

Title Efficacy of adding detergents to sanitizer solutions for inactivation of *Escherichia coli* O157:H7 on Romaine lettuce

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Abstract

Numerous *Escherichia coli* O157:H7 outbreaks have been linked to consumption of fresh lettuce. The development of effective and easily implemented wash treatment could reduce such incidents. The purpose of this study was to evaluate the addition of food-grade detergents to sanitizer solutions for inactivation of *E. coli* O157:H7 on Romaine lettuce. Freshly-cut leaves of Romaine lettuce were dip-inoculated to achieve a final cell concentration of 7.8 ± 0.2 log CFU/g, air-dried for 2 h, and stored overnight at 4 °C. Leaves were then washed for 2 min in an experimental short chain fatty acid formulation (SCFA) or in one of the following solutions with or without 0.2% dodecylbenzenesulfonic acid or 0.2% sodium 2-ethyl hexyl sulfate: 1) deionized water; 2) 100 ppm chlorine dioxide; 3) 100 ppm chlorine; and 4) 200 ppm chlorine. Following wash treatment, samples were blended in neutralizing buffer (1:3) and surface plated on the selective media CT-SMAC. The efficacy of wash treatments, with or without the detergents, in inactivating *E. coli* O157:H7 cells on lettuce leaves were not significantly different. The most effective wash solution was SCFA, which was capable of reducing *E. coli* O157:H7 populations by more than 5 log CFU/g. The rest of the wash treatments resulted in a population reduction of less than 1 log CFU/g. The effectiveness of SCFA surpasses that of other sanitizer treatments tested in this study and requires further research to optimize treatments to preserve lettuce quality. Conventional detergents did not enhance the efficacy of any of the wash treatments tested during this study.