

## Research Note

# Validation of a Washing and Sanitizing Procedure for Cantaloupe at a Mexican Packing Facility

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## ABSTRACT

In-plant validation of an alternative washing and sanitizing method was conducted at a cantaloupe packing operation in Mexico. This method consisted of a spray water wash followed by spraying warm (55 to 60°C) 2% l-lactic acid solution and was compared with the existing method of spray washing the melons with tap water followed by immersion in a chlorinated water tank. Surface samples (100 cm<sup>2</sup>) were collected from 160 melons subjected to each processing method and tested for counts of aerobic bacteria, coliforms, and *Escherichia coli*. The aerobic plate counts from cantaloupes washed in the dump tank ranged from 3.6 to 5.2 log CFU/cm<sup>2</sup> and were significantly higher ( $P < 0.05$ ) than those from melons treated with the alternative spray method, which ranged from 1.8 to 2.6 log CFU/cm<sup>2</sup>. Coliform counts for cantaloupes treated in the dump tank were 0.2 to 2.2 log CFU/cm<sup>2</sup> and were below the detection level ( $-6.0$  log CFU/cm<sup>2</sup>) on cantaloupes treated by the spray method. Growth of *E. coli* was observed in 2.5% of the samples of cantaloupes treated in the dump tank and in none of the samples of cantaloupes treated by lactic acid spray ( $P < 0.05$ ). These results support the elimination of dump tanks in cantaloupe packing operations established by the Mexican government for certification of firms exporting cantaloupes to the United States. When a sanitizer is to be applied to the product, lactic acid seems to be a viable option, at least for products such as cantaloupes whose quality is not affected by an acid wash.

Importation of cantaloupe from Mexico to the United States has been suspended since 2002 because of an import alert released after the occurrence of several outbreaks of salmonellosis linked to cantaloupes shipped from specific Mexican farms (31). *Salmonella* serotype Poona, which is usually associated with reptiles, was responsible for three outbreaks occurring in 2000, 2001, and 2002 (11). An additional outbreak caused by *Salmonella* serotype Anatum also occurred in 2002 (31). A recent outbreak of salmonellosis in which 51 individuals were infected with the same genetic fingerprint of *Salmonella* Litchfield (12) was traced back to cantaloupes grown and packed in Honduras. This outbreak led to a large recall and an import alert for melons coming from a specific Honduran company (32). At least 10 outbreaks of foodborne illness associated with consumption of cantaloupes have been reported in the United States. Of these outbreaks, nine have been caused by *Salmonella* (5, 10, 11, 18, 22, 31) and one was caused by *Escherichia coli* O157:H7 in Oregon, although in this case the cantaloupes and other items in a salad bar likely were cross-contaminated during cutting (13). However, the sources and mechanisms for melon contamination still are unclear. In a recent binational study (8), cantaloupe farms from Mexico and the United States were investigated for *Salmonella* contamination and the presence of *E. coli* as an

indicator of unsanitary operations. During this study, 11 packing facilities were identified as the site with the greatest opportunities for bacterial contamination. Subsequently Johnston et al. (16, 17) reported that during cantaloupe packing operations the populations of different bacterial indicators increased significantly. Different strategies have been developed for minimizing the presence of bacterial pathogens on fresh cantaloupes. The melon industry developed voluntary food safety guidelines that apply specifically to melons in their supply chain (14). After the imposition of the import alert against Mexican cantaloupes in 2002, the U.S. Food and Drug Administration and the National Service of Agro-Alimentary Health, Safety, and Quality (SENASICA) of Mexico signed a memorandum of understanding that permits imports of Mexican cantaloupes based on the food safety performance of their operation. Under the terms of this memorandum, all firms that are not exempt from the import alert must be certified to SENASICA to comply with different requirements before being allowed to ship melons to the United States. As part of the certification conditions, melon packers are required to SENASICA to comply with strict guidelines, which include eliminating the use of dump tanks for washing melons (6). Therefore, all melons currently imported into the United States from Mexico are packed without washing in dump tanks. However, more research is needed to determine if

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