Meetings International

18th International Conference on

FOOD MICROBIOLOGY

April 27-28, 2023 | Rome, Italy

Application of Sonication and Hypochlorous acid (combined and individual) against the growth of Listeria monocytogenes on baby Spinach leaves

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Ready-to-eat vegetables such as baby spinach are prone to bacterial contamination, predominantly from pathogens like Listeria monocytogenes, the leading cause of foodborne illness globally. Sonication is a novel nonthermal preservation technique widely used in the food industry for several purposes (e.g., degassing, emulsification, drying, and filtration). Combining sonication with other sanitisers has successfully reduced pathogens below the detection limit. This study used hypochlorous acid with sonication for 60 and 180 seconds. Additionally, ultrasound frequency was constant at 44 kHz throughout the three trials performed in this study. Moreover, the efficacy of combined treatment in plastic bags and glass beakers was also observed. A combination of hypochlorous acid (25 ppm) with sonication for 180 seconds obtained the highest reduction of 0.37 (55.03%) in L. monocytogenes from baby spinach leaves. Individually hypochlorous acid for 180 seconds had the highest 1.12 log reduction. However, sonication alone was ineffective enough to reduce the L. monocytogenes from baby spinach leaves. The treated baby spinach leaves samples on the 30s, 60s, 90s, 120s, 150s, and 180s did not show any significant difference in textural properties; however, mild dislodged organic matter was observed to interfere with the effectivity of hypochlorous acid during combination treatment. In a nutshell, this study shows the effectiveness of sonication and hypochlorous acid combined and individually.

Biography

Balwant Insa is a student of Master's in Applied Food Safety and Quality Management at the University of Greenwich (Natural Resource Institute). He has a research interest in foodborne pathogens and conducted his independent research at the university. He is actively looking for PhD opportunities.

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