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Gangrenous dermatitis (Necrotic dermatitis)

Gangrenous dermatitis is an acute infection of the subcutaneous tissue of broilers and breeders

In the USA this poultry disease causes severe economic losses due to mortality ranging from 1 to 2% per week in affected turkey operations (Thachil *et al.*, 2010).

Gangrenous dermatitis has been associated with the isolation of different bacteria from the subcutaneous lesions: *C. perfringens*, *C. septicum*, *C. sordellii*, *S. aureus*, and *E. coli* (Ficken, 1991)

Experimental necrotic dermatitis can be reproduced by injecting the listed bacteria subcutaneously with *C. septicum* being the most effective to induce the experimental lesions (Jeffrey *et al.*, 2001; Tellez *et al.*, 2009; Thachil *et al.*, 2010). For this reason, gangrenous dermatitis has been linked to the contamination of skin lesions often associated with low feeder and drinker space.

As with many poultry diseases, gangrenous dermatitis is also associated with immune suppressing diseases such as the infectious bursal disease. Actually, measures to control immune suppressive diseases in a flock will often produce a reduction in the incidence of gangrenous dermatitis (Willoughby *et al.*, 1996).

Despite the general belief that necrotic dermatitis is primarily caused by contaminated skin lesions, several producers have reported continuous outbreaks of the disease even after ameliorating immune suppressing diseases, correcting bird density and supplying generous feeder and drinker space.

Trials conducted by BIOMIN with the collaboration of the USDA with the synbiotic PoultryStar[®] have shown amelioration of necrotic enteritis in broilers reared in commercial facilities with a history of recurrent outbreaks of necrotic dermatitis. The authors attribute the reduction of mortality due to an improved general health condition of the birds treated with probiotics (Waneck *et al.*, 2009).

Recently, necrotic dermatitis has been experimentally reproduced in turkeys following a single intravenous inoculation of *C. septicum* (Tellez *et al.*, 2009). The experimental disease was also reproduced with a combined intravenous inoculation of *C. septicum* and *C. perfringens*.

Interestingly, a cell free culture of *C. septicum* induces neurological signs after injection but fails to produce skin lesions or mortality in turkeys indicating that viable bacteria but not the toxins alone are responsible for the disease.

Development of the disease via intravenous inoculation of the causative agent opens a door for developing new theories that explain the pathogenesis of the disease.

It could be possible that under favourable conditions intestinal bacteria could leak through the

intestinal tract and via the systemic circulation reach subcutaneous tissues generating the disease when the bacteria find the appropriate environment.

Actually, lesions have been related to bruised areas on the skin which could be explained by changes in the micro environment of the subcutaneous tissue favouring the replication of the bacteria (Tellez *et al.*, 2009).

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