Characterization of conjugated linoleic acid-producing lactic acid bacteria as potential probiotic for chicken

ABSTRACT

Aims: Dietary intake of conjugated linoleic acid (CLA) by human is insufficient to exhibit properties of anti-cancer, anti-inflammatory, anti-atherosclerosis, anti-obesity and enhancing immune system. Thus, enrichment of CLA in chicken by bacteria is a suggestion to solve the problem. It would be an advantage to have bacteria capable of producing CLA and has probiotic potential in chicken. Thus, probiotic properties of CLA-producing bacteria were accessed in this study.

Methodology and results: In this study, 47 lactic acid bacteria (LAB) isolated from gastrointestinal tract of chickens were screened for conjugated linoleic acid (CLA) production. Lactobacillus salivarius strain P2, Enterococcus faecium strain P1 and Lactobacillus agilis strain P3 were shown to produce 21.97, 23.35 and 31.08 μg/mL of CLA in MRS broth containing free linoleic acid (0.5 mg/mL) and 2% (w/v) Tween 80, respectively. Lactobacillus salivarius strain P2, E. faecium strain P1 and L. agilis strain P3 were found to be able to tolerate 0.3% oxgall (Difco, France) and pH 2.5. Lactobacillus agilis strain P3 and L. salivarius strain P2 showed better acid tolerance compared to E. faecium strain P1. Besides that, L. agilis strain P3 and L. salivarius strain P2 were resistant to two out of eight types of antibiotics tested, able to produce 220.04 mM lactic acid and 200.17 mM of lactic acid, respectively. Enterococcus faecium strain P1 was resistant to five out of eight types of antibiotic tested, produced 90.39 mM lactic acid and showed hemolytic activity. Only L. agilis strain P3 can produce acetic acid at a concentration of 2.71 mM.

Conclusion, significance and impact of study: These results showed that the CLA-producing L. salivarius strain P2 and L. agilis strain P3 could be potential probiotic bacteria for chickens, which may eventually lead to production of chicken with better meat quality.

Keyword: Conjugated linoleic acid; Probiotic; Lactic acid bacteria; Chicken