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Introduction

Egg drop syndrome '76 (EDS'76), which was first seen in 1976, is caused by an adenovirus which is unrelated to subgroups I and II of avian adenoviruses. The condition EDS'76 was first seen in Holland and a haemagglutinating adenovirus was isolated. This virus is principally transmitted vertically through the egg with the virus remaining latent in pullets until they come into lay. Antibodies to EDS'76 could not be found prior to 1974 and the widespread distribution of the virus and antibodies against it in duck flocks suggests that this EDS'76 was originally a duck virus.

Epidemiology

EDS'76 virus has been isolated in many countries and serological evidence of infection with this virus has been seen in several other countries.

Although disease outbreaks have been recorded in laying hens, the natural hosts for this virus are ducks and geese and antibodies to the virus are widespread in these two avian species. The virus has been isolated from healthy ducks.

When infection enters a laying flock of any age egg production is affected but it is thought that problems in early (peak) lay could be due to the reactivation of infection which occurred in rear.

EDS'76 transmission

In the original, classic, form of the disease very few hens and so very few embryos were infected, although at hatch the spread of virus was efficient. These chicks went through with a latent (or hidden) infection until they came into lay when the virus was then reactivated and rapidly spread.

In an infected flock both normal and abnormal eggs are contaminated on their shells. This leads to contamination of egg trays. Droppings also contain the virus but faecal excretion is intermittent. The infection can also be transmitted by contaminated needles.

Lateral spread of infection is slow and can take three months to spread through a cage house. Spread of virus between birds on litter is usually faster.

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Clinical signs

Typically, clinical signs occur after seven to nine days but on occasions their manifestation can take two and a half weeks. The first sign is the loss of colour in coloured eggs, quickly followed by the production of thin-shelled, soft-shelled or shell-less eggs. The soft shelled eggs can be paddled into the litter or fall into the manure pit and so can be missed. The thin-shelled eggs often have a rough surface. In breeders these eggs can have depressed hatchability and, at flock level, this can be removed by discarding abnormal eggs.

A fall in egg production occurs which can be very rapid and sudden or extended over quite a few weeks. The egg drop lasts from four to 10 weeks and overall egg production can be reduced by 40%, but as this occurs in early lay it can be compensated for in late lay. Occasionally small eggs are seen and there has been a suspicion of 'watery whites' in a few cases. Otherwise affected birds look healthy.

Lesions

In outbreaks of EDS'76 inactive ovaries and atrophied oviducts are often the only changes seen but these are not always present.

Immunity

Antibodies can be detected seven days post infection and peak after four to five weeks. Birds can still excrete EDS'76 virus in the presence of antibodies. Maternal antibody has a half-life of three to four days and active antibody production can not be stimulated in birds with maternal antibody until four or five weeks of age, by which time maternal antibody is virtually undetectable. If the flock as a whole develops immunity pre-point of lay, effects on egg production will not be seen.

Diagnosis

Diagnosis is based on clinical and post mortem findings coupled to virus isolation. Post episode positive blood test results are also useful. Obviously if clinical signs are absent it can be difficult to select birds for the provision of samples for laboratory tests.

It should be noted that flocks infected in ovo do not develop antibodies in the growing period. The differential diagnosis of EDS'76 is that of a drop in egg production.

Control

Minimising spread via contaminated egg trays and/or needles is important. In larger organisations there are merits in segregating eggs from EDS'76 positive breeder flocks from those from negative flocks.

EDS'76 infection has been attributed to waterfowl contaminating water supplies so due consideration should also be given to drinking water management. Vaccination is typically done using a killed oil adjuvanted vaccine between 14-16 weeks of age.