

# Diseases Of Turkeys

## Problems Associated With Age

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**D**URING the past decade, the turkey industry has become an important branch of the livestock industry. The number of turkeys raised in the United States during 1945 was approximately 45,000,000 and the crop in 1946 will be almost as large. When this number is compared with the number of turkeys (3,000,000) raised in the United States in 1920, the increase is phenomenal. The turkey industry has grown from a minor farm enterprise to big business. A few years ago the average size flock was a few hundred. Now it is not uncommon to see flocks of several thousand. During the past year Iowa raised as many turkeys as the entire United States produced in 1920.

This growth has been encouraged by a favorable market. People enjoy a turkey dinner almost any time. Years ago turkeys were thought of by the average family only at Thanksgiving and Christmas. The turkey industry has not been without its problems. In order to remain a big industry the quality should be improved and the losses from disease should be reduced. In 1943 the mortality rate was about 30 per cent, by 1944 it was reduced to 26 per cent, and during 1945 the mortality rate was about 25 per cent. The loss of breeder hens was approximately 10 per cent. This would indicate about 15,000,000 poults were started and were not marketed because of disease or non-specific causes. The death rate can be materially reduced by strict observance

of good basic management practices and disease control measures. The turkey and poultry industries need the aid of the practicing veterinarian in order to bridge the gap between the poultry pathologist, the poultryman and the turkey growers, to reduce the mortality rate. In the past few years it has been encouraging to find more and more of the recent graduates of veterinary colleges assuming their responsibility to the poultrymen. As we move from an era of war-time problems to an era of peace-time problems the veterinarian has an even greater responsibility in helping to minimize the losses from disease.

There are 3 age periods in which certain disease problems may be anticipated. These are as follows: 1, the first 4 weeks of the brooding period; 2, the next 6 weeks; and 3, the range period until marketed. Approximately 50 per cent of total turkey mortalities occur during the brooding period.

During the 1944, 1945 and 1946 season a large number of poults were examined in the Diagnosis Laboratory at University Farm, University of Minnesota. For example, during 1944, the number included 275 lots of poults under 3 weeks of age that represented about 600,000 turkeys. Approximately 75 per cent of the lots were found to be infected with pullorum, paratyphoid, paracolon and typhoid organisms. Some of the other conditions commonly encountered were ascites, air sac infection, omphalitis, dietary deficiencies, inanition and dehydration. During the second age period sinusitis, coccidiosis, trichomoniasis, hexami-

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tiasis and enterohepatitis were the important conditions encountered. During the range period enterohepatitis is still the most prevalent disease.

Salmonella infections may be divided into 3 types which are: pullorum disease, paratyphoid infections and fowl typhoid. Of the 182 outbreaks attributed to Salmonella infection 64 of them were caused by *S. pullorum*, 70 outbreaks involved paratyphoid infections and there were 45 additional outbreaks that were characterized by both conditions. There were 3 outbreaks of fowl typhoid.

### Pullorum

The flocks involved with pullorum disease represented about 125,000 birds. Of this number approximately 26,000 birds died. This represented an average loss of about 21 per cent with the range varying from 4 to 97 per cent in the different flocks. Incidentally, the loss of 4 and 97 per cent occurred on the same farm; different lots of birds were involved. The brood of poults where the 97 per cent loss occurred were hatched from eggs that came from a U. S. pullorum-tested-class flock. At the end of the first week a 50 per cent mortality had occurred. Brooded in the same battery room were poults that had been hatched from eggs that came from pullorum-clean flocks. Loss in this group did not occur until the end of the first week and during the brooding period of 4 weeks a loss of 4 per cent occurred as compared to practically 100 per cent of the other group. The infection was introduced into the clean poults during the hatching period. The wide range of mortality that may occur in an outbreak may be attributed to several factors. The 2 most important factors are the age of the poults at the time of exposure and the degree of exposure. Environmental conditions such as overcrowding, overheating, chilling and lack of a sufficient number of feeders and water fountains play an important role.

In those flocks that suffered losses as a result of paratyphoid infection approximately 74,000 poults were involved with

a loss of about 18,000 birds. The average loss was 24 per cent with a range of from 0.7 to 94 per cent in the different flocks.

During the 1944 season 18 different types of paratyphoid organisms were isolated from poults. During the past 10 years a total of 30 types of Salmonella have been recovered from poults in Minnesota. The common type was *S. typhimurium*. Many of the outbreaks of paratyphoid infections can be traced to adult turkey carriers but not all outbreaks can be associated with this source. There are other carriers such as man, rodents, reptiles, flies, cats and dogs. In fact, all animals may be reservoirs of infection.

The losses from paratyphoid infections usually occur during the same period as pullorum disease. In many outbreaks it is only possible to differentiate by post-mortem examination as to whether the causative agent is *S. pullorum*, a paratyphoid, *S. gallinarum* or a paracolon. There are certain lesions that suggest that one may be dealing with pullorum, paratyphoid or typhoid infections. Many poults may not show lesions suggestive of any of the Salmonella infections but by means of laboratory examination the causative agent will be isolated. Occasionally, losses from pullorum or paratyphoid organisms may occur among birds 8 to 10 weeks of age even after being placed on range.

There were approximately 70,000 birds that were affected with both pullorum and paratyphoid infections. There was a loss of about 21,000 poults with an average mortality of 30 per cent. The range was from 7 to 77 per cent among the different flocks. Some outbreaks had even more than one type of paratyphoid present. On a few occasions, 2 and 3 types have been isolated from a single poult. Multiple Salmonella type infections do occur and cannot be considered as uncommon.

### Fowl Typhoid

Fowl typhoid in Minnesota is not very common. However, during the 1944 season 3 flocks, involving about 15,000 birds, were investigated where outbreaks had occurred. One outbreak was of especial

interest as losses from *S. gallinarum* occurred during the brooding period. The disease ran its course during the period with a 15 per cent mortality. Shortly after the turkeys were placed on range losses began to reoccur. Bacteriological examination of the birds again revealed the presence of fowl typhoid organisms. The losses continued during the range period with an additional 15 per cent mortality. Following this there were periodic flare-ups of the disease. When the birds were about 4 months old the flock was tested by the rapid whole blood method using stained rapid pullorum antigen. About 40 per cent of the birds reacted to the test.

During the season of 1945 a similar outbreak occurred. A 5 per cent loss was experienced during the brooding period. Two weeks after the birds were placed on range losses again occurred as a result of fowl typhoid. By the time the birds were 20 weeks old a total mortality of 20 per cent had resulted and daily losses continued. The flock was tested by the rapid plate method as above and 10 per cent of the birds gave a positive reaction. If an outbreak of typhoid is diagnosed early and strict sanitary precautions are taken, accompanied by a testing program, there is reason to feel that the loss from fowl typhoid may be materially reduced.

#### **Paracolon Infections**

The causative organisms of paracolon infections have an antigenic relationship to the paratyphoids but as yet no specific genus has been assigned to this group of organisms. Several specific strains have been designated by seriological typing. The losses occurred during the same age period as paratyphoid infections, pullorum and typhoid, and they can only be differentiated by bacteriological examination. The bio-chemical reactions in carbohydrates are very similar to the *Salmonellas*.

Seven outbreaks were noted during the 1944 season. The mortality records of 5 flocks were as follows: one flock had 29.1 per cent loss; a second, 50 per cent; a third, 11.6 per cent; a fourth, 20.8 per cent, and a fifth, 37.5 per cent.

The success of any control program must begin with the education and cooperation of all parties involved. This means that the hatcheryman, turkey producer and egg producer must cooperate and understand the problems of each other. The veterinarian has the unique position of giving counsel to the above-named parties. He should urge participation in the National Poultry and Turkey Improvement Programs and in the pullorum testing program.

#### **Inanition**

During the first week losses may occur because the poults fail to eat and drink. Post-mortem examination may reveal a small yellow liver, enlarged gall bladder and little or no feed in the crop or gizzard. Bacteriological examinations have always been negative in cases of inanition not complicated with specific infection. Sometimes the losses may be severe in spite of ideal management practices. In many cases faulty management practices have contributed to the failure of the poults to make a good start. Adequate feeders and water fountains should be available and the brooding temperature should be constantly checked. If the poults have been chilled while in transit or held too long from the time of hatching until placed on feed they usually do not get a good start. Poults require more ideal brooding conditions than chicks.

During the past few years a condition that has been called "water-belly" has been encountered occasionally. Losses from this condition usually begin on the sixth or seventh day and continue during the next 7 to 10 days. Rarely is the condition seen after the third week. Many of the poults that die from ascites are often the larger birds in the brood, those that are developing the best or are making the most rapid growth.

The birds are decidedly "water-logged." There is an accumulation of straw-colored fluid in the pericardial sac and in the abdominal cavity. The lungs are edematous, the heart is enlarged and the kidneys may be pale or red, enlarged and edematous, and usually show the presence of urate deposits. The musoca of the

duodenal loop may be very congested and often the entire length of the small intestine is involved. Some birds may have an excessive accumulation of fluid in the subcutaneous tissue and have no involvement of the abdominal organs nor extra fluid in the peritoneal cavity.

### **Ascites Mortality**

In a few flocks the mortality may exceed 25 per cent, but in most outbreaks the losses average about 5 per cent. During the past few years there have been numerous shortages of certain feed stuffs, especially protein supplements such as meat scraps, dried skim milk, fish meal and soybean oil meal. Because of the increased incidence of this condition there is some indication that it may be associated with dietary factors. A survey of 25 outbreaks revealed the use of 17 different brands of feeds while the poults originated from 14 different hatcheries. The type of litter varied from wire floors to sand, peat, shavings and cotton seed hulls. There were no indications that creolin disinfectants acted as an exciting or associated cause. Lye water was the most common cleansing agent used in the brooder house.

Experimentally, the condition can be reproduced in chicks and poults by excessive amounts of sodium chloride and sodium bicarbonate in the feed or water. During the past season, 1946, numerous samples of turkey starters were obtained from farms that had trouble with dropsy. Analysis of these feeds indicated that the salt content was more than the formula indicated. Even then, only 0.5 or 1 per cent salt had been added to the feed. Some protein supplements may carry an excessive amount of salt and thus increase the amount above the normal requirements. Ascites has been noted in all sections of the United States by poultry pathologists. Management practices should be checked and the use of antiseptics and tonics in the drinking water and feed should be discouraged.

In an outbreak of dropsy it may be worth while to place the poults on a feed containing no salt, except what is norm-

ally present in the natural feedstuffs until an analysis of the feed in use can be obtained.

Occasionally losses are encountered in turkeys during the brooding period caused by deprivation of water. The post-mortem examination reveals a dehydrated condition of the skeletal muscles. They appear to have a dry, reddish appearance. The kidneys usually show deposits of urates. No feed or water will be found in the crop or gizzard. The usual history is that the water fountains were changed to a new location or a new type was installed and that some of the birds did not accommodate themselves to the change. Losses occur 2 to 3 days after the change depending on the temperature of the brooder house. Sick birds may be readily revived by injecting water into the crop.

Usually during the third week some of the nutritional disorders such as vitamin A, B complex, and D deficiencies are recognized. Mineral deficiency may become evident. The most common type is perosis or slipped tendon. Turkeys appear to be more sensitive than chicks to the need of a proper mineral balance of calcium, phosphorous, manganese and choline. The deficiencies of the B complex and biotin which are associated with types of dermatitis are encountered but not as frequently as a few years ago.

### **Coccidiosis**

Coccidiosis is not as serious a problem in turkeys as in chickens. There are only 2 types in turkeys as compared to 8 in chickens. Usually the disease is encountered in poults 3 to 4 weeks of age, but it may be found in poults somewhat older. In the older birds there is a type that produces a catarrhal enteritis of the lower half of the intestinal tract resulting occasionally in the intestines becoming filled with a whitish mucopurulent material containing myriads of coccidia. In young poults a few weeks of age coccidiosis may involve the upper portion of the intestinal tract and only a few coccidia are usually found by means of microscopic examination.

Certain members of the sulfa drugs

have been used to advantage in the treatment of coccidiosis. Sulfaguanidine is being widely used in the dosage of 0.5 per cent to 1.0 per cent incorporated in the mash for a period of 4 to 6 days.

### Enterohepatitis

Enterohepatitis, or blackhead, is the most common disease encountered in range birds and occasionally a serious outbreak is encountered in poults while in the brooder house. Phenothiazine has received enthusiastic support by many turkey growers but its use is limited to the removal of the cecal worm. Mapharsen has also received considerable mention. Satisfactory experimental evidence to support some of the reported field trials is completely lacking. A group of 280 poults weighing about 3 pounds had clinical evidence of enterohepatitis and received mapharsen. About 15 per cent of the group recovered. It is possible that in older birds the treatment may be more effective.

Prevention is the best method of approaching and keeping turkey mortality at a minimum. There is no substitute for sanitation.

New disease conditions are being encountered regularly. Newcastle disease has been encountered in Minnesota during 1946. Reports indicate that the disease is spreading in different areas of this country. At the present time almost half of the states have encountered the disease in chickens. In Minnesota, the virus has been isolated from poults from one flock less than 10 days old. Another flock showed clinical evidence and the serum from recovered birds was found to have neutralizing antibodies against Newcastle virus.

It is encouraging that the younger veterinarians are taking a more active part in the poultry industry. Management should be a combination of sound judgment and prompt action. An accurate diagnosis is of paramount importance. The veterinarian must accept the challenge and give leadership to the poultry industry if we are to be successful in controlling the various diseases that are causing severe losses.

### Cattle-grub

Studies of cattle-grub control methods by the Bureau of Animal Industry resulted in a practicable method of checking the ravages of this parasite on an area basis. The work was carried on with 10 herds in a 120-square-mile area in Colorado. The herds were treated with a medicated wash containing cube powder. From 6 to 10 days after treatment all grubs were extracted from the selected animals and 98 per cent of the parasites were dead.

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George W. Stiles, of the United States Department of Agriculture field laboratory at Denver reports a considerable loss of turkeys in a flock of 6,000 young birds from heat exhaustion. Outdoor shade, better ventilation of the turkey house and a small amount of salt in the drinking water stopped the losses.

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Years of crossbreeding between buffalo and ordinary cattle by the Canadian Government Experimental Farm in Alberta has resulted in a herd consisting of 75 head of cattalo. The purpose was to perpetuate the buffalo's better ability to exist on the western plains. Production of the cattalo was not as simple as mating a buffalo bull to a cow as the big headed calf often killed the mother at birth. Neither was it as easy as mating a buffalo cow to a domestic bull as the hybrid males were at first sterile. Only after the buffalo blood was diluted to 1 part in 32 did the successful cattalo strain appear.

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A new medical instrument known as the slethetron may revolutionize the diagnosis of heart and lung conditions. It makes it possible for the physician to amplify high-pitched sounds and to subdue the low-pitched body sounds which ordinarily interfere with accurate diagnosis. The unit is entirely self contained.

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Only female mosquitoes suck blood. The male sucks the sap of plants for its nourishment.