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This work was conducted to study the changes in the content and composition of chlorophylls and carotenoids in ground thyme leaves as a function of supercritical carbon dioxide and sub-critical propane extraction. The results indicated that the maximum oleoresin yield could be obtained with supercritical carbon dioxide at 400 bar and 35 or 55°C and sub-critical propane at 50 bar. Pigment solvating capacity of supercritical carbon dioxide increased with the increase of extraction pressure. Substantial variation was noticed in pigment composition between raw material, oleoresin and residues (powders after extraction). Chlorophyll b, chlorophyll a and the Mg-free derivatives were the dominant pigments in the raw material with other derivatives being minor constituents. After extraction with supercritical carbon dioxide at 35°C and pressures higher than 200 bar, epimerisation and oxidation of chlorophylls lead to marked accumulation of artefacts in the residues. The content of oxidized chlorophylls was increased proportionally to the increase of the extraction pressure. The brownish green coloured-oleoresins contained only pheophytins indicating that rapid substitution of Mg with hydrogen atoms on the molecules takes place during extraction of such pigment by supercritical carbon dioxide and sub-critical propane. The marked conversion of chlorophyll to pheophytins was found in oleoresin extracted by supercritical fluid extraction at 55 °C and 100 bar.

Keywords: supercritical fluid extraction, chlorophyll, carotenoid, liquid chromatography, thyme

To know and to understand consumers' preferences is essential in every kind of product development. Consumers make their decision on the basis of numerous factors. In case of mineral waters it is frequently mentioned, that sensory quality is an important attribute of the product. To investigate the real importance of this quality parameter we analyzed several mineral waters, which are available on the Hungarian market, with the aim of searching for differences between the products. The applied qualitative method – software-supported profile analysis – is suitable for comparing samples in a much detailed way. Panelists were trained for the use of scales, but they were not selected according to their sensory acuity. This way we simulated the group of consumers – not in a representative, but in a similar way (e.g. average sensory acuity). The aim of the research was to compare the sensory profiles of the samples, and to find those characteristics, in which they actually differ.

Keywords: mineral water, sensory analysis, profile analysis, consumer choice, computer support of sensory analysis

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Reiter, M.G.R., Volkmann, H., Imianovsky, U., Lopez, M.C., Medina, L.M. and Jordano, R.: Listeria monocytogenes in refrigerated and frozen chicken parts. Pp. 27-31. bt1josar@uco.es

The incidence of Listeria monocytogenes in refrigerated and frozen chicken system (bioMérieux). Two™parts was investigated, using the Mini-Vidas hundred and eigthy chicken parts were tested: 40 skin samples from the breast and leg, 120 samples from refrigerated wings, breasts and legs and 120 samples from frozen wings, breasts and legs (40 of each). 219 samples tested positive (78.21%). The parts with the highest incidence were frozen breasts (100%) and wings (95%). In frozen legs, the values were lower (60%). In refrigerated parts, the incidence was higher in breasts (85%) and in wings (80%). In legs samples, similarly to the frozen ones, the incidence was lower (50%). In the skin of the breasts and legs, the incidence was 77.50%. Statistical evaluation demonstrated that there are no differences between frozen breasts and wings but there are differences between similar refrigerated parts. The refrigerated and frozen legs are the only parts that are statistically equal. The percentages that were detected show the importance of requiring the absence of Listeria spp. in chickens.

Keywords: Listeria monocytogenes, refrigerated chicken, frozen chicken.

Kiss, R., Szita, G., Herpay, M., Csikó, Gy., Pászti, J., Mag, T., Kovács, P., Kovács, G., Szita, J., Tóth, P., Szatmári, I. and Bernáth, S.: The isolation of verocytotoxin-producing Escherichia coli (VTEC) strains from improperly pasteurised cow's milk samples. Pp. 32-37. Szita.Geza@aotk.szie.hu

The authors investigated the possibility of the presence of VTEC strains in improperly pasteurized milk samples. A total of 64 Escherichia coli strains were isolated from 135 pasteurized milk samples originating from the same producer. The examined isolates contained 29 haemolysin-, 9 colicin- and 5 aerobactin-producing strains, but the investigations concerning heat-resistant and heat-sensitive toxins gave negative results. Six O128-type E. coli strains exerted a cytotoxic effect on the VERO cell line; 5 of them contained H12 antigen, while one could not be typed. Four of the 6 verocytotoxin-producing strains belonged in phage group 20, one in phage group (2)3(7), and one in phage group 4; four strains were of B3, one of A1, and one of A1(A2) phage type. Because of a technical failure the milk was pasteurized at 69 ºC for 15 s, which is 2 ºC less than required. The results underline the importance of the appropriate pasteurization temperature, as otherwise the milk may contain verocytotoxin-producing E. coli, which is a potentially great hazard for public health.

Keywords: Escherichia coli, verocytotoxin, isolation, pasteurized milk samples, low pasteurization temperature

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Kumar, M., Dhillon, S., Singhal, A., Sood, A., Ghosh, M. and Ganguli, A.: Cell surface and stress tolerance properties of a newly isolated lactobacillus plantarum CH1. Pp. 38-44. aganguli@thapar.edu

We investigated the role of salt, ethanol, hydrogen peroxide on the survival and cell surface hydrophobicity (CSH) of Lactobacillus plantarum Ch1 possessing probiotic properties. Survivability of the strain exposed to elevated (3.40 M) ethanol concentration, Salt (0.5–2 M), Hydrogen peroxide (0.029–0.29 M) was not significantly ($P>0.01$) affected. With the sole exception of oxidative stress, CSH of intact Lactobacillus plantarum Ch1 increased linearly to the respective stress doses, the observed relationships were supported by strong positive correlations between elevated stress levels and increasing CSH values, suggesting a concentration dependent change in CSH of intact cells. The results of our study imply CSH to be a predominant factor for Lactobacillus plantarum Ch1 to endure stress conditions and may be of substantial importance during designing probiotic foods/beverages containing this strain.

Keywords: L. plantarum Ch1, cell surface hydrophobicity, stress, probiotic

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Lenas, D., Papadimitriou, E., Bitchava, C. and Nathanailides, C.: Fatty acid's content and potential health benefits of consuming gilthead sea bream (Sparus aurata) and sea bass (Dicentrarchus labrax). Pp. 45-51. lenasds@teiep.gr

The fatty acid composition of wild sea bass (Dicentrarchus labrax, L.) and gilthead sea bream (Sparus auratus, L.) were compared with gas chromatography. These two species are widely cultivated in Europe and represent a significant portion of consumed fish in the region. The aim of the present work was to compare the nutritional value of fatty acids in the flesh of wild sea bass and sea bream. Significant differences were observed in the saturated and poly-unsaturated fatty acid content. The presence of lauric, myristic and palmitic acids in the flesh of sea bream in quantities far exceeding those in sea bass make sea bream less suitable for preventing cardiovascular diseases. The poly-unsaturated n-3 fatty acids with both anti-atherogenetic and anti-inflammatory action in sea bass surpass those of sea bream by a total of 30%. Sea bass also contains 60% more C22:6n-3. Compared to sea bream, sea bass appears to be more suitable for the diet of people suffering from cardiac diseases, angiopathy, inflammations and Alzheimer's disease.

Keywords: seafood, fish, nutritional value, Dicentrarchus labrax, cardiovascular

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Lugasi, A., Hóvári, J., Kádár, G. and Dénes, F.: Phenolics in raspberry, blackberry and currant varieties grown in Hungary. Pp. 52-64. lugasi.andrea@oeti.antsz.hu

For prevention of non-infectious diseases such as cancer, and cardiovascular disorders consumption of more and more fruits and vegetables is highly advised. Fruits of Ribes and Rubus species are very popular in Hungary. Antioxidant properties of these fruits are well known, but the values of the characteristics depend on several factors including species, varieties, soil and climate conditions, water and nutrition supply, and so on. Phenolics in several varieties of raspberry, blackberry, and currants grown in Hungary were measured. Total polyphenols and anthocyanins were detected by spectrophotometric methods while flavonoids including apigenin, luteolin, kaempferol, myricetin, quercetin and also ellagic acid were quantified by RP-HPLC technique. Total polyphenol contents of raspberry (yellow and red cultivars), blackberry, and currants (white, red, and black cultivars) were 219, 244, 379, 333, 192 and 533 mg/100 g, respectively. The concentrations of anthocyanins in the same order were 1.0, 41.9, 145, 0.2, 46 and 354 mg/100 g. Apigenin, luteolin and kaempferol could not been detected in any of the samples. Ellagic acid (2.0 to 23.7 mg/100 g) could be

measured in white and red raspberries, in blackberries, and in some red and white currant varieties. Quercetin could be detected in all berry species ranging from 0.1 to 14.4 mg/100 g. Measurable amount of myricetin was observed only in black currant varieties between 1.5 and 7.7 mg/100 g. Polyphenols including flavonoids and anthocyanins in berry fruits are important forms of natural antioxidants. These molecules play essential role in the prevention of diseases in the pathomechanism of which free radicals are involved. Berry fruits are good sources of antioxidants consumed either in fresh or in processed forms because of great susceptibility of polyphenols to heat and other physicochemical processes.

Keywords: black currant, red currant, blackberry, raspberry, polyphenols, anthocyanins, flavonoids

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Sedaghati, E., Nikkhah, M.J., Zare, R., Fotuhifar, K.B., Kocsubé, S., Vágvölgyi, Cs. and Varga, J.: Molecular identification of potentially mycotoxigenic black aspergilli contaminating pistachio nuts in Iran. Pp. 65-70. jvarga@bio.u-szeged.hu

Ochratoxin A is a mycotoxin produced by Aspergillus and Penicillium species. This mycotoxin is a common contaminant of various foods including cereal products, spices, dried fruits, coffee, beer and wine. Besides species assigned to Aspergillus section Circumdati, black Aspergilli including A. niger, A. carbonarius and A. sclerotioniger are also able to produce this mycotoxin. Black Aspergilli have been found to be the predominant fungi contaminating pistachio nuts worldwide. We examined the species distribution of black Aspergilli on Iranian pistachio nuts. Sequence-based identifications have been carried out using partial calmodulin sequence data. Our data indicate that instead of the potential ochratoxin and fumonisin producing A. niger species, A. tubingensis dominates on Iranian pistachio nuts. This species is unable to produce either of these mycotoxins, consequently do not contribute to mycotoxin contamination of pistachio nuts in Iran. Further studies are in progress to clarify the role of other Aspergilli in ochratoxin contamination of pistachio in Iran.

Keywords: Aspergillus, pistachio nuts, Iran, ochratoxin A, calmodulin

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Pajin, B., Dimić, E., Romanić, R. and Radujko, I.: Influence of fatty acid composition of sunflower kernel on quality and shelf-life of cookies. Pp. 71-79. pajinb@tf.uns.ac.rs

Sunflower kernel is a rich source of nutritively valuable components like proteins, essential fatty and amino acids, vitamins and mineral matters and as such, is a convenient raw material for the production of enriched cookies, biscuits, crackers as functional food. The influence of high-oleic type sunflower kernel on quality and stability of cookies was investigated, compared to products with standard confectionary sunflower kernel, with dominating polyunsaturated linoleic acid. The optimal keeping time of cookies with standard confectionary sunflower kernel is 4 months, and of cookies with high-oleic sunflower kernel is significantly longer than 5 months.

Keywords: cookies, sunflower kernel, fatty acid composition, quality, shelf-life

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Helyes, L., Lugasi, A., Péli, E. and Pék, Z.: effect of elevated co2 on lycopene content of tomato (Lycopersicon lycopersicum l. Karsten) fruits. Pp. 80-86. Helyes.Lajos@mkk.szie.hu

Recently several studies have focused on the antioxidant activity of lycopene such as quenching of singlet oxygen and scavenging of peroxyl radicals. These properties may play a role in the prevention of different cancer and heart diseases. Tomato is one of the most important sources of lycopene. The main information on the effect of environmental parameters on quality and health-retaining constituents of tomato fruit is mostly related to temperature (air- and fruit canopy temperature) and light effects that might provide a stress to the fruit. Nowadays little is know about the direct effect of elevated CO2. The aim of the present work was to evaluate the effects of elevated CO2 in Perspex open top chambers (OTC) on the lycopene content of tomato fruit. Experiments on the effects of elevated CO2 concentrations showed mixed results. In this work it was found that concentrations of lycopene in a fruit decreased significantly when elevated CO2 was used. Elevated nitrogen sources generated only slight, but not significant difference in the lycopene concentration of tomato fruit.

Keywords: lycopene, CO2, open top chambers, tomato

Limón, J.C., Heredia, N.L., Solís-Soto, L.Y. and Garcia, S.: Cold tolerance of Clostridium perfringens induced by food additives at neutral pH. Pp. 87-94. santos@microbiosymas.com

The aim of this study was to investigate the effect of some food additives used in foods on cold tolerance of Clostridium perfringens at pH close to neutral. Maximal concentrations recommended for foods of sodium benzoate, potassium sorbate, sodium nitrite, monosodium glutamate, or mixtures of those were added to cultures and their effects on C. perfringens tolerance to 10 °C were evaluated. The effect of a previous shock at 28 °C was also determined. Growth of C. perfringens was not inhibited by the substances examined. Sodium nitrite, applied at maximal permitted concentrations, increased C. perfringens survival at 10 °C. Mixtures of GRAS compounds had either no clear effect, or increased tolerance to 10 °C. A pre-shock (28 °C) of the cultures treated with sodium benzoate, sodium nitrite or monosodium glutamate increased survival and stimulated growth of the cultures treated at 10 °C. We conclude that the addition of these compounds including sodium benzoate, potassium sorbate, sodium nitrite and monosodium glutamate to cultures of C. perfringens can influence their cold tolerance. In some cases, the substances that would normally eliminate microorganisms at lower pH, can increase tolerance of this bacterium, permitting survival at low temperatures.

Keywords: Clostridium perfringens, food additives, preservatives, cold tolerance

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Deák, T.: A survey of current taxonomy of common foodborne bacteria. Part II: Gram-positive phyla of firmicutes and actinobacteria. Pp. 95-116. tibor.deak@uni-corvinus.hu

Recent changes in classification of the four major groups of cultivable bacteria commonly encountered in foods are reviewed. Newly described species and genera as well as reassignment of former taxa belonging to Proteobacteria, Bacteroidetes, Firmicutes and Actinobacteria are considered. Taxonomic changes are derived from results of 16S rRNA gene analysis confirmed by other molecular techniques and traditional methods. The review is

aimed to update relevant taxonomic information for those not directly involved in taxonomy, however, this kind of information will have significance in understanding the microbial ecology of food systems and promote improvement of preservation methods, fermentation technologies as well as enhance the safety of products.

Keywords: taxonomy, Firmicutes, Bacillus, Lactobacillus, Clostridium, Actinobacteria

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Biró, L. and Gee, J.: Development of a flexible, updateable, user-friendly electronic food frequency questionnaire. Pp. 117-127. birol@nutricomp.hu

The paper describes the development of an Access-based electronic food frequency questionnaire, capable of collecting information in a convenient, efficient and reliable manner, with data-handling routines to analyse the information and output findings as concise user-friendly reports. It contains a comprehensive food list alongside a nutrient data set, derived from McCance and Widdowson's The Composition of Foods. Frequency of consumption of each food is divided into six categories, and portion size classed as large medium or small, the medium portion being defined in grams. Data can be input directly using a laptop via a simple user interface, removing the need for forms. Immediate analysis of food consumption is accessible on screen or as hard copy, and results can be exported for statistical analysis. The structure and the algorithms of the program make it extremely flexible, enabling it to be tailored and re-validated according to specific requirements.

Keywords: food frequency questionnaire, FFQ, nutrient database, software, intake, consumption, portion

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Bagdi, A., Balázs, G., Schmidt, J., Szatmári, M., Schoenlechner, R., Berghofer, E. and Tömösközi, S.: Protein characterization and nutrient composition of hungarian proso millet varieties and the effect of decortication. Pp. 128-141. tomoskozi@mail.bme.hu

Six varieties of proso millet (Panicum miliaceum L.) and two commercially available millets were investigated in the present study. In order to explore the nutritional potential, major nutrient composition, mineral composition, antioxidant capacity, total phenols content (related to the antioxidant capacity) and dietary fibre content were determined. The effects of decortication on these components were examined. In addition, protein profile of the varieties and amylose/amylopectin ratio of the starch were examined. The range of the values measured for major nutrient composition corresponds with data of other millet species published in earlier studies. Remarkable differences were found among the protein contents of the varieties (11.58% - 14.80%). Although the concentration of minerals was low in the varieties examined, in comparison with other cereals wholegrain millet seems to be nutritionally valuable because of their high dietary fibre content. Decortication had no effect on the protein and fat content of millets, however, it significantly decreased the content of ash, crude fibre, dietary fibre, minerals, total phenols content and antioxidant capacity. Consequently the applicability of millets as functional food decreases. Decortication had no effect on the amylose/amylopectin ratio of millet. No varietal differences were found in terms of protein characteristics.

Keywords: millet, protein characterization, nutrient composition, antioxidant capacity, dietary fibre, decortication

Szeitzné-Szabó, M., Bíró, L., Bíró, Gy. and Sali, J.: Dietary survey in Hungary, 2009. Part I: Macronutrients, alcohol, caffeine, fibre. Pp. 142-152. szabo.maria@mebih.gov.hu

In 2009 Hungarian Food Safety Office (HFSO) performed a countrywide representative dietary survey to obtain food consumption data for quantitative food safety risk assessment utilizable in the field of public health nutrition as well. The consumption of foodstuffs, daily energy- and nutrient intakes, nutritional habits and dietary supplement usage of Hungarian population was assessed. The complex system has included three-day dietary record and a food consumption frequency questionnaire. Some anthropometric parameters were also self-recorded. According to the body mass index, a considerable proportion of both the 31-60 year old males (69%) and females (46%) were overweight or obese. The energy intake of the Hungarian adult population is slightly exceeds the recommendation. The intake of proteins is satisfactory in general. The average intake of total fats is very high (36.1-38.9 energy percent), and the fatty acid composition – mostly the ratio of n-6/n-3 fatty acids - is unfavourable, but the fatty acid pattern regarding saturated- (SFA), mono- (MUFA) and polyunsaturated (PUFA) fatty acid ratio shows favourable tendency. The proportion of complex carbohydrates within the intake of energy providing macronutrients is far lower than the optimal level, but it is a positive finding that added sugar intake is below the outmost recommendation. The average daily cholesterol intake is high (males: 469 mg, females: 335 mg), whilst the dietary fibre intake is lower than the recommended. The article provides data on alcohol, caffeine and fibre consumption, too.

Keywords: nutrition survey, food consumption, nutrient intake, energy intake, fatty acid pattern, cholesterol intake, risk assessment

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Preliminary communications:

Trenovszki, M.M., Lebovics, V.K., Müller, T., Szabó, T., Hegyi, Á., Urbányi, B., Horváth, L. and Lugasi, A.: Survey of fatty acid profile and lipid peroxidation characteristics in common carp (Cyprinus carpio l.) Meat taken from five hungarian fish farms. Pp. 153-164. trenovszki.magdolna@mkk.szie.hu

The aim of present study was to survey the fatty acid composition and fat content in common carp (Cyprinus carpio L.) fillet captured in five different fish farms located in Hungary. Lipid peroxidation characteristics (conjugated dienes and malondialdehyde levels) were also determined in fish muscle. Data on fatty acid composition of common carp has shown that different methods of rearing and feeding cause significant differences in the proportions of n-6 and n-3 polyunsaturated fatty acids of this fish species. According to present results, it seems that the feeding practice of the last month before capture has determined the fatty acid profile of fillet, therefore the technology of carp nutrition should be divided into two main periods: first a growth and weight gain period; and a second one when the nutritional quality of the fillet composition can be improved.

Keywords: pond-cultured common carp; fat content; fatty acids; feeding; lipid peroxidation characteristics

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Preliminary communications:

György, É., Laslo, É., András, Cs.D. and Buzás, A.: Screening of allochthonous microorganisms in drinking water and studies on the faecal-originated escherichia coli isolate survival after chemical disinfection. Pp. 165-171. gyorgybeva@yahoo.com

Access to sufficient water and food of suitable quality is a prime requirement for the improvement and maintenance of public health. Waterborne diseases are typically caused by enteric pathogens which belong to the group of organisms transmitted by the faecal-oral route. In the course of our work, in order to determine the presence of allochtonous microorganisms water of dug wells and springs were microbiologically analysed. The selected non-bottled mineral and well-waters are widely consumed by local people. The survival of faecal coliforms was studied in selected water samples during storage at 4 °C, after desinfection with chloramine and iodine. The microbiological quality of the majority of the analysed well and spring waters is not acceptable. The faecal Escherichia coli was still present in the water samples after 8 and 10 days and presented higher resistance to chloramine, but not to iodine, than the Escherichia coli EC/2 strain chosen for comparison.

Keywords: mineral water, well water, faecal coliforms, Escherichia coli, clostridia, filamentous fungi, bacterial survival, chloramines, iodine