

Study and development of innovative seafood products through the application of emerging process technologies

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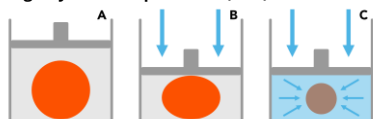
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State of the art

Thanks to the growing consumer demand for minimally processed foods with an extended shelf-life, both scientific and industrial research are investigating the application of innovative processes to ensure safe, high quality food products. Among the various food categories, seafood products have been the subject of a significant increase in demand, thanks to their interesting nutritional properties (FAO, 2020). Fresh fish products are highly perishable due to their biological composition. Heat treatment provides efficient control of microorganisms but causes significant losses of thermolabile compounds and sometimes negative changes in the sensory, physico-chemical and nutritional characteristics of food. Furthermore, through the use of non-thermal treatments, it may be possible not only to improve the hygienic and sanitary quality of products, but also the quality attributes, as well as to reduce the energy costs associated with any technological operations. Moreover, thanks to these technologies it would be possible to reduce food losses and environmental impact as green technologies. (Economou and Boziaris, 2021).

PhD Thesis Objectives and Milestones

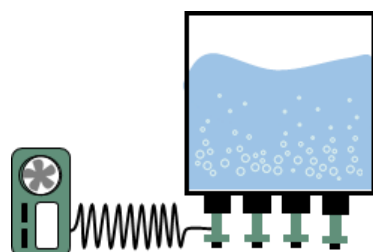
In this context, the objective of this PhD project is to evaluate the effectiveness of US, PEF, HPP and CAP as a unitary operation, or in combination with each other, to obtain a sufficient reduction of microbial load for fresh fish products with a longer shelf-life, and modulation of mass transfer phenomena for innovative seafood production. The aim of the project is therefore to obtain innovative food products, not only in terms of stability, but also with new rheological, chromatic, and structural characteristics. The understanding of the phenomena affecting the studied products will be undertaken through the evaluation of the chemical-physical and microstructural changes of the matrices, following the different process parameters for each used technology. The project can be subdivided into the following activities according to the Gantt diagram reported in the Table below.



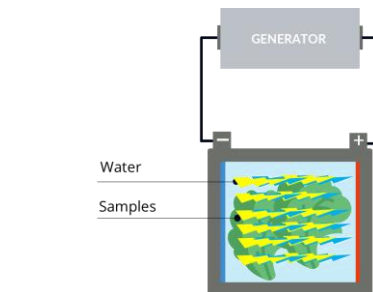
Cold plasma (CAP)



Power Ultrasound (US)



Pulsed Electric Field (PEF)

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Selected references

Economou, S. I., & Boziaris, I. S. (2021). Non-Thermal Methods for Ensuring the Microbiological Quality and Safety of Seafood. *Applied Sciences*, 11(2).

FAO. (2020). The State of World Fisheries and Aquaculture 2020. Sustainability in action. Fao. <https://doi.org/10.4060/ca9229en>

