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# BACILLARY WHITE DIARRHOEA OF CHICKS

By I. E. NEWSOM

**Testing Blood in the Laboratory Gives Definite Results.**

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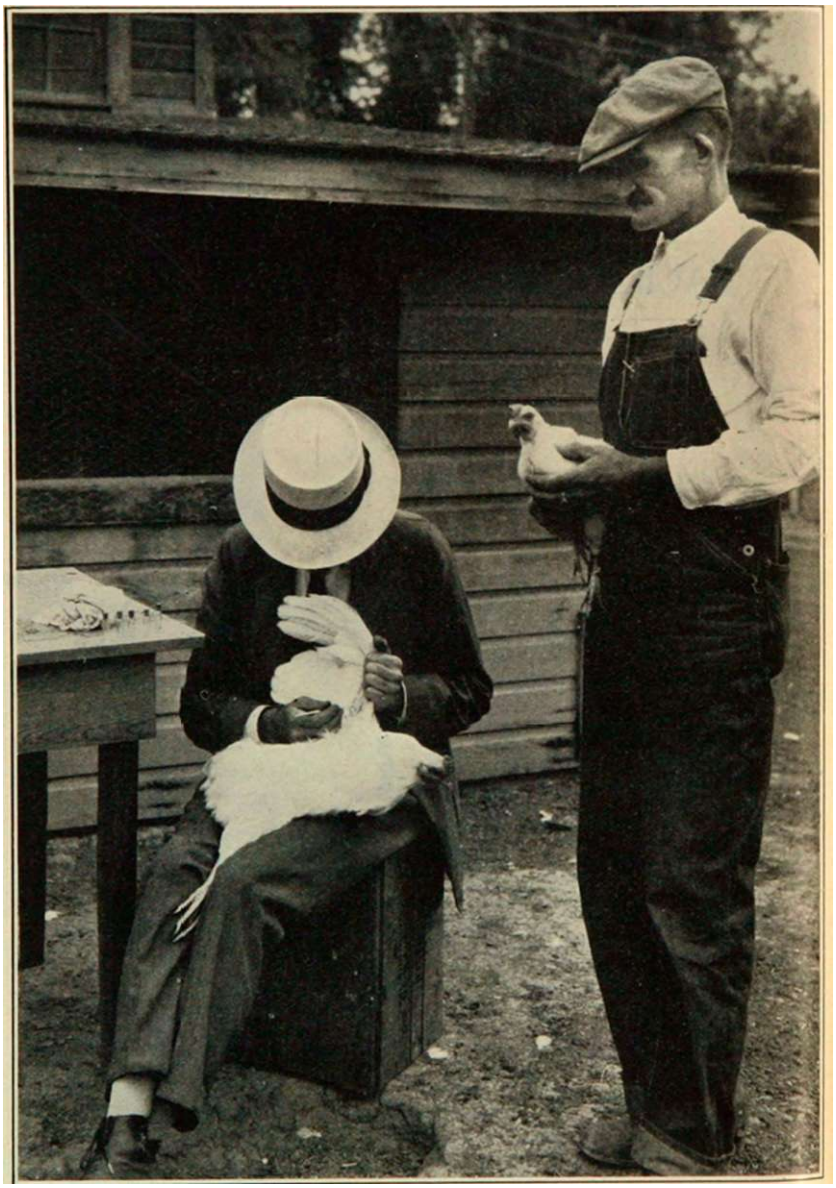


**Making the incision at the point where the vein passes over the first Joint away from the body.**

# BACILLARY WHITE DIARRHOEA OF CHICKS

DR. I. E. NEWSOM, VETERINARY PATHOLOGIST

**Economic Importance.**—With the growth of large hatcheries and the selling of day-old chicks, white diarrhoea has become a very serious malady within the State. In many instances during the past year, from 90 to 95 percent of all the day-old chicks received by certain poultrymen and farmers have died within the first week after their arrival. Literally thousands have succumbed to this malady until many people hesitate to buy baby chicks under any circumstances. This condition calls for remedial measures which it is the purpose of this paper to set down.

**Geographical Distribution.**—The disease exists practically wherever chickens are raised, but manifests itself particularly where large numbers are gathered together, since, under these conditions, it is more easily spread. As long as chickens were raised on farms in small flocks and eggs were hatched under hens little difficulty was experienced, but now that large hatcheries handle thousands of eggs and ship large numbers of baby chicks the disease has been spread to all parts of the country.

**Cause.**—The disease is caused by a micro-organism belonging to the colon typhoid group and named *Bacterium pullorum.*

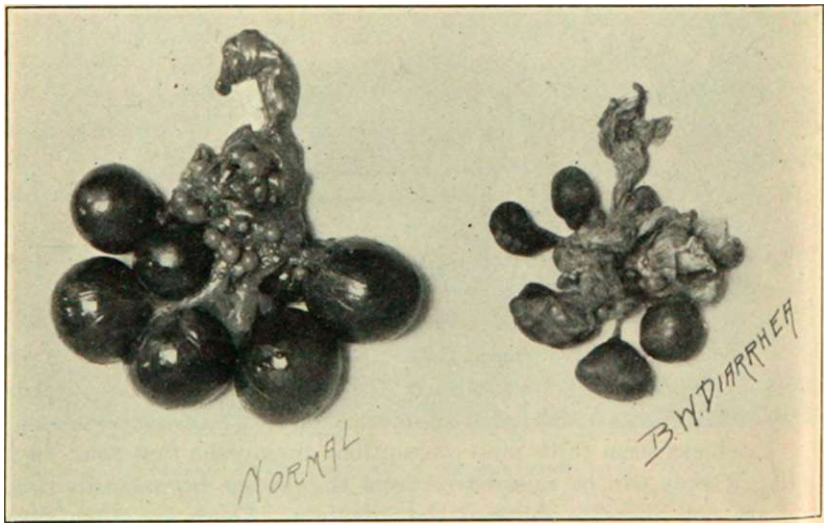
**Transmission.**—As far as our information goes the organism lives for only a short time outside the body of the bird, consequently it is necessary that adult chickens carry the organism within their bodies, thus constantly serving as a source of infection to other chickens. It has been determined that the organisms are largely carried within the ovary of affected hens, and that such hens lay eggs a considerable percentage of which contain the infection. Consequently, chicks are in many instances infected before they are hatched. Such chicks not only contract the disease themselves, but their droppings spread it to others in the same brooder.

As chicks seem to be most susceptible during the first four days of life, if they can be raised free from the disease beyond this time they are not likely to contract the infection. There are, then, two sources of infection. The hen transmits the disease to the chick

through the egg and the chicks transmit it to each other during the first four days of life. Whether the adult chickens transmit the disease to each other is a point that has not been fully determined, but for purposes of control we assume that they do.

**Symptoms.**—Chicks a few days old appear sleepy and dull, do not eat and their wings droop. They huddle in a corner as though chilled, show a whitish discharge from the bowels that "pastes them up behind," finally become paralyzed and usually die within two or three days after showing evidence of the disease. The disease spreads very rapidly so that it not infrequently happens that 80 to 95 percent of a given lot of baby chicks will die within a week after their arrival. Those that survive are often stunted, but even those that do get well are apt to carry the organism in their bodies and spread it to others.

**Diagnosis.**—The disease may be diagnosed partly from the symptoms but, since chilling, overfeeding, and possibly other factors will cause illness simulating diarrhoea it is not safe to make the determination on symptoms alone. An examination of the dead chick will reveal the yolk sack still unabsorbed. Where an accurate determination is to be made several chicks should be sent to the nearest experiment station for determination. Most State experiment stations make the diagnosis by culturing the organisms, which may take several days. However, the isolation of the organism gives the only posi-




Compare the ovary of a normal hen with that of an infected bird.

tive determination of the condition. In hens the chief means of diagnosis is by means of the ovary in which it will be found that the newly formed eggs are misshapen and discolored; the color varying all the way from yellow to green. Occasionally older birds also show infection of the peritoneum and the sac around the heart, in which case there will be grayish deposits on these membranes. However, even in these cases the diagnosis should be made by cultural methods to insure accuracy.

**Treatment.**—All affected chicks should be destroyed as quickly as possible as it is very rare for one to recover, and as long as they are living they are a constant source of infection to the other birds. It is better to take the well chicks and put them into entirely new surroundings, since it is very difficult to disinfect the houses and brooders satisfactorily. When the well chicks have been moved away from the old surroundings they should be constantly watched and any sick ones should be immediately removed and destroyed. The infected brooders should then be thoroughly washed with hot water to which lye has been added and should finally be sprayed with a strong disinfectant, such as a 3 percent compound cresol solution. (Cresol solution can be obtained at any drug store.) The well chicks should be given sour milk, but no system of treatment nor of diet will prove satisfactory in this condition.

**Control.**—Control consists usually in the elimination of the infected hens since these are the ones that- keep up the infection. The determination of infection in hens is best made by means of the **agglutination** test, which is a test made in the laboratory by the use of the blood serum from the suspected birds. In order to run this test a small sample of blood must be furnished from each hen. The liens should be marked in such a way that they can be located after the result of the test is known.

**Equipment for drawing blood—**

A small, thin, sharp scalpel
One-half dram sterile vials with corks
Absorbent cotton

**Procedure.**—The hen is held between the legs or by an assistant. The wing is drawn away from the body, and with the sharp scalpel the vein is cut at the point where it passes over the first joint away from the body. It can be cut lengthwise or crosswise without any serious damage. It requires no antiseptic precaution and no water or other fluid should be used on the area either before or afterward. Even a drop of fluid in the blood will ruin it for testing. The blood is caught in the vial until the vial is approximately half full. The

**Half a vial of blood is caught for the test.**

vial is then corked and laid on its side to allow the blood to clot. The hens should be leg banded and the number on the leg band placed on the vial. If the blood is still flowing freely from the wound a little pledget of cotton can be pressed over it, and held for a few seconds. This will usually stop the flow. The scalpel should be wiped with cotton between birds. As soon as the bleeding is finished the vials should be placed on ice unless they can be shipped at once to the laboratory. They should be well packed and, if in the summer time, should be iced if they must go any considerable distance. Great care should be given to see that the blood gets to the laboratory in good condition, as otherwise the tests cannot be run or, if run, give erroneous results. For the present the laboratory of Veterinary Pathology of the Colorado Agricultural College will run these samples free of charged.

On receiving the reports, all birds reacting to the test, including the male birds as well as the hens, should be eliminated from the flock and preferably sold for slaughter. If more than 25 percent are infected with the disease it is usually better to dispose of the whole flock and start with fresh stock. The test should be carried out annually in flocks where the infection exists, preferably in the fall after the birds have been culled. Where it is desirable to rid the flock of the disease quickly, it may be advisable to test every six months. Experience shows that testing at irregular intervals is unsatisfactory.

**Results of Testing.**—In eastern states, where the work has been carried on longer than in Colorado, the improvement both in hatchability and livability of chicks has been very marked. In one flock in Massachusetts, consisting of 1,110 breeding birds, only 15 percent of the chicks hatched from the eggs matured in 1919. In 1922-24, after the flock had been freed from the disease, out of 11,600 eggs 8,700 chicks were hatched and 92.9 percent of them lived, showing very conclusively the benefits to be derived from freeing flocks from this disease.

During the past year the laboratory of Veterinary Pathology of the Colorado Agricultural College has received twenty shipments of blood for testing. Out of 1,394 samples tested there were 314 reactions or 23 percent. In only two instances were entirely negative results obtained and in one of these only nine samples were furnished and in the other only six. This would seem to indicate that the disease is quite widespread in Colorado.

**Accredited Flocks.**—The State of Illinois seems to have taken the lead in officially accrediting flocks. There the work is in the hands of

the state veterinarian who issues the accreditation and supervises the control. The licensed veterinarians in the state draw the blood and leg-band the chickens for which they are allowed a fee of 5 cents per bird. The samples are sent to the State University, where tests are made for an additional fee of 5 cents per sample. The culling is then done by the veterinarian who draws the blood. After two negative annual tests the flock is accredited, providing the owner signs a contract to follow the hygienic regulations set down by the state veterinarian.

In other states some accreditation work has been done, but as far as our information goes, no other state department has taken it over as has been done in Illinois. In some places the accreditation is under the direction of an association of poultry raisers, which organization appoints one or more men to draw the blood and cull the flock. In practically all eases the testing is done at the State Laboratory.

Owing to the seriousness of this disease it seems reasonable to believe that in a short time neither eggs for hatching nor baby chicks can be sold, except from flocks known to be free from infection.