

Summary of Melons Food Safety Research at the University of Arizona

Prevalence of Foodborne Pathogens and Indicator Microorganisms:



Over 1,000 Arizona grown commercial cantaloupe melons were sampled, along with soil, rhizosphere (root and surrounding soil), air and water samples from commercial cantaloupe fields across Arizona.

Analysis of the Arizona cantaloupe melons found no foodborne pathogens- *Salmonella enterica*, *Listeria monocytogenes* or *Escherichia coli* O157:H7. Indicator microorganisms for potential fecal contamination were consistently higher on the melon rind, soil and rhizosphere samples than the air and water samples.

Cross-contamination Potential of Soil and Dust: Six experimental cantaloupe and honeydew melon varieties which were grown in seven different locations (AZ, CA, GA, TX-Weslaco, TX-Uvalde, NC and IN) were tested for cross-contamination of foodborne pathogens from contaminated soil and dust to the melon rind.



We found that on average there was higher percent transfer of foodborne pathogens from the soil to the cantaloupe melons than to honeydew melons. The opposite was true for dust, which had higher percent transfer of foodborne pathogens on honeydews than cantaloupes on an average. Soil had higher transfer of foodborne pathogens to the melon rind than that from dust. Growers should be more wary of contaminated soil, but dust could still be a potential route of contamination.

Attachment Strength of Foodborne Pathogens on Melon Rind: The attachment strength of *Salmonella enterica* and *Listeria monocytogenes* on melons was investigated. Melon

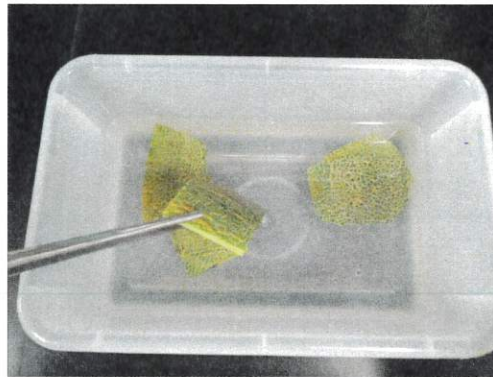
disks were inoculated with either *Salmonella* or *Listeria* on the rind surface and allowed to attach. Afterwards, the melon disks went through a procedure to determine the ratio of strongly attached versus the loosely attached bacteria on the melon rind. Results showed that *Salmonella* is more likely to have stronger attachment



to the melon rind than *Listeria*. These results show that *Salmonella* will be harder to remove without vigorous scrubbing of the melon rind. However, consumers should be aware that washing melons using just running tap water is not enough and *Salmonella* or *Listeria* can remain on the melon surface.

Efficacy of Interventions Against Foodborne Pathogens:

A study was performed to determine the efficacy of plant-based antimicrobials against *Salmonella enterica* and *Listeria monocytogenes* contaminated melon rinds. Cantaloupe and honeydew melons grown in six different locations (GA, AZ,



TX, NC, IN and CA) were tested for the reduction of foodborne pathogens on the contaminated melon rind. The plant-based antimicrobials reduced both bacterial population on all samples, regardless of the melon types, varieties, or growing location. The antimicrobial treatments showed better activity on *Salmonella* than *Listeria*. The effectiveness of antimicrobials was better on honeydews than cantaloupes.

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