

**Editorial: LÁSZTITY, R:** Nutritional quality and safety of organic (bio-) foods -are they more nutritious than conventional foods? Pp. 301-302. lasztity@mail.bme.hu

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**OPREAN, L., MARCULESCU, A., CRISTEA, V. & GASPAR, E:** The antibacterial activity of the volatile oils extracted from medicinal plants. Pp. 303-309.  
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The volatile oils obtained from *Thymus* species (either cultivated or grown wild) show different antibacterial activities due to the phenol content of the volatile oil. The results obtained for the antibacterial activity of the volatile oils obtained from *Thymus* species on the pathogen Gram-positive bacteria *Streptococcus haemolyticus* 2, *Diplococcus pneumoniae* 3 show that volatile oils of *T. marschallinaus* Wild, *T. glabrescens* Wild and *T. pulegioides* L. ssp. *Chamaedrys*, having a high content of phenols, exert an antibacterial activity more powerful than volatile oils obtained from the culture of *T. vulgaris* L. species. From the Gram-positive bacteria studied, *Diplococcus pneumoniae* 3 shows the highest sensitivity to the volatile oils in the *Thymus* species and to the volatile oil's components compared to *Staphylococcus aureus* 1, which is the most resistant. We here report on some volatile thyme oils with antimicrobial activities, which may act as antibiotic agents.

**Keywords:** antibacterial activity, medicinal plants, pathogen bacteria, *Thymus* species, volatile (ethric) oils

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**L. ČERVENKA, S. ŘEZKOVÁ, J. HEJDRYCHOVÁ, J. KRÁLOVSKÝ, I. BROŽKOVÁ, M. PEJCHALOVÁ AND J. VYTRÁSOVÁ:** Study of moisture adsorption characteristics of gingerbreads and biscuits using a hygrometric method. Pp. 311-320.  
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Chemical composition (moisture, ash, protein, fat, total carbohydrate, sucrose, fructose, glucose and maltose) of four types of biscuits and four gingerbreads were determined and moisture adsorption characteristics of samples were evaluated at 25°C using the Novasina hygrometric technique. Generally, the GAB model gave the best description of the experimental sorption data; however, these findings were not statistically significant compared with the BET model. Gingerbreads absorbed higher amount of water (20-25 g/100g on dry weight basis) at  $a_w > 0.70$  in comparison to biscuits studied mainly due to higher content of sucrose and/or other simple saccharides. Monolayer moisture content evaluated by BET and GAB models were in general higher for the gingerbreads. Although the Novasina water activity meter is suitable for construction of sorption isotherms, in the lower range of  $a_w$  values (i.e.,  $< 0.45$ ) the water uptake is slightly underestimated.

**Keywords:** moisture adsorption isotherm, GAB equation, BET equation, monolayer value, biscuit, gingerbread

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**B. BOZAN\*, U. KARAKAPLAN:** Antioxidants from laurel (*laurus nobilis* L.) berries: influence of extraction procedure on yield and antioxidant activity of extracts. Pp. 321-328.

The antioxidant activities of laurel (*Laurus nobilis* L.) berries extracts were evaluated using a DPPH assay, a  $\beta$ -carotene/linoleic acid assay and the Rancimat method. Pericarp and kernel of berries were extracted by different extraction methods with solvents of different polarities. Extraction method and extracting solvents significantly affected the yield, total phenolics and antioxidant activity of the extracts. Total phenolic content varied from 142.4 to 168.1 mg gallic acid equivalent (GAE).g<sup>-1</sup> in pericarp extracts and from 233-240.4 mg GEA.g<sup>-1</sup> in kernel extracts. Kernel extract by Soxhlet method with 80% ethanol showed the highest scavenging activity of 50.78% at 12 $\mu$ g ml<sup>-1</sup> by the DPPH. Fifty percent ethanol extract of pericarp exhibited the strongest antioxidant activity (85.56%) by the  $\beta$ -carotene/linoleic acid system. Protection Factor of all kernel extracts determined by the Rancimat method was comparable with that of BHT. No correlation was found between the total phenolics and antioxidant activities of the extracts.

**Keywords:** antioxidant activity, phenolic content, laurel berries, *Laurus nobilis*, free radical scavenging, rancimat

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**VARGA, J., KONCZ, Z., KOCSUBÉ, S., MÁTRAI, T., TÉREN, J., OSTRY, V., SKARKOVA, J., RUPRICH, J., KUBATOVA, A. & KOZAKIEWICZ, Z:** Mycobiota of grapes collected in Hungarian and Czech Viney Ards in 2004. Pp. 329-341.  
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Ochratoxin A is a mycotoxin produced by *Aspergillus* and *Penicillium* species. This mycotoxin is a common contaminant of various foods including cereal products, spices, dried vine fruits, coffee, cocoa, beer and wine. Apart from cereal products, beer and wine contribute significantly to ochratoxin exposure of humans. In the Mediterranean region of Europe, the black *Aspergillus* species are the sources of ochratoxin contamination of grape products. In this study, we examined the source of ochratoxin contamination of grapes in Hungary and the Czech Republic. The mycobiota of grape berries from 25 Hungarian and Czech vineyards was examined. Potential ochratoxin producing fungi were only identified in grapes from Southern Hungary. Among the 16 black *Aspergillus* strains isolated, 12 belong to the *A. niger* species, and 10 produced small amounts (1.5-10  $\mu$ g kg<sup>-1</sup>) of ochratoxin A in a liquid medium. We could also identify an *A. tubingensis* isolate which produced 3.5  $\mu$ g kg<sup>-1</sup> ochratoxin A in a liquid medium at pH 6.0. However, the amount of ochratoxin A produced was very low even in a medium which is favourable for mycotoxin production, and ochratoxin A was not detected in any of the grape juice, must and wine samples examined, indicating the absence of health hazard to costumers. Other potentially toxigenic fungi including *Aspergillus flavus*, *Penicillium expansum* and *Alternaria* species were also isolated. Further studies are in progress to evaluate the importance of these fungi in food safety.

**Keywords:** *Aspergillus niger*; *Aspergillus tubingensis*, Czech Republic; Grape; Hungary; Ochratoxin A

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**M. DELLO STAFFOLO, M. MARTINO and A. BEVILACQUA:** Texture and sensory properties of dairy desserts with dietary fibres of different sources. Pp. 343-354.

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This study aims to evaluate dairy desserts with (11 g kg<sup>-1</sup>) and without dietary fibres by instrumental measurements of texture and colour and sensory analysis. To maintain a similar texture to that of commercial desserts without fibres, the composition of thickening (corn starch, xanthan and guar gums) and gelling (carrageenan) agents in the basic formulation was also studied. Dietary fibres of bamboo, inulin, wheat, apple, Psyllium and chitosan were tested. Sensory characteristics were evaluated by a non-trained panel. Appearance, flavour, texture and preference were scored using an unstructured line scale. Texture and surface colour were analysed by a Texture Analyser-xT2i and a tristimulus colourimeter (Minolta CR 300). Sensory attributes showed significant differences among treatments. The dessert with chitosan gave the lowest sensory scores. For stress at rupture, the dessert with Psyllium fibre showed the highest value, while the one with chitosan gave the lowest. Apple fibre led to a brownish colour. Panellists preferred inulin or bamboo desserts. Addition of inulin or bamboo fibres to dairy desserts is a good alternative to increase the daily intake of dietary fibres.

**Keywords:** dairy dessert, dietary fibre, texture, sensory, carrageenans

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**N. KHANTISOPHON, D. MONTET, G. LOISEAU, S. K. RAKSHIT, W. F. STEVENS and R. C. RAY:** Formulation of a nutritional cassava (*manihot esculenta crantz*) starch-based beverage. Pp. 355-364. rc\_ray@rediffmail.com

Cassava (*Manihot esculenta Crantz*) starch-based vegetable beverage (cassava milk) was formulated to get a composition close to that of cow's milk with 3% cassava starch, 4% soybean proteins, 3% soybean oil and 0.3% calcium citrate. Heat treatment of the dry starch at 110°C for 6 h was done prior to the addition of other components to stabilise milk and to avoid gelatinisation. The most stable form of cassava milk that did not separate into two phases for 10 days was obtained by homogenisation at high pressure 12000 psi/5min. Milk with starch particle size of 10 µm was found to have sensory qualities close to that of cow's milk with white colour and viscosity of 7.8 cP.

**Keywords:** Cassava beverage, homogenisation, formulation, nutrition, starch

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**K. SZEKÉR, E. NÉMETH, SZ. KUN, J. BECZNER and P. GÁLFI:** Adhesion of lactic acid bacteria to caco-2 cells – evaluation of different detection methods. Pp. 365-371. szeker.krisztina@aotk.szie.hu

Adhesion of *Lactobacillus casei* subsp. *pseudoplantarum* 2750, *Lactobacillus sakei* DSM 20017 and *Bifidobacterium bifidum* B3.2 to Caco-2 cell line was investigated in vitro. The adhesion ability of the tested strains was quantified with three methods: fluorescent-labelling, Gram-staining - followed by cell counting and image analysis - and plate count enumeration in order to compare the different detection methods. Results were in good correlation in terms of number of adhered bacteria, however, aggregate formation resulted in a significantly lower result with plate count enumeration in case of *L. casei* subsp. *pseudoplantarum* 2750. Percent coverage was found to be an appropriate method to compare adhesion ability of the strains, provided the cell sizes are similar. Gram-staining gives satisfactory results, however, fluorescent staining was not a suitable method in this study, since fluorescent dye hexidium iodide also labelled the intestinal cells.

**Keywords:** probiotic, LAB, Bifidobacterium, in vitro adhesion, Caco-2 cells, plate counts, hexidium iodide, Gram staining, percent coverage

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**N. ELMNASSER, M. RITZ, F. LEROI, N. ORANGE, A. BAKHROUF & M.**

**FEDERIGHI:** Bacterial inactivation using pulsed light. Pp. 373-380.

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Pulsed light is a new method intended for the decontamination of food surfaces using short, high frequency pulses of an intense broad spectrum. The effects of broad spectrum pulsed light on the survival of *Listeria monocytogenes* Scott A, *Listeria monocytogenes* CNL, *Pseudomonas fluorescens* MF37 and *Photobacterium phosphoreum* SF680 populations on agar and in a liquid medium were investigated during this study. The sterilisation system generated 1.5 J cm<sup>-2</sup> per pulse with eight lamps for 300 μs. In the case of surface-seeded cells, a 7.8, 8.14 and >7.14 log reduction was obtained for *L. monocytogenes*, *Ps. fluorescens* MF37 and *Ph. phosphoreum*, respectively, after a single pulse of treatment. Inactivation levels were lower for depth-plated cells: indeed, 10 pulses of treatment achieved 1.6, 2.03 and 4.78 log reductions for *L. monocytogenes* ScottA, *L. monocytogenes* CNL and *Ps. fluorescens* MF37, respectively. After 5 pulses, *Ph. phosphoreum* exhibited a 4.6 log reduction. Similarly, bacterial cells in suspension treated with 3 pulses were reduced by 0.52, 0.8, 2.07 and 2.05 for *L. monocytogenes* ScottA, *L. monocytogenes* CNL, *Ps. fluorescens* MF37 and *Ph. phosphoreum*, respectively. No resistance to pulsed light was observed during our experiments.

**Keywords:** pulsed light, treatment, bacteria, inactivation, efficiency

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**M. ÇAM and Y. HIŞİL:** Comparison of chemical characteristics of fresh and pasteurised juice of gilaburu (*Viburnum opulus* L.) Pp. 381-385. mcam@erciyes.edu.tr

Organic acids, total phenolic compounds, and antioxidant activity were determined in two different juices of gilaburu fruits (*Viburnum opulus* L., belonging to the Caprifoliaceae family). Organic acids, analysed by RP-HPLC-UV visible detection, were individually detected and quantified. The predominant organic acid of samples was L-malic acid. The mean concentration of total phenolic compounds of fresh gilaburu juice (FGJ) and pasteurised gilaburu juice (PGJ) was 351.26 and 330.40 mg gallic acid equivalents (GAE)/100 ml, respectively. Average EC50 values (in the DPPH• test) were 25.06 μl mg<sup>-1</sup> DPPH• for FGJ, and 30.87 μl mg<sup>-1</sup> DPPH• for PGJ. Total phenolic compounds of both juices were higher than those of some commonly consumed juices and nectars.

**Keywords:** *Viburnum opulus* L.; Gilaburu; L-malic acid, Antioxidant activity, Total phenolic compounds

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**J.O. AGBEDE, M. ADEGBENRO, O. ALETOR AND A. MOHAMMED:** Evaluation of the nutrition value of *vernonia amygdalina* leaf protein concentrates for infant weaning foods. Pp. 387-393. joagbede@yahoo.com

*Vernonia amygdalina* Del leaf meal (LM), leaf protein concentrates (LPC) and LPC fibre

residues (LR) were characterised and the biological activity of LPC was studied. Five infant weaning foods based on *V. amygdalina*-LPC (VALPC) were compared with three coded commercial infant weaning foods in a 4-week feeding trial using rats as animal model. The LM contained  $318.2 \pm 2.11$  g kg<sup>-1</sup> crude protein and this increased by 38.5% to  $517.4 \pm 1.20$  g kg<sup>-1</sup> in LPC. Also, the LM contained  $96.0 \pm 1.8$  g kg<sup>-1</sup> crude fibre and this decreased by 81.25% to  $18.0 \pm 1.1$  g kg<sup>-1</sup> in LPC. The gross energy in the LM (1.56 MJkg<sup>-1</sup>) increased by 17.9% to 1.90 MJkg<sup>-1</sup> in LPC. The LPC contained higher Na, Ca, Mg, K and Fe than either the LM or LR, while fractionation reduced phytin and tannin contents. Rats fed solely on VALPC lost weight in the biological activity trial. Rats fed 25% VALPC+75% soybean meal (SBM) combination had the highest final weight (FW), while rats fed CFN, a coded commercial food, had the smallest. It was concluded that 25% VALPC+75% SBM mixture is the optimal combination.

**Keywords:** *Vernonia amygdalina*, leaf protein concentrate, infant weaning foods

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**G. ERDAL, K. ESENGUN, AND H. ERDAL:** Factors affecting preference for homemade or manufactured yoghurt consumption in turkey. Pp. 395-401. [gerdal@gop.edu.tr](mailto:gerdal@gop.edu.tr)

Yoghurt is a basic food that can be enjoyed by people of all age groups for a healthy life. Yoghurt is known and consumed all over the world. However, its consumption can be traced back to very early times in Turkey. Both homemade and manufactured yoghurts are consumed in Turkey. Average yearly yoghurt consumption in Turkey is about 17.6 kg/capita. Spending on yoghurt constitutes 2.8% of total household food expenses. The aim of this study was to analyse socio-economical factors that affect homemade or manufactured yoghurt consumption of households. Data from a questionnaire conducted on 302 families living in Tokat Province of Turkey in 2005 were used. Data were analysed using binomial logit model. Of the variables used in the model, household income, work status of woman and number of elderly people in the household were significant in affecting the preference for homemade or manufactured yoghurt consumption. It was concluded that governments should make decisions to promote yoghurt manufacturing having better hygienic conditions and to facilitate the production of reasonably cheaper yoghurt.

**Keywords:** Homemade yoghurt, manufactured yoghurt, yoghurt consumption preference, binomial logit model, Turkey