

**Title** Microbiological quality of fresh-cut cabbage treated with disinfectant and stored in active MAP

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### **Abstract**

Microbiological and organoleptic quality of fresh-cut cabbage was evaluated during storage in active modified atmosphere packaging (MAP) at 10°C. The samples were initially treated with tap water or 0.05% calcined calcium agent (91% of calcium) followed by ozonated water (5 ppm of ozone) and subsequently packaged, which was flushed with air or 10% CO<sub>2</sub>. When fresh-cut cabbage was stored in MAP flushed with air or 10% CO<sub>2</sub> for 7 days at 10°C, CO<sub>2</sub> accumulated to 13-15% and O<sub>2</sub> depleted to 2-4% in the packages. The CO<sub>2</sub> concentration approached equilibrium after 4 days storage in packages flushed with air, while the equilibrium was attained immediately in packages flushed with CO<sub>2</sub>. The treatment with calcined calcium agent followed by ozonated water was effective in reducing counts of mesophiles, coliforms, and psychrotrophes by 1-2 logs relative to water-dipped control on initial day. The count of lactic acid bacteria on all samples was below the detection level (2.4 log CFU/g). A residual effect of the disinfectant treatment occurred with the microbes except for lactic acid bacteria for the first 3 days of storage. The packages flushed with 10% CO<sub>2</sub> was effective in reducing growth of psychrotrophs by 0.8 to 1.1 logs as compared to those flushed with air throughout 7 days of storage. Bacteria isolated from fresh-cut cabbage were phytopathogenic and soilborne organisms such as genera *Acinetobacter*, *Enterobacter*, *Pseudomonas*, and *Stenotrophomonas*. The diversity of bacterial flora in the treated samples was much less in packages with 10% CO<sub>2</sub> than those with air. Neither treatment of disinfectant or 10% CO<sub>2</sub> flush affected organoleptic quality including browning, water-soaked appearance, and pitting of freshcut cabbage. These results indicate that when fresh cut-cabbage was treated with calcined calcium agent with ozonated water and then stored in active MAP of 10% CO<sub>2</sub>, bacterial counts and the number of bacterial strains detected on cabbage were controlled during storage.