

SURVIVAL OF *LISTERIA MONOCYTOGENES*, *LISTERIA INNOCUA*,
AND LACTIC ACID BACTERIA SPECIES IN CHILL BRINES

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(ABSTRACT)

Listeria monocytogenes is the major pathogen in ready-to-eat meat products such as deli meats and frankfurters. Contamination can occur via the salt brines that are used to cool thermally processed meats. Both *L. monocytogenes* and lactic acid bacteria can grow and thrive under these brine conditions, and may become competitive with each other for available nutrients. The objective of this study was to determine the effect of a three strain cocktail of lactic acid bacteria *Enterococcus faecalis*, *Carnobacterium gallinarum*, and *Lactobacillus plantarum* on the survival of *Listeria monocytogenes* and *Listeria innocua* in brines stored under low temperatures up to 10 days. Three brine concentrations (0%, 7.9%, and 13.2% NaCl) were inoculated with $\sim 7.0 \log_{10}$ cfu/ml of one of five cocktails (*L. monocytogenes*, *L. innocua*, lactic acid bacteria (LAB), *L. monocytogenes* + LAB, or *L. innocua* + LAB) and stored for 10 days at either 4°C or 12°C. Three replications of each brine/cocktail/temperature combination were performed. No reductions of *L. monocytogenes* were seen in 7.9 or 13.2% NaCl with LAB; however, reductions of *L. monocytogenes* were seen in the 0% NaCl with LAB (1.43 log at 4°C and 3.02 log at 12°C). *Listeria innocua* was significantly less resilient to environmental stresses than *L. monocytogenes*, both with and without LAB present ($p < 0.05$). This research indicates these strains of lactic acid bacteria are not effective at reducing *L. monocytogenes* in brines at low temperatures. Furthermore, the use of *L. innocua* as a model for *L. monocytogenes* is not appropriate under these environmental conditions.

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