Accepted Manuscript

Combining reformulation, active packaging and non-thermal post-packaging decontamination technologies to increase the microbiological quality and safety of cooked ready-to-eat meat products

Claudia N. Horita, Rafaela C. Baptista, Magdevis Y.R. Caturla, Jose Manuel Lorenzo, Francisco J. Barba, Anderson S. Sant'Ana

PII: S0924-2244(17)30598-8

DOI: 10.1016/j.tifs.2017.12.003

Reference: TIFS 2130

To appear in: *Trends in Food Science & Technology*

Received Date: 10 September 2017

Revised Date: 3 December 2017

Accepted Date: 4 December 2017

Please cite this article as: Horita, C.N., Baptista, R.C., Caturla, M.Y.R., Lorenzo, J.M., Barba, F.J., Sant'Ana, A.S., Combining reformulation, active packaging and non-thermal post-packaging decontamination technologies to increase the microbiological quality and safety of cooked ready-to-eat meat products, *Trends in Food Science & Technology* (2018), doi: 10.1016/j.tifs.2017.12.003.

Abstract

Background

Cooked ready-to-eat (RTE) meat products are subjected to contamination of spoilage microorganisms such as lactic acid bacteria and pathogens such as *Listeria monocytogenes*. These microorganisms contaminate cooked RTE meat products after the cooking step and may further grow during shelf-life potentially leading to spoilage or foodborne diseases, respectively. In the current context of salt, fat and chemical preservatives reduction in meat products formulations, a combined strategy that considers the development of more robust formulations, active packaging and the use of non-thermal post-packaging decontamination strategies seems required to ensure shelf-stable and safe RTE cooked food products.

Scope and approach

The main objective of this review was to discuss the aspects related to reformulation, active packaging and the application of non-thermal decontamination technologies at the post-packaging step of cooked RTE meat products, their advantages, limitations and main challenges for their implementation.

Key findings and conclusions

In general, post-packaging decontamination technologies aim to reduce or inactivate pathogens and spoilage microorganisms present on the surface of ready-to-eat meat products. Low-temperature plasma, high-pressure processing (HPP), pulsed electric fields, pulsed ultraviolet light and ultrasound are promising alternatives in this segment. However, the choice of the most appropriate approach for post-packaging decontamination of ready-to-eat meat products depends on the type of product and the technological objectives. Meat products formulation and packaging material properties should be considered while defining a post-packaging decontamination approach. Although they are advantageous, non-thermal technologies may present certain limitations such as the increase of oxidative reactions over the shelf-life.