

PAP, K., and KISKÓ, G.: Efficacy of disinfectants against static biofilms on stainless steel surface. Pp. 1-7. gabriella.kisko@uni-corvinus.hu

Inactivation and removing efficiency of disinfectants (Descosal and Domestos) was tested against *Pseudomonas aeruginosa* and *Candida albicans* and their biofilms (2 and 72 h, 3, 7 and 14 days old, respectively). The survival of microbes was studied by pour plating and impedimetry, and the attachment by epifluorescent microscopy.

In the surface test, both disinfectants were effective against both test organisms with no significant difference in their efficiency. The decreasing detection times during impedimetric measurements showed higher resistance of the older *Ps. aeruginosa* biofilms. Both disinfectants tested were fungicidal against *C. albicans* and bactericidal against *Pseudomonas aeruginosa* but for biofilm removal Domestos was more efficient.

Keywords: biofilm, sanitation, *C. albicans*, *Ps. aeruginosa*

WOSIACKI, G., NOGUEIRA, A., SILVA, N.C.C., DENARDI, F. and VIEIRA, R.G.: Quality profile of samples of 139 apples cultivars harvested in Brazil from 1982 to 2006. Pp. 9-22. gilvan.wosiacki@pesquisador.cnpq.br

Brazilian pomiculture has definitively been established in the beginning of the 1970's as a result of a joined work of political, industrial and research sectors. After almost 35 years, one can see that this agricultural activity has modified many places in the Southern States of Brazil from both the social and the economical point of view. Such a modification can be observed especially in Fraiburgo, the epicentre of the apple cultivation in Santa Catarina, where even the landscape is completely different nowadays. During the last 23 years, the quality of samples of both commercial and experimental apples harvested at the median stage of the crop has been analysed according to the physicochemical parameters and the results were used to construct a database, which is described and partially shown in this paper. Brazil has recently been considered as member of the top apple producing countries in the world.

Keywords: apple juice quality, apple varieties

KOVÁCS, E., MERÉSZ, P., KRISTÓF, Z. and NÉMETH-SZERDAHELYI, E.: Ripening and microstructure of apricot (*Prunus armeniaca* L.). Pp. 23-39. etelka.kovacs@uni-corvinus.hu

Colour, texture, pectin autolysis, membrane permeability and microstructure (SEM, TEM), β -galactosidase and polygalacturonase were studied in apricots (cv. Magyar kajszai) harvested in mature green, straw yellow, bright orange and deep orange stages. The L^* increased from mature green to straw yellow then decreased from straw yellow to deep orange state. The a^* values increased with ripening. The bright and deep orange apricots were significantly softer than the mature green and straw yellow ones and the membrane permeability increased with ripening. The presence of β -galactosidase enzyme was proved by immunoblotting analysis using monoclonal anti- β -galactosidase clone GAL-13 (Sigma) in all ripening stages. The enzyme activity was very low in mature green stage and increased significantly ($P < 0.05$) with

increasing ripeness and during storage. The PG activity was very low in the mature green apricot. A significant ($P < 0.05$) increase was observed in the straw yellow apricot and in the riper fruits. The mature green apricot showed a regular, the straw yellow and bright orange samples showed a moderately regular tissue structure, while the tissue of the deep orange apricot collapsed (SEM). The cell wall and the middle lamella of the green apricot (TEM) were intact. Generally, there were intact cytoplasm membranes with some damaged parts. In the straw yellow apricot, the cell wall started to loosen, the middle lamella lost pectic polysaccharides. The structure of the cytoplasm was not recognisable, the tonoplast and the cytoplasm membrane were injured. The cell wall of the bright orange apricot was similar to that of the straw yellow ones. The middle lamella dissolved and hairy, fibrillar structure of cell wall was found in the deep orange samples.

Keywords: apricot, ripening, hardness, colour, β -galactosidase, polygalacturonase, membrane permeability, ultrastructure (TEM, SEM)

RASOOLI, I., GACHKAR, L., YADEGARINIA, D., BAGHER REZAEI, M. and ALIPOOR ASTANEH, S.D.: Antibacterial and antioxidative characterisation of essential oils from *Mentha piperita* and *Mentha spicata* grown in Iran. Pp. 41-52. rasooli@shahed.ac.ir

The present work evaluated the antioxidant and antimicrobial activities of the essential oils of *Mentha piperita* and *Mentha spicata*. Survival and growth of *Bacillus cereus*, *E. coli* and *S. aureus* were studied. Twenty-six and fifteen compounds were identified in the essential oils of *Mentha piperita* and *Mentha spicata*, respectively. *Mentha piperita* contained major compounds of α -terpinene (19.7%), isomenthone (10.3%), trans carveol (14.5%), piperitine oxide (19.3%) and β -caryophyllene (7.6%). The major compounds of *Mentha spicata* were limonene (48%), menthol (4.7%), piperitone (20.27%) and caryophyllene (7.9%). The essential oils have good or excellent antimicrobial activities against all microorganisms tested. Complete death time on exposure to *Mentha piperita* L. and *Mentha spicata* L. oils were 90, 15 and 10 min and 45, 30 and 15 min for *B. cereus*, *E. coli* and *S. aureus*, respectively. Two Gram-positive microorganisms, *B. cereus* and *S. aureus*, showed the same pattern of zone/oil concentration ratios, while *E. coli* responded differently. The essential oils notably reduced the concentration of DPPH free radical and bleached β -carotene. The performance of the *M. piperita* oil was better than that of *Mentha spicata*. Application of these oils in food industries is recommended.

Keywords: *Mentha piperita*, *Mentha spicata*, essential oil, *B. cereus*; *E. coli*, *S. aureus*, antioxidant, radical scavenging, antimicrobial

SCHMIDT, J., HUSVÉTH, F., SIPŐCZ, J.†, TÓTH, T. and FÁBIÁN, J.: Dietary manipulations to increase the concentration of conjugated linoleic acid in milk. Pp. 53-63. schmidtj@mtk.nyme.hu

Ten Holstein cows between 8 and 12 weeks in lactation were used to investigate the effect of feeding full-fat soybean, full-fat sunflower, and a Ca-soap source (Profat) on the conjugated linoleic acid (CLA) content of milk. Cows were fed the experimental fat sources in the dosage of 500 g crude fat daily. The results indicated that milk CLA content increased in relation to the linoleic acid concentration of experimental fat supplements, namely, full-fat sunflower increased the most and Profat increased the least the CLA concentration in milk. The strength

of the correlation was $r=0.62$ between the linoleic acid concentration in feed and the CLA content in milk. The strength of correlation increased to $r=0.69$ when both linoleic acid and linolenic acid concentration of feed were used in the calculation. Considering milk production and the daily production of CLA in milk, the following equation described the relationship between the linoleic acid content of fat supplements and CLA concentration in milk: $x=167.52+0.483 \times y$; where x =CLA mg L⁻¹ milk and y =linoleic+linolenic acid content of fat sources, g/day. Along with milk CLA, the trans-C18:1 concentration of milk also increased, but the magnitude of the increase was smaller compared to that of milk CLA.

Keywords: cow, milk, full-fat soybean, full-fat sunflower, Ca-soap, CLA, linoleic acid, linolenic acid, trans-C18:1

LECCESE, A., BARTOLINI, S. and VITI, R.: Total antioxidant capacity and phenolics content in fresh apricots. Pp. 65-76. bartolini@sssups.it

Food quality analysis addressed to the nutraceutical profile is becoming consistent highlighting the possibility to use the antioxidant capacity as further quality index of many fruit and vegetables species. In this study, the total antioxidant status of several apricot cultivars differing in ripening calendar, pomological traits and geographical origin have been determined by Trolox Equivalent Antioxidant Capacity (TEAC) assay and total phenol content by Folin-Ciocalteu (F-C) method. Among the cultivars analysed, the variability on the antioxidant capacity and total phenol content have been consistent, showing an increasing amount of antioxidants in the late ripening genotypes. These genotypes exhibited the best combination of pomological and nutraceutical traits with an excellent fruit qualitative profile.

Keywords: Prunus armeniaca L., quality, fruit, pomological traits, antioxidant activity, phenols

HADANICH, D., PERÉDI, J., JUHÁSZ-ROMÁN, M., and NAGY, B.: The effect of microorganisms deteriorating quality in storing sunflower seed. Pp. 77-86. mariann.roman@uni-corvinus.hu

In the microflora of sunflower seeds stored in domestic stores the, *Alternaria* species dominate, while those of *Penicillium*, *Trichoderma*, *Stemphylium* and *Absidia* spp. are present in lower numbers. During model tests (cca 20% seed moisture content, 25°C, 4 weeks storage) the *Alternaria* species were almost completely eliminated and on the seeds mainly *Aspergillus* species, characteristic of stores, propagated. The moulds significantly deteriorated the quality of the seed and that of the produced oil and meal (reproductive ability, germinating power, oil content, lipoxygenase enzyme activity, acid value, peroxide value, fatty acid composition, UV absorbance, colour, sensorial properties, as well as the protein content, amino acid composition, colour and the smell of the meal), but no aflatoxin production occurred. The findings offer a comprehensive picture on the multiple destructive effects of incorrect storage.

Keywords: sunflower, mould contamination, storage condition, oil quality

NÁDASI, E., PRANTNER, I., DÁVID, T. and EMBER, I.: Effect of a plant-originated

natural compound, CoDTM extract, on c-myc, Ha-ras and p53 gene expression in short-term animal experiments. Pp. 87-92. edit.nadasi@aok.pte.hu

Several plant-originated natural compounds were shown to exhibit chemopreventive effect in carcinogenesis. In our studies, we have investigated CoDTM extract, a complex plant extract made from several tropical plants with possible cancer preventive effect in animal experiments. C-myc, p53 and Ha-ras gene expressions were investigated 24, 48 and 72 h after extracting CoDTM and dimethyl-benz(a)-anthracene (DMBA) treatment in CBA/Ca(H-2K) mice. CoDTM extract administered together with DMBA diminished c-myc, p53 and Ha-ras gene expressions both in the 24 and 48 h experiments, but not in the 72 hours experiments. Further in vivo and human studies are needed to clarify the possible role of CoDTM extract in the prevention of tumour formation carcinogenic exposures.

Keywords: CoDTM extract, plant-originated natural compounds, gene expression, “short-term” studies, anticarcinogenic effect

HORVÁTH, K., SEREGÉLY, Zs., ANDRÁSSY, É., DALMADI, I. and FARKAS, J.: A preliminary study using near infrared spectroscopy to evaluate freshness and detect spoilage in sliced pork meat?. Pp. 93-102. kinga.horvath@uni-corvinus.hu

Experimental batches of chilled boneless slices of pork meat have been stored aerobically in sterile Petri dishes and total aerobic plate counts (TAPC) and sensorial observations were made periodically during storage to monitor bacterial growth and apparent deteriorative changes at 4, 8, and 12°C, respectively. Near infrared spectroscopy (diffuse reflectance) measurement was performed on replicate meat samples in the wavelength range of 1000–1800 nm. Second derivative and multiplicative scatter correction were performed on the spectra as data pre-treatments. Principal component analysis (PCA) and canonical discriminant analysis (CDA) were used for observation of discrimination of the samples due to loss of freshness and onset of bacterial spoilage as a function of the storage time. The percentage of correctly classified samples decreased somewhat by increasing the storage temperature. Partial least squares (PLS) chemometric model was developed to predict and quantify bacterial loads from the scatter corrected 2nd derivative spectra. PLS evaluation (predicted versus measured TAPC values), - when bacterial counts at all sampling days and storage temperatures were taken into account - resulted in a correlation coefficient of 0.977, and a root mean square error of prediction (RMSEP) 0.438 log colony forming units g⁻¹. These preliminary results indicate the potential of utilising near infrared diffuse reflectance spectroscopy in combination with multivariate statistical methods to monitor loss of freshness and detect bacterial spoilage of meat samples rapidly before deleterious microbial changes become apparent. However, much larger number of samples should be studied to ascertain properly the prediction power of the spectroscopic method.

Keywords: NIR spectroscopy, pork meat, freshness, spoilage, chemometry

STILLER, I. and DANCS, G.: Increasing the nutritive value of potato by metabolic engineering of cysteine content. A review. Pp. 103-113. sikolyka@yahoo.com

Plants are the basis of the human nutrition and have been selected and improved to assure this purpose. Nowadays, new technologies such as genetic-, metabolic engineering and genomics

approaches allow further improvement of plants. The nutritional quality of a crop is not only dependent on its energy supply in the form of sugars/starch, but also on the amino acid composition of its storage proteins. Potato, the most important non-cereal food crop, is deficient in the sulphur containing amino acids, methionine and cysteine. The manipulation of the targeted amino acid biosynthesis can be a way to circumvent this problem. Cysteine is synthesised from O-acetyl-L-serine formed by serine acetyltransferase (SAT). The main results and some unpublished ones are summarised here. They present the key role of SAT enzyme in the biosynthesis of cysteine and the biotechnological approaches of nutritive value improvement through elevation of cysteine content.

Keywords: Solanum tuberosum, serine acetyltransferase, nutritive value, stress

YÜCEL, U. and ÜREN, A.: Biogenic amines in Turkish type pickled cabbage: effects of salt and citric acid concentration. Pp. 115-122. ufukyucel@gmail.com

Pickled cabbage in brine is one of the traditional fermented products in Turkey. The effects of salt content (6, 8, 10 or 12%) and citric acid concentration (0 or 1%) on the production of biogenic amines in Turkish type pickled cabbage were investigated. Concentrations of putrescine, cadaverine, tryptamine, spermidine, spermine, tyramine and histamine were determined in 8 pickled cabbage samples, 4 of them contained citric acid and the remaining 4 samples contained no citric acid. Numbers of LAB (lactic acid bacteria), enterobacteriaceae and halophilic microorganisms of samples were determined during fermentation. Amounts of biogenic amines in samples containing 6, 8 or 10% salt and 1% citric acid were found lower than those in samples without citric acid. On the other hand, the highest concentrations of biogenic amines were observed in the sample containing 10% salt and no citric acid ($P < 0.05$). There was a correlation between amounts of biogenic amines and numbers of LAB. Pickled cabbages supplied from the markets had small amounts of biogenic amines.

Keywords: biogenic amine, pickled cabbage

JANEKOVÁ, K. ? and ŠINKOVÁ, T.: Dietary intake of nitrates and nitrites in boarding schools of the slovak republic. Pp. 123-131. -mail: katarina.janekova@vup.sk

All boarding school provisions within the Slovak Republic are due to prepare meals under the guidance of the Ministry of Health that monitors recommended daily intakes of individual foods and dietary allowances of nutrients through scientific meetings. Calculations based on a nutrition model of a boarding school in four months were done to estimate the mean dietary intake of nitrates and nitrites, industrially added to foodstuffs, by children aged 7 to 10 years. Following recognised methodology of the Codex Alimentarius and the European commission, it was assumed that nitrates and nitrites are used in the widest possible range of foods and at their maximum permitted levels, resulting in overestimation of intake values.

The mean daily exposure of consumers with the lowest (21 kg) and the mean (26.5 kg) body mass to nitrates ranged from 0.6 to 6.7% and from 0.5 to 5.3% of their acceptable daily intake (ADI), respectively. For the same consumers, the mean daily exposure to nitrites ranged from 0 to 13.0% and from 0 to 10.3% ADI. No significant seasonal differences were obvious. The results indicated that the above mentioned group of children is sufficiently protected from hazard of nitrates and nitrites in food.

Keywords: nitrates, nitrites, acceptable daily intake, maximum permitted levels, exposure estimation

MRVCIC, J., STEHLIK-TOMAS, V. and GRBA, S.: Incorporation of copper ions by yeast *Kluyveromyces marxianus* during cultivation on whey. Pp. 133-139. jmrvcic@pbf.hr

The production of *Kluyveromyces marxianus* biomass enriched with copper ions were studied. For that reason the growth of *Kluyveromyces marxianus* in whey with different concentrations of copper ions in batch process under semiaerobic and aerobic conditions were examined. The kinetics of copper ions accumulation in yeast cells, under the same conditions, as well as the reduction of chemical oxygen demand (COD) during yeast growth in aerobic condition, were monitored, as well. The concentration of copper ions in media up to 4 mg l⁻¹ did not affect the yeast growth, whereas at a higher concentration, a marked decrease in the rate of yeast growth, ethanol production and lactose consumption occurred. In semiaerobic conditions, the maximum uptake of 0.35 mg Cu g⁻¹ d.m. was obtained, while in aerobic conditions a lower uptake of 0.26 mg Cu g⁻¹ d.m. and COD reduction of 85% were achieved. COD reduction was independent of the copper addition or uptake.

Keywords: whey, biomass production, *Kluyveromyces marxianus*, copper uptake, COD