Title Effects of packaging type and storage temperature on the growth of foodborne pathogens on shredded 'Romaine' lettuce

Author M. Oliveira, J. Usall, C. Solsona, I. Alegre, I. Viñas and M. Abadias

Citation Food Microbiology, Volume 27, Issue 3, May 2010, Pages 375-380

Keywords *Salmonella*; *Escherichia coli* O157:H7; *Listeria monocytogenes*; Fresh-cut vegetables; Modified atmosphere packaging

Abstract

Fresh produce can be a vehicle for the transmission of pathogens capable of causing human illnesses and some of them can grow on fresh-cut vegetables. The survival and growth of *Escherichia coli* O157:H7, *Salmonella* spp. and *Listeria monocytogenes* inoculated onto shredded lettuce was determined under modified atmosphere packaging conditions, at various storage temperatures. We also monitored changes in pH and gas atmospheres within the packages and the growth of psychrotrophic and mesophilic microorganisms. After pathogen inoculation, shredded lettuce was packaged in films of different permeability and stored at 5 and 25 °C. After 10 days at 5 °C populations of *E. coli* O157:H7 and *Salmonella* decreased approximately 1.00 log unit while *L. monocytogenes* increased about 1.00 log unit, in all package films. Moreover, the pathogens level increased between 2.44 and 4.19 log units after 3 days at 25 °C. Psychrotrophic and mesophilic bacteria had similar growth at both temperatures with higher populations in air than in the other atmospheres. The composition of the storage atmosphere within the packaging of lettuce had no significant effect on the survival and growth of the pathogens used in this study at refrigeration temperatures. The results obtained can be considered as a warning indicator, which reinforces the necessity for corrective measures to avoid contamination of vegetables.