

Selected microbial groups and short-chain fatty acids profile in a simulated chicken cecum supplemented with two strains of *Lactobacillus*.

ABSTRACT

Among the bacterial fermentation end products in the chicken cecum, butyrate is of particular importance because of its nutritional properties for the epithelial cell and pathogen inhibitory effects in the gut. An in vitro experiment, operated with batch bioreactor, was conducted to quantify butyric-producing bacteria in a simulated broiler cecum supplemented with *Lactobacillus salivarius* ssp. *salicinius* JCM 1230 and *Lactobacillus agilis* JCM 1048 during 24 h of incubation. Selected bacterial species were determined by real-time PCR and short-chain fatty acids and lactate concentrations were monitored. The results showed that after 24 h of incubation, *Lactobacillus* supplementation significantly increased the number of lactobacilli, bifidobacteria and *Faecalibacterium prausnitzii* in medium containing cecal content and lactobacilli supplementation (Cc + L) compared with the control (Cc). Addition of lactobacilli did not alter *Escherichia coli* and *Clostridium butyricum*, whereas it significantly ($P < 0.05$) reduced *Salmonella* in treatment Cc + L compared with the Cc treatment. Propionate and butyrate formation were significantly ($P < 0.05$) increased in treatment Cc + L as compared with the Cc treatment. Lactate was only detected in treatment containing 2 *Lactobacillus* strains. After 24 h of incubation, acetate concentration significantly ($P < 0.05$) decreased in all treatments. It was suggested that lactate produced by *Lactobacillus* in the cecal content improved the growth of butyric producers such as *F. prausnitzii*, which significantly increased butyrate accumulation. Additionally, the results showed that butyrate and propionate inhibited *Salmonella* without influencing the *E. coli* profile.

Keyword: Microbial group; Short-chain fatty acid; Chicken cecum.