Iron deficiency enhances bioactive phenolics in lemon juice

This study was designed to describe the phenolic status of lemon juice obtained from fruits of lemon trees differing in iron (Fe) nutritional status. Three types of Fe(III) compound were used in the experiment, namely a synthetic chelate and two complexes derived from natural polymers of humic and lignine nature. All three Fe(III) compounds were able to improve the Fe nutritional status of lemon trees, though to different degrees. This Fe(III) compound effect led to changes in the polyphenol content of lemon juice. Total phenolics were decreased (33% average decrease) and, in particular, flavanones, flavones and flavonols were affected similarly.

Iron-deficient trees showed higher phenolic contents than Fe(III) compound-treated trees, though Fe deficiency had negative effects on the yield and visual quality of fruits. However, from a human nutritional point of view and owing to the health-beneficial properties of their bioavailable phenolic compounds, the nutritional quality of fruits of Fe-deficient lemon trees in terms of phenolics was higher than that of fruits of Fe(III) compound-treated lemon trees. Moreover, diosmetin-6,8-di-C-glucoside in lemon juice can be used as a marker for correction of Fe deficiency in lemon trees [Carmen D Mellisho, Rocío González-Barrio, Federico Ferreres, María F Ortuño, Wenceslao Conejero, Arturo Torrecillas, José M García-Mina, Sonia Medina and Angel Gil-Izquierdo* (Research Group on Quality, Safety and Bioactivity of Plant Foods, Food Science and Technology Department, CEBAS-CSIC, PO Box 164, E-30100 Espinardo (Murcia) Spain.), Journal of the Science of Food and Agriculture, 2011, 91(13), 2355-2362].

Goats' milk fermented with L. rhamnosus CRL1505 could be manufactured as an alternative probiotic dairy product since this new food has the ability to stimulate the common mucosal immune system and to improve defenses against respiratory and intestinal infections [Susana Salva, Martha Nuñez, Julio Villena, Adriana Ramón, Graciela Font and Susana Alvarez* (de Referencia para Lactobacilos (CERELA-CONICET), Chacabuco 145, CP 4000, San Miguel de Tucumán, Tucumán, Argentina), Journal of the Science of Food and Agriculture, 2011, 91(13), 2355-2362].

Inulin behaved as a prebiotic to improve firmness of skim milk fermented by (a) pure cultures of Lactobacillus acidophilus (La), Lactobacillus rhamnosus (Lr), Lactobacillus bulgaricus (Lb) and Bifidobacterium lactis (Bl), (b) binary co-cultures of them with Streptococcus thermophilus (St), or (c) a cocktail containing all them. Inulin addition to co-cultures and cocktail enhanced products firmness, either after 1 day (D1) or 7 days (D7) of cold storage,
likely due to the increase in microbial growth induced by metabolic interactions among lactic acid bacteria and partial inulin metabolization. Co-culture firmness did in fact range from 0.33 N without inulin (St–Lb) after D1 and 0.55N with inulin (St–Lr) after D7. Also cocktail cultures exhibited high values of firmness, ranging, as an average, from 0.43N (D1) to 0.46N (D7), which suggests that they could have been potentiated by the reciprocal synergistic effects of microorganisms in complex mixture [Ricardo Pinheiro de Souza Oliveira, Patrizia Perego, Maricê Nogueira de Oliveira and Attilio Converti* ((Department of Chemical and Process Engineering, Genoa University, Via Opera Pia 15, I-16145 Genova, Italy), Journal of Food Engineering, 2011, 107 (1), 36-40].

NPARR 2(4), 2011-0369 Preparation and evaluation of antioxidant capacity of Jackfruit (Artocarpus heterophyllus Lam.) wine and its protective role against radiation induced DNA damage

Jackfruit is an underutilized edible fruit in the tropics and subtropics. Authors produced wine from jackfruit pulp and evaluated the total phenolic and flavonoid contents and antioxidant properties of the wine. The ability of scavenging free radicals was measured using 2, 2-diphenyl-1-picrylhydrazyl (DPPH), ferric reducing antioxidant assay (FRAP), N, N-dimethyl-p-phenylenediamine (DMPD) and nitric oxide (NO) scavenging assays. Experimental results indicated that jackfruit wine was effective in DPPH radical scavenging (69.44 ± 0.34%), FRAP (0.358 optical density value, O.D.), DMPD (78.45 ± 0.05%) and NO (62.46 ±0.45%) capacity. By the analysis of the high performance liquid chromatography coupled to diode array detector (HPLC-DAD), two phenolic compounds namely gallic acid and protocatechuic acid were identified. The jackfruit wine was also able to protect H2O2 + UV radiation and radiation (100 Gy) induced DNA damage in pBR322 plasmid DNA. The antioxidant and DNA damage protecting properties of jackfruit wine confirmed health benefits when consumed and could become a valuable source of antioxidant rich neutraceuticals. Additionally, the wine could be a commercially valuable by-product for the jackfruit growers. [Umesh B. Jagtapa, Shailesh R. Waghmareb, Vinayak H. Lokhandec, Penna Suprasannad, Vishwas A. Bapata*(Functional Plant Biology section, Nuclear Agriculture and Biotechnology Division, Bhabha Atomic research centre, Trombay, Mumbai 400 085, (MS) India), Industrial Crops and Products, (2011), 34, 1595-1601].