

July, 1924

Circular No. 289

UNIVERSITY OF ILLINOIS  
AGRICULTURAL COLLEGE AND EXPERIMENT STATION

URBANA, ILLINOIS

# Botulism in Fowls

## Types A and C

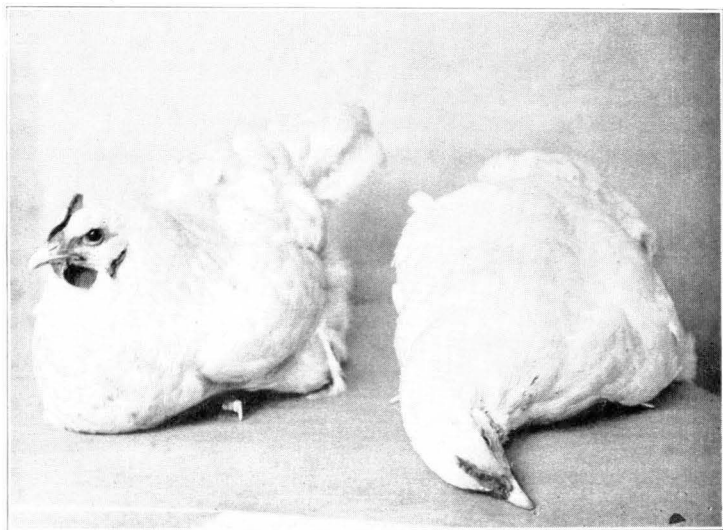
Commonly called

**LIMBERNECK**

By ROBERT GRAHAM and I. B. BOUGHTON

SEP 16 1924

A brief statement of the cause of botulism in poultry, how it may be recognized in a flock, and how it may be combated.



In severe cases of botulism the affected chickens are unable to stand, their neck muscles become paralyzed and their heads and wings rest on the ground.

# Botulism in Fowls

By ROBERT GRAHAM, Chief in Animal Pathology and Hygiene, and I. B. BOUGHTON, Associate in Animal Pathology

Outbreaks of botulism, or food poisoning, in the poultry flock often can be traced to spoiled canned food or to decomposed meat or vegetables. Feed contaminated by the feces of affected poultry and the carcasses of chickens that have died from limberneck also contain enough poison to reproduce the disease. Rations that seem wholesome, including grain, also may occasionally be responsible for the disease, although outbreaks of avian botulism more often are linked up with the feeding of visibly spoiled foods. This spoilage may be only slight and not easily detected.

In every case the disease in chickens is caused by fowls eating food containing the botulism poison or toxin. The most common symptoms are paralysis, and if the neck muscles are involved the disease is referred to as limberneck. It also is known as avian botulism, food poisoning, maggot poisoning, paralysis of the neck, and leg weakness.

Symptoms of paralysis that appear in chickens after they have eaten suspected, discarded food should serve as a warning to people who have eaten or tasted the same food. Symptoms of botulism in poultry traceable to improperly canned food have, in some cases, occurred simultaneously with the disease in humans.

## Two Types of Poisoning

Two distinct types of a microscopic, spore-forming organism called *Clostridium botulinum* are responsible for botulism in chickens. These two types, A and C, are widely distributed in the soil and under favorable conditions may get into decaying animal carcasses or vegetables to produce their fatal poisons. Grains that harbor only the spores of the botulism organism are quite harmless to chickens. On the other hand, corn, oats, and wheat are a favorable medium for the development of the fatal toxin or poison when the right amount of moisture is present and other conditions are favorable. Unless the botulism toxin or poison has been formed in the feed before it is eaten, there seems to be little or no danger of the disease from the rations fed.

Poorly drained soil rich in organic matter is a favorable place for the spores to survive. From contaminated soils the spores may gain entrance to grains and even to decaying animal and vegetable materials. The poison formed in these contaminated materials may be carried on the feet of certain flies and possibly other insects. Maggots that feed on contaminated carcasses may become highly poisonous. The poison taken in by maggots of the house fly when fed on experimentally infected materials has been known to persist in the body of the fly thru the insect's complete transformation. Materials discharged by

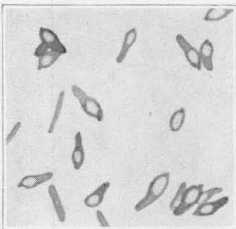


FIG. 1.—THE SPORE-FORMING ORGANISM *CLOSTRIDIUM BOTULINUM* TYPE A, AS SEEN UNDER THE MICROSCOPE

the newly emerged adult fly may, therefore, contain the poison in potent form.

### Poisoned Chickens Are Weak

In the early stages of botulism in poultry the eyes are dull and partly closed. The chickens are inactive and show symptoms of weakness and unsteadiness when they move. In mild cases the preliminary symptoms of leg weakness and drowsiness may disappear and the affected chickens recover in two or three days. In more severe cases, however, the poisoning causes death in a few hours. The affected chickens cannot stand

and the neck muscles become paralyzed, causing the head and wings to rest on the ground. Fatally affected chickens lie in a profound coma, and seemingly are lifeless several hours before they die. In the advanced stages

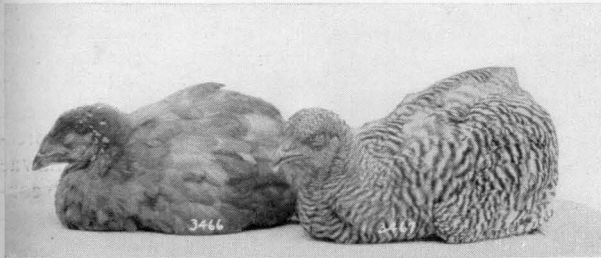


FIG. 2.—THE EYES ARE DULL AND PARTLY CLOSED IN THE EARLY STAGES OF BOTULISM

of the disease there is a broken, quivering, or worm-like movement of the feathers and in some cases large numbers of feathers are shed. Looseness of the feathers is especially noticeable in handling affected chickens. Soft, pasty feces or even diarrhea have been observed in type C poisoning.

### Legs and Wings Paralyzed in Mild Attacks

During the summer months an occasional case of type C poisoning may appear in some flocks without causing serious losses. In chickens thus mildly affected, the limberneck symptom, which is characteristic of fatal cases, may not develop. More commonly paralysis of the legs or wings is noticed in mild attacks. Altho there is little difficulty in diagnosing the disease in typically affected flocks where heavy losses occur, a few mild cases are not easily recognized.

The two known types of food poisoning—A and C—cannot be distinguished on the basis of symptoms alone, inasmuch as no outward signs have as yet been found which can be taken as specific marks of the difference between the two types.

Affected chickens should be sent to a laboratory for examination in case a diagnosis is desired. This is especially



FIG. 3.—A TYPE OF PARALYSIS ARTIFICIALLY PRODUCED BY FEEDING SMALL AMOUNTS OF BOTULISM TOXIN, OR POISON

important since symptoms of leg weakness and limberneck, common to botulism, also may be associated with intestinal parasites, protozoan diseases or improper feeding. Furthermore, bacterial infections, such as fowl cholera, which might be confused with food poisoning, can be eliminated easily by a bacteriologic examination.

### Autopsy Reveals No Striking Changes

No striking changes can be found when fowls that die from botulism are examined. In the lining of the small intestine inflammatory changes may vary from a mild catarrh to small but intense areas of enteritis

characterized by red spots or hemorrhages. Dilated or distended sections of the intestinal tube should be looked for, while the contents of the intestine should be examined for the presence of fly larvae. These larvae have been found in the crop contents of chickens in certain outbreaks of type C poisoning, but their presence is not positive proof of type C botulism, in view of the fact that larvae containing type A poison or even non-poisonous larvae often may be found in the crops of chickens that die from a variety of causes.

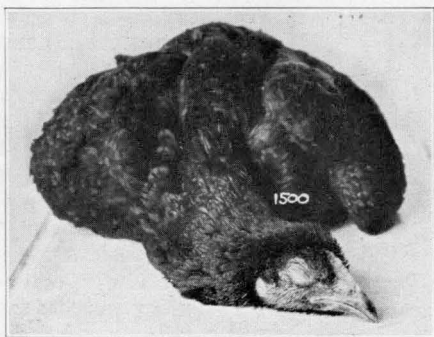


FIG. 4.—A SEVERE CASE OF BOTULISM  
This case resulted within 24 hours after the chicken had received a very small portion of suspected liquid from spoiled spinach.

### Wholesome Rations Prevent Poisoning

Prevention of food poisoning in poultry depends entirely on feeding wholesome rations. The practice of feeding chickens spoiled canned foods, tainted meats or decomposed vegetables is to be discouraged, while the danger to fowls from putrefying carcasses of any kind should be guarded against.

Carcasses of chickens that have died of the disease also are a source of danger and should be destroyed by burning. The poisonous character of the droppings of infected chickens makes it advisable to isolate all sick chickens and to remove all litter from the quarantined pens to fields that cannot be reached by poultry.

All healthy exposed chickens should be given castor oil or Epsom salts in laxative doses. These medicines can be mixed with bran in the form of a wet mash. Mildly affected chickens that do not eat should be given half-ounce doses of castor oil. The Epsom salts may be mixed in the feed for flock treatment at the rate of one pound for 75 to 100 chickens. All other feed should be withheld and the treatment repeated until the digestive tract has been emptied.

The injection of botulism antitoxin, types A and C, also may be used as a preventive treatment. The curative value of the antitoxin, however, seems to be limited and best results are obtained when fowls are treated in the early stages of the disease.