

Process optimization and shelf-life determination of processed food. Review of same case studies.

Elsa M Gonçalves^{1,2*}, Marta Abreu^{1,3}, Teresa R.S. Brandão⁴, Cristina L M. Silva⁴

¹Unidade de Tecnologia e Inovação, Instituto Nacional de Investigação Agrária e Veterinária, 2780-157 Oeiras, Portugal.

²GeoBioTec - Geobiociências, Geoengenharias e Geotecnologias, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Caparica, Portugal

³LEAF (Linking Landscape Environment Agriculture and Food) Research Centre, School of Agronomy, University of Lisbon, Tapada da Ajuda, 1349-017 Lisboa, Portugal.

⁴Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Diogo Botelho 1327, 4169-005, Porto, Portugal

* e-mail [elsa.goncalves@iniav.pt]

Consumers expect processed foods to be safe and have sensory and nutritional quality characteristics similar to fresh products. Food processing has three main objectives: a) to make food safe; b) to provide products with high-quality attributes, transforming them into more convenient or attractive forms for consumption, and c) to extend their shelf life. Food processes, which involve thermal treatments (e.g., blanching, pasteurization, sterilization, or drying) and storage that resort to the use of temperatures such as freezing and refrigeration, are processes that depend on the applied temperature-time binomials [1].

Different mathematical models that describe and/or predict changes in the characteristics of processed foods under constant real or dynamic conditions are fundamental tools in the development of new products, process optimization, and determination of the lifetime of these foods in different scenarios. In this study, the quality of certain vegetables (carrots, pumpkin, broccoli) was modelled as a function of specific temperature profiles to which they were subjected. Optimisation of the blanching operation according to different quality attributes, inactivation of peroxidase activity [2, 3] and determination of their shelf life during frozen storage under isothermal and non-isothermal conditions will be presented and discussed [4, 5].

References:

- [1] Essentials of thermal processing. Turcker, G., Featherstone, S. (Eds). Pndicherry, Blackwell Publishing Ltd, 2011.
- [2] Gonçalves, E.M., Pinheiro, J., Abreu, M., Brandão, T.R.S., Silva, C.L.M. Journal of Food Engineering, 97 (2010) 574.
- [3] Gonçalves, E.M., Pinheiro, J., Abreu, M., Brandão, T.R.S., Silva, C.L.M. Journal of Food Engineering, 81 (2007) 693.
- [4] Gonçalves, E.M., Pinheiro, J., Abreu, M., Brandão, T.R.S., Silva, C.L.M. International Journal of Refrigeration, 34 (2011) 2136.
- [5] Gonçalves, E.M., Pinheiro, J., Abreu, M., Brandão, T.R.S., Silva, C.L.M. Journal of Food Processing and Preservation, 44 (2020) e14953.