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Linear Tuning of Microwaves Power for the Extraction of Bioactive Molecules from Citrus Peels

Giuseppe D'Auria¹, Giacinto d'Amore², Aldo Romano¹, Francesco Marra²

¹Dipartimento di Farmacia – Università degli studi di Salerno, Fisciano SA Italy

²Dipartimento di Ingegneria Industriale – Università degli studi di Salerno, Fisciano SA Italy

In the last years, an alternative and convenient way to composting and/or bio-gasifying the food waste is represented by the extraction of high value bioactive components from such wastes. Particularly, essential oils contained in matrices such as orange or lemon peels may represent high value bioactive components for the nutraceutical and pharma industry. In the recent years, microwave assisted processes were been considered for solvent free extraction. Microwave assisted extraction is often performed in simple microwave systems, with poor control of microwave power release. In this work, the linear tuning of microwave power for the extraction of bioactive components from citrus peels is discussed, with emphasis on the consequent process yield and extract characteristics. The chemical analysis of extract mixture has shown the presence of quite a number of active molecules of great interest for the pharmaceutical and nutraceutical industry, such as glycoside flavanone (Hesperidin and Eriocitrin) in lemon peels and polymethoxylated flavones (Nobiletin and Sinensetin) in orange peels.

Keywords: microwaves, food processing, bioactive compounds

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Comparison of crumb structure in sponge cakes prepared with different sweeteners using computer vision system

Hanieh Amani¹, Ferenc Firtha², Anikó Kovács¹, László Baranyai², Katalin Badak-Kerti¹

¹Department of Grain and Industrial Plant Technology, Szent István University

²Department of Physics and Control, Szent István University

Computer vision system (CVS) is a fast, non-destructive and cost-effective tool for assessment of food properties and quality. This technique has widely been used in the food industry for analysis of color, topping and packaging defects, shape and texture. The aim of this work was to examine the capability of computer vision system for evaluating the effect of sugar reduction and substitution on porosity of cake samples. The cakes samples were made in the laboratory according to standard commercial recipe with different caloric content. The sugar content was decreased with 10% and 20% compared to control, replacing sugar with Stevia (E960, brand name: Canderel) and Xylitol (E967, company name: 1. Magyar Cukor Manufaktúra). In order to analysis the porosity, three slices of each sample were cut from central part of the loaf and the image acquisition was performed using a scanner (Kyocera Ecosys M5526cdn). Pictures were saved in BMP format with 200 dpi resolution. Porosity of each sample was calculated based on Dallman scores with the help of MATLAB software. The results were also compared with Texture Analyzer and the texture profile parameters were used as reference for computed Dallman scores. Results showed that the porosity of cake samples varied by changing sweetener and computer vision system was found to be a suitable technique for quality assessment of sponge cakes. However, this method needs validation on large sample sets before deployment. Application of the presented technique on other bakery products might be possible and extend visual texture evaluation to wide range of products.

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