

Title: Understanding the Cross-Contamination of Melons via Environmental Matrices Under Field Conditions and Prevalence of Foodborne Pathogens

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*Listeria monocytogenes* contaminated cantaloupes were implicated in an outbreak in 2011 causing 33 mortalities. Understanding the vehicles of *L. monocytogenes* contamination and prevalence of foodborne pathogens will assist in risk-analysis. We investigated soil and dust as vehicles of *L. monocytogenes* contamination and the prevalence of foodborne pathogens in Arizona grown melons and environmental samples. Experimental melon varieties and hybrids grown in different states (AZ, CA, TX and IN) were used. Soil from melon fields in Yuma, AZ was used and sieved to create dust. Rinds were placed on soil inoculated with *L. monocytogenes* for 1 h under a bio-hood. Inoculated dust was sprayed on melon rinds in a specially designed chamber. Soil, dust and melon rinds were plated on selective media and enumerated to determine % transfer. 339 cantaloupes, 20 rhizosphere, 20 soil, 20 air and 6 water samples were collected from 4 fields in AZ. Selective enrichment and plating was used to analyze the presence/absence of *Salmonella enterica* and *L. monocytogenes* and to enumerate indicator bacteria. Percent Transfer- On average hybrid-cantaloupes had the greatest (0.040%) and least (0.0001%) transfer of *L. monocytogenes* from soil and dust, respectively. Honeydews had transfers of 0.0034% and 0.00033%, while cantaloupes had 0.018% and 0.0013%, for soil and dust, respectively. *L. monocytogenes* transfer was the highest (0.1112%±0.0049%) for TH7 (AZ), and least (0.00002%±0.000004%) for Infinite Gold SAKATA (IN). No pathogens were detected in melons and environmental samples. On cantaloupes, enterococci and coliforms ranged from 2.3-2.8 Logs and 3.8-4.1 Logs, respectively. Air samples had the lowest enterococci and coliform counts, <1-3.0 Logs and <1-2.1 Logs, respectively. Water samples had enterococci and coliforms ranging 1.6-2.2 Logs and 2.1-3.8 Logs, respectively. Two samples from location-one were positive for non-pathogenic *Escherichia coli*. All fields had signs of wildlife intrusion. Results will help understand the risk of *L. monocytogenes* contamination in field conditions and data can be used for a science-based risk assessment and analysis.