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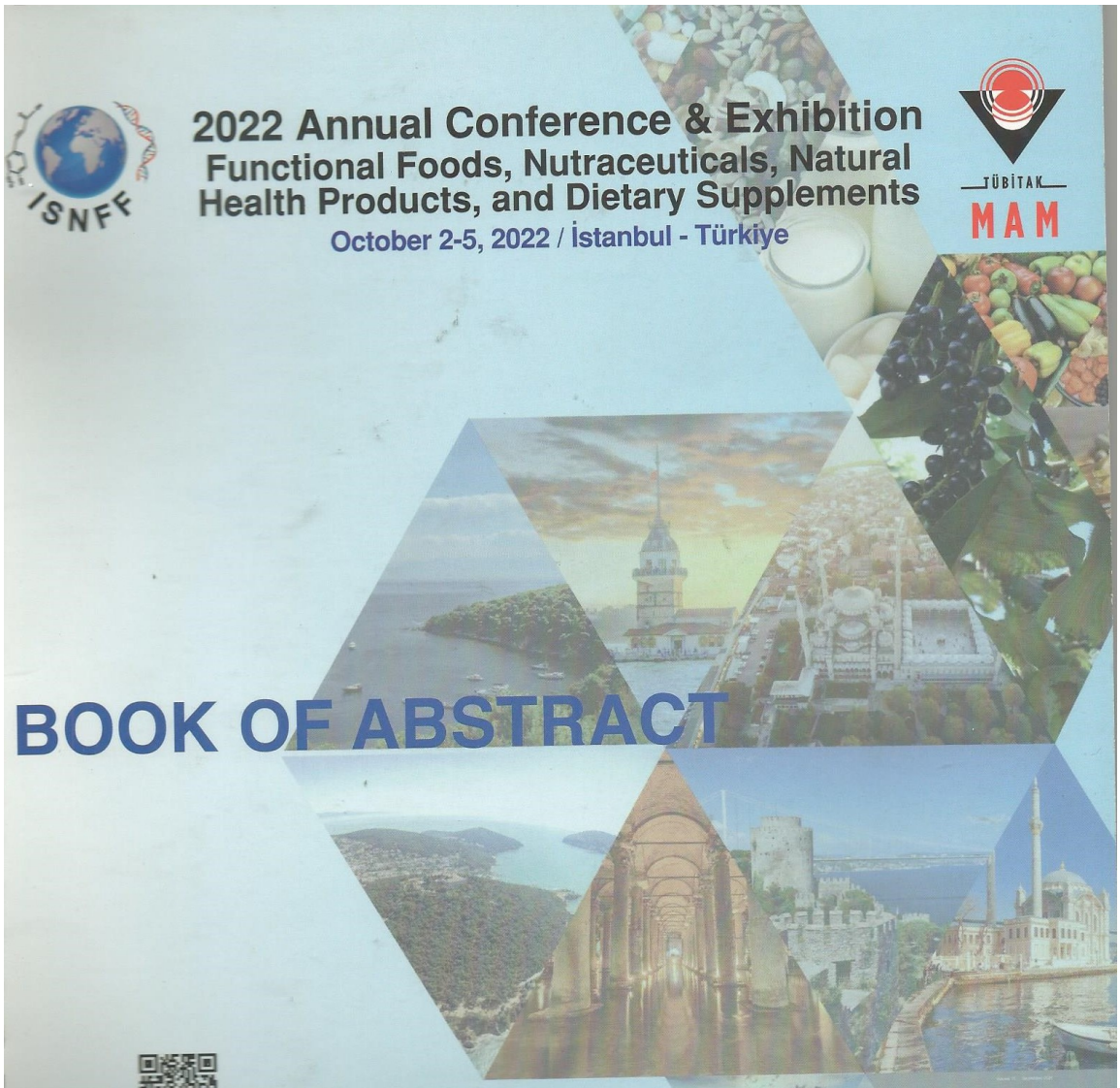

BOOK OF ABSTRACT

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P54 Encapsulation and storage stability of rosemary extract

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Antioxidant activities of rosemary (*Rosmarinus officinalis* L.) extracts are related to the presence of phenolic diterpene compounds, such as carnosic acid (CA), carnosol (C) and rosmarinic acid (RA). Carnosic acid and carnosol are lipophilic antioxidants that scavenge singlet oxygen, hydoxyl radicals and lipid peroxyl radicals thus preventing lipid peroxidation. The addition of rosemary extracts to foods is still challenging due to their low water solubility. The aim of this study was to encapsulate rosemary extract with different wall materials by spray drying to powder form increasing water solubility. Powder properties and stability of CA, C and RA during storage were evaluated. Four different combinations of maltodextrin (MD), gum arabic (GA) and whey protein concentrate (WPC) were used as wall materials in 1:1 ratio (extract: wall ratio). Drying process was performed in a spray drier at 170 °C. Encapsulation efficiency, particle size analysis, wettability, moisture and water activity analysis were carried out. Microstructure of encapsulated extracts was analysed by the scanning electron microscope. CA, C and RA contents of encapsulated extracts were analysed at 23 °C for 6 months. Combination of GA+WPC showed the highest encapsulation efficiency at 79.9% as the retention of total CA+CA. Mean particle size of encapsulated powder was obtained as 71.69 nm with 4.06% moisture, 0.085 water activity and 10.20 min wettability. Encapsulated powder contained 3.98, 2.00 and 0.46 mg/100mg CA, C and RA at the beginning of the storage, respectively. CA, C and RA contents decreased 9.16%, 48.52%, 2.15% and reached to 3.62, 1.03 and 0.45 mg/100 mg at the end of the 6 months storage. ESEM micrographs showed the encapsulated powder as spherical particles with no cracking. GA and WPC are suitable encapsulation materials with better encapsulation efficiency for rosemary extract.

Keyword: Rosemary, encapsulation, carnosic acid, carnosol, rosmarinic acid

P55 Antinutritional compounds in faba bean (*Vicia faba*) proteins as affected by different extraction methods

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Faba bean is a legume crop with a higher seed protein content (26-35% protein) and limited use as human food. Recently, faba bean proteins have gained popularity as a potential alternative protein source for the food and supplementary food industry, generating a vast array of new knowledge and information. In this study, we aimed to determine the antinutritional compounds in faba bean proteins extracted using a newly optimized extraction method based on the Deep Eutectic solvents compared to the traditional alkaline extraction method. Total phenolic content, phytic acid content and trypsin inhibitor units were determined in extracted proteins and faba bean flour based on the dry weight of samples. DES extracted proteins had higher contents of total phenolics (93.4 mg of GAE/ 100 g sample) and trypsin inhibitor units (7.3 TIU/mg sample) compared to those in alkaline extracted proteins (25.7 mg of GAE/ 100 g sample and 5.2 TIU mg sample, respectively). However, the phytic acid content in DES extracted proteins was lower (603 mg/ 100 g sample), than in the alkaline extracted protein sample (1646 mg/ 100 sample). These results indicate that the extraction method can significantly alter the composition of minor compounds such as antinutritional factors in extracted protein samples, and it is important to assess these aspects before utilizing these proteins as protein supplements.

P56 Effect of citric acid fortification on the properties of tiger nut flour

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The effect of citric acid fortification on the properties of tiger nut flour was evaluated. Flour was obtained from tiger nut and fortified with citric acid after which proximate and antinutrient compositions of the native and fortified tiger nut flour were evaluated using standard methods of analysis. Doughnut was produced with fortified flour after which, sensory evaluation, microbial analysis and shelflife was compared with that of unfortified flour (positive control) and wheat flour (negative control). Result showed that there were significant differences ($P<0.05$) in the proximate, antinutrient and sensory evaluations of the fortified flour and that of the control. The ash and carbohydrate contents of the fortified flour (5.51 ± 0.1 and 67.52 ± 0.031%, respectively) were significantly higher ($P<0.05$) than the control (1.60 ± 0.1 and 44.36 ± 0.011%, respectively). Protein contents of the control (5.50 ± 0.0%) was significantly higher than that of the fortified flour (4.20 ± 0.00%). Phytate, oxalate and tannin contents of the fortified flour samples (0.667 ± 0.54, 1.8008 ± 0.01, 0.220 ± 0.11%, respectively) were significantly higher than the control samples (0.845 ± 0.28, 11.399 ± 0.42 and 0.117 ± 0.31%, respectively). Cyanide contents of all the flour samples were not significantly different from each other. Organoleptic score revealed that the taste, texture and appearance of doughnuts made with fortified flour was better than the controls, hence doughnuts made with fortified flour was the most acceptable and preferred. No bacterial growth was recorded in all the doughnut samples however; the shelve-life of doughnuts prepared with fortified flour was higher than (6 days) that of unfortified (4 days) and wheat flour (3 days). Therefore, fortified tiger nut flour may replace the conventional wheat flour in bakery and confectionary owing to its nutritional value and longer shelflife.

Keywords: Citric acid, tiger nut flour, fortification, shelflife