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Title:

UV-C radiation as an effective non-thermal process for 'Cantaloupe' melon juice decontamination

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Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

Thermal pasteurization has negative impacts on overall quality characteristics of foods. UV-C radiation has a germicidal effect and has been applied to eliminate undesirable microorganisms in food products. This technology is more effective in liquid foods, being an alternative non-thermal processing that can be applied to fruit juices.

The objective of this study was to evaluate the effect of UV-C radiation on some quality characteristics and microbiological decontamination of cantaloupe melon (*Cucumis melo* L. var. *reticulatus*) juice, which is an excellent source of antioxidant compounds, such as vitamins, phenolics and carotenoids.

Cantaloupe melon juice was artificially inoculated with *Alicyclobacillus acidoterrestris* spores (spoilage indicator) and *Listeria innocua* (non-pathogenic surrogate of *L. monocytogenes*), used as indicators of the UV-C treatment efficacy. The initial concentration of both microorganisms was around 10^7 CFU/mL.

Juice was exposed to UV-C radiation at an intensity of 13.44 W/m^2 , during 5 and 20 minutes. Some physico-chemical characteristics (pH, colour and soluble solids content), total phenolics and antioxidant capacity were evaluated before and after treatments.

Exposure time affected significantly colour (very distinct alterations) and pH (slight increase from 6.3 ± 0.1 in fresh, to 6.7 ± 0.1 and 7.0 ± 0.1 after 5 and 20 min of radiation; values are mean \pm margin of confidence interval at 95%). The remaining characteristics were not affected by the radiation and were similar to the ones observed in fresh/untreated juice.

In terms of *A. acidoterrestris* spores, reductions of 0.8 ± 0.1 and 4.7 ± 0.1 log-cycles

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were observed after 5 and 20 minutes of radiation, respectively. For *L. innocua*, a reduction of 3.9 ± 0.7 log-cycles was attained after 5 minutes and, for the highest exposure time, no cells were detected.

Since UV-C was effective on microbial inactivation and was able to retain the most of quality parameters analysed, this technology can be considered as a promising alternative to traditional pasteurization of fruit juices.