

Title Decontamination of Whole Cantaloupes Using a Pilot-scale Chlorine Dioxide Gas Treatment System  
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### Abstract

Multi-state cases of salmonellosis from cantaloupes have raised concern. Our objectives were to evaluate a pilot-scale C10<sub>2</sub> gas treatment system to reduce *Salmonella* on cantaloupes and its effects on microbial quality and skin color after the treatment and during refrigerated storage. Each cantaloupe was spot-inoculated with 7 to 8 log CFU of a mixture of five *Salmonella* strains on an area of 4 x 4 cm<sup>2</sup> of cantaloupe surface, stored for 24 h at 22°C, treated with 5 to 12.5 mg/1 C10<sub>2</sub> gas for 10 min at 22°C and 80 to 95% relative humidity with an automated pilot-scale treatment system, and then stored for 1 to 4 weeks at 4°C. Populations of *Salmonella*, aerobic plate count (APC), and yeast and molds (YM) were determined by surface-plating on xylose lysine desoxycholate agar, plate count agar, and dichloran rose bengal chloramphenicol agar, respectively. Surface color was measured using a Hunter colorimeter. The levels of *Salmonella* were reduced by 3.31 log CFU immediately after 5 mg/1 treatment and further reduced by 4.98 log CFU in total after one-week storage. The 12.5 mg/1 treatment led to a reduction of 4.70 ± 1.07 log *Salmonella*, 3.0 ± 1.18 log on APC, and ≥ 3.80 ± 0.4 log on YM. Further storage for 4 weeks at 4°C resulted in a total reduction of 6.0 ± 0.12 log *Salmonella*, 4.17 ± 2.0 log on APC, and 3.77 ± 0.62 log on YM. During the storage, *Salmonella* level decreased and APC and YM populations increased on untreated samples. No significant color changes were observed after C10<sub>2</sub> gas treatments. C10<sub>2</sub> gas technology is promising for reducing *Salmonella* and maintaining quality on cantaloupes.