Title Alternative disinfection techniques to extend the shelf life of minimally processed iceberg lettuce

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Citation Food Microbiology, Volume 27, Issue 2, April 2010, Pages 210-219

Keywords Silver; Hydrogen peroxide; Disinfection; Chlorination; Total plate count; *Pseudomonas*; *Enterobactericeae*; Yeast and moulds

Abstract

Chlorination continues to be widely used by the fresh-cut industry for washing and disinfecting minimally processed fruits and vegetables. However, as chlorination has been reported to produce unhealthy by-products such as, chloramines and trihalomethanes, many alternative methods have been reported in the literature. This study examined the use of silver and hydrogen peroxide as possible alternative to chlorination. The results revealed an obvious bactericidal effect of hydrogen peroxide, silver and their combination on spoilage organisms. Combination of electrochemically generated silver (5 ppm) and hydrogen peroxide (0.4 ppm) caused significant ($P < 0.05$) reduction in the total plate count (0.87 log), *Pseudomonas* (2.66 logs), *Enterobactericeae* (1.61 logs) and yeast and mould (1.60 logs) immediately after washing in comparison to water washed shredded lettuce. However, washing with chlorinated water (5 ppm) under same conditions revealed insignificant reduction in TPC (0.17 log), *Pseudomonas* (0.60 log), *Enterobactericeae* (0.15 log) or yeast and mould (0.81 log) counts. Results revealed also that both sources of silver (electrochemical silver and silver nitrate) have similar disinfecting effects, however, electrochemical silver maintained the quality of washed lettuce.