

Application of *Scutellariae radix*, *Gardeniae fructus*, and probiotics in preventing *Salmonella enterica* serovar Typhimurium infection in chickens

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Abstract

Salmonella enterica serovar Typhimurium usually causes septicemia and is a host-adapted pathogen of chickens. It also causes systemic infection in humans and is one of the important serotypes for salmonellosis transmitted from animals to

humans. Lactic acid bacteria (LAB) strains have been widely studied in recent years for their probiotic properties. In this study, we aimed to develop a combination of LAB strains and herbal plants as feed additives for preventing *S. Typhimurium* infection in chickens. A chicken infection model was applied to evaluate the effects of LAB strains and herbal plants (*Scutellariae radix* and *Gardeniae fructus*) against *S. Typhimurium* infection. LAB strains and herbal plants showed their abilities on reducing bacteria shedding in feces. SR and GF+LAB could also suppress serum levels of IL-8 induced by infection. SR and GF could decrease infection-induced IFN- γ and IL-1 β levels in intestinal tissues. Further studies were conducted to identify the active compounds of SR and GF. Baicalein and genipin exhibited stronger cytotoxicity than baicalin and geniposide did, and also significantly prevented *Salmonella* invading macrophages. These data indicated that these aglycones are more active than their parent compounds. Our study suggested that LAB strains have showed their function for preventing infection by adjusting the enzymatic activity of intestinal microbes in order to converter herbal compounds to active compounds. And SR/GF and LAB strains mixture could be potential infection prevention agents supplied as feed additives.

Keywords: *Salmonella enterica* serovar Typhimurium, *Scutellariae radix*, *Gardeniae fructus*, probiotics