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Effect of Electrolyzed Water for Reduction of Foodborne Pathogens on Lettuce and Spinach

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KEYWORDS

electrolyzed water • lettuce • spinach

ABSTRACT

ABSTRACT: The ability of electrolyzed water (EW) to inactivate foodborne pathogens on the surfaces of lettuce and spinach was investigated. Lettuce and spinach leaves were inoculated with a cocktail of 3 strains each of *Escherichia coli* O157:H7, *Salmonella* Typhimurium, and *Listeria monocytogenes* and treated with acidic electrolyzed water (AC-EW), alkaline electrolyzed water (AK-EW), alkaline electrolyzed water followed by acidic electrolyzed water (sequential treatment, AK-EW + AC-EW), deionized water followed by acidic electrolyzed water (sequential treatment, DW + AC-EW), and deionized water (control, DW) for 15, 30 s, and 1, 3, and 5 min at room temperature (22 ± 2 °C). For all 3 pathogens, the same pattern of microbial reduction on lettuce and spinach were apparent. The relative efficacy of reduction was AC-EW > DW + AC-EW \approx AK-EW + AC-EW > AK-EW > control. After a 3-min treatment of AC-EW, the 3 tested pathogens were reduced below the detection limit (0.7 log). DW + AC-EW and AK-EW + AC-EW produced the same levels of reduction after 5 min when compared to the control. AK-EW did not reduce levels of pathogens even after a 5-min treatment on lettuce and spinach. Results suggest that AC-EW treatment was able to significantly reduce populations of the 3 tested pathogens from the surfaces of lettuce and spinach with increasing time of exposure.

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