

Title Safety and quality assessment of packaged spinach treated with a novel ozone-generation system

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Abstract

The quality and safety of packaged salad are major concerns to consumers. Ozone gas is a non-thermal processing technology capable of treating food to reduce pathogens. The ozone generation system (PK-1) used in this study consisted of a pair of electrodes with an adjustable gap inside a package. Individual, fresh, prepackaged, whole spinach leaves inoculated with *Escherichia coli* O157:H7 6460 were treated in packaging with ozone generated in air and oxygen. Samples were treated for 5 min and stored at room temperature (22 °C) or refrigeration (5 °C) for 0.5, 2, and 24 h. Gas composition and relative humidity were measured. All treated samples showed reductions in *E. coli* O157:H7 populations with the largest reductions (3–5 log₁₀ CFU/leaf) after 24 h of storage. After 5 min of treatment, ozone concentrations were 1.6 and 4.3 mg/L for air and oxygen gas, respectively. The concentrations of ozone decreased with time and were not detectable after 24 h. A 5-point Spinach Color Quality (SCQ) scale was established (5-best, 1-worst). Treated spinach showed discoloration with SCQ-values of 3.83 and 1.00 for air and oxygen gas exposed leaves after 24 h. These results indicate that the PK-1 system is capable of reducing *E. coli* O157:H7 in packaged spinach; however, minimizing quality changes after treatment requires further research.