

Title Influence of spectral distribution on bacterial inactivation and quality changes of fresh-cut watermelon treated with intense light pulses

Author Ana Y. Ramos-Villarroel, Nicoleta Aron-Maftei, Olga Martín-Belloso and Robert Soliva-Fortuny

Citation Postharvest Biology and Technology. Volume 69, July 2012, Pages 32–39

Keywords Fresh-cut watermelon; Intense light pulses; Quality parameters; *Escherichia coli*; *Listeria innocua*

Abstract

The application of intense light pulses (ILP) is an emerging technology with interesting prospects regarding food preservation. However, information concerning the factors affecting the inactivation of microorganisms and their impact on the quality of fresh-cut fruit is scarce. In this study, the effects of spectral ranges on inactivation of *Escherichia coli* and *Listeria innocua* in fresh-cut watermelon were determined. In addition, the effect of ILP on the quality parameters of fresh-cut watermelon was evaluated. The effectiveness of ILP was significantly affected when the UV-portion of light was blocked, which resulted in lower log reductions for both microorganisms. Full-spectrum treatments with an overall fluence of 12 J/cm^2 reduced the *E. coli* populations by more than three log cycles. On the other hand, the initial loads of *L. innocua* were reduced by 2.79 log, demonstrating that this microorganism is less sensitive to ILP treatment than *E. coli*. The entire spectral range of ILP had a higher negative effect on the color, texture and headspace gas composition in comparison to treatments without UV light. This work demonstrates that a slight modification in the spectrum of ILP treatments, mainly in the UV portion, may have a negative impact on the effectiveness of the treatment.