
Effect of high pressure on structure and nutritional properties of raw salmon flesh

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Atlantic salmon (*Salmo salar*) is one of the most eaten fish in Europe, known for its high unsaturated fatty acid and protein content. However, it is a fragile product, which after slaughter is rapidly altered by chemical, enzymatic and microbiological phenomena. In this context, high pressure can be used for preserving this product.

High pressure can alter the properties of the macromolecules, particularly proteins, which account for almost 70% of the dry matter in salmon. The alteration of these molecules by high-pressure treatment can therefore alter the nutritional and organoleptic properties of the product.

Understanding the biochemical mechanisms that lead to changes in the characteristics of salmon could make it possible to control the high-pressure process to improve the shelf life of salmon without affecting consumer acceptability, or conversely to use the new properties of salmon proteins and muscle to elaborate innovative products.

This study aims to evaluate the effect of high pressure treatments on salmon proteins, in order to explain the consequences of the process on its organoleptic and nutritional qualities.

The effect of high pressure on muscle microstructure, color and protein digestion was studied.

Results show a reduction in the size of the fibres and an increase in the size of the extracellular spaces. In addition, pressure induces an increase in protein oxidation rate and modifications of tertiary and secondary structures. The quantity of helix- α structures is reduced by the pressure in correlation with an increase in aggregated β -sheets. With regard to in vitro pepsic digestion, treatments at 600 MPa increase the maximum digestion rate and reduces the half-digestion time from 200 MPa. Moreover, pressure has little effect on the proportion of different amino acids.

This study highlighted changes in protein structure and digestion of salmon fillet after high-pressure treatment.