

**Experiments on the  
Influence of Avian Cholera and Typhoid Vaccines  
on the Accuracy of Pullorum Tests  
of Turkeys**

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# Experiments on the Influence of Avian Cholera and Typhoid Vaccines on the Accuracy of Pullorum Tests of Turkeys

By DON L. BROOKS and E. E. HARNDEN\*

Many turkey breeders vaccinate their turkeys for fowl cholera, typhoid, or both. The vaccines used usually contain a mixture of organisms closely related to *Salmonella pullorum*. This raised the question: Will vaccination of turkeys with commercial fowl cholera-typhoid vaccine cause the birds to give a positive pullorum reaction when tested later in the year?

Information on the accuracy of the pullorum test is important because this test is required of all flocks participating in the National Turkey Improvement Plan. Therefore experiments were undertaken to determine whether commercial fowl cholera-typhoid vaccines would produce agglutinins in the turkey that would react with *Salmonella pullorum* antigen.

No previous publication bearing directly on this question has been found. Jordan's "General Bacteriology, 12th edition, puts *Skigella gallinarum* in the O antigen group IX with *Salmonella pullorum*. Merchant's "Veterinary Bacteriology" states that the Salmonella subcommittee placed the organism *S. gallinarum* in the Salmonella genus because its O antigen is identical with that of *Salmonella pullorum*.

Experiments were conducted in 1946, 1947, and 1948, as follows:

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## The Story in Brief Is . . .

*In the experiments reported in this bulletin, vaccinating turkeys with cholera-typhoid vaccines, or combination vaccines, did not cause the birds to react to the standard test for pullorum disease. This does not mean that such vaccinations are recommended or have proved effective; but it does show that any reactors found by pullorum tests after the birds have been vaccinated are to be considered pullorum reactors, and not merely reactors as a result of the vaccinations.*

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### 1946

Seventy turkeys 12 to 16 weeks of age were divided into seven lots of ten each. Five lots were vaccinated with five different commercially produced fowl cholera vaccines containing *Salmonella gallinarum*, using 2 cc of vaccine per bird. The sixth lot was similarly vaccinated with a vaccine produced from *S. gallinarum* in the bacteriological laboratory of the Oklahoma A. & M. College. The seventh lot was used as a control. The birds were tested for pullorum by both the tube and serum plate methods before vaccination and again three weeks afterward. All birds were negative to pullorum tests on both occasions.

### 1947

One hundred turkeys 12 to 16 weeks of age were bled and tested for pullorum, fowl typhoid and paratyphoid, using the tube test. All were negative. Ten were then vaccinated with a vaccine prepared with a strain of *Shigella gallinarum* received from the United States Department of Agriculture. Nine were vaccinated with a vaccine prepared from *Salmonella typhimurium* from the same source. Forty-nine were vaccinated with a commercial typhoid vaccine; and thirty were left for control. (The two birds not accounted for were victims of coyotes.)

Blood was drawn from all these birds three weeks later and tested by the tube method for the agglutinins of pullorum, typhoid and paratyphoid. All birds were negative to the pullorum antigen.\*

## 1948

One hundred turkeys varying from 12 to 16 weeks of age were bled and tested for pullorum. Four were found to be reactors, and two had incomplete reactions.

The 100 birds were divided into lots of 25 each. One lot was the control; and the other three lots were vaccinated three times at weekly intervals with three commercial vaccines of avisepticus, gallinarum, and typhimurium mixed bacterins. Two weeks after the third vaccination, the birds were bled and tested for agglutinins of pullorum. No reactors were found except for the birds which had reacted in the first pullorum test.

The four reactors were killed after completion of the experiment, and cultures were made in an attempt to isolate pullorum or typhoid; but neither was found.

### Summary and Conclusion

Approximately two hundred turkeys 12 to 16 weeks of age which had reacted negatively to the standard pullorum test were vaccinated with various commercial fowl cholera—typhoid vaccines or pure culture vaccines of *Shigella gallinarum* and *Salmonella typhimurium*, and then retested for pullorum. None of the birds reacted positively to the pullorum test after being vaccinated. (Four complete and two partial reactors in the preliminary pullorum tests gave similar reactions after vaccination.) Sixty-five birds were used as controls in the various experiments, no pullorum reactors being found. It is therefore concluded that use of commercial vaccines containing organisms closely related to *Salmonella pullorum* does not invalidate pullorum tests of the same birds made at a later date.

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\* Four of the 49 birds vaccinated with the commercial typhoid vaccine were positive to the typhoid antigen. Eight of the nine vaccinated with the paratyphoid were positive to the paratyphoid antigen but not to the typhoid or pullorum antigens.