Slovak Society of Chemical Engineering

Institute of Chemical and Environmental Engineering

Slovak University of Technology in Bratislava

PROCEEDINGS

42nd International Conference of Slovak Society of Chemical Engineering

Hotel Hutník

Tatranské Matliare, Slovakia

May 25 – 29, 2015

Editor: prof. Jozef Markoš

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Proceedings of the 42nd International Conference of SSCHE
Tatranské Matliare, May 25 – 29, 2015

ISBN: 978-80-89475-14-8
EAN: 9788089475148

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ACKNOWLEDGEMENT

This conference was organized with the support of the Ministry of Education, Science, Research and Sport of the Slovak Republic within the Research and Development Operational Programme for the project "University Science Park of STU Bratislava", ITMS 26240220084, co-funded by the European Regional Development Fund.

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Knezevic-Jugovic, Z., Jovanović, J., Stefanović, A., Jakovetic, S., Grbavčić, S., Elmalimadi, M., Bugarski, B.: Hydrolysis of egg white and wheat proteins with protease from bacillus licheniformis: fractionation and identification of bioactive peptides, Editor: Markoš, J., In *Proceedings of the 42nd International Conference of Slovak Society of Chemical Engineering*, Tatranské Matliare, Slovakia, 753–753, 2015.

Hydrolysis of egg white and wheat proteins with protease from Bacillus licheniformis: Fractionation and identification of bioactive peptides

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Key words: antioxidant peptides, membrane ultrafiltration, egg white proteins, gluten, enzymatic hydrolysis

Wheat gluten is a relatively inexpensive industrial byproduct from wheat starch processing, and in Europe also from manufacturing of bioethanol fuel. Egg producers are also faced with problems of excess of egg white because mayonnaise industry and bakery industry use relatively high egg yolk amounts and egg white is the remainder. Of high importance is the production of new value-added products based on gluten and/or egg white proteins with improved properties and specialized functionality to be used in food and biobased consumer products.

The objective of this research was a production of both wheat gluten and egg white protein hydrolysates with improved antioxidant properties. For this purpose, both substrates were pretreated by thermal treatment and then intensively hydrolysed with a commercial food-grade bacterial protease, Alcalase. Thus, the obtained hydrolysates were further separated by sequential ultrafiltration into four peptide fraction viz. Fraction I (> 30kDa), II (10 - 30 kDa), III (1 - 10 kDa) and IV (< 1kDa) which were investigated in terms of their antioxidant activity. The antioxidant activity of hydrolysates and peptide fractions were evaluated using 1,1-diphenyl-2-picrylhydrazyl (DPPH), 2,2′-azinobis(3-ethylbenzothiazoline-6-sulphonic acid) diammonium salt (ABTS) radical scavenging assays and measuring ferric reducing antioxidant power assay. Scavenging of 2,2′-diphenyl-1-picrylhydrazyl (DPPH) and 2,2′-azinobis(3-ethylbenzothiazoline-6-sulphonic acid) diammonium salt (ABTS) by Fraction III, prepared with gluten protein was found to be significantly higher than other gluten or egg white fractions. The results show that the fractionated hydrolysates were superior to the original hydrolysate in the antioxidative activity tested in all cases and can be concluded that by combining thermal pretreatment and controlled enzymatic hydrolysis, the hydrolysates with improved antioxidant properties can be produced enhancing utilization of egg white and gluten in food products.

ACKNOWLEDGEMENT
This work was supported by EUREKA Project E!6750 and Innovative project “Production of new dietary formulations based on natural protein with antioxidant and antitumor effect” from the Ministry of Education, Science and Technological Development of the Republic of Serbia.