Tuberculosis in DOMESTIC FOWLS

By E. M. DICKINSON,
Associate Veterinarian

Nature and cause. Tuberculosis is a chronic contagious infectious disease. It is caused by a specific germ, of which there are three types or strains, the human tubercle bacillus, the bovine tubercle bacillus, and the avian tubercle bacillus. The avian tubercle bacillus is the only one that infects domestic fowls.

Occurrence and transmission. Any domestic fowl may become infected with the avian tubercle bacillus when given an opportunity to consume infected material. Further, many species of wild birds have been found infected with this bacterium. The avian tubercle bacillus is responsible for most of the tuberculosis in swine. Occasionally other domestic animals, such as cattle and sheep, may become infected with the avian tubercle bacillus. In very rare cases man has become infected with this type of the disease.

Tuberculosis is quite widespread in Oregon farm flocks, but is rarely encountered on specialized commercial poultry farms in this state. A general practice that contributes to the spread and maintenance of infection in farm flocks is to allow birds free run of the ranch with no program of culling and disposal of old birds.

The disease is most likely to be brought to the farm by infected mature fowls. Indiscriminate trading or purchasing of mature stock may bring infected birds onto the place. An occasional ranch may become infected by purchasing swine that are infected, and fowls that have the run of the ranch pick up infection in the pig lot.

Infection usually spreads through droppings from infected birds. Birds having access to all parts of the ranch may scatter the infected droppings to other birds or animals; i.e., swine. Dead birds should be promptly disposed of, since other fowls or swine may eat the carcasses.

Symptoms. Since this is a chronic disease, symptoms usually appear gradually. Although fowls may become infected at an early age, because of the insidious progress of the disease, most birds are a year or more of age before symptoms are observed. The most uniform symptoms observed are gradual loss of weight, droopiness, and a general unkempt appearance of the plumage. Occasionally a fowl showing no symptoms will be found badly infected with tuberculosis. Lameness, intermittent diarrhea, and decreased egg production are symp-
toms that are variable in their appearance. Symptoms merely indicate sick birds, they are not dependable for diagnosis.

**Mortality.** Deaths usually occur at intervals among the older birds in a flock. The rate of loss is likely to be much slower in a newly infected flock than in one in which the infection has been of long standing.

**Lesions.** The disease derives its name from the nature of the lesions produced; namely, tubercles. Yellowish-white tubercles or nodules of varying size, usually roundish, with irregular surface may be found in the liver, spleen, and wall of the intestines (Figure 1). Characteristic tubercular lesions are less frequently encountered in the lungs, bones, joints, kidneys, and ovary. The yellowish tubercles practically always found in the liver or spleen are firm and quite readily peeled out of the tissue pulp. The tubercles are cheeselike in consistency and often are slightly gritty when mashed between two pieces of glass.

![Figure 1. Tubercular lesions in the liver (A), in the spleen (B), and in the small intestine (C).](image)

**Diagnosis.** The preliminary diagnosis of this disease can be made from the history of the flock, coupled with autopsy findings of characteristic tubercular nodules in the liver and spleen and perhaps other organs. It is desirable to have such lesions checked microscopically, by some competent person, for the presence of tuberculosis organisms. A diseased bird or a piece of infected tissue, accompanied by the flock history, may be sent to the Department of Veterinary Medicine, Oregon Agricultural Experiment Station, for this purpose.

It is possible to diagnose tuberculosis in living fowls by the use of the intradermal tuberculin test. This has not proved to be economically practical, however, since there is considerable expense incurred when the tuberculin test is used.
Differential diagnosis. Tuberculosis is frequently confused with other disease conditions. Cheesy nodules in the wall of the lower half of the small intestines may be caused by tapeworms. In such cases, no lesions are found in other organs and by slitting open the intestine and holding a piece of the infected intestine in a glass of clear water the small threadlike tapeworms may be seen with one end floating free from the mucous membrane.

Tumors of various kinds may be confusing; they are rarely cheeselike, however; and they do not separate from the liver or spleen tissue as readily as the tuberculosis nodules. Microscopic examination of such lesions reveals no tuberculosis organisms.

Abscesses or areas of decaying tissue in the liver, such as those that occur in black-head infection of turkeys and chickens, may be confusing. Black-head lesions in the liver, however, are always accompanied with areas of decaying tissue in the ceca or blind pouches. Further, the surface of the liver is slightly depressed over the area occupied by the black-head lesions, much like a rotten spot in an apple. Since tuberculosis and black-head both may be present in old turkeys, care must be taken not to overlook this possibility. A microscopic examination is necessary to make a final differential diagnosis.

Eradication. The most successful means of combating this disease is by eradication of the infection. In the average small flock this is best accomplished by selling for slaughter all fowls on the place. Sale should be made to a plant that provides for meat inspection since fowls in good flesh that have only localized lesions may be used for food purposes. The poultry house should be thoroughly cleaned and disinfected. Replacements should be made with day-old chicks and they should be reared in thoroughly clean, disinfected brooders, on ground that has not been used for fowls previously. The mature birds for replacement should be confined to the laying house, and the infected yards should remain unused for at least one year.

In case it is not practical to dispose of all of the fowls, a careful culling program may be practiced and all birds that are not in good flesh should be killed and burned or buried 3 feet or more under ground. The balance of the flock should be confined to a clean, disinfected house and culled often to eliminate infected birds as soon as symptoms appear. From this flock chicks may be obtained for replacement. The chicks should be brooded and reared in clean, disinfected brooders on clean range. At no time should young replacement stock be allowed to mingle with the other stock on the farm. The infected stock should be sold for slaughter at the earliest opportunity and the house thoroughly cleaned and disinfected.

In breeding flocks of considerable value, one might justify the expense of the tuberculin test. A testing program for tuberculosis would require the services of a qualified veterinarian who would advise on the cleaning and disinfection program following the application of the tuberculin test.

Cleaning and disinfection. The poultry house should be scraped and swept clean of droppings and litter. The nests should be cleaned of filler. All boards, paper, and other loose building material should be removed from the house. The droppings, litter, and trash cleaned from the house should be burned. Do not put such material on the fields for fertilizer. Equipment such as feed hoppers, drinking fountains, and cleaning utensils should be scraped and cleaned.
Following a thorough dry cleaning, the house and all equipment should be thoroughly scrubbed with a hot lye solution. A suitable lye solution is made by dissolving 1 can of lye in 15 gallons of hot water. Use the water as hot as possible for scrubbing.

After the thorough scrubbing, the house and equipment should be sprayed with a reliable disinfectant. Most coal-tar disinfectants, such as sheep dip or cresol, are satisfactory. They should be used in a strength of solution recommended on the container for killing bacteria (usually about 3-per-cent solution). Crude carbolic acid, in a 5-per-cent solution, also may be used. Commercial formalin, mixed in the ratio of 1 gallon formalin and 10 gallons of water, makes a satisfactory disinfectant. Formaldehyde gas that readily escapes makes this disinfectant objectionable to handle.

For best results a thorough clean-up must precede the disinfection and the disinfectant should be applied in a systematic manner so that no areas are missed.

**Poultry yards** can not be satisfactorily disinfected. The yards should be cleaned of all debris and weeds and then covered with quick lime and cultivated. When poultry yards are exposed to direct sunlight and drying during the summer, tuberculosis organisms are quite effectively destroyed. In shaded and protected areas, such as under buildings, however, the organisms may remain alive for many months. With this in mind, the clean-up program should be extended to sheds or areas, other than the poultry house, that were occupied by the birds.

**Prevention.** Some important management precautions that would help prevent tuberculosis in small farm flocks are as follows: (1) Confine the flock to a suitable poultry house and yard. (2) Replacements should be made with newly hatched chicks whenever possible. (3) Rear chicks and young stock on clean range separate from the old mature birds. (4) Quarantine any new mature birds for 3 weeks before they are put with the main flock. (5) Identify birds of each age group (toe punch, or leg bands). (6) Keep only young birds in the small farm flock. *No bird should be allowed to remain in the flock following the second year of production, when tuberculosis is a problem.* (7) Cull the flock twice each year and dispose of all poor unproductive birds. (8) Give the poultry house an annual cleaning and disinfection. (9) Rotate the use of the poultry yard annually so that the birds will have a yard that has not been occupied by fowls for at least one year. Wire porches may be substituted for yards part of the time.