

Fate of foodborne pathogens in minimal processed orange and reduction of their growth using UV-C illumination

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Abstract

The consumption of minimally processed products increased in recent years and with it the concern of the occurrence of outbreaks due to foodborne. Chlorine is the most commonly used disinfectant, however there are concerns about the formation of carcinogenic chlorinated compounds and the limited effectiveness or completely ineffectiveness of chlorine solutions. The aim of this work was to study the survival and growth of *Escherichia coli* O157: H7, *Salmonella* and *Listeria innocua* and to evaluate the effects of two doses of UV-C illumination on reducing their populations in minimally processed orange 'Valencia late'. The results indicate that minimally processed orange was a good substrate for the growth of foodborne pathogens. The three pathogens were able to grow in oranges when stored at temperatures of 10°C or higher. When stored at 5°C the population remained constant over time, indicating the importance of maintaining a cold chain and of avoiding contamination. Concerning the use of UV-C as an eco-innovative disinfection system, the results showed that the efficacy of UV-C at 3.0 and 7.5 kJ/m² and sodium hypochlorite at 100 ppm is low for this type of product. The most effective treatment, 30 minutes after application, was (in general) sodium hypochlorite and after 6 days the best result was obtained with UV-C at 7.5 kJ/m², indicating the importance of good manufacturing practices in processing.