

Title Potential of *Escherichia coli* O157:H7 to grow on field-cored lettuce as impacted by postharvest storage time and temperature

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Abstract

A recent development in iceberg lettuce harvesting is field coring, the technique of removing the outer leaves and the cores of the lettuce heads at the time of harvesting in order to reduce shipping waste and maximize production yield. However, this method may increase the potential for contamination during field procedures and therefore, it is important to evaluate the survival and growth of *Escherichia coli* O157:H7 on pre-cored lettuce under simulated field conditions. Using a coring knife artificially contaminated with 2×10^5 cells of *E. coli* O157:H7, the transfer of the pathogen to lettuce heads and subsequent growth of the pathogen at simulated field and refrigerated temperatures (30 and 5 °C) were examined. No significant ($P > 0.05$) growth or loss of viability of *E. coli* O157:H7 was noted at 5 °C during an 8 h incubation period. However, at 30 °C, significant ($P < 0.001$) increases in *E. coli* O157:H7 populations occurred between 0 to 4 h and 4 to 8 h. Regardless of whether *E. coli* O157:H7 were cold-stressed prior to use as inoculum, *E. coli* O157:H7 populations increased by more than 2.0 log cfu/g at 30 °C from 0 to 8 h. A single contaminated coring knife was found to successively inoculate at least nineteen lettuce heads. These findings suggest that preventing contamination of the coring knife and cored lettuce, as well as prompt chilling of freshly cored lettuce heads, are necessary steps to ensure the safety of field-cored iceberg lettuce.