

Efficacy of detergent rinse agents to recover pathogenic bacteria from the surface of fresh produce

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ABSTRACT:

Fresh produce has been implicated in several foodborne outbreaks. A primary site of microbial contamination for produce occurs on the surface during production and handling. An approach to reduce contamination is to sample the surface of produce. This study used different detergent agents at 22°C and 40°C to determine their efficacy for recovery of pathogenic bacteria, from surfaces of several produce types and examined survival of organisms in detergents over time. Strawberries, tomatoes and green leaf lettuce were dip inoculated in a 6-6.5 LOG CFU/ml cocktail of nalidixic acid resistant organisms. After drying, produce were rinsed with either 0.1 % sodium lauryl sulfate (SLS), 0.1% Tween 80, or water at different temperatures. Rinse solutions were plated onto Tryptic Soy agar supplemented with 50-ppm nalidixic acid (TSAN). About 4 LOG CFU/ml of *Salmonella*, and 3-LOG CFU/ml *Shigella* were recovered, with slightly lower recovery from tomatoes. Inoculated strawberries rinsed with SLS, displayed minimal recovery at ~1.5-LOG CFU/ml at 22°C, and <1-LOG CFU/ml at 40°C. When whole strawberries treated with SLS were analyzed, few *Salmonella* were recovered. Lack of recovery of *Salmonella* rinsed with SLS, suggests SLS may be inactivating *Salmonella*, especially at elevated temperatures. Detergent solutions were inoculated with 3-LOG CFU/ml cocktail and incubated for up to 32 hours at 22°C, and 40°C. Aliquots were plated onto TSAN at varying times. All solutions at 40°C allowed *Shigella* to grow. SLS gave initial drops in

Salmonella populations followed by slight recovery. SLS may cause an initial injury of *Salmonella*. While organisms were able to survive in detergents, the application of detergents to produce was no more effective in recovery of organisms from produce than water.