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# **6<sup>th</sup> International ISEKI-Food Conference**



*“Sustainable Development Goals in Food Systems:  
Challenges and Opportunities for the Future”*

## **BOOK OF ABSTRACTS**

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ONLINE

# **6<sup>th</sup> International ISEKI-Food Conference**

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## **Sustainable Development Goals in Food Systems: Challenges and Opportunities for the Future**

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### **BOOK OF ABSTRACTS**

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## #268: Inactivation kinetics of *Listeria innocua* in thermosonicated kiwi juice

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In fruit juice processing, traditional heat treatments such as pasteurization are usually used. However, this processing method may often induce undesirable quality changes in fruit juices. Alternatively, thermosonication has been found to have a great potential in microbial inactivation and fruit juices' quality retention.

The objective of this study was to evaluate thermosonication and thermal treatments' influence on the inactivation kinetics of *L. innocua* 2030c (a surrogate of the pathogenic *Listeria monocytogenes*) in kiwifruit (*Actinidia deliciosa* cv. Hayward) juice.

The kiwi peel was manually removed with a peeler to prepare the juice, and then flesh was sliced with a stainless-steel knife. The juice was extracted using a domestic centrifuge. The obtained juice was artificially inoculated with *L. innocua* subculture ( $\sim 10^9$  CFU/mL). The kiwi juice was adjusted to a pH of 3.6 by adding Cantaloupe melon (*Cucumis melo* L. var. *reticulatus*) juice, a natural component. Thermosonication was carried out in a water bath coupled with an ultrasound homogenizer at a constant frequency of 20 kHz, 80% amplitude and discontinuous pulsation (10s on, 5s off). The juice samples were submitted to thermosonication treatments at 45, 50 and 55°C for 15, 10 and 3 minutes, respectively. At the same temperatures, thermal treatments were performed as a control for 60, 25 and 10 minutes. Each experiment was repeated three times.

The Weibull model was used to fit all *L. innocua* log-survival data, based on regression analysis.

For thermal treatment at 45°C, the first decimal reduction time ( $\delta$ ) obtained was  $23.31 \pm 3.51$  min, while with thermosonication, the value was significantly reduced to  $3.19 \pm 0.59$  min. The same happens to the other temperatures, with  $\delta$  for thermal treatments at 50 and 55°C being  $5.06 \pm 1.73$  and  $2.50 \pm 0.70$  min, whereas, with thermosonication, the  $\delta$  decreased respectively to  $1.47 \pm 0.59$  and  $0.46 \pm 0.21$  min. These results proved the existence of a synergistic effect between temperature and ultrasounds, making it possible to apply mild heat treatment processes and improve the final product's quality.

Since thermosonication treatment was effective in *L. innocua* inactivation, this technology can be considered a successful alternative to fruit juices' conventional thermal treatment.

### Keywords

thermosonication, kiwifruit juice, thermal treatment, inactivation kinetics, *L. innocua*

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