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