

IMPACT OF HIGH-INTENSITY ULTRASOUND PROBE ON THE FUNCTIONALITY OF EGG WHITE PROTEINS

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Abstract

High-intensity ultrasound represents a non-thermal processing method that has been extensively researched and used in the last decade. The application of power ultrasound offers the opportunity to modify and improve some technologically important compounds which are often used in food products, such as proteins. The focus of this research was to evaluate the effect of high-intensity ultrasound on egg white proteins (EWPs) with an objective to improve their functional properties.

In this study, 10% (w/w) aqueous solution of egg white was treated with ultrasound probe which frequency was 20 kHz and treatments were performed for 5, 10, 15 and 20 min. The effect of the treatment was examined for aforementioned properties: the change of pH and temperature, solubility, foaming by a whipping method, emulsifying by turbidometric technique, sulfhydryl content (exposed and total SH groups), antioxidant and antimicrobial activity and susceptibility of treated samples to enzymatic hydrolysis.

Ultrasound affected functional properties of egg white proteins and improved antioxidant and antimicrobial activity. Furthermore, the samples showed an increased concentration of the total SH groups, while the concentration of exposed SH groups was not affected. pH did not change significantly upon the ultrasound treatment, while the temperature of the egg white solutions increased.

These results suggest that high-intensity ultrasound probe can be used for improvement of the functionality of the EWPs and thus it could be potentially applied in the food industries. The trials reported here may represent relevant information to consider when attempting the use of high-intensity treatment for improving functional properties.

Key words: *High-intensity ultrasound probe, Egg white protein, Functional properties, Antioxidant and antimicrobial activity.*