Abstract number: T2/P56
Theme:

Knowledge transfer and research collaboration between higher education, research organizations and industry in the field of ***Food Studies***

Title:

Development of innovative non-thermal pre-treatments for frozen vegetables: A case of collaborative effort between academic research and food industry

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INTRODUCTION

The development of innovative technologies promoting vegetables' safety is an actual concern. In vegetable processing industries, blanching is often used as a pre-treatment before freezing. This treatment aims at ensuring products' safety and quality from a microbiological and enzymatic point of view. However, quality is negatively affected by the thermal impact at microstructural level. Recently, innovative techniques such as ultrasonication, ultraviolet radiation and ozone treatments, seem a good solution for safety and quality improvements. However, the effectiveness of these technologies depends on the microbial sensitivity to the treatment used, and consequently variable results are commonly reported by researchers. These promising and alternative technologies may reduce microbial content, while retaining products' quality standards. The industrial interest for these treatments made possible one collaborative portuguese project between academic institutions and a food industry.

OBJECTIVES

The objective of this work was to study the effect of some innovative technologies (ozone in aqueous solution, ultraviolet light and ultrasounds) on safety (evaluated by Listeria innocua enumeration) and some quality features (pH, colour and texture) of red bell peppers used as case study, throughout 3 months of storage at -7ºC and -30ºC.

RESULTS AND DISCUSSION

The impact of the tested technologies in terms of bacteria reduction (at -7 and -30 ºC) was equivalent to a water washing.

In terms of quality parameters, colour was better retained during frozen storage when ozone treatment was applied. The other quality parameters were not affected by ozone, ultraviolet light and ultrasounds.

CONCLUSIONS

The industrial partner decided to include an ozone treatment in a stage previous to the freezing process of vegetables. It should be remarked that the quality of water (in terms of microbial contamination) used in the treatments were greatly improved when ozone in aqueous solution was used.

KEYWORDS: vegetables, quality, safety, non-thermal treatments

Acknowledgements: Fundação para a Ciência e a Tecnologia – FCT, AGRO project - 822

Thank you for your contribution.

Looking forward to see you at our conference!

Our very best regards,

Paola Pittia and Cristina Silva

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