Pediocin for Control of *Listeria monocytogenes* on Frankfurters

A.S. Leaflet R1993

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Summary and Implications

Application of pediocin, as ALTA™ 2341, on the surface of frankfurters before packaging reduced the population of contaminating *Listeria monocytogenes* and delayed growth of the remaining cells. Therefore, pediocin provides an effective intervention treatment for control of *L. monocytogenes* on frankfurters and contributes to improved safety of these products for consumers.

Introduction

Numerous illnesses and several deaths have occurred from *L. monocytogenes* contamination of ready-to-eat (RTE) processed meats such as frankfurters. *L. monocytogenes* is a hardy organism that is difficult to eradicate from the environment and most often contaminates processed meats after cooking and before packaging. Pediocin, a compound produced by lactic acid bacteria, is a significant microbial inhibitor and may offer enhanced protection from *L. monocytogene* in RTE meat products.

Materials and Methods

Frankfurters were manufacturered, cooked, smoked and chilled in preparation for inoculation and packaging. For packaging, frankfurters were placed in high-barrier bags, sprayed with a 40% solution of pediocin (ALTA™ 2341) to result in 3000 AU or 6000 AU of pediocin, and then inoculated with a 5-strain mixture of *L. monocytogenes.* After sealing, packages were then separated into groups to be stored at 4°C, 10°C and 25°C.

Packages were opened periodically during storage and surviving *L. monocytogenes* enumerated at each temperature. Uninoculated frankfurters were also evaluated for quality changes including purge, color and sensory quality.

Results and Discussion

Application of the pediocin (ALTA™ 2341) immediately reduced *L. monocytogenes* populations by 1.5 to 2.0 log CFU/g in a concentration-dependent manner. Further, the pediocin treatment delayed growth of survivors for 7 weeks at 4°C, 2 weeks at 10°C and 1 day at 25°C. Figure 1 shows the results for both *L. monocytogenes* and aerobic bacteria on frankfurters stored at 10°C. There was no difference in effectiveness between the two concentrations of the pediocin during storage at 10°C but a reduction in the initial number of organisms plus a delay in growth of the survivors for the first 2 weeks is clearly evident.

Quality evaluations of uninoculated frankfurters treated with the pediocin showed that color was slightly darker and redder but all other quality characteristics were unaffected. Consequently, treatment of frankfurters with pediocin (ALTA™2341) can provide an intervention step to reduce the risk of *L. monocytogenes* on these products.

Acknowledgement

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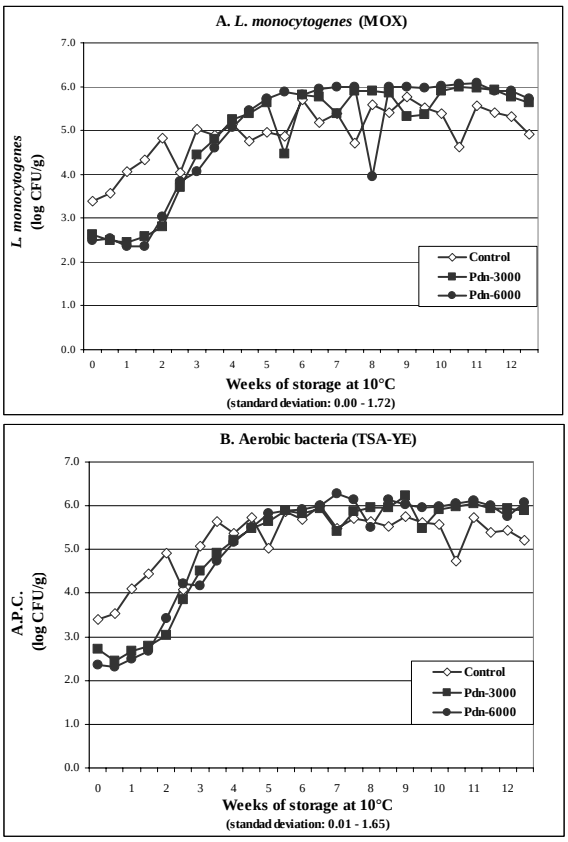

Figure 1 - Survival and growth of *Listeria monocytogenes* (3.40 log CFU/g inoculation) and aerobic bacteria on the surface of frankfurters treated with pediocin (in ALTAÔ 2341) at 3,000 AU or 6,000 AU and stored at 10°C; A. *L. monocytogenes* on MOX agar, B. Aerobic bacterial counts (A.P.C.) on TSA-YE

Pdn-3000- Frankfurters (5 links / pkg) treated with 3,000 AU pediocin
Pdn-6000- Frankfurters (5 links / pkg) treated with 6,000 AU pediocin