

Editorial: BECZNER, J: The Hungarian spice paprika. Pp. 403-404. j.beczner@cfri.hu

Š. TUMA, F.K. VOGENSEN, M. PLOCKOVÁ AND J. CHUMCHALOVÁ: Isolation of Antifungally active lactobacilli from Edam Cheese. Pp. 405-414. stepan.tuma@vscht.cz

The antifungal activity of 322 lactobacilli strains isolated from Edam cheese at different stages of the ripening process was tested against *Fusarium proliferatum* M 5689 using a dual overlay spot assay. Approximately 21% of the isolates showed a certain level of inhibitory activity.

Seven strains with the strongest antifungal activity were examined by the milk agar plate method with three different mould strains isolated from spoiled dairy products as target microorganisms and were compared with the antifungal effectiveness of standard antifungal strains *Lactobacillus rhamnosus* VT1 and *Lb. plantarum* DC 1246.

The newly isolated lactobacilli strains exhibited the strongest inhibition against *F. proliferatum* M 5689, followed by *Penicillium* sp. DMF 0006 and *Aspergillus niger* DMF 0801. The level of mould growth inhibition of several new isolates, namely *Lb. paracasei* ST 68, *Lb. fermentum* ST 40 and *Lb. fermentum* ST 41, was comparable to or slightly higher than that of standard strains. By use of both phenotypic and genotypic methods (REP-PCR, 16S rDNA), four out of seven antifungally active isolates were identified, one as *Lb. paracasei*, and three as *Lb. fermentum*. *Lb. paracasei* ST 68 was chosen for further testing as antifungal protective adjunct for Edam cheese production.

Keywords: antifungal activity, Edam cheese, non-starter lactobacilli, REP-PCR, 16S rDNA

K. LADÓ, M. THEN, Z. MAY and K. SZENTMIHÁLYI: Element determination of volatile oil content in fennel (*foeniculum vulgare*) by icp-oes and polarography. Pp. 415-418. lado@chemres.hu;

Fennel (*Foeniculum vulgare*) is frequently used for making tea and it is also applied as spice. Since the digestion of oils is relatively difficult and the undigested oil may greatly alter the element data, three different acid mixtures (nitric acid and hydrogen peroxide; nitric acid, hydrochloric acid and hydrogen peroxide; nitric acid, hydrochloric acid and hydrofluoric acid) were tested for determination of element content in fennel. Inductively coupled plasma optical emission spectrometry (ICP-OES) and polarography were applied for the determination of elements (Al, Ba, Ca, Cr, Cu, Fe, K, Mg, Mn, Ni, P, S, Se and Zn). The extraction was realised by using microwave digestion technique under low and high pressure. Lucerna p-alfalfa as reference material was used for the accuracy and precision of the analytical procedures. According to the results, it can be stated that the digestion of medicinal plants.

Keywords: fennel, elements, ICP, polarography

J. CUBERO, V. VALERO, D. NARCISO, J. SÁNCHEZ, A.B. RODRÍGUEZ, C. BARRIGA: Application of the oral administration of the amino acid l-tryptophan as a possible antioxidant precursor. Pp. 419-424. jcubero@unex.es

The use of melatonin as antioxidant has been extensively established. But what would the antioxidant function be if one were to go one step back in the anabolism of that amine, and orally administer its precursor — the amino acid tryptophan? Diurnal animals (*Streptopelia roseogrisea*) were administered orally capsules containing 125 or 300 mg L-tryptophan/kg b.w. for 7 days at the end of the light period (20:00 h). A control group received capsules with methylcellulose. The antioxidant function was studied through the reduction of nitroblue tetrazolium (NBT) by superoxide anion, and through the levels of malonaldehyde (MDA) produced in the lipoperoxidation that occurs from the respiratory burst in response to the presence of a foreign particle in phagocytic cells (heterophils), which were extracted at 02:00 h — at the acrophase of melatonin in the blood stream. In the heterophils extracted from the group that received 125 mg/kg b.w. tryptophan, there was less oxidative stress as determined by the NBT reduction than in those from the 300 mg/kg b.w. group. In the study of the lipoperoxidation of the membranes as determined by the levels of MDA, however, no significant variations were observed between the different groups. The lower concentration (125 mg L-tryptophan/kg b.w.), administered orally, succeeded in diminishing the free radicals produced in the heterophils for the destruction of the ingested foreign agent, but not fully or maximally. The possible solution to this prooxidant/antioxidant imbalance would be to administer a lower concentration of tryptophan to attain the perfect balance for application in nutritional treatments.

Keywords: tryptophan, antioxidants and melatonin.

S. VALCHEVA-KUZMANOVA, V. GADJEVA, D. IVANOVA, A. BELCHEVA :

Antioxidant activity of aronia melanocarpa fruit juice in vitro. Pp. 425-428.

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Aronia melanocarpa fruit juice (AMFJ) used in this experiment was very rich in phenolic substances, anthocyanins being the main flavonoid group. The antioxidant action of AMFJ was determined in vitro through measuring its Trolox equivalent antioxidant capacity (TEAC), superoxide dismutase (SOD)-like activity and catalase (CAT)-like activity. The TEAC of AMFJ was 63 ± 0.8 mM. The SOD-like activity of 1 ml AMFJ was equivalent to that of 230.3 ± 8.4 U SOD and was equal to that of 12.3 mg L-ascorbic acid and 11.4 mg Trolox, respectively. The CAT-like activity of 1 ml AMFJ was equivalent to the activity of $3,223.5 \pm 91.3$ U CAT and was equal to that of 6.4 mg L-ascorbic acid, while Trolox did not show such an activity. The pronounced antioxidant action of AMFJ is probably due to its high content of phenolic compounds.

Keywords: antioxidant activity, Aronia melanocarpa fruit juice, L-ascorbic acid, Trolox

SIPOS, X. M. MEYER and P. STREHAIANO: Development of a non-linear dynamic mathematical model for the alcoholic fermentation. Pp. 429-438. e-mail:

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This paper proposes a non-linear mathematical model that makes it possible to simulate the batch alcoholic fermentation of white wine. The model was developed in stages, considering the yeast cells' physiological states. The parameters of an equation that describe the latent period were calculated considering temperature influence. The biomass equation was

established starting from the Monod model and validated with experimental data. For substrate consumption and product, the Bovée and Strehaiano model has been used. The mathematical system was completed with heat transfer equations in bioreactor and jacket. The model was implemented as a Matlab S-function and results were compared with the experimental data.

Keywords: alcoholic fermentation, non-linear mathematical model, computer modeling

L. KÖRMENDY?, E. ZUKÁL, I. CSAPÓ and N. TÖRÖK: Problems relating to the calculation of meat equivalent and 'meat content' with particular reference to the quid (quantitative ingredient declaration) regulation. Pp. 439-453. OHKI@interware.hu

The aim of this study was a survey of relationships used for calculating 'meat content' with respect to the QUID regulation (COMMISSION DIRECTIVE, 2001). The recommended equations are presented in a concise form. The advantages of a possible introduction of the meat equivalent concept are also treated [assessment of lean content of the meat ingredient(s)]. A non negligible condition for applying the QUID equations is, in principle, the equality of the fat-free protein concentrations of the various tissue types in the raw meat materials. This needs an adjustment of the protein concentrations of the recipes to a reference value (PFFref), which can be achieved by effective or virtual addition of water to the formulation or 'removal' of water from it. The influence of moisture loss during meat processing on QUID is also discussed. The results of various calculation methods are presented with examples.

Keywords: meat content, meat equivalent, fat-free protein content (PFF), quantitative ingredients declarations (QUID), labelling of meat products

E. KUBICKA and R. ZADERNOWSKI: Enhanced jasmonate biosynthesis in plants and possible implications for food quality (a review). Pp. 455-469. ewa@pan.olsztyn.pl

Food supply chain is long, complex and comprises different stages – from raw material production, processing, distribution to retail. There are some environmental factors, which can affect nutritional components of plants being the raw materials in the food industry. Plants have developed a number of defense mechanisms to any injuries occurring. Jasmonates - formed from linolenic acid on the allene oxide synthase pathway - are considered to play the key role in plant defense mechanisms. It has been found that there is a relationship between jasmonates and production of new proteins, glucosinolates and polyphenolic compounds. The effect of jasmonates on carbohydrates and other plant metabolites has also been reported. Jasmonates are characterised by olfactory properties and thus can exert an effect on sensory quality of foods and contribute to commercial attractiveness of foods. Moreover, the implications resulting from consumption of jasmonate-affected foods appear to be of high immensity and can have severe adverse effects on human health, and on the other hand, jasmonates appear to be a promising means in directed production of chemical compounds and pharmaceuticals as well as a preservative substance during food storage.

Keywords: Jasmonates, food quality, proteins, glucosinolates, polyphenolic compounds, carbohydrates, plant metabolites

Á. KONCZ, L. MÉSZÁROS, J. FARKAS, K. PÁSZTOR-HUSZÁR, R. HELT and N. LECHNER: Pasteurization of raw milk by high hydrostatic pressure. Pp. 471-481.
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Thermal and HHP treatments were compared. We established that the applied HHP treatments reduced the total cell count more significantly than thermal treatments. For example, the 10 minutes 600 MPa/ HHP treatment was equivalent to about 10 minutes thermal treatment at 70°C. This combination of temperature and time is not used in the pasteurisation practice of the dairy industry. The various thermal treatments reduce the phosphatase enzyme activity to between one third and one hundredth of the original activity. The HHP treatments yielded similar results. Six hundred MPa pressure caused 10 to 70% decrease in the enzyme activity, while 700 MPa pressure led to a decrease of one log cycle. In the second year we tried to investigate the kinetics of the effect of HHP treatment. The 5, 10, 20, 40 min holding times were systematically applied in the range of 400 to 700 MPa. According to the results, 600 and 700 MPa HHP treatments effectively assured a decrease in the total cell count and the alkaline phosphatase enzyme activity. No organoleptic changes occurred.

Keywords: high pressure treatment, milk; total cell count; phosphatase enzyme activity

M. ARDIC, K. KAV, A. GUNER and Y. DOGRUER: Identification of enterobacteriaceae in urfa cheese. Pp. 483-488. mardic@harran.edu.tr

The purpose of this study was to determine the Enterobacteriaceae counts and to identify the species isolated in Urfa cheese traditionally manufactured from raw milk in Sanliurfa. In the research, 75 samples obtained from retail markets were examined. Enterobacteriaceae was detected in 45.33% of the samples and counts varied between 102-108 CFU g⁻¹. A total of 8 different species were identified, the most common of those was *Klebsiella pneumonia* (30% of the isolated strains), followed by *Escherichia coli* (25.29%), *Enterobacter cloacea* (16.47%), and *Enterobacter aerogenes* (11.76%). *Klebsiella oxytoca*, *Citrobacter freundii*, *Yersinia enterocolitica* and *Serratia marcescens* were present in small quantities (7.06, 5.88, 2.45 and 1.18% of the isolates, respectively). *Salmonella* spp. was not detected in any of the cheese analyzed. The results obtained from this study clearly indicate that measures should be taken to control and reduce the contamination and multiplication of pathogens such as *E. coli*, *Y. enterocolitica* and other Enterobacteriaceae spp. in Urfa cheese.

Keywords: Urfa cheese, Enterobacteriaceae

F.O. ABULUDE W.O.ADESANYA, M.O. OGUNKOYA, O.A. ELEMIDE and E.E. ESIET: Nutritional composition of ogi and its by-products. Pp. 489-493.
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The nutritional composition of ogi and its by-products were evaluated with respect to proximate composition, mineral contents and physico-chemical properties using standard methods of analysis. The results showed that guinea corn contained more protein (17.52%) than maize (11.24%), but was lower in nitrogen free extract, lipid and minerals (P, K, Na, Fe, Zn and Cu). The predominant content of residue was fibre.

Keywords: Ogi, residue, wash water, proximate composition, mineral elements

E. KLEWICKA: Antifungal activity of lactic acid bacteria of genus *Lactobacillus* sp. In the presence of polyols. Pp. 495-499. klewicka@p.lodz.pl

The controlled lactic fermentation is a common method for food preservation. Lactic acid bacteria (LAB) manifest antagonistic activity mainly against Gram-negative bacteria but the growth of some Gram-positive is inhibited, too. Yeasts and moulds manifest slight or no sensitivity to the LAB metabolism products. In this study antagonistic activity of selected *Lactobacillus* strains (n=12) against fungi was investigated. Polyhydroxyalcohols (glycerol, lactitol, erythritol, sorbitol, mannitol) were added to basic MRS agar (10 g l⁻¹). *Lactobacillus* bacteria multiplied effectively in the presence of polyhydroxyalcohols inhibiting the growth of fungi (*Fusarium latericum*, *Mucor hiemalis*, *Aspergillus niger*, *Aspergillus ochraceus*, *Candida mycoderma*, *Alternaria alternata*, *Geotrichum candidum*). The most effective antagonistic activity was observed in the presence of sorbitol.

Key words: antagonism, antifungal, *Lactobacillus*, polyols