

# Ozone effect on some fruits and vegetables microbial contamination



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## Objective

The objective of this work was to study the effect of ozone in aqueous solution on the safety of red bell peppers, strawberries and watercress, evaluated, respectively, by *Listeria innocua*, total mesophiles and total coliforms enumeration.

## Introduction

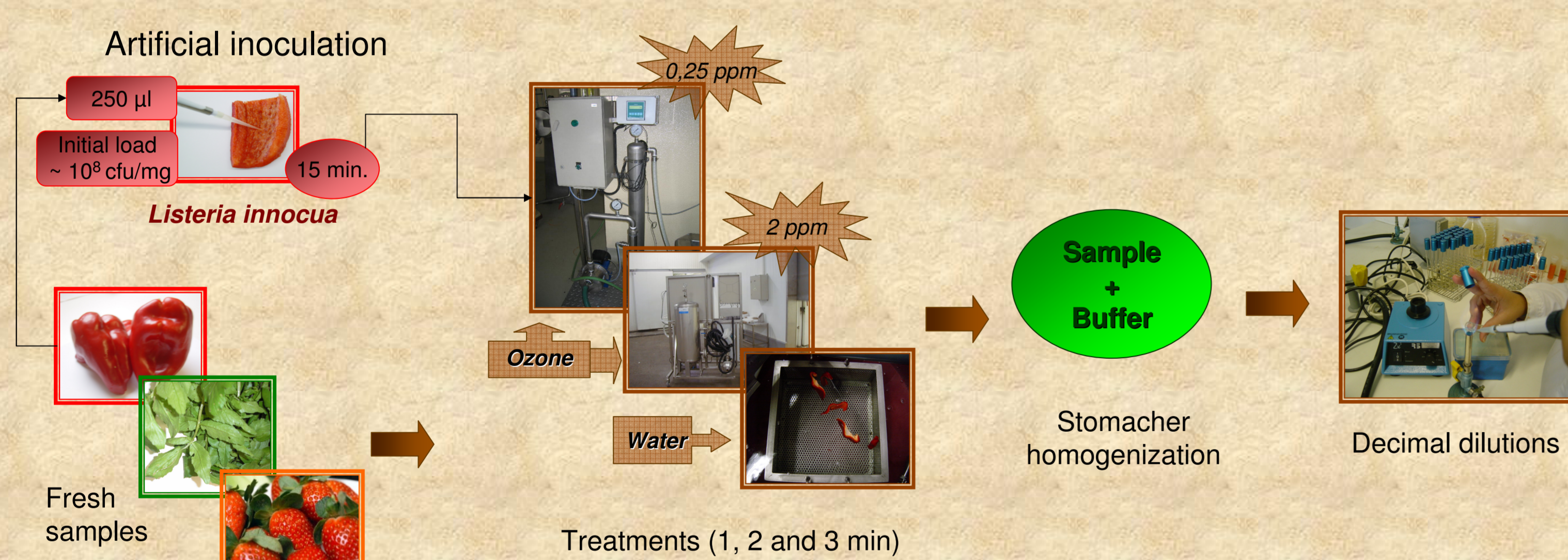
The use of ozone as a disinfectant agent has a potential application in the food industry, due to its powerful oxidizing capacity. In 1997, ozone was decreed a Generally Recognised as Safe (GRAS) substance for use as a food and food processing disinfectant or sanitizer, as long as good manufacturing practices were provided.

Fruits and vegetables are perishable foods and can be important sources of food borne diseases, since they are consumed uncooked or unprocessed. Preservation of their quality and safety usually involves technologies that prevent microbial growth.

## Materials and Methods

- A pilot plant ozone generator was used in experimental assays.
- Red bell peppers were artificially contaminated with *Listeria innocua* (initial load  $\sim 10^7$  CFU/mg).
- Strawberries, red bell pepper and watercress safety was evaluated in terms of total mesophiles, *Listeria innocua* and total coliforms, respectively.
- Contaminated samples were cut in small pieces and were emerged in ozonated water for 1, 2 and 3 minutes.
- Two different ozone concentrations were considered (0.25 and 2.00 ppm).
- Water washings for the same periods of time were carried out as control of the ozone treatments.

## Experimental Description



### Incorporation method

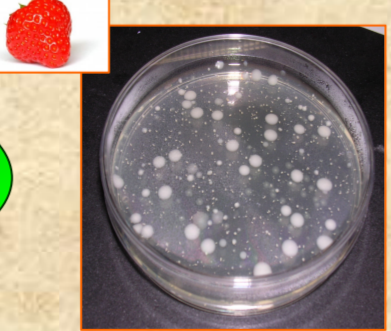


- VRBA medium
- PCA medium
- Palcam medium



30 °C

After 3 days



Total mesophiles



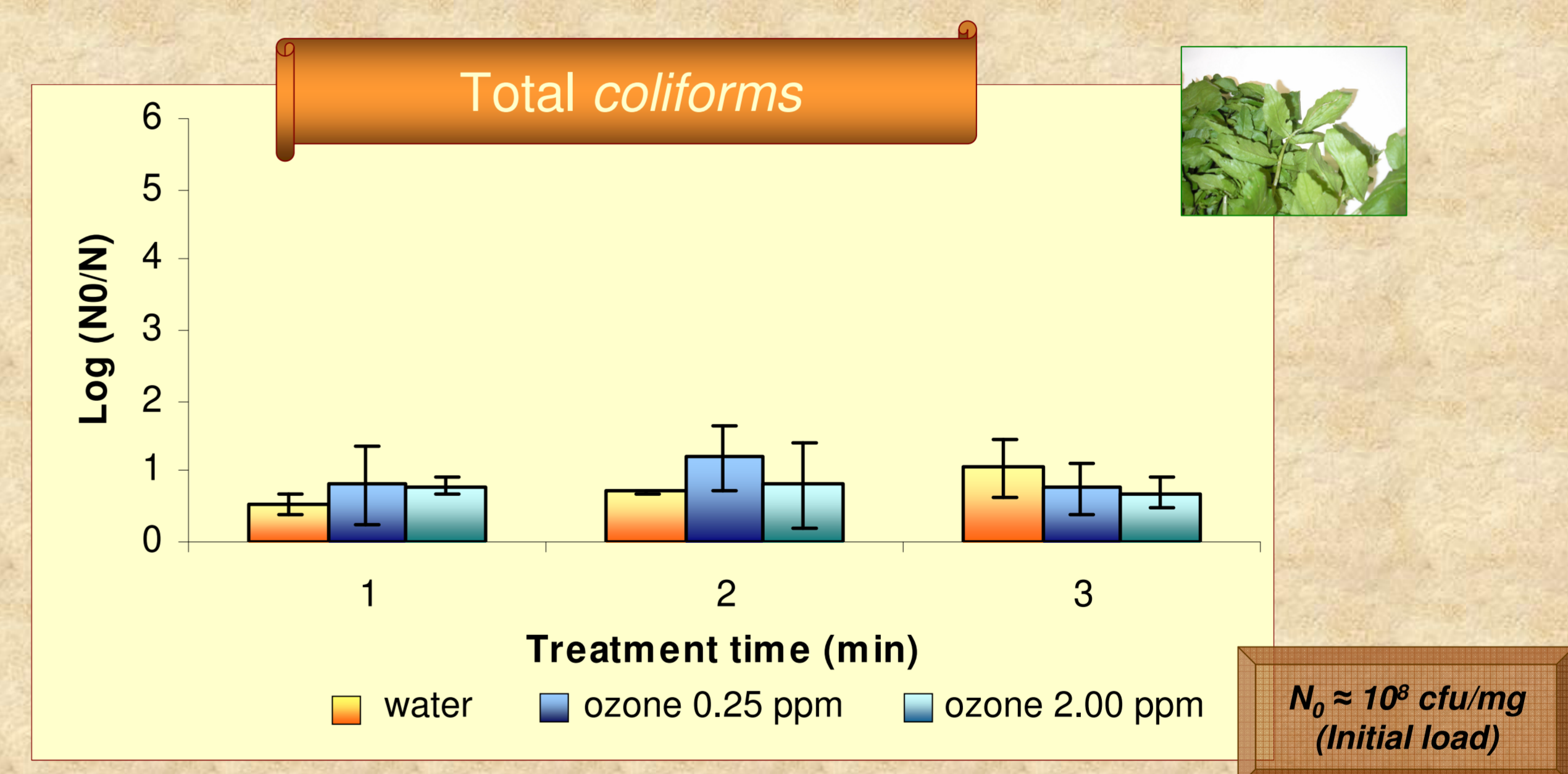
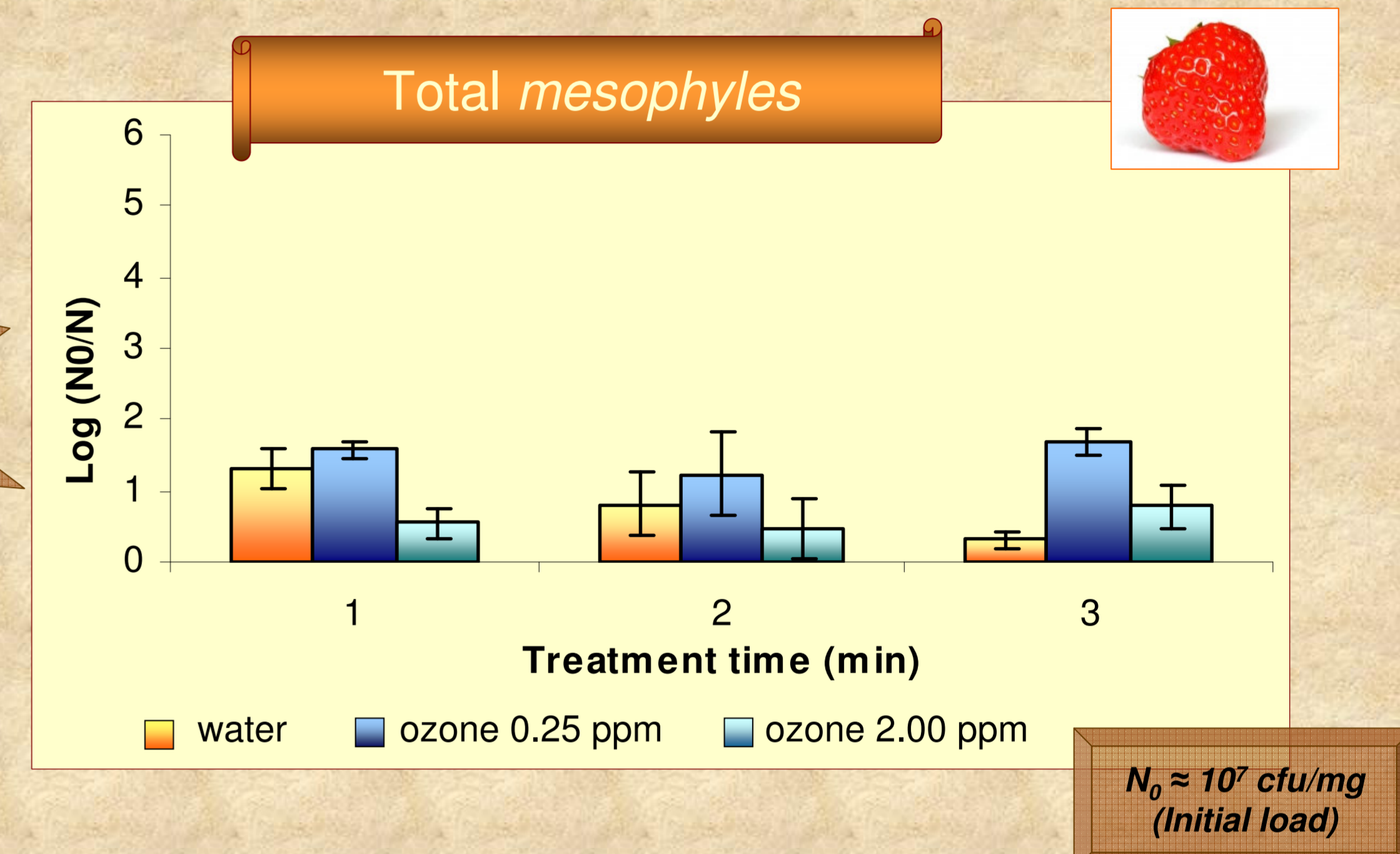
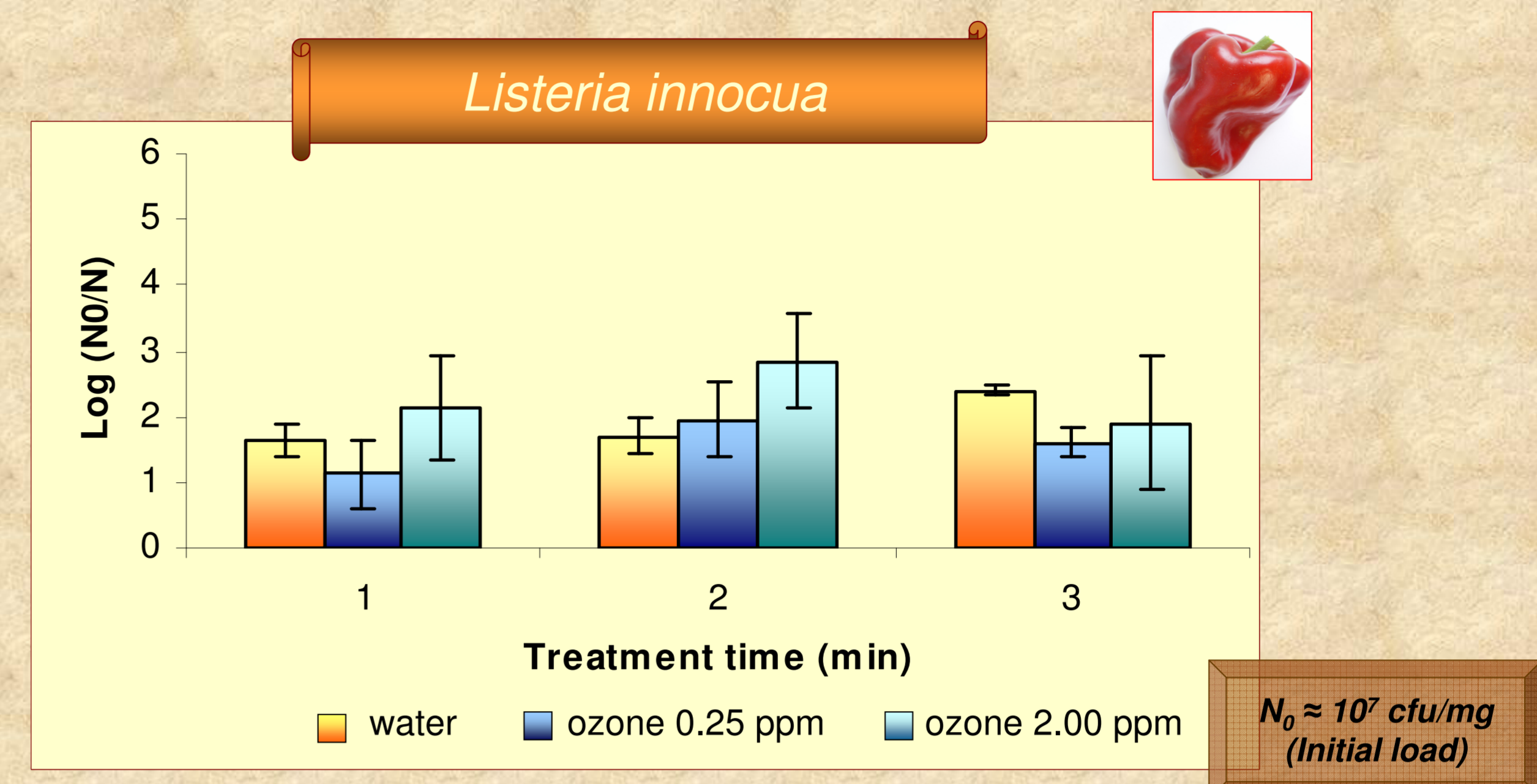
*Listeria innocua*

After 1 day



Total coliforms

## Results and discussion



- Microbial reductions observed in the products treated with ozone were similar to the ones obtained with water-washings
- The ozone concentration effect was not significant as well as the time of treatment considered for the microorganisms/products studied (Anova analysis were carried out)
- On average, 1.9, 1.0, and 0.8 log cycles reduction were observed for *Listeria innocua*, total mesophiles and total coliforms respectively, when ozonated water washings were considered

## Conclusion

Ozonated-water treatments were equivalent to water washings in terms of microbial reduction

## Acknowledgments

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