FoodOmics 2024

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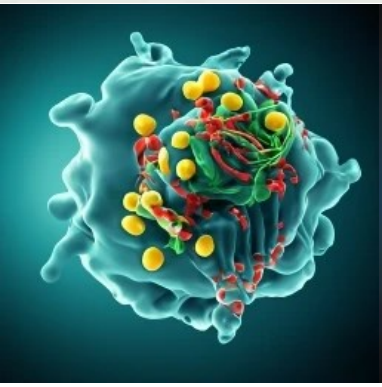
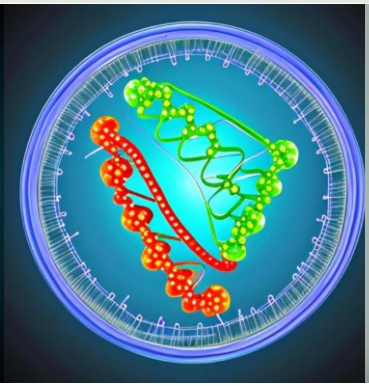
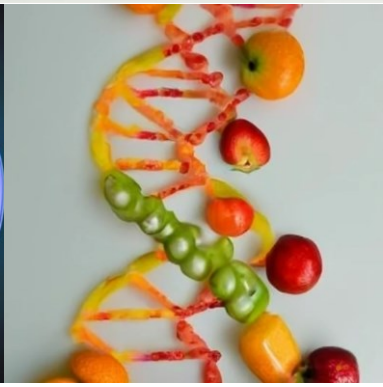

2009-2024, fifteen years on from.
Where are we now, what's next.

14-16 February, Cesena (Italy)

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ABSTRACT BOOK

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Department of Agricultural and Food Sciences
Alma Mater Studiorum Università di Bologna

Plasma activated water as alternative decontamination treatment for leafy vegetables and wash water.

Beatrice Cellini[1], Gebremedhin Gebremariam Gebremical[1], Federico Drudi[1], Santiago Condon Abanto[3], Raquel Virto Resano[3], Ines Echeverria Goni[3], Marco Dalla Rosa[1,2], Pietro Rocculi[1,2], Rosalba Lanciotti[1,2] and Lucia Vannini[1,2]

[1]Department of Agricultural and Food Sciences, University of Bologna, Piazza Goidanich 60, Cesena, FC, Italy
[2]Interdepartmental Centre for Agri-Food Industrial Research, University of Bologna, via Q. Bucci 336, Cesena, FC, Italy
[3]CNTA, San Adrian, Navarra, Spain

Decontamination of wash water and fresh produce is generally achieved through chemicals being sodium hypochlorite the most commonly used one. However, there are several concerns related to human health and environmental pollution which

lead to search for alternative methods. The aim of this study was to test effectiveness of plasma-activated water (PAW) in decontaminating baby leaf vegetables and the wash waters. For the wash waters, challenge tests with 3 pathogens – *Salmonella* Enteritidis, *Listeria monocytgenes*, *Escherichia coli* – were carried out by considering 2 contamination levels, i.e. 2-3 and 6 Log CFU/ml. Fresh produce was washed with PAW in comparison to chlorinated water by addressing natural microbiota. Also a shelf-life study was performed to test the effects of the treatments on the surviving indigenous microbiota over refrigerated storage. Results on wash waters showed that the highest efficacy was achieved only when initial contamination values were at the lowest levels regardless the target pathogen. Data on the baby leaf lettuce indicated that mesophilic bacteria were significantly reduced after 2 min of washing with both PAW and chlorine. However, prolonging washing up to 20 minutes did not significantly ($P>0.05$) improve the effectiveness. No significant differences were found for the counts of *Enterobacteriaceae*, while psychrotrophic bacteria seem to be the most sensitive population to chlorinated water after a 2-min washing. After 12 days of storage at 4°C, the baby leaf lettuce washed with chlorine showed black areas and loss of tissue consistency, whereas the PAW-treated vegetables maintained the visible quality and appearance at acceptable levels. Overall, proper tuning of processing conditions is necessary for wash waters by considering their specific features and particularly the contamination level, while PAW appears to be a promising innovative technology for leafy vegetable decontamination.

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