

# Lysozyme and Nisin Inhibit Spoilage Bacteria on Naturally Contaminated Pork

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The majority of Canadian pork is distributed in vacuum packages, which provide an environment largely free of oxygen. Only bacteria that are able to grow in the absence of oxygen develop over time. If the initial contamination level is low and the temperature control is good, prolonged storage life may be expected. The lactic acid bacteria (LAB) dominate the microflora during refrigerated vacuum packaged storage. If their numbers increase above  $10^7$  cfu/cm<sup>2</sup>, they can spoil the meat. Intervention strategies that inhibit their growth could be used to prolong the storage life of vacuum packaged pork.

Commercial vacuum packaged pork loins were purchased. They were immersed in an aqueous antimicrobial solution (treated) or in water (untreated). The antimicrobial was nisin and lysozyme in a 1:3 (w/w) ratio at a concentration of 10 mg/ml of solution. The loins were vacuum packaged and stored at 2°C for 6 wk. Weekly, 2 loins were removed and chops were cut from them. The chops were displayed under retail conditions for 7 d. The bacteria on the treated loins, untreated loins and chops were compared at selected times.

The LAB grew to log 7.2 cfu/cm<sup>2</sup> on untreated loins during 6 weeks of storage. The loins treated with nisin and lysozyme had numbers of LAB 4 log units lower. The aciduric lactic acid bacteria (AcLAB) have been associated with flavour defects. Their numbers were reduced 5.6 log units from 6.1 log cfu/cm<sup>2</sup> in untreated samples to 0.5 cfu/cm<sup>2</sup> in treated samples. The antimicrobial treatment did not result in significant changes in the pH, colour or odour of the pork. The effects of the antimicrobial persisted on the pork chops through the retail display period.

**Implications:** The pork industry has difficulty attaining a long storage life in their vacuum-packaged products, primarily due to the growth of LAB over extended refrigerated storage. Nisin and lysozyme in a 1:3 (w/w) ratio showed antimicrobial activity against the LAB and the AcLAB throughout 6 weeks of vacuum-packaged storage. These antimicrobials are naturally occurring and could be used to extend storage life.