

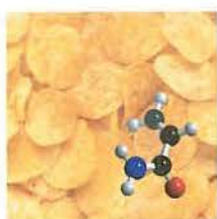
# BOOK OF ABSTRACTS

International conference on new knowledge on  
chemical reactions during food processing and storage

# CHEMICAL REACTIONS IN FOODS VII

November 14–16, 2012  
Prague, Czech Republic

J. Pulkrabová, M. Tomaniová, V. Godulová, K. Cejpek and J. Hajšlová  
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Edited by  
Jana Pulkrabová, Monika Tomaniová, Vanda Godulová, Karel Cejpek and Jana Hajšlová

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# **CHEMICAL REACTIONS IN FOODS VII**

**November 14–16, 2012 • Prague • Czech Republic**  
Masaryk College Conference Centre

Organized by:

**Institute of Chemical Technology, Prague, Czech Republic**  
**Department of Food Analysis and Nutrition**

**&**

**Food Research Institute Prague, Czech Republic**

**&**

**Czech Chemical Society**

**Section of Food and Agricultural Chemistry**

**&**

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**ELECTRON BEAM RADIATION APPLIED TO PORTUGUESE CHESTNUTS (*CASTANEA SATIVA* MILL.): EVALUATION OF THE EFFECTS ON NUTRITIONAL PARAMETERS**

**Márcio Carochó<sup>1</sup>, Amílcar L. Antonio<sup>2\*</sup>, Albino Bento<sup>3</sup>, Iwona Kaluska<sup>4</sup>, Isabel C. F. R. Ferreira<sup>5</sup>**

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Chestnuts are a widely consumed nut around the world, being China the biggest producer. Portugal represents 4% of its worldwide production with a gross weight of 22105 tons of chestnut in 2010, and an income of 15 M€. The Trás-os-Montes region produces 75% on the nation's chestnuts being one of its main economic resources. Storage of these nuts is an important step during processing to avoid rotting related to their relatively high metabolic activity. Until 2010 the most common treatment for post-harvest desinfestation was methyl bromide, a widely used fumigant which was banned in the European Union under the Montreal protocol due to its toxicity and deleterious effect on the environment [1]. Other treatments like temperature, high pressure blast, hot water dip and other fumigants still pose quite a few disadvantages [2]. Food irradiation processing has been introduced as a safe and environment friendly alternative for conservation, being used in several products such as meat, fish or fruits [3]. Previous studies of our research group showed that gamma radiation had no major negative effect on the nutritional value of chestnuts; in fact, storage time had a much bigger influence on the chestnut quality [4]. In the present study, we report the effect of another type of radiation post-harvest processing, electron beam, with doses of 0, 0.5, 1, 3 and 6 kGy in the nutritional value of chestnuts (ash, energy, fatty acids, sugars and tocopherols), stored at 4°C during 0, 30 and 60 days. The storage time seemed to reduce fat and energetic values but reported a tendency for higher values of dry matter. Regarding fatty acids, there was a higher detected quantity of C20:2 in non-irradiated samples, and four fatty acids were only detected in trace quantities. The levels of  $\gamma$ -tocopherol decreased during storage time but did not alter its quantity for all the radiation doses, in fact they seemed to be present in higher concentrations in the irradiated samples. Sucrose and total sugars were lower in non-irradiated samples and raffinose was only detected in irradiated samples. Electron beam irradiation seems to be a suitable methodology, since the effects on chemical and nutritional composition are very low, while storage time seems to be quite important in chestnut deterioration.

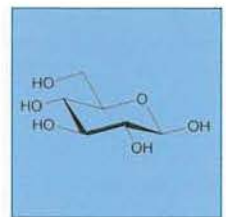
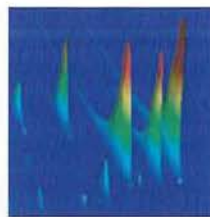
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