

Title Use of hydrogen peroxide in combination with nisin, sodium lactate and citric acid for reducing transfer of bacterial pathogens from whole melon surfaces to fresh-cut pieces

Author Dike O. Ukuku, M.L. Bari, S. Kawamoto and K. Isshiki

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### Abstract

Hydrogen peroxide (2.5%) alone or hydrogen peroxide (1%) in combination with nisin (25 µg/ml), sodium lactate (1%), and citric acid (0.5%) (HPLNC) were investigated as potential sanitizers for reducing *Escherichia coli* O157:H7 or *Listeria monocytogenes* populations on whole cantaloupe and honeydew melons. Whole cantaloupes inoculated with *E. coli* O157:H7 and *L. monocytogenes* at 5.27 and 4.07 log<sub>10</sub> CFU/cm<sup>2</sup>, respectively, and whole honeydew melons inoculated with *E. coli* O157:H7 and *L. monocytogenes* at 3.45 and 3.05 log<sub>10</sub> CFU/cm<sup>2</sup>, respectively, were stored at 5 °C for 7 days. Antimicrobial washing treatments were applied to inoculated whole melons on days 0 or 7 of storage and surviving bacterial populations and the numbers transferred to fresh-cut pieces were determined. At days 0 and 7 treatment with HPLNC significantly ( $p < 0.05$ ) reduced the numbers of both pathogens, by 3 to 4 log CFU/cm<sup>2</sup> on both types of whole melon. Treatment with HPLNC was significantly ( $p < 0.05$ ) more effective than treatment with 2.5% hydrogen peroxide. While fresh-cut pieces prepared from stored whole melons were negative for the pathogens by both direct plating and by enrichment, fresh-cut pieces from cantaloupe melons treated with 2.5% hydrogen peroxide were positive for both pathogens and pieces from honeydew melons were positive for *E. coli* O157:H7. The native microflora on fresh-cut melons were also substantially reduced by HPLNC treatment of whole melons. The results suggest that HPLNC could be used to decontaminate whole melon surfaces and so improve the microbial safety and quality of fresh-cut melons.