

Control of *Listeria monocytogenes* ATCC 15313 in Ground Beef by Lactococcal Bacteriocins and Modified Atmosphere Packaging

Hye Jung Park*, Na-Kyoung Lee, Jin Ok Choi, Dong Sun Lee,
Hyun-Dong Paik and Jung Uk Ha
Division of Life Sciences, Kyungnam University

A psychrotrophic pathogen *Listeria monocytogenes* may be of concern, particularly in chilled and frozen foods. Application of bacteriocins to chilled and frozen food storage will be one of the best way in controlling *L. monocytogenes*. This study were to evaluate the inhibition effects of the lactococcal bacteriocins, nisin and lacticin NK24, and modified atmosphere packaging (MAP) on the growth of *L. monocytogenes* ATCC 15313 in ground beef during refrigerated (4°C) and frozen (-18°C) storage. The fresh ground beef was inoculated with *L. monocytogenes* ATCC 15313 at a level of 1×10^3 CFU/g, and were treated with nisin and lacticin NK24 at a level of 100 AU/g, respectively. The ground beef was treated with two different bacteriocins and held at 4°C and -18°C under aerobic condition. The cells of *L. monocytogenes* ATCC 15313 were enumerated by using *Listeria* selective agar medium. The *L. monocytogenes* cells in samples treated with the bacteriocin were reduced by one log count while shown increasing in the control with time elapsed. The inhibitory effect of nisin and partially purified lacticin NK24 (100 AU/g) was examined using *Listeria* selective medium against *Listeria monocytogenes* ATCC 15313 in meat-based food packaging systems, such as, oxygen-permeable, under vacuum, and under a modified atmosphere. In conclusion, it demonstrated that *L. monocytogenes* in ground beef could be inhibited by the bacteriocins during chilled and frozen storage. The cells of *L. monocytogenes* ATCC 15313 in nonbacteriocin-added ground beef were increased, whereas those of bacteriocin-added one were decreased gradually. However, synergistic effects of vacuum and MAP with the bacteriocin were not shown in this study.