

Effect of pulsed electric fields on the recovery of antioxidant protein extracts from fish side streams

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Abstract

Fish side streams represent between 20-80% of the weight of fish, and their disposal represents an environmental and economic problem. These side streams contain proteins and antioxidant compounds that give them added value. In order to valorise these side streams, an extraction assisted by pulsed electric fields (PEF) was carried out to obtain proteins and compounds with antioxidant activity. An extraction for the same time but without PEF pre-treatment was used as a control. The side streams used were head, skin, viscera and backbone from sea bass. The antioxidant capacity was measured by two complementary methods, TEAC and ORAC. The results showed that in the case of head and skin, treatment with PEF notably improved protein extraction by 37.7 and 37.8%, respectively. However, for viscera the best values were achieved with the control extraction. Finally, backbone did not show significant differences in protein recovery between PEF-assisted extraction and control extraction. Regarding antioxidant capacity, the results followed the same trend as for proteins. For head and skin, the pre-treatment with PEF increased the extraction of antioxidant compounds, improving the TEAC values by 21.74 and 29.11% respectively. On the other hand, ORAC results increased 22.11% for head extracts and 40.93% for skin extracts. In the extracts obtained from the viscera, the TEAC and ORAC values were better in the control sample, being 21.43% and 24.82% higher, respectively. The antioxidant compounds present in the samples may be the bioactive peptides, but a more exhaustive analysis using chromatographic techniques would be necessary to complete the information. Therefore, it has been seen that PEF-assisted extraction can be a good strategy to increase the recovery of proteins and antioxidant compounds from fish side streams like head or skin, but not for viscera and backbone.

Keywords

Fish side streams; proteins; antioxidant; pulsed electric fields

