
THE STATE COLLEGE OF WASHINGTON

INSTITUTE OF AGRICULTURAL SCIENCES

Poultry Pointers

No. 27 (Revised)

AGRICULTURAL EXTENSION SERVICE

Extension Bulletin Number 351

January 1947

PULLORUM, FOWL TYPHOID AND PARATYPHOID IN CHICKENS AND TURKEYS

The Poultry Council¹ of The State College of Washington

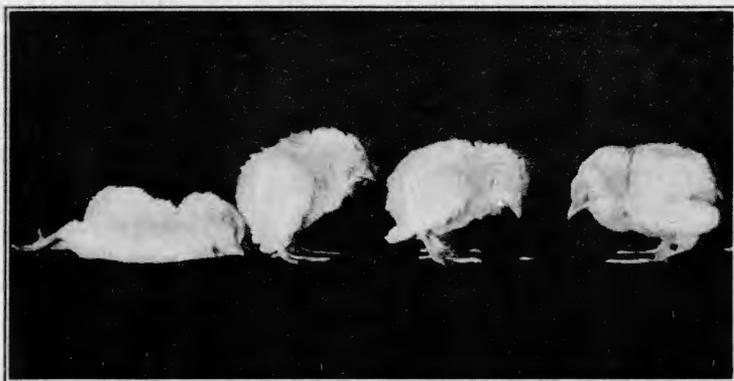


Fig. 1. Chicks affected with Pullorum Disease.

Salmonella diseases of domestic fowl include pullorum, typhoid, and paratyphoid. All three of these are caused by infection with certain germs. Pullorum is caused by the organism, *Salmonella pullorum*, typhoid by *Shigella gallinarum*, while paratyphoid may be caused by any one of 40 or more closely related organisms of the salmonella group.

¹THE POULTRY COUNCIL of The State College of Washington is composed of staff members of The State College of Washington at Pullman and Puyallup who are engaged in teaching, research, and extension work in poultry husbandry and pathology.

Published and distributed in furtherance of the Acts of May 8 and June 30, 1914, by The State College of Washington Extension Service, E. V. Ellington, Director, and the U. S. Department of Agriculture, co-operating.

12-46-10m-82718

Pullorum and paratyphoid are connected with losses in young birds under four weeks of age. While older birds may get either of these diseases, death losses are very few and the birds usually do not seem to be sick. However, losses in partly-grown turkeys are reported once in a while. Pullorum causes less egg production in hens and may be the cause for lowered fertility and hatchability. Typhoid, while it may be a cause of losses in newly-hatched birds, is more often the reason for losses in partly-grown birds.

Pullorum is found in both chickens and turkeys. Typhoid, the least common of the three salmonella diseases in Washington, is mainly a disease of chickens although it may be found in turkeys. Paratyphoid is often found in turkeys and sometimes in chickens.

Transmission

With one difference to be noted, the means of transmission or carrying of the three salmonella diseases of birds are the same and include:

1. **Egg.** All three of the salmonella diseases of birds may be egg carried. Egg transmission probably is most important in pullorum.
2. **Incubator.** Infected eggs, that is, eggs carrying the germs, which hatch may serve to infect healthy birds at the time of the hatch because the down which goes into the air, especially in forced draft incubators, carries the organisms or germs.
3. **Direct contact.** The organisms of all three of the salmonella diseases may be in the droppings of infected birds both young and old. Organisms passing from the infected droppings to the litter, feed, and water containers is one of the main ways of transmission of these diseases.
4. **Indirect contact.** Shipping boxes and other equipment, including feed bags, used with or around infected birds may carry disease to healthy stock. The disease may be carried also on the feet of workers.
5. **Egg and offal eating.** The vice of egg-eating by adult birds or the practice of feeding raw eggs or uncooked offal from slaughtered birds is a common means of transmitting these diseases.
6. **Contact with other types of livestock.** Paratyphoid may be gotten by birds through contact, direct or indirect, with other types of livestock as well as with wild life. The list of pos-

sibilities includes pigs, sheep, cattle, horses, dogs, cats, rats, snakes, and many others. Poults, for instance, have been known to get paratyphoid after drinking irrigation ditch water. Pullorum, on the other hand, is probably never gotten by birds except through contact, direct or indirect, with other infected birds.

Diagnosis of Salmonella Diseases in Young Birds

Pullorum or paratyphoid should be thought of in any outbreak bringing unusual losses in chicks or poults under four weeks of age when the loss plainly is not caused by some fault of management of feeding. For certain diagnosis, however, **typically-affected live birds** should be taken to a diagnostic laboratory for bacteriological examination. It is not possible to tell the difference between pullorum and paratyphoid in birds under four weeks of age without laboratory examination. It is important to know which disease is causing the loss because good ways of control are different.

PULLORUM

Diagnosis of Pullorum in Adult Birds

Pullorum (and typhoid) may be diagnosed in adult birds by

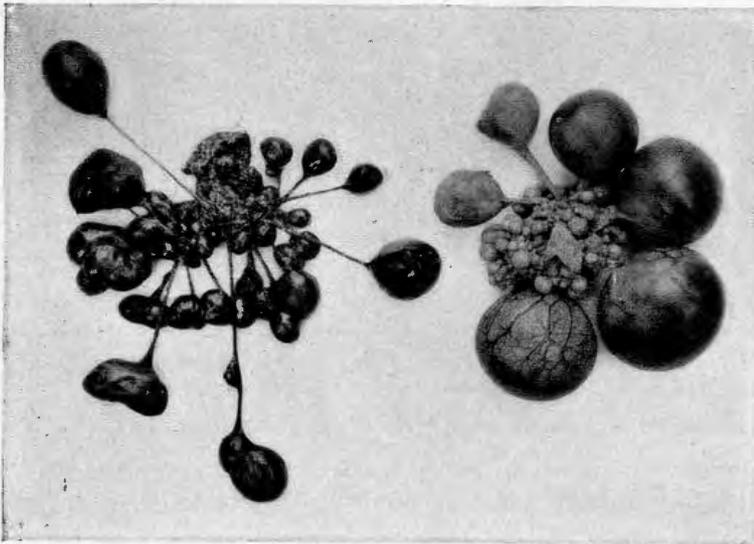


Fig. 2. Ovary on left shows numerous diseased ovules (Yolks). Ovary on right shows two diseased ovules, the two misshapen ones at upper left of cluster. Other ovules in right ovary are normal.

means of the agglutination test. There are three ways of giving this test:

1. **Rapid, whole blood plate tests.** One drop of fresh blood from the bird to be tested is mixed with one drop of the test fluid on a glass surface. A clumping in the mixture within the time stated in the directions shows that the bird is infected. This test is used in the pullorum testing of chickens, but cannot be trusted when used with turkeys.
2. **Tube agglutination test.** Blood samples from birds to be tested are collected in vials and sent to a central laboratory for testing. The tube test is thought to be more accurate than the plate tests. It is the official test in the pullorum testing of turkeys.
3. **Rapid, serum plate method.** This test is the same as the whole blood test except that one drop of clear serum is used instead of the whole blood. The serum plate test together with the tube test is often used in the pullorum testing of turkeys.

For information about the pullorum testing of turkeys, write to the Veterinary Division, Western Washington Experiment Station, at Puyallup. Persons wishing to act as pullorum testers for chickens should attend a state pullorum tester school. For information, write Extension Poultryman, The State College of Washington, Pullman, Washington.

After the pullorum testing of a flock, chickens or turkeys, fowls showing a reaction should be taken out promptly and marketed. The premises, including all buildings and grounds, should be cleaned and disinfected. For detailed information about cleaning and disinfection, see your county Extension agent or secure Washington State College Extension Bulletin No. 245.

It is important to remember that it is rarely possible to wipe pullorum out of a breeder flock by taking out reactors after a single blood test. Repeated tests every three to six weeks are necessary.

Flock Classification with Respect to Pullorum Control

Following pullorum testing, flocks taking part in the National Poultry and Turkey Improvement Plan are placed in one of four groups:

Pullorum (or blood) tested	Pullorum passed
Pullorum controlled	Pullorum clean

The qualifications for these groups are different between chickens and turkeys and may be changed from year to year. For the person who is going to buy chicks or poults, it is important to know that the only flocks he can be sure are free from this disease are the pullorum clean and, to a less degree, the pullorum passed flock. Pullorum tested and pullorum controlled flocks are flocks in which small numbers of infected birds have been found. If no infected birds were found, the flock would be classified as either pullorum passed or pullorum clean. **Even though the infected birds are removed, pullorum can and often does occur in chicks and poults coming from pullorum tested or pullorum controlled flocks.**

Prevention of Pullorum

The best thing to do to prevent and control pullorum in both chickens and turkeys is to build flocks from source flocks known to be **pullorum clean**. This is very practical in a state like Washington where there are many pullorum clean flocks, both chickens and turkeys, to serve as foundation stock for other pullorum clean flocks. To keep pullorum clean flocks, the following recommendations are made:

1. Blood test the breeder flock every year before the egg-laying season. Every type of bird, such as ducks, geese, and guineas, should be tested. Remove all reactors promptly, if found, and clean and disinfect premises.
2. Hatch eggs from pullorum clean flocks only in incubators handling eggs from other pullorum clean flocks. Because pullorum is generally found more often in chickens than in turkeys, it is recommended that turkey eggs not be hatched in incubators handling chicken eggs. If both chicken and turkey eggs come from pullorum clean flocks, there is no reason why they cannot be hatched together.
3. Raise the birds upon clean premises and away from all adult birds.
4. Guard against bringing in pullorum by adding breeders or other birds to the flock. Pullorum is often brought in with the addition of male birds.
5. Guard against the introduction of the disease through birds shown at fairs, shows, and egg-laying contests.
6. Do not feed uncooked eggs or offal from slaughtered birds to poultry.

7. Remember that pullorum may be introduced into a flock by means of any material or equipment which has been used around an infected flock, such as shipping boxes and feed bags as well as the shoes of workers.
8. Burn or otherwise destroy dead birds.

Drugs Effective in the Control of Pullorum

It has lately been shown that the new drug sulfamerazine and possibly sulfamethazine may be of value in the control of pullorum. Best results have been gotten by placing young birds, just hatched, upon mash containing from 0.4 to 0.5 per cent of the drug (four-tenths to five-tenths pound of drug per 100 lbs. of mash), and feeding the mixture constantly for five days. At the end of the five-day period, the birds are given regular mash. Although detailed information is lacking, treatment of newly-hatched birds in this manner does lower losses from pullorum when the parent stock is infected. The same five-day treatment probably will lower the losses if given to groups of birds in which pullorum has appeared.

The use of these and other drugs in the control of pullorum and other poultry diseases is very new and full facts are lacking now. In the next few years, we will surely learn a great deal more about the best ways to use them. **It is urged, however, that poultrymen use these drugs only as recommended by good veterinary authorities; the drugs are poisonous when used in the wrong way. If they are not used carefully, heavy damage to birds may follow.**

Order Regarding Sale of Pullorum-Infected Birds in Washington

Washington and the Pacific Coast hold a high place among the states of the union in the amount of pullorum control which has been carried out both in chicken and in turkey flocks. In order to keep this position and hold the marketing advantages gained by it, the State Department of Agriculture has made the following ruling:

Regulation I. It shall be unlawful for any person, firm, or corporation to sell, offer for sale, or otherwise distribute baby chicks and/or poults in the state of Washington that are affected with pullorum disease.

Penalty: Any person, firm, or corporation violating this regulation shall be deemed guilty of a misdemeanor.

The State Department of Agriculture accepts a positive diagnosis of pullorum only after it is made by bacteriological or laboratory

examination. It is important to remember also that the State Department looks into pullorum outbreaks mainly to aid in finding and stopping the source or sources of the disease rather than to enforce the letter of the law. The law is to be used only when a person does not work with the officials in stamping out the disease.

PARATYPHOID

Paratyphoid is much like pullorum, being a disease causing heavy losses in poults and chicks under four weeks of age. Older birds may become infected but do not often show signs of illness. Paratyphoid, like pullorum, may be egg carried. Because of the similarity to pullorum, the causes of paratyphoid, the birds affected, the transmission, and the diagnosis in young birds have been discussed in the first part of this paper. The diagnosis of paratyphoid in adult birds differs, however, from that of pullorum. **There is not and probably never will be a practical blood test for finding paratyphoid in adult birds.** Since the disease is known to be egg transmitted, and since no practical way is known now for detecting infected grown birds, it is recommended that entire flocks in which paratyphoid has appeared should be marketed. No breeder birds must be retained. The flock should be replaced from a source known to be paratyphoid and pullorum free. Paratyphoid is often started in poults and possibly in chicks from contact with domestic animals as well as with wild life, from contact with infected humans, or from drinking unclean water. The source of the disease in these cases should be found and stopped to keep the infection from breaking out season after season.

Sulfamerazine or other drugs may someday be useful in the control of paratyphoid in birds, but there are few facts on it now.

TYPHOID

Typhoid is like pullorum in that it may be carried in the egg and may be a cause of heavy losses in young chicks and poults. It, however, is more often connected with losses in partly-grown birds. Adult birds may have the disease without showing symptoms of illness.

The diagnosis and handling of typhoid outbreaks is the same as that of pullorum. The blood agglutination test used in the testing of adult birds for pullorum shows at the same time birds which may be infected with typhoid. A well-organized campaign for the control of pullorum automatically, therefore, takes care of typhoid.

Sulfa drugs may prove to be useful in the handling of typhoid outbreaks, but recommendations cannot be made at the present time.

For additional information on other poultry diseases and a complete list of Poultry Pointers, consult your county agent.