

Title: Antimicrobial activity of nisin and sodium diacetate against *Listeria monocytogenes* is strain dependent

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Abstract:

Listeria monocytogenes is a pathogenic microorganism commonly found in the food processing environment. Post-processing cross-contamination with *L. monocytogenes* at retail level is also common, and particularly dangerous when the food is ready-to-eat, i.e, when there is no microbial kill step before consumption. To increase the safety of ready-to-eat products at retail, the food industries are constantly looking for new technological alternatives to inhibit or delay the growth of this microorganism. Besides conventional antimicrobial food additives, new compounds such as the bacteriocin nisin produced by *Lactococcus lactis* have been studied for this purpose. Some food ingredient companies are proposing the combined use of nisin and other natural antimicrobial compounds, claiming that the combination would increase the antimicrobial activity and better protect the ready-to-eat meat products from post-processing contamination, safeguarding the health of the consumers. The purpose of this study was to compare the activity of nisin (Nisaplin®) and sodium diacetate against three *L. monocytogenes* strains isolated from Brazilian meat products (strains 500, 508 and 595) and two culture collection strains (ATCC 7644 and Scott A), using the twofold microdilution method in Muller-Hinton broth and spectrophotometric measurements at 620nm. Viability of surviving cells was confirmed by the drop plate method. Results indicated that the minimal inhibitory concentration of sodium diacetate was strain dependent, and varied from 4% to 1% according to the strain (4% for 508 and 595 strains, 2% for 500 and ATCC 7644 strains and 1% for Scott A strain). On the contrary, 0,013% of nisin was enough to inhibit all strains. These results indicate that combinations of these antimicrobials must be evaluated very carefully before use, as activity may vary according to the strain that contaminates the meat product.

Key-words: nisin, meat, food safety, antimicrobials

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