

## The Construction of a Probiotic Lactic Acid Bacterium Expressing Acid-Resistant Phytase Enzyme

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**Abstract :** The use of probiotics engineered to express specific enzymes has been the subject of considerable attention in poultry industry because of increased nutrient availability and reduced cost of enzyme supplementation. Phytase enzyme is commonly added to poultry feed to improve digestibility and availability of phosphorus from plant sources. To construct a probiotic with potential of phytate degradation, phytase gene (*appA*) from *E. coli* was cloned and transformed into two probiotic bacteria *Lactobacillus salivarius* and *Lactococcus lactis*. *L. salivarius* showed plasmid instability, unable to express the gene. The expression of *appA* gene in *L. lactis* was analyzed by detecting specific RNA and zymography assay. Phytase enzyme was isolated from cellular extracts of recombinant *L. lactis*, showing a 46 kDa band upon the SDS-PAGE analysis. Zymogram also confirmed the phytase activity of the 46 kDa band corresponding to the enzyme. An enzyme activity of 4.9U/ml was obtained in cell extracts of *L. lactis*. The growth of native and recombinant *L. lactis* was similar in the presence of two concentrations of ox bile.

**Keywords :** *Lactobacillus salivarius*, *Lactococcus lactis*, recombinant, phytase, poultry

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