

Thermosonication applied to kiwi peel – a mild technology for quality preservation

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Finding strategies to add value to waste parts of fruits for the development of healthy and affordable food products is important. Consumer trends are shifting towards healthier, minimally processed, and nature-friendly ingredients. Industries are also shifting to novel processing technologies, which retain quality as much as possible.

The objective was to develop a safe, high-quality kiwi (*Actinidia deliciosa* cv. Hayward) peel product by applying thermosonication as a preservation treatment. *Listeria innocua*, a non-pathogenic surrogate of *L. monocytogenes* was used as a safety indicator, and total chlorophylls and phenolic contents were evaluated.

Kiwi peels were removed, cut into small pieces, and artificially inoculated with *L. innocua* by immersion in a suspension of about 10^7 cfu/mL.

Conventional thermal treatments were performed at 55 °C (T55) and 60 °C (T60) for 30 and 15 minutes, respectively. These times allowed 5 log-cycles reductions of *L. innocua*. Thermosonication treatments were performed at the same temperatures and times (US+T55 and US+T60). *L. innocua* on kiwi peel was enumerated before and after treatments. Total chlorophylls and phenolic contents were also analyzed in fresh and treated samples.

Results showed that coupling temperature to ultrasound had a synergistic effect in *L. innocua* inactivation. For both temperatures, 6 log-cycles reductions were attained.

Chlorophylls content in kiwi peel was 199.82 ± 56.08 µg/g (on a dry basis, d.b.). This value decreased significantly after all treatments. However, US+T60 allowed the highest retention, 49%.

The total phenolic content in fresh peel was 5.38 ± 0.19 mg/g d.b. Thermosonication at 60 °C allowed total retention of phenolics, while decreases of 11, 40, and 56% were observed after the remaining treatments (US+T55, T60, and T55, respectively).

Thermosonication is effective in microbial inactivation, allowing the retention of some bioactive compounds in kiwi peel. It can be considered a potential strategy to add value to fruit wastes.

Keywords: Fruit wastes, *Listeria*, chlorophylls, phenolics

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