

Editorial: Szeitz-Szabó, M. and Farkas, J.: – Renewal of National Food Safety Programme in Hungary. Pp. 173-181. szabo.maria@mebih.gov.hu

Matusek, A., Merész, P., Le, T.K.D. and Örsi, F.: Fructo-oligosaccharide degradation in apple pulp matrix. Pp. 182-193. meresz@mail.bme.hu
The degradation process of fructo-oligosaccharides (Raftilose® P95) has been studied in apple pulp matrix at 70-80 °C in pH range 2.7-3.3. Changes of sugar compositions have been analysed by an appropriate isocratic HPLC with differential refractive index detector for oligosaccharide determination. According to Arrhenius equation significant effect of temperature has been observed on the decrease of oligomer concentration. The oligomers (DP3-DP7) degrade continuously at any pH between 2.7 and 3.3. The lower the pH is the higher the change of oligomer and monomer concentration. The oligomers (DP4-DP7) could give out in 30-40 min below pH 3.0 caused by the high concentration of protons. The rate of degradation depends not only on the processing time, temperature, and the proton concentration of the solution, but on the characteristic of apple pulp, too, where the degradation is significantly higher than that in water solution.

Keywords: fructo-oligosaccharides, oligofructose, degradation, hydrolysis, apple

Škrbić, B., Mačvanić, N. and Filipčev, B.: Nutritional and sensorial aspects of wheat bread enriched with high-oleic sunflower seed. Pp. 194-204. biljana@tehnol.ns.ac.yu

An investigation on the quality characteristics of wheat bread enriched with seeds of high-oleic sunflower is reported which included important parameters that affect its nutritional quality (chemical composition, fatty acid composition: saturated, monounsaturated, polyunsaturated, linoleic and linolenic acid, tocopherol content: *alfa*, *beta*, *kappa*, *delta* content of essential microelement selenium) and its sensory quality. The study also includes the assessment of a persistent pollutant, benzo[a]pyrene. The objective of the study was to determine and compare the concentrations of nutrients and contaminants of the control and enriched wheat bread in order to assess the benefits and potential risks of regular consumption of these products. It was found that bread enriched with seeds of high-oleic sunflower would significantly improve the daily intake of fat, fibre, selenium, *alfa* tocopherol and linolenic acid. Regular consumption of a daily portion of such bread (300 g) would not incur significantly increased health risk from contaminant.

Keywords: bread, sunflower seed, nutrients, selenium, tocopherols, fatty acids, benzo[a]pyrene, intake

Kaškonienė, V., Venskutonis, P.R. and Čeksterytė, V.: Sugar analysis for authenticity evaluation of honey in Lithuanian market. Pp. 205-216. rimas.venskutonis@ktu.lt

The aim of the work was to evaluate the authenticity of honey present in Lithuanian market using GC-FID analysis of trimethylsilylated carbohydrates. In total, 15 natural honey samples and one artificial honey sample were analysed. In general, the composition of carbohydrates in the tested samples of natural honey was quite similar, except for trisaccharides, which were

not found in any of the analysed samples. Although the amount of identified compounds was different, the percentages of the quantified sugars in natural honey were within the limits established by Codex Alimentarius Commission. Artificial honey contained 9.01% of sucrose and 34.60% of maltose, while the content of maltose in natural honey varied in the range of 0.29–1.41%. The content of fructose and glucose in artificial honey was 2.41% and 22.89%, respectively; while the sum of the main monosaccharides in natural honey was averagely 38.80%. The results obtained indicate that tested natural honey samples from Lithuanian market were genuine products.

Keywords: honey, carbohydrates composition, authenticity, GC-FID

Lisiewska, Z., Kmiecik, W., Gębczyński, P. and Sobczyńska, L.: Retention of chlorophylls in frozen french bean, green asparagus, and pea prepared for consumption depending on pre-treatment before freezing and the temperature of frozen storage. Pp. 217-226. rlisiew@cyf-kr.edu.pl

The investigation involved French bean, green asparagus and pea. The evaluation concerned fresh material; material after blanching and cooking; and frozen vegetables prepared for consumption after 0, 4, 8 and 12 months of frozen storage. In the investigation the tradition method of freezing - blanching before freezing (TT product) and the modified technology - cooking before freezing (MT product) were used. The obtained MT product only requires defrosting and heating in a microwave oven. Frozen products were stored at -20 oC and -30 oC. Fresh bean contained 9.67 mg chlorophylls; green asparagus 6.76 mg and pea 9.21 mg in 100 g fresh matter. Blanching, cooking, frozen storage and the preparation of vegetables for consumption brought about varied decreases in the analyzed pigments. Products prepared for consumption after 12 months of frozen storage retained the following amounts of total chlorophylls compared to that found in the raw material: French bean 63-81%; green asparagus 46-79%; and pea 73-97%, depending on the investigated sample. The MT products contained 14-27% less chlorophyll than TT products; frozen products stored at -30 oC contained 6-29% more chlorophyll than those stored at -20 oC.

Keywords: chlorophylls; pretreatment; frozen storage; preparing for consumption; French bean; green asparagus; pea

Bóka, F., Nagymajtényi, L. and Paulik, E.: Dietary behaviour in young men of various levels of physical activity. Pp. 227-234. paulik@puhe.szote.u-szeged.hu

This study investigates the relationship between the characteristics of healthy nutrition and other lifestyle factors and state of health in youth. A total of 330 men of 10 to 25 years of age with light, moderate and high level of physical activity were involved in this cross-sectional study. A self-administered questionnaire was used as a method of data collection. The positive dietary factors were scored on the basis of a self-reported food frequency questionnaire about the past month consumption of foods. In the univariate analysis age, physical activity and smoking was proven to be in relationship with dietary habits, while body mass index or self-rated health not. The health behaviour of sportsmen showed different picture indicating that active sport is not unequivocally resulted in healthier dietary habits.

Keywords: healthy behaviour, sport, nutrition

Valkovszki, N. J. and Németh Zámbari, É.: Effects of growing conditions on content and composition of the essential oil of annual caraway (*Carum carvi* L. var. *annua*). Pp. 235-246.
valkovszki.noemi@mvk.tsf.hu

Preservative qualities of caraway, known in ancient times, have regained importance as 21st century food safety issues predominate. Essential oil content and its composition of annual caraway varies significantly when row spacing and nutrient supply are manipulated under experimental conditions. During 2006-2007, *Carum carvi* var. *annua* cultivar 'SZK-1' was sown in small plots in three replications with two factors in split plot design. The row spacings were 24 cm, 36 cm, and 48 cm, and six nutrient application rates were applied (Control, N0K80, N80K0, N80K80, N80+70K0, N80+70K80). The results show that the percentage of essential oil content is influenced by the row space. Furthermore, our data show that increased potassium level enhances not only the essential oil content of seeds, but the amount of d-carvone in the oil as well. Every treatment of potassium produced higher d-carvone levels (53.34%) than those found in the control. In 2006, the first year of the two-year study, the highest carvone level (66.25%) was measured in the treatment of N80+70K80, whereas in 2007 the highest level occurred in the N80K80 (49.216%) treatment.

Keywords: nitrogen, potassium, nutrients, row spacing, d-carvone, d-limonene

Hornig, Q., Lorbeer, E. and Vollmann, J.: Isoflavone concentration of soybean in Central Europe as determined by HPLC/UV analysis before and after acid hydrolysis. Pp. 247-253.
johann.vollmann@boku.ac.at

Isoflavones are phenolic compounds present in soybean and other legumes, which have attracted considerable attention because of various health effects associated with their bioactive properties. From twelve isoflavones known in soybean, nine are present in a glycoside form, whereas health effects are mainly attributed to the aglycones daidzein, genistein and glycitein. While most analytical methods focus either on total isoflavone content before hydrolysis or on isoflavone aglycones after hydrolysis, a two-step analytical procedure using HPLC separation and UV detection has been applied to detect both the isoflavone glycosides naturally present in soybean as well as their aglycones after acid hydrolysis. Five soybean genotypes of early maturity groups have been grown in the east of Austria in two climatically contrasting seasons, and seed samples were analysed for isoflavones. Total isoflavone concentrations of the soybean samples determined before and after hydrolysis ranged from 258–1137 µg/g and from 140–748 µg/g, respectively. For most isoflavones analysed, differences were statistically significant both for genotypes and growing seasons. The results suggest that the analytical procedure applied is useful both for selection of high isoflavone soybean genotypes as well as in quality control, particularly in view of isoflavone bioavailability.

Keywords: soybean, *Glycine max*, isoflavones, genistein, daidzein, acid hydrolysis, HPLC analysis, environmental variation

Jancsó, Z., Márton, H., Simay, A., Újhelyi, I. and Ilyés, I.: The effect of eating habits on cardiovascular risk factors and the assessed cardiovascular risk. Pp. 254-261.

jancsoz@med.unideb.hu

Study was aimed to assess the effect of eating habits on cardiovascular risk factors and the assumed cardiovascular risk among 18-60 years old individuals in Hungary. 1320 patients were recruited who had not been treated previously because of known cardiovascular risk factors or diseases. Taking questionnaire on eating habits, physical examination, laboratory tests (total cholesterol, LDL-, HDL- cholesterol, triglyceride, fasting blood glucose, OGTT) and cardiovascular risk assessment were carried out. Proportion of involved people who tended to follow healthy diet (determined on the basis of relevant European cardiovascular primary prevention guideline, focusing on the following parameters: total daily calorie-, fat-, cholesterol intake, fruit/vegetable- and salt consumption) was 66%. In „healthy diet” group we found more patients with normal total cholesterol, LDL-cholesterol and triglyceride, blood pressure (BP) and body mass index (BMI) levels compared to „unhealthy diet” group and this difference was significant. There was no significant difference between the quality of diet and HDL-cholesterol and glucose levels. The level of cardiovascular risk changed in line with the quality of diet significantly: among those people who tended to follow a healthy diet, the proportion of low risk individuals was higher whereas among those people who did not care the quality of food, this proportion was the opposite. Intention to follow healthy diet is an important part of cardiovascular risk mitigation policy among adult Hungarian people.

Keywords: eating habits, cardiovascular risk factors, assessed cardiovascular risk

Rodríguez Madrera, R. and Mangas Alonso, J. J.: Distribution of the principal minor volatiles during cider distillation in ‘alquitara’. Pp. 262-269. rodriguez@serida.org

A study of minor volatiles from 12 fractions collected during distillation of cider in ‘alquitara’ was carried out. Compounds favouring spirit quality are found in the first half of the distillate. Some compounds imparting aromatic defects could be eliminated by removing a percentage of heads during distillation. In contrast, when distilling ciders without defects, removing heads would not be justified, as their incorporation in the final distillate should lead to obtaining spirits with higher aromatic riches. Tails, however, which are mainly constituted by unpleasant aromas, must be rigorously removed to avoid incorporating compounds that could reduce the quality of the final product.

Keywords: Cider spirit, distillation, aroma, GC-FID

Slačanac, V., Hardi, J., Lučan, M., Kun, Sz., Havas, P. and Krstanović, V.: Effect of honey addition on fermentation activity of *Lactobacillus casei* Lc-01 in cow’s and goat’s milk: a kinetic study. Pp. 270-281. Vedran.Slacanac@ptfos.hr

The aim of this study was to determine the stimulatory effect of honey addition on fermentation activity of *Lactobacillus casei* Lc-01 in cow’s and goat’s milk. Two monofloral honey types, dark-coloured chestnut and light-coloured acacia honey were added to cow’s and goat’s milk before fermentation. Different mathematical and statistical models were used to describe the kinetics of fermentation in all analyzed samples. The basic hypothesis of this study was that addition of honey could influence fermentation kinetics in both types of milk. Comprehensive kinetic analyses suggested complex interaction between all components in fermented milk samples. The results presented in this paper showed that addition of both

types of honey had a stimulatory effect on the growth of *Lactobacillus casei* Lc-01 in cow's and goat's milk. Addition of acacia honey significantly stimulated ($P < 0.05$) the growth of *Lactobacillus casei* Lc-01 in cow's and goat's milk. This resulted in higher number of *Lactobacillus casei* cells, as well as in lower pH values of the samples with addition of acacia honey. Furthermore, goat's milk was fermented faster than cow's milk. Calculated values of selected kinetic parameters showed that the critical period of fermentation kinetics, when influence of honey proved stimulatory, was between 10th and 20th hour of the fermentation.

Keywords: *Lactobacillus casei* Lc-01, cow's and goat's milk, acacia and chestnut honey, fermentation kinetics

Srećec, S., Zechner-Krpan, V., Marag, S., Mršić, G. and Špoljarić, I.: Hop pellets type 90: ESEM studies of glandular trichomes morphological and structural changes during the different phases of hop processing. Pp. 282-290. vzrkpan@pbf.hr

The results of this study show that the most usual damages of hop glandular trichomes are obtained on tunica of peltate glandular trichomes as well as cracking of bulbous glandular trichomes. In fresh hop cones any sorts of damage of glandular trichomes are obtained, on the other hand frequency of damaged hop glandular trichomes increase after drying ($\bar{f}_i = 0.08$) and after pelletization of hop cones the structure of glandular trichomes is completely destroyed. Volume of hop glandular trichomes of dried hop cones is significantly smaller in the comparison with volume of glandular trichomes of fresh hop cones ($D = 0.544 \times 10^{-2} \text{ mm}^3$; $P < 0.01$) and a phenomenon of shrinkage on tunica surface of peltate glandular trichomes of dried hop cones is also visible in comparison with the fresh one. The decrease in volume of hop glandular trichomes in dried hop cones is the result of dehydration of hop cones and consequently hops glandular trichomes during the drying process which cause shrinkage of peltate glandular trichomes. However, after pelletization the structure of hop glandular trichomes is completely destroyed.

Keywords: hop pellets type 90, hop processing, ESEM, hop glandular trichomes damage, volume of hop glandular trichomes

Sipos, L., Ladányi, M. and Kókai, Z.: Mineral water consumption and market forecast in Hungary. Pp. 291-300. laszlo.sipos@uni-corvinus.hu

In our study we have proven that Bass model depicting the market spread of different products is suitable also for the study and forecast of mineral water consumption. Years in the near future can be predicted trustworthily. Nevertheless, calculation of the optimal parameters is expedient to be executed after every year of consumption data. Our data are belonging from the years of exponent consumption growth (1979-2007), that is to say, from the time before saturation of market, thus one can apply both Bass model and exponent model. We made forecasts for the current forthcoming years by the Bass model.

Keywords: mineral water, market diffusion, Bass model, forecasting

Biró, L., Szeitz-Szabó, M., Biró, Gy. and Sali, J.: Dietary survey in Hungary, 2009. Part II. Vitamins, macro- and microelements, food supplements and food allergy. Pp. 301-312.

birol@nutricomp.hu

The fourth countrywide nutrition survey was initiated and co-ordinated by the Hungarian Food Safety Office jointly to the yearly Household Budget Survey of Hungarian Central Statistical Office in 2009. The dietary assessment was performed by trained interviewers and skilled dieticians using a complex questionnaire system, containing three-day diary, short food frequency questionnaire and questions on taking of dietary supplements and on prevalence of food allergy. The data records were processed and the questionnaires were validated, the results obtained on the micronutrient intakes of the adult population are shown in this article. From fat soluble vitamins, the average daily intakes of vitamin A and D were lower than the national recommendations in case of both genders, meaning low intake for around 60% (in case of retinol) and 80-90% (in case of calciferols) of adults. The intakes of some water soluble vitamins belonging to B group, vitamin C and folates were low as well. Regarding the macroelements, the most important health problem on population level is the extremely high sodium load of the inhabitants, combined with unfavourable sodium/potassium ratio. The average daily calcium intake of every age and gender group was far below the recommended value. The average daily intake of iron was low for the 50% of adult females. The article also provides data on frequency of food supplement taking habits of inhabitants and of self-reported food allergy.

Keywords: nutrition survey, food consumption, vitamin intake, macroelements, microelements, food supplements, food allergy