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The effect of raffinose and *Lactobacillus acidophilus* on lysozyme and TNF-α gene expression in carp (*cyprinus carpio*)

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Abstract

The aim of this study was to evaluate the effects of raffinose and *Lactobacillus acidophilus* on expression of immune-related lysozyme and TNF-α genes in carp (*Cyprinus carpio*). 12 fish with an average weight of 10 ± 2.5 gr were storaged in 500-liter tanks. Fish were fed with diets containing 2% raffinose, 6×10^8 CFU/g of *L. acidophilus*, the combination of these supplements and control groups without probiotic and prebiotic for 8 weeks. To investigate the lysozyme and TNF-α gene expression from skin tissue, sampling was done at the end of trial. RNA was extracted from the tissue, and cDNA was synthesized and by using specific primers via Real Time PCR, lysozyme and TNF-α gene expression was examined. The results showed that *L. acidophilus* had significant effect on lysozyme gene expression ($P<0.05$). In addition, the result of gene expression showed that there were no remarkable differences among groups fed with prebiotic, symbiotic and non-supplemented diet ($P>0.05$) while these supplements had no significant effect on TNF-α gene expression ($P>0.05$) and the lowest gene expression was observed in symbiotic treatment. This study showed that *L. acidophilus* increased immunity through the increase in relative expression of lysozyme in carp.

Keywords: Raffinose, Symbiotic, *Lactobacillus acidophilus*, Lysozyme and TNF-α

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