DISEASE OF TURKEYS
(INFECTIOUS ENTERO-HEPATITIS)

By E. F. PERNOT.
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INFECTIOUS ENTERO-HEPATITIS.

"BLACK HEAD."

Turkey raising in some parts of Oregon is developing into a profitable industry. During the holiday season of the past year the local dealers inform us that some turkeys netted the producer from 16 to 18 cents per pound each.

Taking this as a basis, and considering the small expenditure which turkeys require where they have access to a large range, the industry is a profitable one, providing that the fowls escape the ravages of contagious diseases.

Young turkeys are very delicate and require a great deal of care. Many of them die when very young of acute indigestion from improper feeding and from exposure to wet and cold. Such losses are frequently attributed to contagious disease, merely because many are subjected to the same conditions at the same time.

The most destructive disease which has come to our notice, attacking both old and young turkeys, is Entero-Hepatitis, sometimes known as "black head." The latter term is a common one owing to a peculiar dark color which the head assumes when the disease is at its height, but this is merely a manifestation of disease situated in some other part of its anatomy.

Entero-Hepatitis is an intestinal disease situated in the free ends of the caeca, and is caused by a parasitic protozoa named by Smith *Amoeba meleagridis*; as this is what may be termed a feeding disease, the parasite enters the body with food or drink, finally finding lodgment in the mucous membrane of the caeca or in the liver. There it multiplies and causes an inflammation which finally destroys the mucous membrane. The affected caecum is very much enlarged and filled with fecal matter sometimes giving it a dark blue-black appearance, at other times it may be filled with a yellowish slimy mass, which when ejected adheres to the feathers in the vicinity of the anus. Either or both of the caeca may be affected, and be empty and shrunken, as seen in Plate 1, Fig. II, which had only one large ulcerated spot at the point marked X, this, however, does not show well in the illustration. Cutting the caecum in two at this point, there is a fibrinous growth adhering to the inner wall which nearly fills the passage.

A very fine, large bird dissected February 18 had one free end of the caeca badly affected, while the other was nearly normal. The affected one was about twice its normal size, stuffed like a sausage at its extremity and of a blue-black color. Midway and on the side nearest its companion, there was an irregular circular spot about the size of a ten-cent piece, resembling an ulceration. The spot was of a mottled red and yellow color surrounded by an angry red zone, showing an acute inflammation. There were no signs of disease in any other part of the digestive tract, but the liver was very seriously affected, being
PLATE I.

**FIG. I**—Healthy cæca.

**FIG. II**—Diseased cæca.
Plate II. Liver of Diseased Turkey, one-half natural size.
(Original).
about twice its normal size, dark in color and filled throughout with yellow spots varying in shape and size. But few of these spots have a definite outline, and the color varies from a mottled yellow to a dark brown, which merges into the surrounding tissue; they are flat, and sometimes depressed below the surface of the liver. Some of the larger ones, however, are raised like blisters. These spots are composed of dead liver tissue, and are the disease centers where the parasites may be found. See Plate II.

The liver is not always affected, as we have dissected birds in which there were no other lesions except in the free ends of the caeca.

CAUSE OF THE DISEASE.

As before stated, this disease is caused by protozoa, animal parasites which are from one to four times as large as blood corpuscles. They can only be detected by the aid of a microscope, and slides properly prepared for it. They are more or less circular in form, and have a nucliated granular spot usually near the center. Because of their minuteness, and growth in the mucous membranes of the digestive tract, they are easily carried by the excreta to food which, upon becoming contaminated, transmits them to other fowls. This is the usual means of infection.

After the disease is established in the caeca the parasites are probably carried by the blood to the liver, where they again find a suitable medium to grow in, causing the diseased areas already described.

At the same time they are no doubt carried by the circulatory system to all parts of the body, but as we have found no other lesions except in the caeca and liver, it is to be inferred that these are the principal seats of disease, yet the blackening of the head which occurs at times is probably due to growths of the parasites causing thrombosis, a damping of the blood, which would indicate that they do grow elsewhere than in the liver and caeca, although we have never found this to be positively the case.

SYMPTOMS.

The symptoms of this disease where the contagion takes place under ordinary conditions, are not always of a pronounced character, and we have to largely depend upon descriptions given us by owners of the fowl who do not observe the earlier stages. In fact, their attention is usually not called to it until the disease has advanced to a dangerous point, or death has occurred in one or more fowls.

The most pronounced symptom is diarrhoea which, once begun, is constant. The discharges are frequent, thin, watery and generally of a yellowish color. This, however, sometimes occurs from other intestinal disorders, such as tapeworms, or bacterial irritation, and therefore cannot alone signify that they are afflicted with this particular malady. If the affection first occurs in the caeca, diarrhoea will appear earlier than if it were in the liver, for the disease in the liver must progress to such
a stage as to interfere with the gall ducts discharging the contents of
the gall bladder into the intestines, thus interfering with digestion and
causing diarrhoea; the next symptom is a drooping of the tail, followed
by a drooping of the wings, after which death soon ensues.

If a blackening of the head occurs, by an engorgement of blood, it
takes place about the time when the tail droops and usually continues
until death. The affected birds have fickle appetites and mope about;
in chronic cases they become emaciated, whereas in the acute form,
when both liver and caeca are affected, they die before there is any
appreciable wasting away.

We have received specimens of full-grown birds, which were in fine
condition, fat and plump, no symptoms of disease was noticed in them
until shortly before death. In these cases both liver and caeca were
seriously affected, showing that the disease had made such rapid prog-
ress that wasting away had not occurred. The disease also becomes
chronic sometimes in a mild form, from which the birds eventually
recover.

Young turkeys are much more susceptible than are the older ones,
or they may be more delicate and cannot withstand the invasion of the
parasites so well; however this may be, they succumb very readily to
the disease.

The symptoms are similar to those of older birds, and even more
pronounced. They begin by moping and hunching up as if they were
cold, diarrhoea soon sets in, the tail droops, then the wings drop and
they go about uttering a pitiful "peep," after which they soon die. A
blackening of the head does not always occur.

It must be remembered that the symptoms of many of the diseases,
especially in young fowls, are so nearly alike that by the symptoms alone
the nature of the disease cannot be ascertained.

It is only upon a careful post mortem examination that the true
cause of disease may be determined.

When a poultry raiser is uncertain of his own diagnosis, this Station
is always willing to do it for him free of charge, provided the specimens
are forwarded prepaid, accompanied by a good description of the symp-
toms observed.

REMEDIES.

It has been pointed out that Entero-Hepatitis is caused by a micro-
scopical parasite which passes with the excreta from diseased turkeys.
Whether these pass a part of their life cycle outside of the living bird,
is not known, nor do we know how long they will retain their vitality
after expulsion. Suffice it to say that the diseased bird scatters many of
them in the vicinity in which other fowls are fed; therefore the first
step towards remedy is prevention. Food given to fowls should never
come in contact with their droppings.

We know that it is customary, especially on the farm, or in places
where poultry is confined to small runs, to scatter grain to fowls where
they are compelled to pick it out of their excreta. By this means bacterial diseases and intestinal parasites are passed from fowl to fowl.

There is more tuberculosis spread in this way than by all other means combined, and there are more fowls affected with tuberculosis than all other diseases combined.

So it is with Entero-Hepatitis, one bird with an advanced case of the disease, will infect the feeding ground of others.

It would be far better to sacrifice that bird at once than risk spreading the infection to the whole flock.

This holds good with any other disease. A sick bird should be removed from the flock and placed in close quarters which may afterwards be disinfected, or the bird may be killed at once and burned. This precaution is worth many times the value of the one sacrificed.

When Entero-Hepatitis once becomes established medical treatment is not very successful, owing to the difficulty of reaching the parasites at the seat of disease, yet, treating them with some of the following remedies is well worth the trouble.

An outbreak occurred in the flock of full-grown turkeys belonging to Mr. T. A. Logsdon, from which five died before the cause was discovered. A treatment with Sulphur—5 grains, Sulphate of Iron—1 grain, Sulphate of Quinine—1 grain, was tried. This amount was placed in capsules and one administered night and morning to each turkey for one week. Only one turkey showed symptoms of the disease at the time, and died ten days later. Whether or not the others were affected and amenable to the treatment is not known.

Dr. Salmon has also recommended Benzonaphthal—1 grain, Salicylate of Bismuth—1 grain. Hyposulphite of Sodium may be useful in doses of two to four grains, or Betol in the dose of one grain.

Any of these doses should be administered twice daily for some time, to birds weighing not less than four pounds. For birds under that size the dose should be decreased proportionately.

Treatment by injection through the rectum has been suggested, but by referring to Plate 1, Fig. 1, it will be seen that an injector thus introduced would follow the intestine and not enter the caeca. Even were this possible, the liver might be diseased and could not be reached.

SUMMARY.

Summarizing the most reasonable course to follow when the disease is known to exist is to separate from the flock any fowl showing the least symptom of disease. Place it where it may be treated, and if it does not respond to medicines, but continues failing, kill the bird without drawing blood and burn the carcass, then sterilize the coop where it has been kept with quick-lime, using a sufficient quantity to cover the ground. An easy way to prepare the lime, so that it can be scattered, is to place it in a box and sprinkle water on it until the lime is reduced to a dusty powder. Old air-slacked lime loses its strength and is not so good.
Instead of this, a strong whitewash may be made, and with a broom or spray wet every part of the coop and floor.

Five cents worth of lime will disinfect a good-sized coop if thoroughly applied.

A solution of carbolic acid prepared by mixing 5 parts of the acid to 100 parts of water makes a good disinfecting solution and may be applied in the same manner as the whitewash, or chloride of lime, five ounces to one gallon of water is good.

Corrosive sublimate (mercuric chloride) in a strength of one ounce to about eight gallons of water, is a strong disinfectant and may also be used as the preceding ones, but it is poisonous and must be handled with great care.

The habits of turkeys are peculiar. They are not so domesticated as other fowls and seem to thrive better when allowed to roam at will. They are particular and suspicious of strange food given them, making it difficult to administer medicines without confining them and using force.

Considering these peculiarities, an attempt to administer medicine while they run at large or to disinfect the premises, is impracticable, but lime should be freely used on the excreta beneath where they roost and on their feeding grounds.

When the disease becomes seriously destructive it is more than likely that all the flock are affected, although they do not show signs of it, and many may naturally recover. Such radical means as destroying all the remaining birds may be resorted to, then by disinfecting as thoroughly as possible and suspending the raising of turkeys for one year, will eradicate the infective agent.

Upon restocking, eggs from healthy fowls which are not too closely in-bred should be secured, and the young raised on a part of the premises least frequented by the old flock.

A little timely care and precaution may prevent further serious losses.

This bulletin is in a popular form, for the guidance of turkey breeders, so that they may recognize the disease as soon as it is discovered.

E. F. Pernot.