P-006 - NON-THERMAL SYNERGISTIC APPROACH TO LISTERIA MONOCYTOGENES INACTIVATION IN MILK: THE COMBINED EFFECT OF HIGH PRESSURE AND BACTERIOPHAGE P100

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Background

Regarding the increasing demand in the food market for reducing the use of chemical additives and environmentally harsh chemical sanitizers and disinfectants, bacterio(phages) could be considered a natural alternative that represents a renewed technology for food decontamination and preservation; it is an eco-friendly technology, which minimizes the impact on the nutritional and organoleptic properties and, at the same time, the endogenous and often beneficial microbiota is preserved. Despite the promising results obtained from phage application towards food decontamination, a noticeable bacterial regrowth has been observed during refrigerated storage of bio-treated foods, especially in studies targeting *Listeria monocytogenes*.

The objective of the present work was to evaluate the effect of synergistic process which combines mild high hydrostatic pressure – HHP and phage Listex™ P100 as a new non-thermal process for *L. monocytogenes* decontamination in milk.

Method

Two batches of UHT whole milk were inoculated with phage P100 with a final MOI of 10000 and 10 to 10^4 and 10^7 log (CFU/mL) of *L. monocytogenes*, respectively. One set of samples was subjected to mild HHP (300 MPa, 5min, 10 °C) and other set directly stored at atmospheric pressure (0.1 MPa) under refrigeration (4° C, non-pressure treated). Stability of P100 inoculated in milk was accessed at pre-set time intervals (0, 1.3 e 7 days) in non- and pressure-treated samples. Additionally, a third set was inoculated only with *L. monocytogenes* and submitted to a conventional heat treatment (pasteurization – 72 °C / 15s).

Results & Conclusions

Results from pressure treated samples with final MOI 10000 demonstrated cultural undetectable *L. monocytogenes* cells in the milk during all refrigerated storage (4 °C), being comparable to the results obtained from pasteurization. Otherwise, pressure treated samples with final MOI 10 resulted in a 1.08 ± 0.16 log cycles reduction followed by a bacteriostatic effect of up to the 7 days of storage. Phage particles were stable during all storage in milk and no significant differences were observed in the phage titers (P >0.05). In non-pressure treated samples inoculated with P100, *L. monocytogenes* regrowth was observed during the storage period. The pressure-phage system is a promising minimal food processing option, which offers freshness and unique properties to the raw food.

References & Acknowledgments

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