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008 - Aspergillosis

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Introduction

Some fungi cause disease in poultry by tissue invasion and damage. A good example of such a disease is aspergillosis. When it occurs in young chicks or turkey poults, this condition is known as brooder pneumonia. The fungus Aspergillus is commonly associated with bedding materials such as rice hulls and straw.

Aetiology

The commonest cause of aspergillosis is Aspergillus fumigatus, but others such as A. flavus and A. niger are sometimes the cause of this problem. These fungi commonly occur in the soil and grow easily on organic matter (for example, feed, litter, rice hulls or straw) under warm, humid conditions. They are also found in similar environments in hatcheries, such as ventilation ducts and damaged eggs.

The fungus has a typical plant cycle of growth followed by seed (spore) formation. Both stages like warm conditions but the former stage prefers higher humidities, while the latter prefers slightly lower humidities.

Diseases

Brooder pneumonia typically occurs in the first week and follows acquisition of infection in the hatchery or immediately upon placement on the farm.

Aspergillus pneumonia and air sacculitis can occur in older hens and turkeys when they are exposed to heavy aspergillus spore burdens in the air. An example of this is when there is a field of corn adjacent to the poultry house and the dust discharged by the combine harvester is drawn into the house by the fans. However, as a rule, older birds are more resistant to infection.

In the hatchery, if aspergillus spores enter the air cell of eggs via shell cracks or microcracks, a condition known as 'fungal air cells' develops during incubation. In this condition there is a profuse fungal growth in the air cell. These eggs, especially if they break, can be a source of infection to chicks or poults at hatching.

Pathogenesis

The birds breathe in aspergillus spores which come to rest on mucosal surfaces in the respiratory tract and lungs where they germinate and produce fungal growth. Localised tissue reactions occur which can result in granulomas or nodules. The infection can then be spread via the blood to deeper organs such as the brain, heart sac, kidneys and bone marrow.

Large lesions in the lower trachea or bronchii can cause respiratory distress and asphyxiation. In the chronic form of the disease interference with heart function and ascites can ensue. This is mainly seen in turkeys.

Clinical signs

Chicks or older birds show respiratory distress and, in the case of the former, a biphasic mortality in the first three weeks of life is seen. Survivors often show chronic respiratory signs and become runts.

In chicks, the first phase of the mortality (from hatchery infection) occurs over the first five days of life.

An interesting feature of aspergillosis in older birds is the occurrence of respiratory distress without râles (a rattling sound in the windpipe which is a feature of many respiratory diseases of poultry).

Post mortem findings

These mainly comprise of pale granulomas in the respiratory tract and lungs. They are occasionally seen in the brain, eyes and viscera. In older birds lesions in the lungs can be quite large and are often characterised by pigmented fungal growth in their centres.

Diagnosis

Diagnosis can be made on clinical and post mortem findings and the culture of Aspergillus Spp. from the lesions.

Treatment

The condition can not be effectively treated in birds. So, management has to focus on culling of afflicted birds and the removal of bedding and litter that is contaminated. The use of a fungicidal disinfectant will reduce the level of infection in the environment. Vaccination is not possible.

In the hatchery, fungicidal disinfectants and smokes have been used with significant success. Hatching eggs should be stored where they are not contaminated by dust and ‘egg sweating’ should be avoided. On the farm wet litter should be removed and, whenever possible, the use of high risk bedding materials should be avoided.