

**SZILÁGYI, M.** IN MEMORIAM ISTVÁN PAIS. Pp. v.vi.

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**Editorial: TURZA, S:** Food indexing as a tool for characterising foods. Pp. 149-150.  
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**R. VIDRIH AND J. HRIBAR:** Studies on the sensory properties of mead and the formation of aroma compounds related to the type of honey. Pp. 151-162. rajko.vidrih@bf.uni-lj.si

Three different types of mead were prepared from chestnut, lime and honeydew varieties of honey. All three types of honey were diluted with water until the solution reached 25 Brix. The solution was inoculated with a selected yeast strain and allowed to ferment at 15°C. Fermentation of chestnut mead was completed first (in 24 days), while the fermentation of lime and honeydew types took 39 days to complete. At the end of the process, all three meads contained 14.2% vol. of ethanol. During fermentation, more higher alcohols (n-propanol, iso-butanol, iso-amyl alcohol) and ethyl acetate were produced in chestnut mead compared to lime or honeydew type mead. A panel test ranked chestnut and lime mead as equal, followed by the honeydew types. The panellists also preferred mead with a higher amount of reducing sugar (80 g/l) over mead with a lower amount of reducing sugar.

**Keywords:** fermentation, higher alcohols, honey, mead, sensory evaluation

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**SLACANAC, V., HARDI, J., PAVLOVIC, H., CURCIK, D. & LUCAN, M:** Inhibition of growth of *Staphylococcus Aureus* by goat's and cow's milk fermented with *Bifidobacterium Longum* BB-46. Pp. 163-172. Vedran.Slacanac@ptfos.hr

The aim of this study was to determine the influence of goat's milk fermented by *Bifidobacterium longum* Bb-46 on pathogenic *Staphylococcus aureus* strain, as well as to determine the differences of inhibitory potential between fermented goat's and cow's milk. The results showed significantly higher inhibitory effect of fermented goat's milk on the growth of *Staphylococcus aureus* compared to that of fermented cow's milk. Fermented goat's milk inhibited the growth of *Staphylococcus aureus* during the whole fermentation period. In contrast to fermented goat's milk, weaker inhibitory effect of fermented cow's milk was observed only during the first phase of fermentation (incompletely fermented samples with higher pH values and lower number of viable cells of *Bifidobacterium longum* Bb-46). The obtained results suggested that there was no correlation between changes of pH or CFU of *Bifidobacterium longum* Bb-46 during fermentation and the inhibitory effect of fermented cow's and goat's milk. However, the results suggested some correlation between the inhibition of *Staphylococcus aureus* growth and the content of SCFA and MCFA in fermented cow's milk. At the same time, considerably higher amounts of all examined SCFA and MCFA were produced in goat's milk in all the phases of the fermentation process.

**Keywords:** *Bifidobacterium longum* Bb-46, fermented goat's and cow's milk, inhibitory effect, *Staphylococcus aureus*

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**REICHART, O., NAGY, B., JOZWIAK, Á. & SZAKMÁR, K:** Rapid method selective

enumeration of bifidus Essensis in activia youghorts. Pp. 173-183. microtest1@t-online.hu

The aim of this study was to develop simple, rapid and reliable methods for the selective determination of 'Bifidobacterium essensis' from ACTIVIA (Danone) yogurts. The methods are based on a modified MRS medium (B-broth), which does not contain inhibitory additives. The sugar source of the medium is maltose, which is metabolized by the bifidobacteria applied in the probiotic products, and not by the normal microflora of yogurt (*Streptococcus thermophilus* and *Lactobacillus delbrueckii* subsp. *bulgaricus*). The redox potential of the medium was reduced with cysteine-HCl. Due to its reduced redox potential, the new bouillon is suitable for aerobic cultivation of bifidobacteria, while in agar form it needs anaerobic incubation. In bouillon form (MPN method) the incubation time is only 2 days compared to the 5-day requirement of the classical anaerobic plate counting methods. The B-broth in diluted form was successfully used in a RABIT (Don Whitley) equipment for selective impedimetric determination of bifidobacteria in Danone yogurts. The exact detection time of the Bifidobacterium counts in a good quality probiotic yogurt, containing bifidobacteria at a concentration of  $10^7$  to  $10^8$  CFU/ml is not more than 10 to 12 h (in contrast to the 5 days of classical anaerobic plate counting methods).

**Keywords:** Bifidobacterium, selective medium, impedimetric method

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**PILJAC-ZEGARAC, J., MARTINEZ, S., VALEK, L., STIPCEVIC, T. & KOVACEVIC-GANIC, K:** Correlation between the phenolic content and DPPH radical scavenging activity of selected Croatian wines. Pp. 185-193. jpiljac@irb.hr

The Folin-Ciocalteu (FC) test and cyclic voltammetry (CV) at a glassy carbon electrode were used to quantify phenolic antioxidants in a set of 17 Croatian wines and express them in gallic acid (GAE) and catechin equivalents (CE). The total phenolic index (TPI) values for red wines expressed in GAE ranged from 18.851 to 26.905 mM, while TPI for white wines ranged from 1.722 to 2.869 mM. The levels of phenolics derived from CV measurements were markedly lower than those of TPI, since these values include only those phenolic compounds that get oxidised up to 500 mV and contain ortho-diphenol and triphenol groups. The free radical scavenging ability of the same set of wines was evaluated according to the Brand-Williams assay and expressed in equivalents of catechin, gallic acid, vitamin C and Trolox. Ivan Dolac barrique 2002 exhibited the highest antioxidant activity. The DPPH radical scavenging ability of the wines was also evaluated and correlated to the TPI values. Better correlation was observed between the TPI and the antioxidant activity for red wines ( $r^2=0.826$ ) as opposed to white wines ( $r^2=0.686$ ). The highest correlation ( $r^2=0.970$ ) was found between the TPI and the antioxidant activity measured when the whole set of samples was considered.

**Keywords:** phenols, antioxidants, wine, cyclic voltammetry, DPPH.

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**TAKÁCS, K., NÉMEDI, E., MÁRTA., GELENCSÉR, É. & KOVÁCS, E.T:** Use of the enzyme transglutaminase for developing glutenfree noodle products from PEA flour. Pp. 195-205. elisabet@szef.u-szeged.hu

Yellow pea flour contains very low quantity of prolamins, thus it could be a good alternative dietary source for individuals suffering from celiac disease or wheat allergy. Beside

emulsifiers, enzymes can be used for developing noodle structure with high quality. Transglutaminase (TG) enzyme was tested in model systems for improving noodle structure by using beneficial cross-linking property of the enzyme. Sensory- and cooking properties and biochemical attributes of proteins were evaluated to characterize structure-function relationships in accordance with the concentration of the applied enzyme. The amount of water and salt soluble protein fractions was reduced meaningfully and the molecular weight distributions assessed by SDS PAGE were changed by addition of 50-200 mg kg<sup>-1</sup> TG enzyme. At the same time, sensory properties were improved and high water uptake and low cooking loss were also observed. Forasmuch an increase has been expected in the amount of the cross-linked molecules, the cross-reactivity of prolamins with anti-gliadin antibody was also tested to reduce the risk related to gluten sensitivity. Finally, the possible contamination with wheat was controlled by DNA-based PCR.

**Keywords:** yellow pea, transglutaminase enzyme, noodle, gliadin-ELISA, wheat-PCR, SDS-PAGE, immunoblot

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**K. DELONGA, I. RADOJČIĆ, V. DRAGOVIĆ-UZELAC, V. MRKIĆ and J. VORKAPIĆ-FURAC:** Distribution of glucosinolates in some raw and processed brassica vegetables grown in Croatia (glucosinolates in raw and processed vegetables). Pp. 207-216. ivana.radojci@inet.hr

The interest in food with chemoprotective properties has been steadily increasing due to many epidemiological studies indicating the lower probability of acquiring some kinds of cancer (e.g. colon, prostate, breast, cervical) in populations, whose diet includes large quantities of Brassica vegetables. The biologically active compounds in Brassica vegetables are the breakdown products of glucosinolates, including isothiocyanates, nitriles, thiocyanates, indoles and oxazolidinethiones from which indoles and isothiocyanates in particular have been implicated to have anticarcinogenic properties. The object of the present study was to investigate glucosinolates distribution as well as their losses during blanching and cooking in edible parts of white cabbage, cauliflower, kohlrabi and collard. In all vegetable, only indole glucosinolates as precursors of anticarcinogenic compounds were identified, while glucoraphane was not detected. In cauliflower and collard, proportion of indole glucosinolates was more than 90%, followed by kohlrabi (70%) and white cabbage (50%). Analysis of glucosinolates losses during blanching and cooking showed substantial decrease in all vegetables. The major losses were observed for cauliflower, around 60%, for cooked vegetable, followed by white cabbage (55%), kohlrabi (53%), and collard (44%). The losses after blanching were approximately 15% less than in cooked vegetables.

**Keywords:** glucosinolates, blanching, cooking, white cabbage, cauliflower, kohlrabi, collard

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**B. ŠKRBIĆ AND B. FILIPČEV:** Element intakes through the consumption of different types of bread by Serbian population. Pp 217-229. biljana@tehnol.ns.ac.yu

The mineral composition of mercantile wheat samples and sunflower seed cultivars collected from all Serbian growing regions was determined by means of atomic absorption spectrophotometry. The mean element contents of wheat and sunflower seed samples (in mg kg<sup>-1</sup> on a dry weight basis) were: 8127.5 and 5038.6 for K, 258.6 and 221.7 for Na, 1022.5 and 147.4 for Mg, 1457.2 and 432.3 for Ca, 56.5 and 35.2 for Fe, 33.9 and 15.2 for Mn, 4.1

and 19.5 for Cu, 23.8 and 64.2 for Zn; (in  $\mu\text{g kg}^{-1}$  on a dry weight basis) 5.6 and 0.2 for Hg, 28.8 and 574.5 for Cd, 136.9 and 711.1 for Pb, 55.4 and 346.6 for As, respectively. The calculated mean and median levels of elements in the samples were compared with the regulated maximum levels according to the European Commission and the national legislation. On the basis of the obtained data, intakes of macro, micro- and toxic elements by consuming white, wholegrain and speciality breads with sunflower seeds were calculated and compared to the Dietary Reference Intakes (DRI) values and Allowed Daily Intakes (ADI) for contaminants.

**Keywords:** dietary intakes, macro elements, micro elements, toxic elements, wheat, bread, sunflower seed.

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**K. SZENTMIHÁLYI and M. THEN:** Examination of microelements in medicinal plants of the carpathian basin. Pp. 231-236. szklari@chemres.hu

The application of medicinal plant drugs for curing has become popular again. The favourable effects of most of them have been examined and proven. Nevertheless, the beneficial properties of plants and extracts may be due to inorganic mineral elements besides organic constituents. Investigation of microelement content in plant drugs may be relevant for the determination of environmental relations. In pharmacological aspect microelement content in teas is essential. For plants, all extracts (teas, alcoholic extracts, etc.) prepared by divers ways (traditional-, microwave extraction, etc.) contain elements in different quantity. The comparison of microelement content of definite amount of tea consumed with Recommended Dietary Allowances, Dietary Reference Intake may give information on possible nutritional value.

**Keywords:** microelements, herbs, extracts

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**M. THEN, M. HAJDÚ, P. JASZTRAB and K. SZENTMIHÁLYI:** Element transfer from extract of greater celandine (*chelidonium majus* l.). Pp. 237-240. szklari@chemres.hu

Greater celandine (*Chelidonium majus* L.) is used internally as a herbal remedy besides external applications. It was supposed that the elements besides organic compounds in greater celandine also have favourable effect as adjuvants, therefore, the aim of the study was to evaluate the bioavailability of the elements. The element transfer through the gastrointestinal system was measured by in vitro model from the pressed extract into buffer solutions with different pH (stomach pH=1.1, intestine pH=2.8, plasma pH=7.5). It was stated that the elements (Al, B, Ba, Ca, Cu, Fe, Mg, Mn, S, Zn) were able to be absorbed through the stomach-bowel system, since they passed through the membrane. The transfer of the elements from the latex into the different buffer solutions greatly depends on the element and the pH of applied buffer solution. The transfer of the elements from the latex ranged between 0.9% (Ca into buffer solution pH=7.5) and 59.3% (B into buffer solution pH=2.8). The transfer of the highest amount of elements was observed in the case of buffer solution pH=2.8, and less transferable elements were Ca with 33.64% and Mg with 33.89% of the initial value. On the basis of results, it can be stated that the elements are able to transfer through the gastrointestinal system and may have adjuvant effects.

**Keywords:** *Chelidonium majus* L., in vitro transfer, elements

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**E. NÉMEDI<sup>1</sup>, G. UJHELYI, and É. GELENCSÉR:** Detection of gluten contamination with pcr method. Pp. 241-248. E.nemedi@cfri.hu

It is well established that the ingestion of cereal prolamins, such as gluten, causes the characteristic symptoms of celiac disease (CD) in people predisposed to it. DNA-based PCR method provides new ways to detect gluten in processed foodstuffs, such as bread. The aim of this work was to adapt a new primer pair combination and to initiate a carefully elaborated PCR methodology to experiment with DNA-based analysis. At first, the purity of cleaned DNA was verified using B49317 and A49855 chloroplast DNA primer pair. Then TR01/2 wheat specific PCR primer pair was used for checking the origin of the DNA, and P1/2 microsatellite (SSR) adapted primer pair for detecting allergen (gluten) specific residues. Method optimisation was achieved with cereal flour samples, then bread and dry pasta products from wheat were used, which were analysed as heat-treated samples with three primer pairs. The gluten specific primer pair was tested on cross-reactive cereals such as rye, barley, triticale and on some questionable cereals, such as oat, and pseudo-cereals, e.g. buckwheat and amaranth.

**Keywords:** PCR method, gluten, celiac disease, cereals, pseudo-cereals

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**VIRÁG, V., VARJAS, T., GYÖNGYI, Z., SOMLYAI, G., EMBER, I. & NÁDASI, E:** The possible role of natural products in the dietotherapy of cancer-related weight loss: an animal model. Pp. 249-256. edit.nadasi@aok.pte.hu

Despite many different trials, no effective dietotherapy exists for curing enormous weight loss caused by malignant diseases yet. The present study was aimed at determining in an animal model, whether some natural products might be included in the dietotherapy of cancerous patients with cachexia. Tumour was transplanted into Fischer 344 rats drinking either seabuckthorn extract, green tea, deuterium depleted water, trace elements preparation, fruits' extract or multivitamin solution. Weight loss, tumour growth and expression of Ha-ras gene were determined. All the investigated natural products have significantly decreased tumour growth, and trace elements preparation has significantly decreased weight loss. Green tea, seabuckthorn extract and deuterium depleted water have notably diminished Ha-ras gene expression. Our results suggest that these natural products may be useful in inhibiting tumour growth, and some of them may be applied in the dietotherapy of cancer-related weight loss.

**Keywords:** cancer-related weight loss, tumour growth, natural products, dietotherapy, animal model

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**J. BARTA and GY. PÁTKAI:** Chemical composition and storability of jerusalem artichoke tubers. Pp. 257-267. gyorgyi.patcai@uni-corvinus.hu

Five different Jerusalem artichoke cultivars were investigated to compare their nutritional value. Investigations were carried out on samples harvested in December 2004 and stored

until the end of March 2005 under natural climate in prism, in cold store and also after overwintering in the soil. Investigations were repeated in 2005 and 2006. According to the results of storage outdoors in prism and in cold store, the total- and soluble solid content, the total carbohydrate and inulin content (w/w) did not change significantly as a function of storage time. Changes in sucrose- and reducing sugar content and that of glucose/fructose ratio were also insignificant. There was no significant difference in the ratio of carbohydrates of the tubers stored under those two above-mentioned conditions, however, there was a significant difference in the carbohydrate composition of the tubers harvested in winter or in spring. Compared to the majority of vegetables, the main nutrient of Jerusalem artichoke tubers is inulin, instead of starch. Total carbohydrate content of the tubers is divided into 80-90% inulin, 7-14% sucrose and 3-6% reducing sugars, on average. Because of its high average yield and outstanding inulin content, this is a plant of great interest as raw material for inulin and fructose processing, as well.

The cultivar "Ceglédi" is, first of all, suggested for industrial processing. The present research data verified its outstanding inulin content and a high fructose/glucose ratio, too.

**Keywords:** Jerusalem artichoke tubers, chemical composition, inulin, storage changes, healthy food

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**H. BAŠA ČESNIK\*?, A. GREGORČIČ, Š. VELIKONJA BOLTA and V. KMECL:** Pesticide residues in agricultural produce of slovene origin in the period from 2001 to 2005. Pp. 269-282. Helena.basa@kis.si

Analyses of 777 samples of cereals (barley, wheat), fruit (apple, grape, pear, strawberry) and vegetables (carrot, cauliflower, cucumber, head cabbage, lettuce, pepper, potato, spinach, string beans, tomato) of Slovene origin were made during the period from 2001 to 2005 at the Agricultural Institute of Slovenia. No detectable residues were found in 58.3% of the samples, in 35.3% of analysed samples residues were equal to the MRL or below it, and in 6.4% (2005) and 12.9% (2004), all samples exceeded their respective MRL. Dithiocarbamates were the most frequently found active substance in cereals, fruit and vegetables. Their most frequently determined concentration level for fruit (36.6%) and vegetables (45.6%) was <0.5 mg kg<sup>-1</sup>. Residues that were <10% of MRL were found in 60.2% of all samples. The values exceeding MRL were mainly due to dithiocarbamates found in potato (4.6%), meaning that their proper use may be questionable. In apples, grapes and pears more than 70% of tested samples contained residues of different pesticides. The number of samples containing multiple residues was 134 (17.2%). Produces, which contained 5 or more pesticide residues, were apples, pears and strawberries. The maximum number of active substances found in one apple sample was eight.

**Keywords:** pesticide residues, monitoring, GC-MS, HPLC

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**HORVÁTH, K., ANDRÁSSY, É., KORBÁSZ, M. & FARKAS, J:** Using automatic conductimetry for monitoring spoilage bacteria on chilled pork cutlets. Pp. 283-291. j.farkas@cfri.hu

Experimental batches of chilled cutlets of pork have been stored aerobically and surface growth of bacteria was determined by standard aerobic spread-plate counts, and colony counts of pseudomonads on Cetrimid Agar simultaneously with detection times of respective

stomached samples in triplicate using a Malthus Microbiological Analyzer at 30 oC, applying general impedance broth and Pseudomonas impedance medium, respectively. To study the effects of storage temperature on growth of spoilage bacteria, numerous samples were kept in successive experiments at 4, 8 or 12 oC. Parameters of the bacterial growth curves were estimated by curve fitting of the colony counts by Dmfit programme package of the ComBase softwares, using Baranyi's dynamic growth model. Linear correlations were found between the respective colony counts and the conductimetric detection times observed in periodic investigations during storage. According to these calibrations, the conductimetric method at 30 oC incubation is able to assess within 8 h whether a sample of pork cutlets contains greater or less than 107 CFU g<sup>-1</sup> of psychrotrophic spoilage bacteria.

**Keywords:** automatic conductimetry, impedimetry, spoilage, chilled pork