

UNIVERSITY OF MISSOURI COLLEGE OF AGRICULTURE
AGRICULTURAL EXPERIMENT STATION

M. F. MILLER, *Director*

Mold Diseases of Chickens and Turkeys

A. J. DURANT

COLUMBIA, MISSOURI

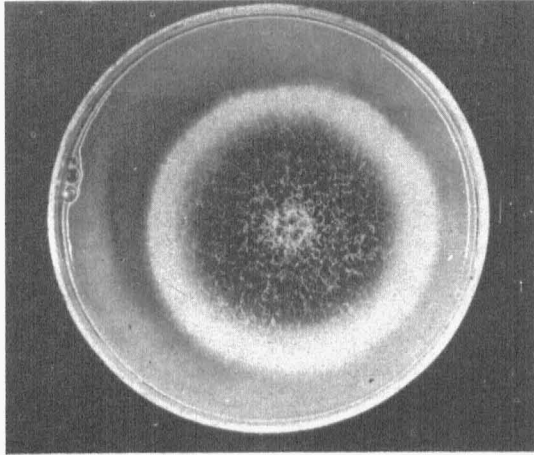


Fig. 1.—A petri dish of culture media upon which is growing the mold, *Aspergillus fumigatus*. The light center surrounded by the dark area is a small section taken from the lung of an affected poult. The mold has grown out in all directions from this area. (x 10).

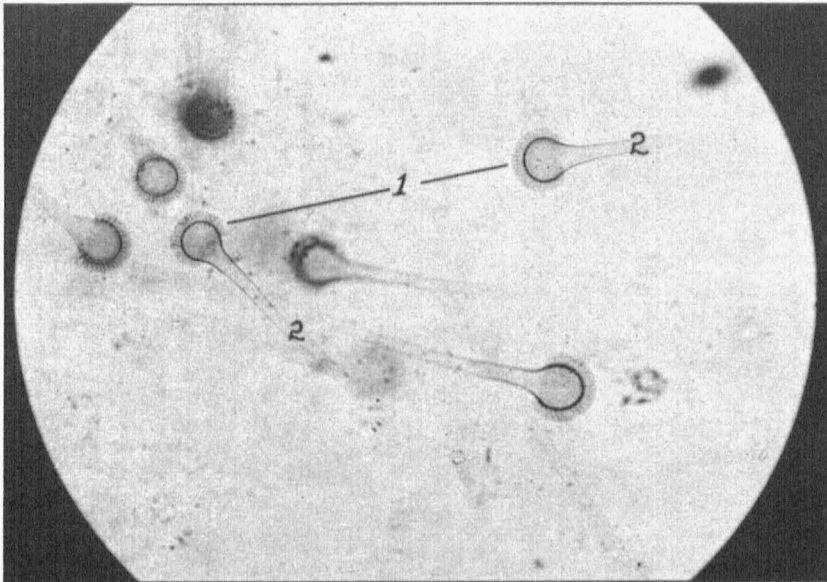


Fig. 2.—A photo-micrograph (x 316) of the mold *Aspergillus fumigatus*. The Aerial hyphae (2). From each one of these bud-like conidia spores (1) are released conidia from which are developed a new generation of the mold.

Mold Diseases of Chickens and Turkeys

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Considerable losses in chickens and turkeys are experienced from mold diseases each year in this state. There are three common diseases recognized as being caused by molds. In the order of their frequency they are as follows:

1. *Aspergillosis*—caused more frequently in this state by the mold, *Aspergillus fumigatus*.
2. *Thrush*—caused by the mold, *Monelia albicans*.
3. *Favus*—caused by the mold, *Anchorion gallinae*.

Aspergillosis and Thrush are of much more frequent occurrence in this state than favus. Furthermore, it would appear that the turkey is more frequently affected with these two molds than the chicken.

In 1934, 5,000 wild turkey poults were involved in an outbreak of aspergillosis, in which approximately 40 per cent died from the disease. A pure culture of the mold, *Aspergillus fumigatus*, which was isolated from affected poults, caused the death of only one out of 11 one day old baby chicks which were fed large quantities of pure cultures of this mold—indicating a marked resistance in the chickens as compared to the turkeys.

ASPERGILLOSIS

Aspergillosis is the most common one of the mold diseases affecting poultry. Since Mayer and Emmet, in 1815, recorded the presence of aspergillosis in the lungs of a jay, the fungus has been reported frequently from all the avian families in Europe and in the United States, and during the past ten or fifteen years it has caused heavy losses in young poults from four to five weeks of age. During that same period only isolated cases of aspergillosis in chickens have been reported, which would tend to substantiate the observation that chickens are more resistant to the infection than are turkeys.

CAUSE

The cause of the disease is a mold known as *Aspergillus fumigatus*. This particular aspergillus strain has been identified as the principal cause of losses in poultry. The spores of *Aspergillus fumigatus* are widely distributed in nature. Birds usually contract the disease by coming in contact with the mold in damp feed, damp litter, or other damp material which may become contaminated with the mold. In most cases observed in Missouri the source of the disease was traced to feed, either damp mash or recently contaminated grain. A few cases have been observed where the disease apparently originated in damp litter of the poultry house.

Young poults may become infected with Aspergillosis as early as five days after they are hatched when the mold occurs in damp feed with which the poults are fed. In the case referred to in which 2,000 poults were lost from feeding damp, moldy feed, two carloads of a commercial mash were purchased to feed 5,000 wild turkey poults. The feed was stored in sacks in a building with a leaky roof. Heavy rains occurred just previous to the start of feeding of this mash, and as a result the mash became dampened and proved to be an excellent media for the growth of *Aspergillus fumigatus*.* Poults as young as five days developed symptoms of the disease and died in large numbers, and all of the poults from the age of five days to four weeks of age were exposed to the disease by being fed the infected mash. The losses were exceedingly heavy before a diagnosis could be made and preventive measures instituted.

SYMPTOMS

The symptoms in very young birds are rather obscure, and about the only intimation of a disease being present is to find the young poults dead under the brooder. Later they may develop difficult breathing, with rattling in the throat because of the involvement of the lungs. The mortality is highest in young birds and varies according to the age. In the more chronic forms emaciation is marked. In very young poults, from five to ten days of age, and in older birds in the initial stages of the disease the lung is the first organ to be affected and shows marked congestion or reddish color. Later in the more chronic development of the disease the congestion is followed by minute yellowish-white nodules, round and seed-like, which are formed throughout the lung. The number of these is usually very great and they may vary greatly in size—depending on the stage of development. Later on the disease may affect the air sacs, forming yellow masses in the air sacs, over the kidneys, liver, and spleen. In advanced cases the actual grayish-black mold may be observed on the inner surfaces of the air sacs. A pure culture, on ordinary media, can be readily isolated from the lesions in the lungs or air sacs. A small section from the lung placed in the center of an agar petri dish will produce luxuriant growth of the mold, very quickly establishing the diagnosis. The lesions produced in chickens are similar to those observed in turkeys. The turkey is mentioned especially because it is the common fowl affected in this state.

*Durant, A. J.; Tucker, C. M.; 1935. Aspergillosis of wild turkeys reared in captivity. Jour. Am. Vet. Med. Assn. 86:781.

THRUSH (Mycosis of the crop, Moniliasis)

Thrush is a disease which occurs almost as frequently as *Aspergillosis* and in some districts appears to be more common. It is a disease of the digestive tract and more commonly affects turkeys, though chickens are susceptible and sometimes die from this disease. Other fowls found to be affected are pigeons, geese, pheasants, ducks, ruffed grouse, and quail. In Missouri it is rather rare to observe the disease in chickens. Because of the nature of this disease, it is more likely to be observed in adult turkeys than in the young birds. Most of the outbreaks studied by the author have been in adult birds, the contrary to that observed in *Aspergillosis*. The

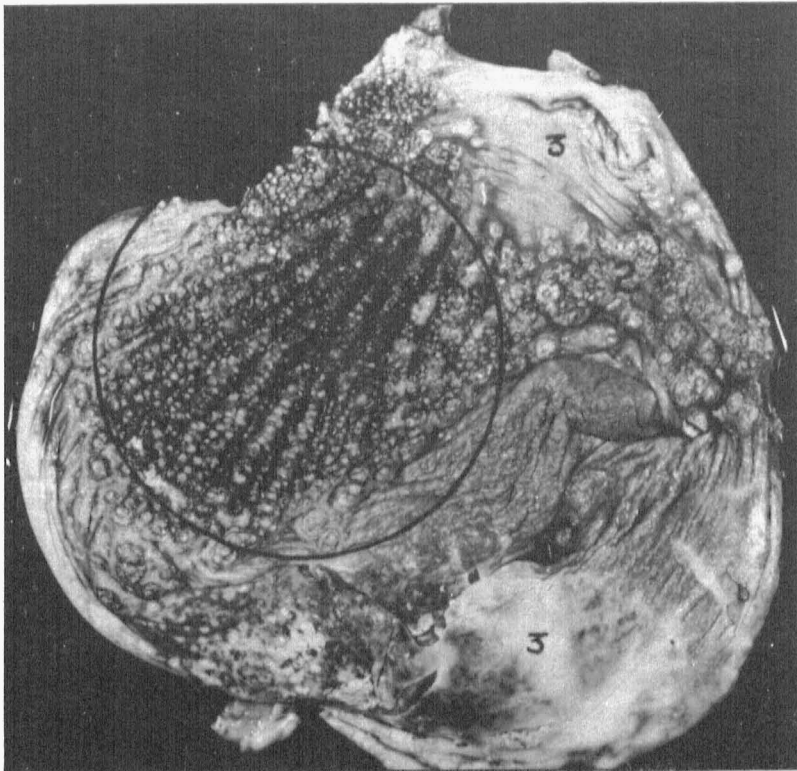


Fig. 3.—The crop of an adult turkey affected with thrush. The crop has been opened to expose the inner surface on which the mold, *Monilia albicans*, has made severe and multiple lesions. The area enclosed by the circle is severely affected with the disease. The area indicated by 2 marks more severe changes due to the disease. The area marked 3 shows healthy tissue.

disease may affect any part of the digestive tract of turkeys or chickens. In adult birds it is not unusual to observe lesions begin-

ning at the upper portion of the swallow or esophagus. Little raised, blister-like, semi-translucent nodules on the inner surface of the esophagus are present. These nodules line the surface of the esophagus and extend down into the crop, where usually more extensive lesions are observed (Fig. 3). These lesions are so extensive that they coalesce or run together, forming a solid mass of nodules. In most cases the crop will be found empty, though it may contain a sour, ill-smelling liquid. The intestines show a catarrhal inflammation and contain a thick mucus-like material. The discharge from the bird is a yellowish color, which may in some cases be mistaken for the symptoms produced by blackhead, though practically always the droppings may be distinguished from blackhead because they are not of the intense yellowish-orange color, but are of a dull yellow color.

The mold may be demonstrated microscopically by removing some of the nodules from the esophagus, crop, or scrapings from the intestinal tract. The isolation and culture of the mold is easily established by bacteriological methods. Affected birds may live for several weeks, especially if they are old birds. The disease is usually fatal. The author has never observed a case of spontaneous recovery.

FAVUS

This mold disease is exceedingly rare in Missouri, the author only observing one or two cases in 25 years. The disease is produced by a mold known as *Anchorion gallinae*. The disease is characterized by a formation of white mold-like growths on the unfeathered parts of the head, principally the comb and wattles, but may extend and occupy the entire area of the body (Fig. 4). The disease when it occurs affects only individual birds and never appears as an epidemic. The picture shown illustrates one of two cases which occurred on a poultry farm during a 25 year period. This illustrates the rarity of the disease and the fact that it does not spread readily. The disease usually starts around the beak because that is where the infection is most likely to be closely associated with the soft tissues of the body. The disease then spreads to other parts of the head, including the comb and wattles particularly. After a time the disease may affect the entire body surface (Fig. 4). Care should be observed in handling cases, since it is readily transmissible to humans. Spontaneous recovery may occur.

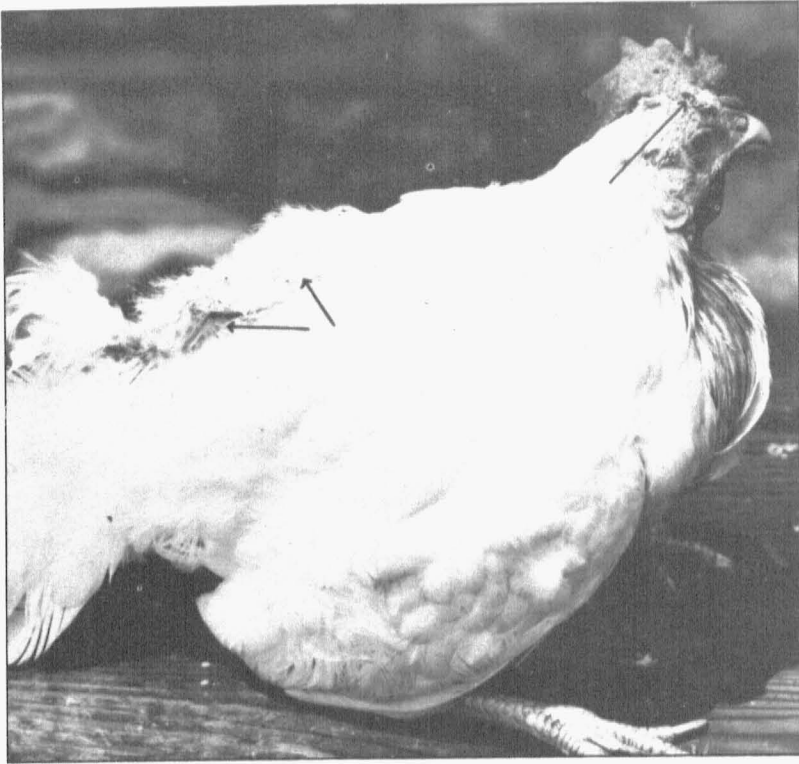


Fig. 4.—A White Leghorn hen which is recovering from an attack of favus—the location of the lesions indicated by the arrows. Spontaneous recovery is not unusual in these cases.

PREVENTION AND CONTROL

Since the recommendations for the prevention and control of aspergillosis and thrush are exactly the same, the following outline will apply to both diseases, and, to a certain extent, the third mold disease, favus; though information concerning the source and nature of this mold is not as well understood as the other two.

The prevention of mold diseases can be accomplished by careful selection of grain, litter and mash with which to feed the turkeys. Also by avoiding the accumulation of damp litter or waste feed in the poultry house where the turkeys are kept. Since all mash usually contains a form of dried milk, it is an excellent media for the development of *Aspergillus fumigatus*, thrush, and favus, and care should be taken to prevent dampness of the feed and the resulting growth of the molds. Where feed is fed in outside hoppers they should be protected from dampness and rain by proper shelters and the edges of the feeders should be provided with a lip to prevent the feed from being spilled while the turkeys are eating, and develop

mold by coming in contact with the damp ground. Screened platforms for feeders and waterers, as recommended by Van Es of Nebraska, will do much to prevent an outbreak from this source. Well drained runs or areas should be provided so that the accumulation of mud holes in turkey runs can be avoided.

To control an outbreak the source of infection or mold should be located and immediately removed, regardless of whether it is the feed, litter, or some other source. All contaminated material should be immediately removed and the damp condition which favors the development of the mold also eliminated. Fresh clean litter and feed should be provided.

The treatment of affected birds is of little avail, and all birds which die of the disease should be destroyed by burning to get rid of as much of the infective agent as possible. It should also be remembered that humans are susceptible to this infection, and care should be exercised in handling the material infected with molds.

The use of copper sulphate solution in a 1-2000 dilution to substitute for all drinking water has been recommended as a helpful means of controlling thrush, though its value for aspergillosis would probably be very slight, if any. Where copper sulphate is used it is suggested it be continued for a few days in place of the drinking water.

Where the rather rare disease of favus occurs the affected birds should be immediately removed from the flock and isolated for treatment. Because of the rarity of favus the source of the infection is not as well understood as the other two diseases. However, it may be assumed that this mold may occur in somewhat the same manner as that of the other two molds. Birds which die of favus should be burned to get rid of the infection.

Beech and Halpin* found an ointment of formaldehyde and vaseline to be effective in treating the disease. This is prepared by melting vaseline in a jar in a water bath. Five per cent, by weight, of commercial formalin is added, the cover tightened, and the mixture shaken until the vaseline has solidified. One or two applications well rubbed into the lesions usually suffice.

A case under observation by the author recovered without any treatment, but the time was long and it is likely that treatment would hasten the recovery of affected birds.

Mold diseases may probably never become a major source of losses to the poultry industry of Missouri. However, if proper measures are not recommended and carried out for their prevention and control, losses may become severe. This bulletin should be a helpful means to the poultrymen in keeping mold diseases under proper control.

*Beech, B. A., and Halpin, J. G.; 1918. Observations on an outbreak of favus. Jour. Agr. Res. 15:415.