

DISEASES
AND PARASITES
AFFECTING

poultry

Coccidiosis of Chickens and Turkeys

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COCCIDIOSIS costs poultry raisers millions of dollars each year because of the unthriftiness, poor utilization of feed, loss of weight, and death of infected birds.

Coccidiosis is caused by coccidia, which are microscopic protozoan parasites. Coccidia of poultry are nearly always host specific—each species is so adjusted to a life within the body of one kind of bird that it may not survive very long in another.

The coccidia that affect chickens and turkeys follow a similar course of development. They develop within the cells that line the wall of the intestine and cecal pouches. In their resistant stage—as oöcysts—they are discharged into the cavity of the intestine and pass out with the droppings.

Before they can infect birds, the

oöcysts must develop, or sporulate. When the weather is warm and the oöcysts remain moist, development is completed in about 1 to 3 days. Oöcysts have tough shells. They can withstand cold and dryness and have been known to survive on soil and elsewhere for many months.

Poultry get coccidiosis by swallowing the sporulated oöcysts with feed and water that have become contaminated with the oöcysts of infected birds. The droppings are spread from place to place by the birds themselves and by mice, cats, dogs, flies, and other insects. Persons that care for poultry may carry the oöcysts on their hands, feet, and clothing. Dirty sacks and crates and contaminated litter may also be responsible for the spread of coccidiosis.

Not every bird that swallows infective oöcysts develops symptoms of coccidiosis. Some birds may pick up just enough oöcysts to produce a light infection, which may cause them little or no discomfort.

Repeated light infections may cause the bird to build up a resistance to the particular species involved. Resistant birds may then pick up large numbers of the same species of oöcysts without serious effects. Once a bird becomes immune or resistant to one or more species of coccidia, it may remain resistant to them for several months.

Two types of coccidiosis occur in chickens. In one, the infection is limited primarily to the blind pouches, or ceca. It is known as cecal coccidiosis. In the other, the parasites attack the part of the intestine between the gizzard and the opening of the ceca—the ceca may or may not be involved. This type is known as intestinal coccidiosis.

In cecal coccidiosis, the parasites enter the cells lining the walls of the ceca, multiply rapidly, and destroy them. Severe bleeding and death may be the result. Bloody droppings are an important sign of cecal coccidiosis. This disorder is caused by only one species of coccidia, *Eimeria tenella*. It occurs mostly in chickens less than 2 months old. Chickens of any age may get it, however. It strikes suddenly. Sometimes the poultryman is taken completely by surprise.

The following is a typical picture of an outbreak of cecal coccidiosis: Yesterday the birds appeared healthy—eating, drinking, and chasing each other around the pen. Today some or many are dead. Others are visibly sick, while still others are eating and drinking and are apparently healthy. Bloody droppings are seen on the ground or litter.

THE SEVEN SPECIES of coccidia that cause intestinal coccidiosis occur mainly in the small intestine—occasionally in the large intestine or bowel and ceca.

They give rise to a serious but usually

less acute condition than occurs in cecal coccidiosis. This type may affect chickens of any age, but serious losses occur oftenest in young pullets.

Economic losses to the poultryman from intestinal coccidiosis are due primarily to the slowness with which many of the birds recover. The laying flocks may be unprofitable for several weeks.

Intestinal coccidiosis frequently appears soon after pullets are confined to the laying houses. Generally only a few birds are affected at first, but more develop symptoms from day to day until many are affected. Deaths occur mostly after several days to 2 or 3 weeks, but some die in the early stages. Many of the affected birds gradually regain their appetite, become stronger, and recover.

Loss of appetite, loss of weight, weakness, and an abnormal drop in egg production in pullets are some of the first indications of intestinal coccidiosis. The droppings may be watery or slimy, and greenish or brownish, or may consist almost entirely of bloody mucus.

The small intestine of a bird that has a severe case of intestinal coccidiosis may be greatly distended and have tiny white and red spots on the lining, which are visible on the outer wall (*Eimeria necatrix*); thickened intestinal walls, with numerous transverse white bars or streaks, which are visible from the outside as well as the inside and are particularly abundant in the intestinal loop or duodenum (*E. acervulina*); distended intestine, with walls thickened and filled with thick, greenish or brownish mucus (*E. maxima*); short, red streaks arranged in a ladderlike fashion in the lower part of the intestine and a cheeselike material in the narrow, tubular portion of the cecum (*E. brunetti*).

Three other species (*E. praecox*, *E. mitis*, and *E. hagani*) occur in the intestinal tract of chickens but are not known to be associated with any pronounced visible changes in the wall of the intestine.

TURKEYS harbor seven species of coccidia. One of them, *Eimeria meleagridis*, develops in the ceca. Three others, *E. innocua*, *E. meleagrimitis*, and *E. subrotunda*, develop in the intestine. The remaining ones, *E. adenoides*, *E. dispersa*, and *E. gallopavonis*, occur in the ceca and intestine.

The species that are most important apparently are *E. adenoides* and *E. meleagrimitis*.

The symptoms of coccidiosis in turkeys are not distinctive or specific.

None of the species causes severe hemorrhage, such as occurs in severe cecal coccidiosis of chickens.

Affected poults eat very little, lose weight, and stand huddled together with drooping wings and ruffled feathers. They may discharge cylindrical fecal pellets or fluid droppings containing small amounts of blood, blood flecks, or plugs of mucus.

The injuries produced in the intestine and ceca of turkeys tell little about the species of coccidia present. All, except *E. innocua* and *E. subrotunda*, produce inflammation of the intestinal tract, with a whitish discharge. The intestine may be swollen, the walls thickened, and the lining congested with blood or whitened. The intestine may contain large amounts of fluid, white or green mucus, or a cheesy material. Small strands of clotted blood may occur in the droppings. The ceca may be distended with granular, creamy material or with a cheesy plug. The walls may be slightly thickened. Rows of bloody spots or petechial hemorrhages may occur on the lining.

SEVERAL IMPORTANT FACTS have been discovered in studies on coccidiosis of poultry: Coccidia are present wherever poultry is raised. Repeated light infections help the bird build up a resistance to the species it harbors, but not against the others. The severity of the disease depends largely on the number of oöcysts swallowed. Young birds are usually affected more severely than older ones. The infection generally lasts only a short time, provided rein-

fection is prevented. Sick birds recover slowly, if at all, when treated. Resistant birds, although healthy, shed oöcysts and thus serve as sources of infection, which may overwhelm others.

THE BEST WAY to control coccidiosis of poultry is to prevent severe infections, and the best way to do that is to develop resistance to the disease.

Birds that recover from a light infection become resistant to coccidiosis. Experimentally repeated light infections confer a stronger resistance than a single infection, whether it be light or heavy.

Farm-raised flocks generally suffer less from coccidiosis than flocks raised under crowded conditions. Because of the space over which farm birds can range, their chances of picking up heavy or fatal doses of coccidia are less great—the droppings are scattered over a wide area and the sun and wind dry them quickly, so that the oöcysts are destroyed.

Outbreaks of coccidiosis have occurred in farm flocks, it is true, but they occur less often and are less severe than outbreaks in large commercial flocks that are crowded together. Instead of being exposed to large numbers of oöcysts in a short time, the farm-raised bird may pick up a few oöcysts each day and eventually develop a resistance. This may explain the relatively few deaths from coccidiosis in farm-raised poultry.

Poultry production has increased tremendously in a few years. Flocks numbering thousands of turkeys are common. The increase in numbers of birds and higher costs of production have brought about a tendency to grow two birds where one grew before. This tendency to crowd birds sometimes has been carried to the point where control measures for parasites and other disorders, particularly respiratory disease, are inadequate.

Sanitation and other measures are necessary to keep up the birds' resistance and keep down disease.

Crowding should be avoided because it favors disease by contributing

to a buildup of the number of disease organisms. It also deprives the birds of the exercise they need.

A comfortable, sunny, well-ventilated poultry house, free from drafts or dampness, favors good health. Damp litter is an ideal place for the multiplication of parasites and germs.

Birds of different ages should be reared separately. Older birds may be immune or resistant to a particular organism but young birds may be highly susceptible to it.

Poultry houses should be thoroughly cleaned and disinfected before clean birds are placed in them. Oöcysts of coccidia, eggs of worm parasites, and other disease-producing agents may remain infective in litter and soil for many months. You should first remove all dirt and manure from the walls, floors, and windows and bury it or take it to a remote place where birds cannot get at it. Then you should scrub the entire house thoroughly with hot water, to which lye and soap have been added. A thorough spraying with household ammonia (10 parts to 100 parts of water) is advised in houses where coccidiosis has occurred.

In the case of birds in houses, the litter should be kept dry and loose. Frequent turning of the litter and removal of any wet litter and replacing it with dry material helps to do that. Stirring the litter helps to keep it dry and buries disease germs and parasite eggs so that the birds cannot get at them easily.

Leaky founts and broken feeders should be repaired or replaced. They should be placed on wire platforms wide enough so that wasted water and feed and droppings will fall through the openings and collect underneath out of reach of the birds. Spilled feed is attractive to birds and often it becomes mixed with droppings that may contain infective eggs and oöcysts.

It is highly important to isolate any new stock for several days. There is always the possibility that the new birds may harbor disease-producing organisms, which should be eradicated

before they spread to clean birds. Any birds that die should be buried or burned promptly. Otherwise their entrails may become scattered about the premises.

The owner or attendant of another poultry flock should be discouraged from entering the poultry yards or houses lest disease germs or parasitic material be carried in on his shoes or clothing.

Even when all the essential precautions have been taken, outbreaks of disease occasionally occur. The earlier the signs of disease are detected, a correct diagnosis made, and something is done to check its progress, the more effectively can the outbreak be brought under control.

Not always are reliable sources for diagnoses close at hand. If your veterinarian or county agent is unable to help you, it will be necessary to take or send two or three sick birds to the nearest State Livestock and Poultry Diagnostic Laboratory, State Veterinary College, or the State Agricultural College for diagnosis.

As soon as a diagnosis has been made, and if coccidiosis is the cause of the trouble, the treatment should be started. If several days must elapse before obtaining the diagnosis, it may be wise to start treatment anyway. It will do the birds no harm, and it may mean saving the lives of a number that might otherwise die.

Every poultryman should have on his supply shelf one or more of the drugs that have proved useful against coccidiosis for emergency use. These drugs are available either as solutions for mixing with the drinking water or as a premix (a small amount of mash containing the drug) for mixing with the feed.

One of the first steps is to remove the sick birds from the flock and place them in separate pens, where they will have a better chance to get plenty of feed and water and will not infect other birds. There is not much you can do for sick birds except to see that they get plenty of feed and water and

hope that some of them will recover.

The other birds should be placed on a medicated mash or given water in which the right amount of the drug has been added. Some poultrymen are equipped with a water system that is well suited for the administration of medicated water; for others, the use of medicated water would require a large amount of extra time and labor. They will find that medicated feed is more economical.

A number of drugs for preventing and treating coccidiosis can be bought from feed companies, commercial drug houses, or drug salesmen.

Nitrofurazone and sulfaquinoxaline, nicarbazin, and nitrophenide have been thoroughly tested and found to be satisfactory for the prevention of the disease. Any one of them can be administered in a low concentration for a

period of several weeks without causing any ill effects.

In the event of an outbreak, however, the drug of choice is sulfaquinoxaline or sulfamethazine. The medicated water or mash must be prepared exactly as directed on the package or bottle containing the drug.

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Blackhead of Turkeys and Chickens

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BLACKHEAD is caused by a microscopic, single-celled animal, *Histomonas meleagridis*.

It was a devastating disease in turkeys in the East and Midwest a generation or two ago. It still causes heavy losses in some flocks of turkeys and is recognized as a serious disease in chickens whose resistance is lowered by other diseases, by vaccination, or by undue exposure to adverse conditions.

The death rate in individual flocks of turkeys may run as high as 50 percent. Most of the survivors are seriously affected. Turkeys of any age may contract blackhead, but losses are usually greatest among birds 8 to 18 weeks old.

Outbreaks are most common in the spring and fall and usually are more

serious in wet seasons than in dry ones. A study in Minnesota in 1951 revealed that of every 1,000 poults started, 87 died with blackhead after being placed on the range; only 6 were lost while poults were still in the brooder house. The average age of birds succumbing to blackhead on range was 17 weeks.

The symptoms of blackhead—which is known also as histomoniasis and infectious enterohepatitis—are quite distinct, but the name is misleading in that the head does not always turn dark. Other diseases also may cause the head to get black.

The first symptoms are not specific for blackhead but are suggestive. The birds stand with their heads tilted downward or drawn to the body. Their feathers are ruffled. The wings droop.