

# Canterbury Chamber of Commerce

## Agricultural Bulletin

# TUBERCULOSIS OF POULTRY

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BULLETIN

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The following bulletin is the first of a series in which it is intended to discuss some of the commoner poultry diseases in New Zealand. Tuberculosis has been selected for discussion as it is already a limiting factor on some Canterbury farms, the incidence sometimes reaching 30-50 per cent. Further, there is evidence that the disease is widespread.

### Definition of the Disease

Tuberculosis derived its name from the tubercular or nodular nature of the abscesses which characterise the disease. Other names applied to the same disease are spotted liver, wasting, going light, and pining. The latter names are descriptive of other diseases. For example, spotted liver is also characteristic of coccidiosis and necrosis of the liver.

### Cause of the Disease

Tuberculosis of poultry is caused by a specific organism, the avian type of the bacillus of tuberculosis. The three recognised types which attack man and other animals are the human, bovine, and avian. No type is confined to its own particular species of animal. For example, the bovine type affects human beings, and the avian type sets up tuberculosis in pigs. While there are no figures available in New Zealand to show the extent of tuberculosis in poultry or the incidence in pigs due to the avian type, data from Great Britain show that out of 258 cases of tuberculosis investigated in pigs, 178 were bovine in origin, five human, 70 avian, and five mixed infection. Similar results have been obtained in other countries. The information stresses the desirability of keeping poultry and pigs apart.

### The Viability of the Organism

The tuberculosis organism leaves the body of infected animals by way of natural and unnatural excretions. In the case of poultry the organism is voided in the droppings. The organism does not multiply outside the body, but is capable of remaining virulent for varying periods. Recorded data show that the germ may live for 126 days in dry sputum protected from light, six weeks in decomposing sputum and 167 days in decomposed cattle manure. The organism may remain alive in cow manure for four to five months in autumn and winter and two months in summer. Direct sunshine kills the organism in about two

hours and a 1 per cent. carbolic acid solution in five minutes.

### Susceptible Animals

All breeds of poultry are susceptible to tuberculosis. Wild birds readily contract the disease when exposed to infection. Turkeys, ducks, geese, pheasants, and almost every species of bird kept in zoological gardens are susceptible. When the disease occurs in pet parrots it is usually due to the human type of tuberculosis.

The incidence is highest in old birds, due to their greater chances of infection. The disease may occur at any age. It is most prevalent among ordinary farm poultry and least common, in fact rare, in efficiently managed stock kept indoors all the year round.

### The Importance of the Disease

The disease is commonest in poultry kept under unhygienic conditions and confined to contaminated dark quarters. In Canterbury the incidence sometimes reaches 50 per cent. The loss includes decreased egg production, loss of condition and deaths.

Another economic aspect of tuberculosis in poultry is the fact that pigs are susceptible to the avian tuberculosis organism, and as previously stated over 30 per cent. of tubercular pigs may be infected with the avian type. They become infected from the droppings of infected birds contaminating the food supply and from feeding on unboiled diseased carcasses. Investigation shows that cattle can be affected with the avian type, a matter which may require to be taken into consideration in building up tuberculosis-free herds. Avian tuberculosis is not transmitted to man under ordinary conditions, although cases have occurred.

### Methods and Spread of Infection

A knowledge of the methods and spread of infection is essential in any scheme of control and eradication. The organism is excreted in the droppings of affected birds. In poultry the disease usually arises from the ingestion of infected food and water. Occasionally, the disease arises from wound inoculation. In this case the foot is most commonly affected (bumble foot).

As affected birds may show no outward sign of the disease, it will be apparent that widespread infection may occur some time before cases are detected. Old birds act as carriers. Under good management, therefore, young stock should be kept separate from old.

The system of feeding and watering has a bearing on the spread of infection. Troughs and water vessels when unprotected from faecal contamination favour spread of the disease. The organism is present in less than 1 per cent. of eggs from infected hens. However, the possibility of infection being transmitted through the egg must not be overlooked.

### Symptoms

Tuberculosis is a contagious, slow-developing disease, the correct diagnosis of which depends on microscopic or other tests. In the early stages there are usually no clinical symptoms. For this reason, some attention should be given to the past tubercular history of the property and the birds. A history of odd deaths among older birds and the appearance of spotted livers in those killed because of disease or for human consumption should make one suspect tuberculosis.

Affected stock fail to thrive, although properly fed. The appetite is maintained until near the end. An intermittent scour later becomes persistent. Egg production decreases, and finally ceases. There is marked loss of condition. Varying degrees of lameness may develop, due to the disease affecting the bones. Widespread lameness in a flock of birds is strongly suggestive of tuberculosis. In the later stages of the disease, scouring is usually pronounced, the feathers are ruffled, the appetite is lost and the carcass is poorly nourished. Sometimes moderately well-nourished birds succumb when infection has been heavy and the liver and bowels are badly affected. Complications such as stagnation of food in the crop, eye disease, etc., are not uncommon.

### Post-mortem Appearances

The nodule or tubercle, which is characteristic of tuberculosis, is usually found in the lymphatic glands, but in advanced cases practically any organ or tissue may be affected. The most common organs involved in poultry are the liver, bowels, and spleen. Less frequently the limb bones are attacked and more rarely the ovary and the foot.

The tubercle or tubercular abscess varies in size, appearance, and consistency, with age. It takes about six weeks before the nodule reaches the size of a pin head. Old standing abscesses may reach the size of a large marble.

Tubercular nodules in the liver are first seen as small grey masses, either in the capsule itself, which surrounds the liver, or near the surface of the organ. The tubercular areas may gradually enlarge until they form greyish yellow masses of considerable size (spotted liver). Similar nodules are usually found in the bowels and their lymphatic glands. When the skeleton is affected absorption and destruction of the bone tissue occurs and in advanced cases the bone contains a putty-like material. These changes sometimes lead to deformity of the limbs. The appearance of tuberculosis of the foot, usually referred to as bumble foot, may be almost identical with changes resulting from other infection.

The fleshy parts of a tubercular carcass are often free of disease. The organs most frequently affected are usually discarded during dressing for the table. Boiling for half an hour is sufficient to render tubercular meat harmless.

#### Prevention and Control

Tuberculosis is generally introduced into a clean flock by the purchase of diseased birds. The dissemination of infection is further facilitated by bad sanitation, filth, faecal contamination of the food and water supply, and by allowing young and mature stock to run together.

Control measures depend on the number of birds affected, the value of the stock, and the available isolation facilities. Successful prevention is wrapped up in good management and hygienic methods. Tuberculosis is rarely a serious menace in efficiently-managed flocks.

When a large proportion of the flock is affected it is advisable to destroy the lot. The carcasses should be burned or buried or boiled if fed to pigs.

To detect early cases among valuable birds, use may be made of the

tuberculin test. This is invaluable in the detection of latent cases, as ordinary examination methods are not delicate enough. The test is applied by members of the veterinary profession and officers of the Department of Agriculture.

For a low incidence among valuable birds, the non-reactors may be isolated from the reactors. The latter should be gradually replaced by healthy birds.

The non-reactors should be placed in clean quarters and confined to the fowlhouse and run, if the general surroundings have been contaminated. The system of confinement may be relaxed as soon as sufficient time has elapsed to allow outside surroundings to become free of infection—a period of about six months.

When testing is not possible, reliance must be placed on eradicating obvious cases and adopting measures to prevent young and old stock running together. Ailing birds should be segregated as soon as noticed. Hens should be disposed of after they have completed their second season of production. This is very important, as the common practice on many farms is to keep hens well beyond their span of economic production. They act as carriers.

#### Disinfection of Fowlhouses

The poultry plant should be erected in a sunny spot, and as rats and mice can carry the disease, the buildings and runs should be vermin proof. The feed troughs and watering vessels should be suitably covered and raised off the ground to prevent faecal contamination.

To render a fowl house tubercle free demands care in cleaning as well as in disinfection. All droppings, litter, etc., should be removed and either burned or treated with quicklime. The walls, nests, perches, troughs, etc., should be scraped and scrubbed with hot water containing about 10 per cent. of caustic soda to remove debris

and grease. The interior of the house and the equipment should be sprayed with a reliable disinfectant of sufficient strength. Adequate spelling of the run, in itself, is sufficient to render it disease free. If it can be divided into two, one half can be spelled while the other is in use. The period necessary is not fixed, but depends on its exposure to sunlight and the season of the year. Sterilisation may be hastened by digging or ploughing and the application of quicklime at the rate of about two tons an acre or about 11b a square yard. A six months fallow is usually sufficient.

#### Summary

1. Tuberculosis of poultry is a chronic contagious disease caused by a specific organism.

2. All species of fowl are susceptible and the avian organism may cause tuberculosis in pigs.

3. The organism is passed out from the body in the droppings.

4. Infection in poultry is usually caused by ingestion of infected material, and tubercle free flocks become infected through the purchase of diseased birds.

5. The organism lives in the soil and litter for several months. A six months' spell is generally adequate under average conditions.

6. Factors which favour dissemination of infection are bad sanitation, filth, faecal contamination of the water and food supply, and running young and old stock together.

7. Total destruction of the flock and segregation of reactors and non-reactors are methods of control. The tuberculin test is valuable in detecting latent cases.

Copies of this bulletin may be obtained from the Secretary, Canterbury Chamber of Commerce, P.O. Box 187, Christchurch.