

ON THE ASSESSMENT OF AN AGAR OVERLAY METHOD FOR THE RECOVERY OF HEAT-INJURED *LISTERIA INNOCUA* IN PARSLEY

Fátima A. Miller, Bárbara F. Ramos, Teresa R. S. Brandão, Paula Teixeira, Cristina L. M. Silva

Escola Superior de Biotecnologia, Universidade Católica Portuguesa

E-mail: clsilva@esb.ucp.pt



INTRODUCTION

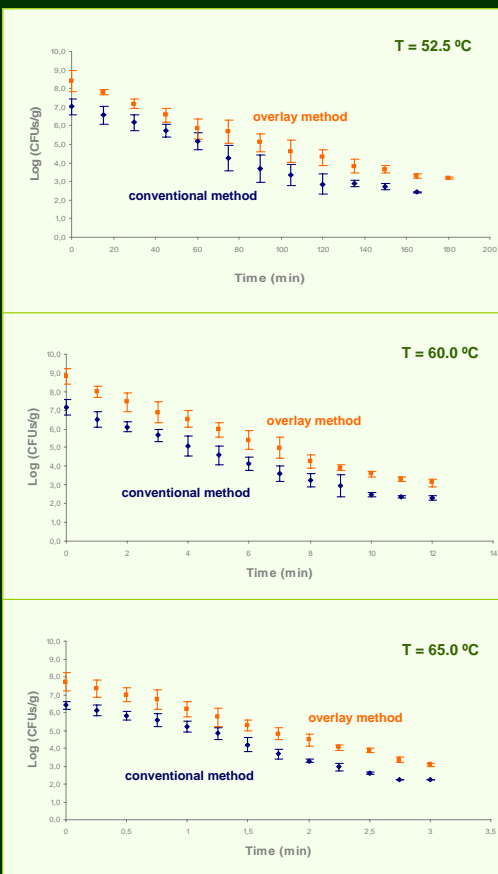
The development of methods to detect pathogenic bacteria, such as *Listeria monocytogenes*, in thermally processed foods is crucial for assessing products' safety. Current methods for *Listeria* detection require enrichment techniques. When the objective is to quantify bacterial cells, researchers reduce the enrichment steps, choosing merely a selective media for microbial enumeration. However, the selective agents present in these media inhibit repair of injured cells, that might recover and regain their pathogenicity.

OBJECTIVE

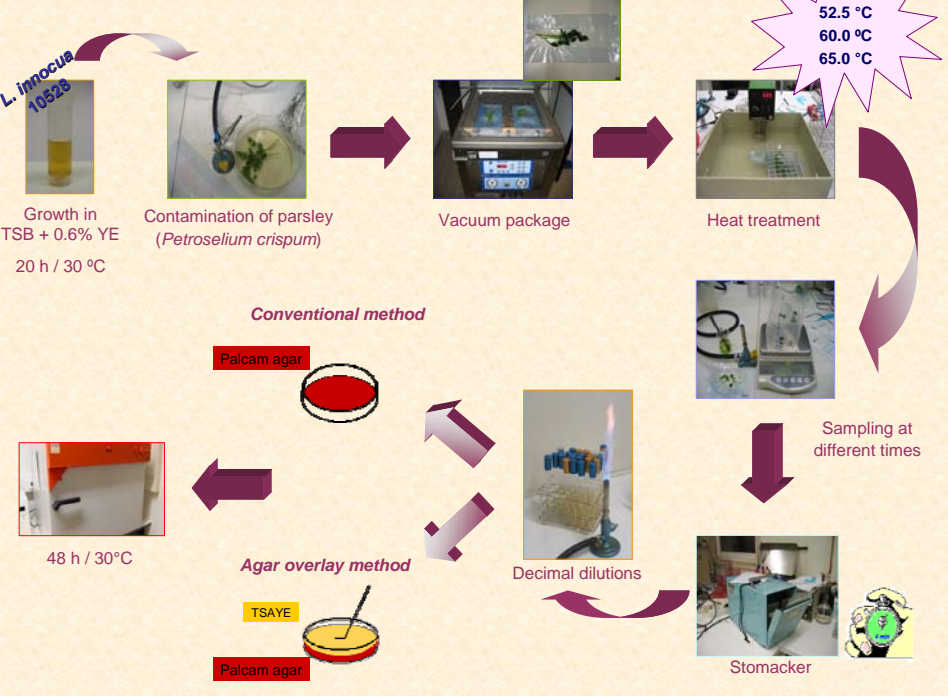
The objective of this work was to assess a methodology for the detection of heat-injured *Listeria innocua*. A non-selective medium (Tryptic Soy Agar + 0.6% Yeast Extract; TSAYE) was overlaid on a selective medium (Palcam agar + selective supplement)^[1]. Studies were carried out in parsley, using *L. innocua* as an indicator of the pathogenic species.

RESULTS

Thermal inactivation of *L. innocua* 10528 in parsley



MATERIAL AND METHODS



Using the conventional method (Palcam agar + selective supplement), typical *Listeria* colonies were obtained.

In overlay method, *Listeria* cells were inoculated on the top of media using spiral plating. The top layer of TSAYE allowed heat-injured cells to recover. After diffusion of selective agents from Palcam agar to TSAYE, typical *Listeria* colonies were formed with inhibition of the parsley's natural microflora.

Higher colonies were observed when the overlay method was used, allowing an easier bacteria enumeration.

Higher microbial counts were observed when the overlay method was used → at least one log difference was observed during all inactivation process. Similar results were obtained for all temperatures tested.

CONCLUSIONS

This methodology ensures reliable heat-injured cells enumeration, attaining accurate quantification of bacteria. This is crucial in thermally processed foods for assessing products' safety.

REFERENCES

[1] Kang, Dong-Hyun and Fung, Daniel Y.C. (2000). Application of thin agar layer method for recovery of injured *Salmonella typhimurium*. International Journal of Food Microbiology. 54: 127-132.

ACKNOWLEDGEMENTS

The author Fátima A. Miller would like to thank the Ph.D. grant SFRH/BD/11358/2002 to FCT. Teresa R.S. Brandão also acknowledges financial support to FCT (grant SFRH/11580/2002).