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UTAH STATE AGRICULTURAL COLLEGE

Utah Agricultural Experiment Station

Coccidiosis of Chickens

D. E. MADSEN, D.V.M.¹-----

Nature of the Disease

Coccidiosis is a highly contagious disease of chickens and other fowls which is widespread and destructive, especially to half-grown chickens. The heaviest losses occur in chicks from 2 to 10 weeks of age. Just prior to and during their first laying season, pullets sometimes become affected with the disease in a chronic form. The cause is a microscopic protozoan parasite, the oocyst form of which is present in the droppings of diseased birds in large numbers. At least three species of the parasite have been recognized in fowls. The severity of the outbreak is thought to be determined by the species of parasite present.

After being eliminated with the droppings, the parasite cannot re-infect birds until it has passed through the sporulating stage by remaining on the floor or soil for about 48 hours. If, after this period, it again gains entrance to the intestinal tract it changes form, multiplies greatly, and causes damage to its host by entering the cells which line the intestine. After one or two weeks the many parasites present again change to the original oocyst form and are eliminated in the droppings to pass through another cycle of development. In the meantime if the fowl has not picked up more infective oocysts it should now be relatively free from the parasite. It is the continued reinfection that produces the disease in a severe form. Small numbers of the most severe type in the intestines apparently produce no harm. Small numbers of the parasite are present in a large percentage of healthy mature birds. Investigators have found that mild infection continued over a period of time or recovery from a severe infection seems to confer varying degrees of resistance or complete immunity to serious infection. This probably accounts for the fact that fowls over one year of age seldom show evidence of the disease.

Symptoms, Lesions, and Diagnosis

The younger birds affected eat but little, the head is drawn in, and the wings droop. A bloody diarrhea is frequently present. Death usually results in two to five days. On autopsy the ceaca (blind guts) show considerable thickening of the

The author gratefully acknowledges his appreciation to Professor Byron Alder, Station Poultryman, for his helpful suggestions in the preparation of this circular.

¹Station Animal Pathologist.

wall, and red blotches are seen on the inner lining of these organs. Not infrequently caeca are filled with almost pure blood. In other instances a cheesy, semi-solid, yellow-brownish material is present. When any quantity of blood is found in the caeca or intestines one may be quite safe in making a diagnosis of coccidiosis. Since the blood is not constantly present in all outbreaks it is sometimes necessary to make microscopical examinations before the disease can be accurately diagnosed. An accurate determination is essential, as treatment advocated for diseased birds would not be desirable for those not affected.

The older birds affected with the chronic type show pale combs and wattles, emaciation, and loss of appetite. Some investigators have found leg-weakness (leg paralysis) to be quite common among pullets suffering with chronic coccidiosis. Leg weakness, however, may also be due to causes other than coccidiosis. Consequently, this symptom should not lead one to make a definite diagnosis of coccidiosis. Diarrhea may or may not be present. In many cases the symptoms cannot be differentiated from those produced by worm infestation.

On autopsy the small intestinal wall just posterior to the gizzard usually shows some thickening and the inner lining has a spongy appearance. Red hemorrhagic areas may be present in several outbreaks. The caeca are usually not involved. In order to definitely diagnose chronic coccidiosis, a microscopical examination is imperative. The common practice of administering treatment without a definite determination is to be heartily condemned².

Prevention

Sanitation is the foundation of control. It has been shown that the coccidia oocyst voided with the droppings of infected birds *are infective* only after remaining on the floor or soil for a period of 48 hours or longer, under warm moist conditions. Therefore, frequent cleaning and the practice of keeping the floors and litter dry are among the most important control measures. When the same brooder houses and yards are used year after year the surroundings become so contaminated with coccidia that practically each group of chicks becomes infested. This can be partially overcome by thorough cleaning followed by applying a boiling lye solution and disinfectants. The parasite oocyst has been known to live in the soil for several years and still show pathogenicity for the fowl if consumed. Coccidia and worm eggs are extremely resistant even to strong disinfectants. The hot lye solution, however, is quite effective and is prepared by adding 1 pound of lye to 20 gallons of water. Yards with a soil floor are difficult to keep free from disease germs and parasites. Some poultrymen overcome this by brooding in portable houses and moving them frequently to well-drained sandy or gravelly soil not previously occupied by fowls. By frequent changing of the yards the house need not be moved so often. Another method preferred by some is to build a permanent concrete yard which can be thoroughly cleaned and kept clean by frequent sweeping. Elevating chicks from contaminated soil by means of wire netting is also a means of maintaining strict sanitation. If this method is used it is essential that the accumulated droppings under the wire be removed before the level of the wire floor is reached. Moist areas around watering places and overcrowding are especially to be avoided.

It should be borne in mind that most mature fowls are a constant source of infection for the younger growing birds. For this reason the young birds should

²Upon receipt of birds suspected of being affected, the Animal Pathological Laboratory, Utah Agricultural Experiment Station, Logan, Utah, will make the necessary examination, for Utah residents without charge.

be kept segregated from the mature fowls and brooded on soil not previously occupied by older fowls. Droppings from the mature flocks may adhere to the shoes of the attendant and may be tracked to the brooder-house. As a safeguard it is well to wear rubbers over the shoes and remove them before entering the brooder-house or yards. Improperly cleaned brooder equipment, flies, birds, mice, and streams are also possible sources of infection and should be guarded against.

Treatment

In severe outbreaks the California Agricultural Experiment Station has demonstrated that, together with sanitary precautions, the addition of large quantities of milk to the ration is beneficial. They have found that milk should make up 40 per cent of the ration and, therefore, have suggested the following mash mixture where dry skim milk or buttermilk is to be used:

Dry skim milk or buttermilk	40 lbs.
Wheat bran	10 lbs.
Yellow cornmeal	30 lbs.

ground barley 20 "

This mash is fed immediately after it has been definitely determined that the flock is affected with coccidiosis. Scratch grain is fed once or twice daily, but the amount consumed should not equal more than one-third to one-half the weight of mash consumed. Adequate green feed and increased drinking space should be provided. If liquid milk or buttermilk is used the chicks should be given no water and fed no mash but should be given the allowance of grain and green feed mentioned above. The containers for the milk should be constructed so as to prevent chicks from contaminating the contents with droppings.

As soon as the disease disappears the original ration is gradually resumed. The duration of the milk ration will depend somewhat upon the severity of the outbreak. In no event should the high milk ration continue longer than two weeks. The limited value in controlling the disease, expense, and tendency to cause too-early egg production makes the milk treatment applicable for short periods only. In acute outbreaks the daily scraping and sweeping of the floors and soil where the chicks congregate is highly recommended.

The treatment of the chronic infection of older birds is brought about in much the same manner as in the chicks. However, it is well to separate out the visibly sick and to administer the milk treatment only to those affected. The treatment is continued until visible improvement is apparent. The results obtained will be in direct proportion to the ability of the caretaker to keep the floors and yards as clean and as dry as possible.

The administration of various drugs in an effort to check the malady is of questionable value. Poultrymen should beware of various patented powders and liquids sold on the market as cures for coccidiosis. IF DRUGS ARE GIVEN THEY SHOULD BE PURCHASED THROUGH A COMPETENT VETERINARIAN AND ADMINISTERED ACCORDING TO HIS DIRECTIONS. Thus far, no drug has been definitely proved to be of appreciable value in the treatment of this disease.

