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Limberneck (Botulism) In Fowls

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A few cases of limberneck in poultry are reported each year at the veterinary department of the Missouri Experiment Station, and though this disease never occurs in the form of an epidemic, it is of sufficient frequency to justify information being made available concerning its nature and control. In most of the cases of poultry infection which have been investigated in Missouri the source of the toxic material has been decaying animal or bird carcasses. Losses in poultry from eating spoiled canned vegetables seem to be less common in this state.

Limberneck (botulism) is the name given to the disease which results from birds eating and absorbing the poison excreted or thrown off by a bacterium (*clostridium botulinum*). This organism was first isolated from spoiled sausages and for that reason the disease was called botulism, which is the Latin word for sausage. There are two types, A and C, of the bacteria which may produce limberneck in fowls. It should be mentioned that extensive losses have occurred in the United States in wild waterfowls caused by the botulism organism Type C.

This disease may affect all classes of poultry, but it is more common in chickens and ducks, in which it may cause the loss of a majority of a flock in a very short period of time. A limber neck and loose feathers are the most characteristic symptoms of the disease. In advanced cases there may be a complete paralysis of the entire body.

The disease is more likely to occur in the hot summer months after a rainy spell than at other times, though it may occur at any season of the year, depending upon the source of the infection.

When describing diseases of birds the most common forms are usually recorded, as they are most frequently encountered by the poultryman. However, unusual forms of this disease may occur.

Coburn* and Quortrup have reported an unusual occurrence of botulism or limberneck in turkeys. Because some form of this might occur in some of the plains regions of this state, the circumstances should probably be explained in some detail.

The outbreak occurred in "a flock of 1400 birds in Utah. The birds were ranging on a 20-acre stubble field. Fifty birds were sick at the time of our visit and 50 birds were reported to have died during the previous week. In the middle of the field was a shallow pool of irrigation water. It was immediately suspected that this stagnant pool was the source of the trouble."

Subsequent investigations by the authors showed that botulism toxin was present in the stagnant water in sufficient quantities to produce death in the turkeys. A test of the soil showed that Type C botulism organism was present and the water contained sufficient vegetative material to serve as a natural cultural medium for the development of the toxin producing organism.

The value of this report is evident, as it clearly shows that decaying vegetation in stagnant water may be the source of a highly toxic substance. Poultrymen may avoid such dangers by providing their flocks with an abundance of clean water and preventing them from ranging in areas containing stagnant water.

Cause

The micro-organisms and the poisons produced by them are commonly found in decaying carcasses of animals or in spoiled canned foods. Spoiled vegetables, such as canned beans, string beans, canned corn, and various other vegetables have caused large losses when fed to poultry flocks.

It is probable that the disease occurs more frequently as a result of chickens feeding on dead carcasses of farm animals, such as hogs, other chickens, and sometimes dead rats which have not been found by the poultryman. It is not uncommon for chickens to die with typical limberneck symptoms when they have eaten maggots that have developed on dead carcasses. Not all maggots produce limberneck symptoms when eaten by chickens; it is only those that have fed on the carcasses of animals which contain the disease.

Symptoms

In mild outbreaks of the disease the first symptom usually noticed is that in the morning a few of the birds may remain on the roosts, some of which, when in a standing position, have their heads hang-

*Coburn, Don R. & Quortrup, Erling R., "A typical Botulism in Turkeys"—A.V.M.A. Jour., Dec., 1938—Vol. XCIII, N. S. V. 46, No. 6.

ing perfectly limp, in a pendulous position in front of the body, a complete loss of tonicity of the muscles having developed. Some birds may show only a slight paralysis, in which the neck will be "bowed" at a rather sharp angle near the middle. This condition is caused by a semi or complete paralysis of the neck muscles, allowing the head and neck to hang limp. (Figs. 1 and 2).

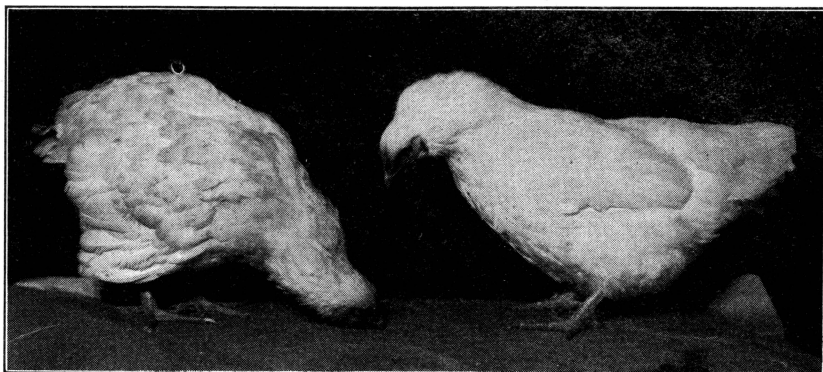


Fig. 1.—Birds affected with limberneck (botulism) in the early stages before complete paralysis had occurred. The bird on the right has the typical bowed neck in which only half of the neck is affected. The bird on the left has lost entire control of the head and is resting it on the floor. The one on the right made a nice recovery under treatment. The one on the left died from the disease.

In severe outbreaks of the disease many birds may be found dead, and the sudden appearance of several cases of typical limberneck in the flock is usually the first indication of the disease. A bright red comb, ruffled feathers (easily pulled out), paralysis of the third eye-lid, and a limber neck are probably the most characteristic symptoms of the disease. Usually large numbers of the flock are affected at once and are found lying in a recumbent position, either on their chests or sides. When picked up they may utter a cry of pain and the feathers are so loose many of them are removed while the birds are being handled. A sub-normal temperature is sometimes present. A watery or whitish diarrhea may be present and the skin, soiled by this discharge, may appear red and congested.

Often when a bird dead from the disease is examined, the crop may contain a number of maggots and bits of decomposed meat. Sometimes the crop contains spoiled corn, spoiled beans, or other food that carries the toxic material.

Losses from limberneck may vary from 5% to 95% of a flock, unless measures are promptly instituted for its control as soon as the disease is first noticed.

Differential Diagnosis

There are several diseases which might be mistaken for true limberneck or botulism. There is a condition in fowls known as wry neck, in which the neck is twisted or held to one side but is not limp as in the case of botulism or true limberneck. Wry neck may be caused by worm troubles, by infection of the middle ear, by fowl paralysis, or by severe intestinal disturbances, due to organisms or foreign bodies other than those producing true limberneck.

Another condition which may easily be mistaken for the last stages of true limberneck is a form of malnutrition which occurs as a result of an inadequate diet. Ducks and geese are most frequently affected, and in these cases there is a generalized paralysis, the bird being in an unconscious state, helpless, with eyes closed, remaining in this state for two or three days or longer. There is labored respiration. This condition may be distinguished from limberneck in that the birds live longer; they are on an exclusive grain ration; there is a lack of paralysis of the neck muscles; the feathers are not loose; and they quickly respond to a diet high in protein.

In the early stages of limberneck there is no loss of power of movement of the body muscles, but there is a loss of function of the neck muscles.

Prevention

The prevention of this disease is the most important factor in its control. The poultryman should feed his flock a liberal, well-balanced, adequate ration at all times, since well fed birds are much less likely to pick up foods containing the poison which produces limberneck. The farm should be carefully searched for all dead or decaying animal meats which when found should be burned or deeply buried. No spoiled canned vegetables should be thrown out to the poultry.

Treatment

It is very important to make an early diagnosis of limberneck in chickens. The earlier a diagnosis is made and proper measures for control are instituted, the less likely are large losses to occur in a flock.

If a large number of birds are affected a veterinarian should be called in immediately, as antitoxins (serums) are of great importance. In case only a few birds are affected and the antitoxins are not available, many of the birds can be saved by the following treatment:

It is not unusual to find a good deal of poisonous material still in the crop of an affected bird. In order to prevent further absorption of the poison, the crop should be emptied as soon as possible. The crop is emptied by flushing with water several times. It is well to

add a tablespoonful of bicarbonate of soda to each quart of the water used in flushing the crop.

A long nozzle bulb syringe (nozzle 6 to 8 inches long) or dosing syringe equipped with a long nozzle that has been used for drenching sheep is satisfactory. The bird to have its crop emptied should be placed on a level table, on its chest with its feet and legs stretched back and its head held slightly lower than the level of the table. The long nozzle syringe or bulb syringe should then be filled with water,

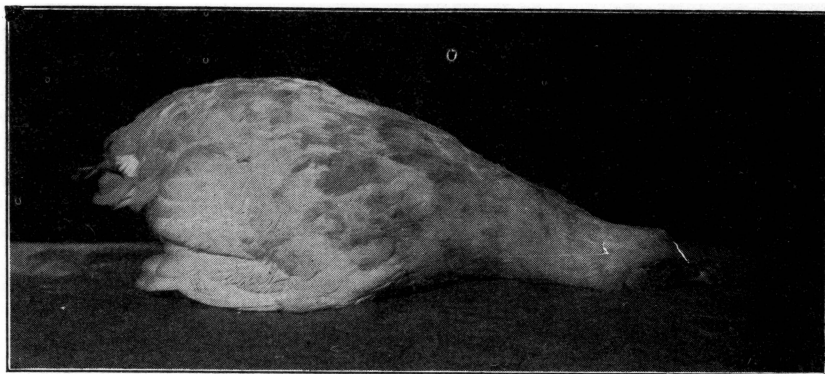


Fig. 2.—A later photograph of the bird shown on the left in Figure 1 in the more advanced stages of limberneck when complete paralysis of the entire body has taken place just before death.

the nozzle of which should be passed down the throat of the bird and the water expelled in the crop. This should be repeated until the crop is well distended with the water. The water and crop contents may then be removed by holding the beak open with the index finger of the left hand and with the right hand fingers extended push backward, upward and forward on the distended crop, at the same time holding the bird's head downward. In removing the solid material with the water from the crop care should be exercised to keep the large pieces coming from the crop from lodging at the base of the tongue, thereby forcing water into the windpipe. This can be prevented by the use of the index finger, the tip of which is inside the bird's mouth. It may be necessary to fill and empty the crop several times before all the solid material is removed.

After the crop is empty each bird should be given castor oil and turpentine. These drugs may be placed directly into the crop with the bulb or dose syringe which was previously used. One tablespoonful of castor oil containing 17 to 23 drops of turpentine may be given to each chicken. The dose may be doubled for large turkeys.

If the removal of the material and the purgative are administered early enough in the disease, the majority of the birds treated will make a rapid and uneventful recovery. For the apparently healthy birds in the flock a brisk purge is recommended. Epsom salts may be given in a wet mash at the rate of one pound of salts for 100 birds and just enough mixed so that the birds will clean up all of the feed at one time.

It is of course very important to follow the suggestions given under prevention and to see that all of the offending material on the farm is removed and properly disposed of to prevent further exposure of the flock.

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