

Title: Control of Intestinal Spirochaete Infections in Chickens

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Summary

In recent years, intestinal spirochaetal bacteria of the genus *Brachyspira* (formerly *Serpulina*) have become recognised as being common inhabitants of the large intestines of commercial layer and broiler breeder chickens. Several distinct species of these bacteria infect poultry, some of which are pathogens. The organisms have fastidious growth requirements and need anaerobic conditions for their laboratory isolation; hence diagnosis of the infections is difficult. Despite an increased awareness of these bacteria, relatively few studies have been carried out on them.

In Australia, studies of intestinal spirochaetal infections in commercial poultry flocks have showed that colonisation with the pathogenic species *Brachyspira intermedia* and *Brachyspira pilosicoli* is common and present a constraint to efficient production. These spirochaetes are recovered significantly more frequently from layer and broiler breeder flocks with diarrhoea and reduced egg production than from clinically normal flocks.

Drawing further from a report from 2001 under the same name conducted by Hampson and Stephens, the purpose of the current project was to seek means to improve control of infections with the two main species associated with disease in Australia.

The project had two main components. First, on-farm studies were conducted to investigate determinants of the infections in order to devise the means to break the cycle of infection in individual farms. This included identifying patterns of infection with different strains and species of the bacteria, looking for potential reservoirs of the bacteria and examining their survival in the environment of the production house.

Second, a series of experimental studies were conducted in layer hens fed different diets and infected with the spirochaetes bacteria in an attempt to identify potential dietary influences on the infection. The ability to reduce or modify the infections by using specific diets, without having to recourse to antibiotics, could potentially improve the capacity of individual producers to control the infections.

This study has shown that flocks can vary greatly in their AIS status and that infection with intestinal spirochaetes can rapidly disappear from previously infected flocks. While it is shown that disinfectants can be used to remove potential environmental sources of infection, there are also bio-security measures to prevent cross-transmission of infection from older to younger flocks. This project also demonstrated that there are dietary influences on infection of layer hens and that it is worth considering modifying the diet to try to reduce the level of infection in the flock.