

Title Biofilm Formation by *Salmonella* spp. on Cantaloupe Surfaces
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Abstract

In recent years *Salmonella* spp. have been implicated in numerous outbreaks linked to fresh produce, most notably, cantaloupe melons. Previous research in our laboratory has documented the inability of a variety of sanitizing rinses and other treatments to inactivate *Salmonella* inoculated onto cantaloupes. In addition, the efficacy of sanitizers decreased significantly when the organism was allowed to reside on the melon surface for more than 24 h. We speculated the increased contact time allowed for the formation of a bacterial biofilm prior to sanitation. The entrapment of cells of *Salmonella* within a biofilm is likely responsible for enhanced sanitizer resistance. Therefore, the goal of our research was to demonstrate that cells of *Salmonella* form biofilms on cantaloupe surfaces. Two outbreak-related strains of *Salmonella* were utilized in our study. Ten microliters of bacteria were spot-inoculated onto melon rinds in pre-marked areas, and melons were held at either 10 or 22°C. Biofilm formation was monitored using scanning electron microscopy (SEM) on excised portions of the melon rind at 2, 24, 48, and 144 h post-inoculation. Micrographs indicated that biofilm formation occurred rapidly following introduction of cells onto the melon surface. Fibrillar material was visible after just two h of inoculation, and cells were embedded in extracellular polymeric material within 24 h of storage at either temperature. These results indicate that *Salmonella* spp. are capable of rapidly forming biofilms on cantaloupe tissue and that biofilm formation could be the reason for the increased recalcitrance of attached bacteria to aqueous sanitizers.