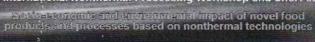
## Proceeding of the IFT-EFFoST 2018 International Nonthermal Processing Workshop and Short course

Socio-economic and environmental impact of novel food products and processes based on nonthermal technologies

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## INFLUENCE OF COMMINUTION DEGREE ON THE PEF-ASSISTED EXTRACTION OF HIGH-ADDED VALUE PHENOLIC COMPOUNDS FROM ARTICHOKE BRACTS

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The concept of "agri-food wastes valorisation" has become of great importance in the last decades, due to the possibility of extracting valuable bioactive compounds to be potentially used as supplements and nutraceuticals in feed, food, pharmaceutical and cosmetic sectors. Pulsed electric field (PEF)-assisted extraction has showed the potential to improve the efficiency of conventional extraction processes, even thought more investigation is needed including the effects of raw material properties (e.g., size, conductivity, moisture content) on the yield of the extracts.

In this work, the effect of the size of artichoke bracts of circular shape (0.5 - 3 cm in diameter) and of PEF treatment parameters (E = 0.5 - 5 kV/cm;  $W_T = 1 - 20 \text{ kJ/kg}$ ) on the cellular permeabilisation degree of tissue, as well as on the extractability of phenolic compounds, was investigated. Optimal PEF conditions (3 kV/cm; 5 kJ/kg) were chosen on the basis of impedance measurements and used for the subsequent PEF-assisted extraction tests, which were carried out for 6 h in pure water at room temperature. The obtained extracts were then analyzed in terms of total phenolics content and FRAP antioxidant power. Results showed that the permeabilization effect of cell membranes induced by PEF led to a greater extraction yield of phenolic compounds (+175% on average) with respect to the control samples. Moreover, the smaller the size of artichoke discs, the greater the initial diffusion rate. Coherently, FRAP values of extracts from PEF treated artichoke discs resulted to be higher (+190% on average) than those detected for untreated ones. However, the higher the comminution degree, the lower the percentage increase in the extraction yield from PEF treated samples as compared with the control ones. These results demonstrated the efficacy of PEF in avoiding the need for high comminution degrees of the raw materials, with subsequent reduction in operative costs and a better preservation of antioxidant compounds.