The First North and East European Congress on Food

NEEFood - 2012

April 22 -24, 2012
St. Petersburg, Russia

Book of Abstracts

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Institute of Technology
(TechnicalUniversity)

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THE EFFECT OF THE TECHNOLOGICAL PROCESS ON SENSORY QUALITY AND CHANGES IN CONTENTS OF BIOLOGICALLY ACTIVE COMPOUNDS IN APPLE JUICE WITH AN ADDITION OF RED CABBAGE

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The aim of this study was to determine the effect of technological processes applied when producing apple juice with an addition of red cabbage on sensory quality and changes in the contents of vitamin C and polyphenolic compounds as well as antioxidant activity of the final product.

Analyses were conducted on Szampion apples and red cabbage cv. Huzaro. Red cabbage was added to apple juice in the form of pomace and comminuted raw material, in both cases the addition amounting to 20%. The final product was preserved by pasteurization and hot filling.

Polyphenolic contents were determined according to Folin-Ciocalteau and by HPLC method, vitamin C was assayed by HPLC method, antioxidant activity was determined using the ABTS reagent. Sensory examination was performed using a 10-point scale.

Produced apple juice with an addition of red cabbage was characterized by the examination panel as a product of high desirability. Raw juice with an addition of red cabbage pomace received sensory examination scores of 8.8, while that with an addition of comminuted red cabbage - the score of 8.9. Aroma and taste of the product were evaluated as typical of fruit juices, while colour was described as heather to dark purple.

Contents of polyphenolic compounds in the produced raw apple juice with an addition of red cabbage pomace amounted to 78.7 mg/100 g, while after pasteurization it was 76 mg/100 g. Antioxidant activity of the final product was 6.7 μmol Trolox/1 g of product. In apple juice with a 20% addition of comminuted red cabbage a higher content of polyphenolic compounds was recorded at 83.3 mg/100 g, while antioxidant activity was found to be 6.4 μmol Trolox/1 g of product. Vitamin C content in the final product, both in case of apple juice with an addition of pomace and comminuted cabbage, was very low, amounting to approx. 0.35 mg/100 g of product.

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EFFECTS OF GAMMA IRRADIATION ON THE FATTY ACIDS PROFILE OF LACTARIUS DELICIOSUS WILD MUSHROOM

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The short shelf-life of mushrooms (1-3 days at ambient temperature) is an impediment to the distribution and marketing of the fresh product. Despite of the immense popularity of this food all over the world data regarding alternative technologies to increase mushrooms shelf-life are scarce. Treatment by irradiation emerges as a possible conservation technique that has been tested successfully in several food products and is regulated in the European Union by the Directive 1999/2/EC. Herein, the influence of gamma irradiation dose (0.5 and 1 kGy) over the fatty acids profile of Lactarius deliciosus L. wild mushroom, collected in the Northeast of Portugal (November 2011), was evaluated by gas-chromatography coupled to flame ionization detection (GC-FID). The analyses were performed after 0 (control), 4 and 8 days of storage at 4 oC. The control and the irradiated samples revealed an identical profile, with C18:0 (stearic acid), C18:2n6c (linoleic acid), C18:1n9c (oleic acid) and C16:0 (palmitic acid) as the main fatty acids. These results are in agreement to the reported by our research group in a previous study with nutritional characterization of this species [1]. Nevertheless, some differences were found in the percentage of some fatty acids in the different samples. For instance, control sample (non-irradiated) after 8 days of storage, showed a lower C18n1n9 percentage (decreased from 8 to 4.4%) contributing to a decrase in MUFA levels. Otherwise, in the sample irradiated with 0.5 kGy the percentage of the mentioned fatty acid did not changed until day 8. Overall, irradiation could be an alternative to ensure the quality and extend the life of mushrooms, protecting their fatty acids composition.

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References: [1] L. Barros, P. Baptista, D.M. Correia, J.S. Morais, I.C.F.R. Ferreira (2007) J. Agric. Food Chem. 55, 4781-4788.

ANTIOXIDANT ACTIVITY OF GAMMA IRRADIATED LACTARIUS DELICIOSUS L. FROM NORTHEAST PORTUGAL

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A diet rich in natural antioxidant compounds has been linked to a reduced risk of developing chronic oxidative stress-related diseases, including cancer and cardiovascular and neurodegenerative diseases. In addition to their highly appreciated nutitional value, mushrooms could be an interesting source of antioxidant compounds [1]. Nevertheless, their short shelf-life might be a limitation to the distribution and marketing of fresh mushrooms. Gamma irradiation could be an alternative to ensure the quality and extend mushrooms shelf-life, that has been used in several food products (Directive 1999/2/EC).

Herein, the effects of gamma irradiation (0.5 and 1 kGy performed in a 60Co experimental equipment) and storage time (0, 4 and 8 days at 4 °C) in antioxidant potential of the wild edible mushroom Lactarius deliciousus L. collected in Trás-os-Montes, Northeast Portugal, were evaluated for the first time. The antioxidant properties were evaluated through scavenging activity against 1,1-diphenyl-2-picrylhydrazyl (DPPH) radicals, reducing power (RP), inhibition of lipid peroxidation using thiobarbituric acid reactive substances (TBARS) and β-carotene-linoleate model systems. Data obtained show influence of storage time and irradiation dose over antioxidant activity. Some effects were clearly observed, such as the case of the highest antioxidant potential observed in irradiated samples (with both doses) when compared to non-irradiated ones (control) at 0 days. Therefore, the application of gamma irradiation seemed to be advantageous for the assayed antioxidant methods, but further studied are necessary to understand the mentioned effects.

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References: [1] I.C.F.R. Ferreira, L. Barros, R.M.V. Abreu (2009) Curr. Med. Chem. 16, 1543-1560.

GAMMA IRRADIATION OF CHESTNUTS: DOSIMETRIC STUDY AND ITS INFLUENCE IN DRYING

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Food irradiation is a process that has been regaining an increasing interest for different food products to increase shelf life, for disinfestation or sterilization. In industry the drying of chestnuts is used to produce other sub-products, such as flour. So far as we know this is the first time that the influence of gamma irradiation in drying behaviour of an european chestnuts variety was performed. First the dose rate distribution was