

**In memoriam D.A.A. Mossel, pp. 1-2**

**TYIHÁK, E.:** New approach to mechanism of action of trans-resveratrol. Editorial. pp. 3-4.  
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**CASTILLO A., L.A., MÉSZÁROS, L., KISS, I.F.:** Effect of trisodium phosphate on the microbial contamination of chicken meat. pp. 5-11. [istvan.kiss@uni-corvinus.hu](mailto:istvan.kiss@uni-corvinus.hu)

The microbiological spoilage of foods depends on the initial microbiological contamination and some factors which influence the growth of microorganisms. Therefore, reducing the initial cell count is necessary for both extending shelf life and improving food safety.

Physical, chemical and combined treatments serve this purpose.

In these experiments, the effect of trisodium phosphate dipping (0-15 % solutions) was studied. Chicken wings were used, which after dipping (1 min) in the solution were packed in PE-PA-PE pouches and stored at 4 °C. Aerobic mesophilic (Nutrient Agar, Merck), pseudomonad (Pseudomonas Selective Agar, Oxoid), and Enterobacteriaceae counts (VRBD Agar, Merck) were determined by Spiral Plate Technique at 30 °C incubation temperature. Effect of 3.8, 5.7, 7.6 % trisodium phosphate dipping solutions was studied as a function of storage time. Immediately after treatment, total colony count was reduced by maximum 1.5 log cycles. Pseudomonads were the most sensitive. One day after treatment with these low concentration solutions, the colony count was reduced by 2 log cycles. Na<sub>3</sub>PO<sub>4</sub> concentration higher than 7.6 % practically did not result in higher effectivity. The growth rate and maximum cell count of surviving fraction were estimated as a function of trisodium phosphate concentration. It can be concluded from fitted survival curves that immediately after treatment the initial viable cell count was reduced and the critical spoilage level (10<sup>7</sup>g<sup>-1</sup>) has been reached 2-3 days later than in case of the untreated samples, i.e. the shelf-life was extended.

**Keywords:** microbiological decontamination, trisodium-phosphate, dipping, survivors, critical level, shelf-life

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**HADOLIN, M., KNEZ, Ž., and BAUMAN, D.:** Stabilisation of butter with rosemary antioxidants. pp.13-21. [zeljko.knez@uni-mb.si](mailto:zeljko.knez@uni-mb.si)

The aim of the present study was to test the antioxidant activity of rosemary extract and its mixture with propylene glycol on the stability of fat in butter. Rosemary extract was added at a concentration of 0.02% (w/w) and mixture of rosemary extract with propylene glycol at a concentration of 0.25% (w/w) to the cream before churning. For comparison, control samples without added antioxidant were also prepared and tested. Samples were stored at 4 °C and at 20 °C for 27 days and their peroxide values were determined periodically. The measurement of peroxide values for butter at 60 and 98 °C was also performed. Activity of rosemary extracts was compared with synthetic antioxidant BHT.

The rosemary extract and its mixture with propylene glycol exhibited strong antioxidant activity in butter when added to a cream before churning and in an aqueous emulsion system of b-carotene and linolenic acid.

**Keywords:** natural antioxidants, rosemary extract, butter, peroxide values, antioxidant activity

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**BARAĆ, M., STANOJEVIĆ, S.:** The effect of microwave roasting on soybean protein composition and components with trypsin inhibitor activity. pp. 23-31.

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The effect of microwave roasting on protease inhibitor activity and soluble protein content and composition in cracked soybeans was investigated in relation to the duration of treatment. Soybeans of Hodgson var. were cracked to 1/6 – 1/8 of the size of whole bean, dehulled and were exposed to microwaves at a frequency of 2.450 MHz. Soluble protein content of hexane defatted samples were determined and PAGE, SDS-PAGE and densitometric analyses were used to determine the change of major soybean protein subunits as a function of roasting time. Residual protease inhibitor activities and iso inhibitor composition were also determined. Microwave treatment is an effective way for inactivation of protease inhibitor activity in cracked soybeans. Roasting for only two minutes reduced the trypsin inhibitor activity to 13.33% of the initial value. Both types of inhibitors, Kunitz (KTI) and Bowman-Birk (BBI) were responsible for residual inhibitor activity. The duration of microwave roasting had strong influence on soluble protein content and polypeptide composition. Microwave treated samples were characterized by dominant content of glycinin, and high stability of acidic (-A 1,2,3-, -A5-) and basic (-B 1,2,3,4-) glycinin subunits were established.

**Key words:** cracked soybean, microwave roasting, protease inhibitor activity, glycinin, b-conglycinin

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**NAGY, A., JĘDRYCHOWSKI, L., GELENCŚÉR, É., WRÓBLEWSKA, B. and SZYMKIEWICZ, A.:** Induction of specific mucosal immune responses by viable or heat denatured probiotic bacteria of Lactobacillus strains. pp. 33-39. [a.nagy@cfri.hu](mailto:a.nagy@cfri.hu)

In recent years, research related to studying the effect of gut microflora on the human health has become of major economic importance. The main objective of our study was to examine whether or not the orally administered Lactobacillus strains (LB) as an oral adjuvant can improve the mucosal immune protection via an enhanced IgA secretion to a co-administered marker antigen ovalbumin (OVA). We adapted a murine (BALB/c) model to demonstrate beneficial adjuvant effects of probiotic LB strains. Orally sensitised mice with OVA, which were prefed with native or heat denatured (HD) Lactobacillus salivarius (Ls) or Lactobacillus casei (Lc) responded better or with the same efficiency to a vaccination with antigen (OVA) than mice that had been sensitised only with OVA or not sensitised at all. Antibody (IgA) responses in the gut were increased in response to vaccination with OVA in mice that had been prefed with native or heat denatured Ls or Lc followed by Ls or Lc and OVA feeding. In prefed groups, the OVA feeding alone primed for specific immune response, while adjuvanted OVA has increased the immune exclusion potential of the gut.

**Key words:** probiotic bacteria, mucosal immune response, tolerance induction

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**SINDHU, S.C., KHETARPAUL, N. and SINDHU, A.:** Effect of probiotic fermentation on carbohydrate and mineral profile of an indigenously developed food blend. pp. 41-47.

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An indigenous food mixture was developed by mixing rice flour, whey, sprouted green gram paste and tomato pulp (2:1:1:1, w/w) and was coded as RWGT. The mixture was autoclaved (1.5 kg cm<sup>-2</sup>, 15 min, 121 °C), cooled and inoculated with 2% liquid culture (containing 10<sup>6</sup> cells ml<sup>-1</sup> broth). Two types of fermentations were carried out, single culture fermentation [*L. casei*, *L. plantarum* (37 °C, 24 hr)] and sequential culture fermentation [*S. boulardii* (25 °C, 24 h) + *L. casei* (37 °C, 24 hr); *S. boulardii* (25 °C, 24 h) + *L. plantarum* (37 °C, 24 h)]. Single culture fermentations caused significant (P<0.05) reduction in the total soluble sugars (51-54%), non-reducing sugars (73-78%) and starch content (41-43%). Sequential culture fermentations decreased the total available carbohydrates by 62-64 %. All the fermentations significantly (P<0.05) improved the HCl-extractability of minerals viz. iron (54-67 %), calcium (22-32 %), sodium (25-30 %) and potassium (17-24 %)

**Key words:** Probiotics, *L. casei*, *L. plantarum*, *S. boulardii*, carbohydrates, minerals

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**SIDDIQUI, S., KOVÁCS, E., BECZNER, J., GOYAL, R.K. and GARG, F.C.:** Effect of ethanol, acetic acid and hot water vapours on the shelf life of guava (*Psidium guajava* L.). pp. 49-57. [saleemsiddiqui@sancharnet.in](mailto:saleemsiddiqui@sancharnet.in)

The study was undertaken to increase the shelf life of fruits of guava (*Psidium guajava* L. cultivar Banarsi Surkha). Uniform size and healthy fruits at green mature stage from winter season crop were exposed at atmospheric pressure to vapours of absolute ethanol and acetic acid for 2 h and hot water (vapour heat treatment) for 10 min. In the present investigation, only ethanol vapour treatment proved to be promising in enhancing the shelf life of guava fruits, as other treatments showed phytotoxic effect. Ethanol treated fruits showed smaller weight loss and higher flesh firmness during storage. The activities of polygalacturonase, b-galactosidase and cellulase were decreased by all the vapour treatments, however, ethanol was the most effective. It also reduced ethylene evolution and the contents of total soluble solids and ascorbic acid. All the vapour treatments could effectively decrease the total colony forming units of surface microflora and eliminate coliforms. The results are discussed in relation to the mode of action of these vapours in delaying ripening of fruits.

**Keywords:** cell-wall enzymes, guava, fruit quality, microbiology, shelf life

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**MORAIS, H. A., DE MARCO, L. M., OLIVEIRA, M. C., and SILVESTRE, M. P. C.:** Casein hydrolysates using papain: peptide profile and encapsulation in liposomes. pp. 59-69. [malice@farmacia.ufmg.br](mailto:malice@farmacia.ufmg.br)

Hydrolytic parameters were tested to prepare casein hydrolysates with high oligopeptide content for dietetic purpose, using papain. Employing a temperature of 37 °C and an E:S ratio of 2% was the most economical condition for large-scale manufacture. The encapsulation in liposomes was used for masking the bitterness, and was also able to reduce the hydrophobicity as well as to keep the chemical stability during 60 days of storage. The UV spectrometry with second derivative transformation was used to measure the encapsulation rate, which changed from 56% to 62%. The size distribution of vesicles was in the range of 500 to 1000 nm.

**Keywords:** casein hydrolysates, peptide profile, bitterness, liposomes

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**TACZMAN-BRÜCKNER, A., MOHÁCSI-FARKAS, CS., BALLA, CS., KISKÓ, G.:** Comparison of biocontrol activity of *Kluyveromyces lactis* with other yeast strains against *Penicillium expansum*. pp. 71-80. [andrebruckner13@yahoo.co.uk](mailto:andrebruckner13@yahoo.co.uk)

Applying antagonistic yeasts is one of the recent possibilities for controlling postharvest disease caused by blue mould (*Penicillium expansum*). In this work, antagonistic activity of several *Kluyveromyces lactis* strains was tested against two strains of *P. expansum*. Three strains of *Kluyveromyces lactis* were compared to three biocontrol yeasts: *Metschnikowia pulcherrima*, *Sporobolomyces roseus* and *Pichia anomala*. The investigations were carried out at 25 °C, 15 °C and 5 °C, applying different yeast cell densities and culture media. Statistical analysis showed no significant differences among the three *Kluyveromyces lactis* strains. The inhibitory effect of the tested yeasts was different according to the applied mould strain temperature, culture medium and cell density. Application of antagonistic yeasts combined with reduced temperature enhanced the inhibitory effect. Direct relationship was observed between increasing cell density and the biocontrol efficiency of *Kl. lactis*. According to this work, *Kluyveromyces lactis* is a possible biocontrol agent.

**Keywords:** biocontrol, *Penicillium expansum*, *Kluyveromyces lactis*

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**FARKAS, G., REZESSY-SZABÓ, J.M., ZÁKÁNY, F. AND HOSCHKE, Á.:** Interaction of *Saccharomyces* and non-*Saccharomyces* yeast strains in an alcoholic fermentation process. pp. 81-90. [gabriella.farkas2@stud.uni-corvinus.hu](mailto:gabriella.farkas2@stud.uni-corvinus.hu)

Fermentation trials were conducted in all-malt wort with mixed cultures of *Saccharomyces cerevisiae* WS 34/70 and one of two non-*Saccharomyces* yeast strains: *Saccharomyces ludwigii* and *Torulaspora delbrueckii* DSM 70607. Interactions were observed between the two yeasts during the alcoholic fermentation process started with eight different initial cell ratios ranging from 1:1 to 1:20 (*Saccharomyces* yeast : non-*Saccharomyces* yeast). Composition of the medium greatly affected the cell yield, degree of attenuation and ethanol concentration due to the maltose-negative characteristic of the non-*Saccharomyces* yeast strains. Starting cell ratios had less effect on the outcome of the fermentation experiments. *Saccharomyces cerevisiae* limited the growth of *T. delbrueckii* to a great extent, overgrowing it in the course of fermentation. On the other hand, *S. cerevisiae* did not grow as dynamically in mixed culture with *S. ludwigii* as the composition of the medium would have suggested.

**Keywords:** *Saccharomyces cerevisiae*, non-*Saccharomyces* yeast, mixed culture, beer

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**SZEKÉR, K., BECZNER, J., HALÁSZ, A., MAYER, Á., REZESSY-SZABÓ, J.M., GÁLFI, P.:** In vitro adhesion of lactic acid bacteria and bifidobacteria to Caco-2p and IEC-18 cells. pp. 91-99. [k.szeker@cfri.hu](mailto:k.szeker@cfri.hu)

The adhesion of twenty-six *Lactobacillus* strains to two intestinal cell lines (Caco-2P and IEC-18) and 21 *Bifidobacterium* strains to Caco-2P cells was investigated. Non-specific adherence was determined on the surface of culture plates. The effect of short chain fatty acids (SCFA) on epithelial cells, and bacterial adhesion were investigated by Na-n-butyrate treatment.

The adherence of LAB and bifidobacteria greatly varied in a strain-dependent manner. The adherence of LAB was better to IEC-18 cells than to Caco-2P cells, and bifidobacteria adhered better to Caco-2P cells than the LAB. Some strains adhered well or even better to the

background than to the cells, which queries the specificity of adhesion of these strains. Na-n-butyrate treatment stimulated the differentiation of IEC-18 cells and therefore increased the number of adherent bacteria, probably because only the cell surface increased not the number of epitopes.

**Keywords:** probiotics, LAB, Bifidobacterium, adhesion, Caco-2P, IEC-18