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Editorial: Venskutonis, P.R.: Food additives: the dilemma of "synthetic or natural".
pp.1-5. rimas.venskutonis@ktu.lt

Rade, D.,. Mokrovčak, Ž., Štrucelj, D., Škevin, D., and Neđeral, S.: the effect of processing conditions on the nontriacylglycerol constituents of sunflower oil.
Pp. 7-18. derade@pbf.hr

In this study samples of non-refined sunflower oils, obtained in industrial and laboratory scale by cold and hot pressing and hexane extraction, as well as sunflower oils from single refining steps were investigated. The content and composition of carotenoids, sterols, and the content of chlorophylls as well as their oxidative stability were investigated. To obtain the data about the acidity and oxidative status of the oil samples, basic quality analyses of free fatty acid content (FFA), peroxide value (PV) and spectrophotometric analyses in UV area (K232, K270 and ΔK) were used.
The results showed that the predominating carotenoid in sunflower oil is lutein, and that the total amount of carotenoids during refining process was reduced to about 15% of the initial amount. The major sterol in sunflower oil (about 70 %), as well as in other vegetable oils, was β-sitosterol. The other important sterols in sunflower oil were D7-stigmasterol, stigmasterol, campesterol, D5-avenasterol and D7-avenasterol. The composition of sterols in non-refined and refined oils was more or less the same, while the content of sterols during refining process decreased to 22%. Among all analysed sunflower oils, the laboratory extracted oil had the best oxidative stability (e.g. the longest induction period, according to Rancimat method), while cold and hot pressed oils were less stable than the fully refined one.

Keywords: non-refined sunflower oil, refining, nontriacylglicerols

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Unbehend, Lj., Unbehend, G. , and Kersting, H. J.: Rheological properties of some Croatian and German wheat varieties and their relation to protein composition.
Pp. 19-29. g.unbehend@bagkf.de

Rheological properties and protein macro fraction of ten Croatian and five German wheat varieties were studied. Differences in dough rheological properties of German and Croatian wheat varieties were analysed by ANOVA. Multiple regression was used to determine the influences of protein macro fractions of Croatian and German wheat varieties on rheological properties of their doughs. The investigation had shown that Croatian and German wheat varieties had similar dough properties. Protein content and protein composition influenced many of investigated rheological parameters. However, most of the influences were found in the mixing properties of doughs in both German and Croatian wheat varieties. Dough development time, stability and the degree of softening from the Farinograph and dough strength from the Alveograph showed the highest correlation coefficients with the protein composition. Influences of protein macro fraction of Croatian wheat varieties and influences of protein macro fraction of German wheat varieties on rheological parameters showed some differences.

Keywords: Croatian wheat variety, German wheat variety, protein composition, rheological properties

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Bekers, M. Marauska, M. Grube, D. Karklina, and. M. Duma: New prebiotics for functional food.
pp.31-37. mbek@lanet.lv

A technology of fructan syrup production from sucrose using bacteria Zymomonas mobilis 113 “S” has been developed. The obtained fructan syrup contained 64% of total carbohydrates and 45–48% of fructans (fructooligosaccharides and levan) from total carbohydrates. The product has a reduced energetic value and excellent honey-like taste. Fructan syrup additive of 4 to 11% was used for fat-free milk and oat mash to study the influence on Bifidobacterium lactis 12 growth during 24 h. High cell count of Bifidobacterium was achieved after the 6 h of fermentation.

Keywords: Zymomonas mobilis, fructan syrup, fructooligosaccharides, functional food products

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Mälkki, Y.: Trends in dietary fibre research and development. A review.
pp. 39-62. yrjo.malkki@cerefi.inet.fi

In the past twenty years, the main interest in increasing dietary fibre intake has been to reduce risk of coronary heart disease. In addition to the reduction of blood cholesterol by soluble viscous dietary fibre, this risk is also reduced by antioxidative and fibrinolytic effects. Attenuating levels and fluctuations of blood glucose and insulin have interest not only for diabetic people, but also for improving endurance in sports or physical work, and because of the multitude of physiological effects of insulin as well. Dietary fibre is also in a key position in weight control due to its effect on satiety. New data on the effects of fibre on the intestinal function have shown advantages of soluble fibre sources, partly due to their ability to support selectively the growth of beneficial bacteria, and partly by alleviating constipation. Both soluble and insoluble fibres have effects which reduce risks of cancers, not only colorectal cancer. In applications, the trend is now towards a more specific use of the different types and sources of dietary fibre.

Keywords: dietary fibre, cholesterol, glycemic effects, weight control, cancer risks, antioxidants, lignans, prebiotics, immunological effects

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Csányi, E., Bélafi-Bakó, K., Nemestóthy, N. and Gubicza, L.: Study on ethanol fermentation integrated with simultaneous solvent extraction and enzymatic reaction.
Pp. 63-70. bako@mukki.richem.hu

Ethanol recovery from aqueous fermentation broth by extraction using oleic acid with simultaneous esterification by lipase enzyme was studied. To determine the optimal conditions for the complex process, the ternary system was characterised; binodal curves and tie lines of (ethanol + oleic acid + water) system were determined. Enzymatic esterification of ethanol and oleic acid was carried out and resulted in higher than 50% conversion with

simultaneous reduction of ethanol content in the broth. Finally, the effect of the ester product (ethyl oleate) on the distribution of ethanol was determined.

Keywords: lipase, extractive fermentation, oleic acid, ethanol, enzymatic esterification, ternary system

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Leskauskaitė, D. and Trečiokienė, E.: thermodynamic incompatibility of whey proteins with polysaccharides in aqueous media.
pp. 71-78. lmai@takas.lt

Phase diagrams of aqueous whey protein (WP) and polysaccharide (PS) mixtures, including carboxymethylcellulose (CMC), κ-carrageenan (C) and locust bean gum (LG) are presented in this paper at pH from 5.0 to 7.0 with 0.1 to 0.5 M NaCl. Thermodynamic incompatibility of WP–CMC, WP–LG and WP–C systems increased as pH was close to the isoelectric point of WP (pI=5.2). Increasing salt concentration (0.1 to 0.5 M) increased the incompatibility of WP–LG and WP–CMC systems. However, the effect of NaCl on thermodynamic incompatibility of WP–C was the opposite, i.e. increasing salt concentration decreased the thermodynamic incompatibility of the system. The type of the polysaccharides was the critical factor, which affected the compatibility of WP–PS systems. The thermodynamic compatibility of WP–PS systems decreased in the following order: locust gum > carboxymethylcellulose > κ-carrageenan.

Keywords: whey proteins, polysaccharides, thermodynamic incompatibility, phase diagrams

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Róth, E., Kovács, E. and Felföldi, J.: The effect of growing system on the storability of apple.
pp. 79-86. e.kovacs@cfri.hu

The effect of organic growing was studied on the storability of apple cv. Jonica, Liberty, Mutsu and Pinova. Fruits from integrated and organic orchards were stored at 2-4 °C, 95-99% relative humidity for 6 months. Firmness, β-galactosidase activity was determined and polygalacturonase enzymes examined. There was no difference in the activity of β-galactosidase and polygalacturonase enzymes at harvest between the organic and integrated apples, but a significant difference was noted between the cultivars except for Mutsu and Pinova. The activity of β-galactosidase enzyme increased significantly during storage except for cv. Pinova and that of polygalacturonase enzyme also increased significantly. The difference in the activity of polygalacturonase became significant between the cultivars during storage except for cv. Jonica and Pinova. The firmness decreased significantly during storage, with the least change in case of cv. Liberty. It can be established that there is, in general, neither a considerable difference between the growing systems nor between varieties at harvest. The differences became higher during storage. It can be stated that the effect of cultivar on the storability is much more considerable than the effect of growing system.

Keywords: organic apple, storability, firmness, β-galactosidase, polygalacturonase

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Zorman. T., and Smole Možina, S.: Optimisation of specific pcr detection of Campylobacter coli in enrichment broth.
Pp. 87-94. Sonja.smole@bf.uni-lj.si

Campylobacter jejuni and C. coli are among the most important causes of acute diarrhoea in humans throughout the world. Poultry meat is a major source of Campylobacter infections. Sensitive detection methods are necessary to identify contaminated samples. Detection of campylobacters by culturing is slow and tedious, whereas PCR technology offers the potential for rapid and sensitive detection, however, it may be inhibited when used directly for food or pre-enriched food samples. Different methods for sample and/or DNA preparation were studied to find an optimal combination for sensitive PCR detection of C. coli in enrichment broth. Buoyant density centrifugation (BDC) prior to cell lysis improved PCR detection of C. coli by 100-1000-fold. Preston enrichment broth spiked with 101 - 102 CFU ml-1 was detected positive after 18 h of enrichment. Specific flaA PCR detection of C. coli in enrichment broth following BDC and simple heat lysis of the cells can be conducted within two working days. This study is a part of the undergoing development of a rapid and sensitive molecular procedure for specific detection of C. coli in foods.

Keywords: Campylobacter, C. coli, detection, PCR, flaA gene, Preston enrichment broth, buoyant density centrifugation, BDC