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001 - Colisepticaemia - I

Introduction

Colibacillosis is the collective term for a whole group of diseases of poultry caused by the bacterium E. coli, including coligranuloma or Hjarre's disease, yolk sac infection, omphalitis, egg peritonitis and colisepticaemia. Colisepticaemia is the end result of a generalised infection of the bird's body by the E. coli bacterium and its septic metabolic waste products. Hence the name COLI (E. coli) SEPTIC (waste products) AEMIA (transported around the body via the blood). In everyday language we talk about E. coli, but its full name is Escherichia coli.

This bacterium is a Gram negative rod or bacillus with flagellae (microscopic, whip-like appendages which can propel the bacterium through a water film).

Aetiology

The E. coli bacterium can easily be grown in the laboratory on bacteriological media and, typically, E. coli ferments glucose, mannitol and lactose but not inositol. This fermentation profile is important when it comes to confirming the identity of this bacterium. The different types or serovars of E. coli are usually identified by their somatic or 'O' antigens although 'K' (capsular) and 'H' antigens also exist. Most of the E. coli which are pathogenic to poultry belong to a small group of serogroups and these include the O1:K1, O2:K1 and O78:K80.

Typically, colisepticaemia affects chickens and in the broiler sector it was seen as a 'disease of intensification' but, as our knowledge of the disease has improved, its impact on broiler production has been significantly reduced. Colisepticaemia is also seen in other forms of poultry and game birds.

Epidemiology

E. coli is a member of a larger group of bacteria known as the Enterobacteriaceae and, as this name suggests, the organism inhabits the digestive tract of poultry. It can be shed from there in large numbers so the faecal-oral route of transmission is important. This can be a direct route or an indirect route when the faeces contaminate, for example, water or feed. In addition, E. coli will persist in the environment (dust, litter etc) for long periods of time.

Thus, an important aspect of controlling E. coli infections, including colisepticaemia, in poultry can be a thorough cleaning and disinfection of the poultry house at the end of a production cycle and using an all in, all out rather than a multi-age housing policy on a broiler farm. The design of the hen is not very good in that both eggs and faeces leave the bird via its cloaca and this provides a perfect scenario for the faecal, and hence the E. coli or salmonella, contamination of eggs. This is important in the epidemiology of yolk sac infection and related entities.

An indicator organism

E. coli infection and colisepticaemia often occur secondary to another, often viral, infection or a stress. When we diagnose colisepticaemia in a flock we should always try to identify the primary or precipitating/predisposing factor(s), as their management is often important in the long term control of colisepticaemia on a particular farm.

Typical precipitating factors include viral infections such as infectious bronchitis (normal and variant strains), Newcastle disease, avian pneumovirus and Gumboro disease, Mycoplasma gallisepticum infection, the application (and especially the misapplication) of live respiratory disease vaccines, coccidiosis, heavy worm infestations and nutritional deficiencies such as gross under-nutrition or vitamin A deficiency. In this last scenario, the vitality of the bird's mucous membranes is greatly reduced, thereby making them more prone to infection.