In vivo infection of broilers with Salmonella paratyphi B var. Java by oral gavage or contaminated feed

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Abstract
The prevalence of Salmonella paratyphi B var. Java (S. Java) in broilers in the Netherlands is increasing the last decade. The last 2 years it is considered the most difficult strain to fight in the broiler house environment. The organism persists on many farms for long periods and special protocols have been developed to help farmers fight contamination of broilers with this strain. To be able to evaluate the effect of feed and water additives on the infection with S. Java we developed two infection models for broilers. One with oral gavage and one which uses contaminated feed. 

Commercial broilers (Cobb) from Salmonella free parent stock were housed in cages and given a standard feed without antimicrobial substances. In the first experiment broilers were challenged by oral gavage at day 7 with $10^2$, $10^3$ or $10^4$ S. Java (0.5 ml of a diluted fresh overnight culture in Brain Heart Infusion broth). In the second trial a standard feed without antimicrobial substances was contaminated with S. Java at levels of 0.1, 1.0 and 10 cfu S. Java per gram. The feeds were given to the birds from day 0.

Success of infection was followed by analysis of cloaca swab of individual broilers (presence/absence) and Salmonella counts in faecal samples (per cage) or cloaca samples.

When broilers are given a single oral challenge at day 7 a dose of 700 cfu is enough to establish an infection. When broilers are fed a S. Java contaminated feed a dose of 10 cfu per gram feed is necessary to give infected birds.