International Poultry Production

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Colisepticaemia - III

Localised forms of colibacillosis

Up until now we have used the phrase colisepticaemia because that is the phrase that everyone knows and uses. In fact, if we are technically precise, colisepticaemia is one form of colibacillosis. Colibacillosis can be defined as any localised or systemic infection caused by avian pathogenic E. coli, although in everyday language we tend to use the phrase to relate to a systemic or generalised infection. We will now consider localised infections caused by E. coli.

Yolk sac infection or omphalitis

Omphalitis, or inflammation of the navel and yolk sac infection, is self-explanatory. Infection is usually a combination of these two entities because the yolk sac adjoins the navel. Sometimes the phrase 'mushy chick disease' is used. Infection invariably follows the entry of E. coli into an unhealed navel although, rarely, infection can be acquired in ovo if a hen has a salpingitis (inflammation of the oviduct), an oophoritis (inflammation of the ovary) or following artificial insemination in turkeys.

When yolk sac infection or omphalitis is encountered one needs to try and remove the source of E. coli to prevent recurrence of the problem but it is just as important to check that we do not have a concurrent problem of slow navel healing due to an incubator problem. This is sometimes a key background factor in hatcheries that appear to have an on-going yolk sac infection/omphalitis problem. However, it is thought that the most common source of E. coli infection is from faecal contamination of the eggshell. E. coli can also cross the intestinal wall and move via the blood stream to the yolk sac.

One must be careful in the interpretation of bacteriological results from yolk sac cultures because many normal yolk sacs can contain low numbers of E. coli and many of these may be non-pathogenic strains. Pure heavy growths of E. coli from a yolk sac are diagnostic of yolk sac infection; the isolation of a couple of colonies is not. It should also be noted that other bacteria can cause yolk sac infection although the most common bacterium is E. coli. Isolates of E. coli associated with omphalitis often have adhesin factors.

With E. coli infection of the egg as a consequence of salpingitis or oophoritis some embryos may die before hatching, especially in the latter stages of incubation. The incidence of omphalitis increases in the first few days after hatching, peaks and then declines. Losses by the third week are rare although sometimes poor doers with a chronically infected yolk sac or yolk sac remnant can be found. These are birds that have had an on-going battle with the E. coli infection. The bird has eventually won, albeit having paid the price of becoming a poor doer or runt. When a strain of E. coli is involved that has low lethality there may be no embryo or chick mortality but chick livability and weight may be adversely affected.

Clinical signs

Typically chicks have swollen bellies and the blood vessels associated with the navel are congested. Navel inflammation is typified by redness, oedema and swelling of the navel. Non-specific changes such as dehydration, visceral gout, loss of weight, pasted vents and enlarged gall bladders are seen. Sometimes the skin near the navel dies and becomes wet and dirty and this gives rise to the term mushy chick disease.

In yolk sac infection the yolk sac is enlarged or swollen because the yolk has not been utilised by the chick and its mass has been added to by inflammatory waste products. In such instances the yolk is usually abnormally coloured, of abnormal consistence and has an abnormal odour. If chicks live more than a few days with yolk sac infection/omphalitis a fibrinous (characterised by the deposition

of the inflammatory by-product fibrin) pericarditis (inflammation of the heart sac) and perihepatitis (inflammation around the liver) may be seen.

Consequences

The main consequences of yolk sac infection/omphalitis are:

- Death
- Poor absorption (therefore loss to the chick) of important nutrients
- Deprivation of maternal antibodies
- Spread of infection from the yolk sac into the body cavity or the blood system to produce colisepticaemia
- Absorption of toxins that have resulted from bacterial growth and multiplication

Survivors are usually of a lower weight, usually have an infected yolk sac remnant and often, in the case of broilers, end up as condemnations or downgrades in the processing plant.

Cellulitis

If E. coli infection gets into the area under the skin known as the subcutis, cellulitis or inflammation of that area often results. Cellulitis has many causes but probably the most common cause in chickens is E. coli infection, whereas in turkeys other bacteria are more important.

Swollen head syndrome

Swollen head syndrome is an acute/sub acute cellulitis in the head region which results in a swelling of the subcutaneous tissues of the head, hence the name. Usually the condition is associated with concurrent avian pneumovirus or infectious bronchitis infection. The condition can be aggravated by high levels of ammonia in the poultry house.

Scour/diarrhoea

Scour or diarrhoea is a common consequence of E. coli infection in mammals, such as man and pigs, but is not very common in poultry. Affected birds often have scour and are dehydrated with pale and distended intestines and caeca. In the latter there is often an accumulation of pale fluid and gas.

Salpingitis/peritonitis

E. coli infection of the oviduct can result in depressed egg production and sporadic mortality. This is a quite common cause of losses in breeders and table egg layers as well as geese and ducks. Infection usually occurs as a result of E. coli ascending the oviduct from the cloaca. If this condition is found it is always prudent to see if a co-infection with a virus such as infectious bronchitis or mycoplasma is present. In chronic forms of salpingitis the oviduct can be distended with large amounts of caseous material.

Orchitis and related conditions

Occasionally E. coli can ascend the male reproductive tract and cause an orchitis (inflammation of the testicle).