

## CLASSIFICATION BRIEF



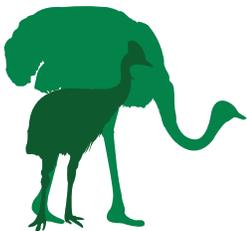
EGG-TYPE CHICKENS



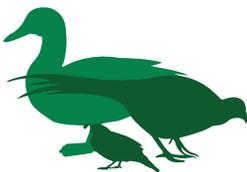
MEAT-TYPE CHICKENS



TURKEYS



OSTRICHES, EMUS, RHEAS,  
AND CASSOWARIES



WATERFOWL, EXHIBITION  
AND GAME BIRDS



HUMAN HEALTH  
SIGNIFICANCE



### Fowl Typhoid (*Salmonella enterica* serotype Gallinarum)

#### NPIP Classifications

- **U.S. Pullorum-Typhoid Clean**
- **U.S. Pullorum-Typhoid Clean State**
- **Availability:** *All types of breeding poultry defined in 9 CFR 145; this classification is required to participate in NPIP.*

#### Etiology

Fowl typhoid is caused by *Salmonella enterica* serotype Gallinarum a bacterium which is placed in the same species classification as *Salmonella pullorum* (Pullorum disease): *Salmonella enterica* subsp. *enterica* serovar Pullorum-Gallinarum, family Enterobacteriaceae. It is a Gram negative, non-motile, facultative anaerobe. Fowl typhoid and pullorum disease are combined into a single NPIP classification. However, we will describe the diseases separately.

#### Species Affected and Zoonotic Potential

Chickens are the natural host of *Salmonella* Gallinarum, but turkeys and most other domestic and wild fowl are susceptible. *Salmonella* Gallinarum has been rarely isolated from humans and is of little public health significance.

#### Geographic Distribution

Fowl typhoid is distributed worldwide. The disease has been eradicated from commercial poultry flocks in the United States and many other countries. It may still be present in backyard flocks, but no isolations have been reported in the United States since the late 1980s. Fowl typhoid is common in Mexico, Central and South America, Africa and the Indian subcontinent.

#### Transmission

Fowl typhoid can be transmitted horizontally through infected birds and vertically through egg transmission. Vertical transmission is the most significant mode of transmission. Vertical transmission occurs through eggs by contamination of the ovum following ovulation or by localization of the organism in the ovules before ovulation. As many as one third of the eggs laid by an infected hen may be infected with *Salmonella* Gallinarum.

Horizontal transmission may occur in the hatchery through contact with infected chicks or poults. Transmission may also occur through feces and contaminated feed, water or litter. Fomites including people, equipment, insects, wild animals and rodents may also transmit the disease.

#### Clinical Signs

**Young chicks and poults:** Fowl typhoid, like

pullorum disease, is often a disease of chicks and poults. Birds hatched from infected eggs may be moribund or dead shortly after hatching. Signs of fowl typhoid are very similar to those of pullorum disease. Clinical signs of fowl typhoid can include depression, loss of appetite, somnolence, droopy wings, huddling, dehydration, thirst, ruffled feathers, and weakness. Yellow or green diarrhea with pasting of the vent feathers is common, and there may be blindness or swelling of the joints. Birds that survive may be underweight and poorly feathered, and may not mature into productive adults.

**Adult chickens:** In growing or adult birds, fowl typhoid is a more significant disease than pullorum disease. In chickens, an acute outbreak of fowl typhoid may begin with a drop in feed consumption, with droopy birds with ruffled feathers, and pale, shrunken combs. Other signs include decreased egg production or fertility.

**Turkeys:** Signs of fowl typhoid and pullorum disease in turkeys include: thirst, anorexia, listlessness, a tendency to move away from healthy birds, and green to greenish-yellow diarrhea. Death may occur without clinical signs.

#### Prevention and Control

Prevention of the disease is best obtained through management practices aimed at preventing the introduction of disease into the flock. Disease control is done by testing and eliminating carriers. Eggs and birds should be obtained from flocks free of pullorum disease. Proper sanitation and biosecurity measures must be implemented to reduce the risk of disease introduction through contaminated feed, and other outside sources.

#### Diagnosis

Definitive diagnosis of fowl typhoid is based on the isolation and identification of the organism. A tentative diagnosis may be made based on flock history, clinical signs, mortality and lesions. Serology may also be helpful in diagnosing an infection, however caution must be exercised with respect to negative test results as agglutinating antibodies may appear 3-10 days following infection. Positive results must also be viewed with caution due to cross reactivity with other Group D salmonellae.

This information was developed by staff veterinarians at the CFSPH and approved by APHIS for use as training materials for the USDA APHIS National Veterinary Accreditation Program.



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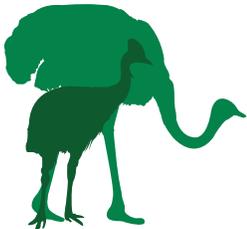
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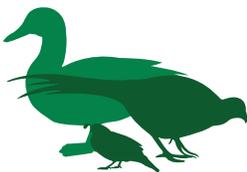
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HUMAN HEALTH  
SIGNIFICANCE

 Affected

 Not Affected

#### Testing Requirements

The rapid whole-blood test used to test for pullorum disease is also effective in testing for fowl typhoid. The antigen used reacts to both anti-pullorum and anti-typhoid antibodies. Confirmatory testing is done through authorized laboratories and with a variety of approved tests. Turkeys are not eligible for the rapid whole-blood test and must have blood submitted to an authorized laboratory for testing.

Most states in the NPIP are now considered U.S. Pullorum-Typhoid Clean. This means that many multiplier flocks that originate from U.S. Pullorum-Typhoid Clean Primary flocks may qualify without blood testing. When testing is required, generally it will only need to be done every 12 months.

#### Approved Tests

The official blood tests for pullorum and typhoid are standard tube agglutination test, microagglutination test, enzyme-labeled immunosorbent assay, rapid serum test, and the stained antigen, rapid whole-blood test (except turkeys).

#### Reference

- Saif, Y.M, et al., *Diseases of Poultry*, 12th ed. Blackwell Publishing, Ames, IA, 2008.
- Fowl Typhoid Factsheet, CFSPH (June 2009) [http://www.cfsph.iastate.edu/Factsheets/pdfs/fowl\\_typhoid.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/fowl_typhoid.pdf)