

In vitro fermentation of broiler cecal content : the role of oactobacilli and pH value on the composition of microbiota and end products fermentation.

ABSTRACT

Aim: To assess the probiotic effects of *Lactobacillus agilis* JCM 1048 and *L. sali-varius* ssp. *salicinius* JCM 1230 and the pH on the cecal microflora of chicken and metabolic end products. **Methods and Results:** An in vitro system, operated with batch bioreactor, was used for this assessment. Selected bacterial species were monitored at two pH values, over 24 h of batch culture incubation. The concentration of short chain fatty acids (SCFA) and lactate in the fermented material was also determined. The addition of *L. agilis* JCM 1048 and *L. salivarius* ssp. *salicinius* JCM 1230 into vessel 2 (Cc + P) increased the total anaerobes, lactobacilli and bifidobacteria after 24 h incubation. Moreover, lactobacilli supplementation decreased the total aerobes and streptococci, but it did not have any effects on coliforms. The supplementation of lactobacilli in vessel 2 (Cc + P) was found to significantly increase the production of lactate, propionate and butyrate. Further- more, pH did not alter the formation of butyrate, whereas the production of acetate and propionate was significantly decreased at pH = 5Æ 8. **Conclusions:** *L. agilis* JCM 1048 and *L. salivarius* ssp. *salicinius* JCM 1230, as probiotic bacteria, have the ability to re-establish proper microbial balance by the formation of lactate as well as propionate, and stimulate butyrate-producing bacteria to produce butyrate in the chicken cecum. **Significance and Impact of the Study:** This study was the first to report this under in vitro conditions, highlighting the probiotic roles of the two *Lactobacillus* strains in broiler cecal fermentation at different initial pH. These useful data can be helpful in improving the fermentation process in chicken cecum.

Keyword: Broiler cecal microbial fermentation; Lactobacilli; pH.