they may block the intestine, resulting in mortality.

Diagnosis and Control

Definitive diagnosis is based on finding tapeworm segments in the feces or intestine. There are no approved drugs for the treatment of tapeworms. A number of extra-label drugs have been used successfully. Intermediate hosts, of which there are many, should be controlled in the rearing area to prevent reinfestation, if possible.

Treatments

Piperazine is the only approved drug for the treatment of roundworms. There are currently **NO** approved drugs for the treatment of the other parasites described above. Numerous products were available in the past, but due to many new governmental regulations, these products (many having been used safely and with efficacy for many years), have lost their approval.

A number of drugs are available for control of these parasites on an extra-label basis and are used by adding them to the drinking water. These drugs are widely reported, along with glowing testimonials, in the popular media. These products are not specifically or officially approved for use in poultry, but they have been approved for use in pets or livestock. Since approval has not been sought for use of these products in poultry, they cannot be recommended in this official publication. These products are highly efficacious, but since significant markets do not exist for these products, drug manufacturers have not sought approval for poultry. This approval process is very costly and time-consuming. Without official approval and without recommendations on withdrawal time, the user must use their own good judgment when using these products.

Some examples of these extra-label drugs that are added by way of drinking water include:

1. Levamisole Hydrochlorida
2. Albendazole
3. Oxfendazole
4. Fenbendazole
5. Ivermectin