FOOD (incl. Dairy, Fishery, Poultry and other Plant and Animal products)

**NPARR, 6(3 & 4), 2015-152** By-product from decoction process of *Hibiscus sabdariffa* L. calyces as a source of polyphenols and dietary fiber

Dietary fiber (DF) and antioxidant compounds are widely used as functional ingredients. The market in this field is competitive and the search for new types of quality ingredients for the food industry is intensifying. The aim of this study was to evaluate the composition and antioxidant activity of by-products generated during the decoction of calyces of four Mexican *Hibiscus sabdariffa* L. cultivars (‘Criolla’, ‘China’, ‘Rosalis’ and ‘Tecoanapa’) in order to assess them as a source of functional ingredients. Some calyx components were partially transferred to the beverage during the decoction process, while most were retained in the decoction residues. These by-products proved to be a good source of DF (407.4–457.0 g kg\(^{-1}\) dry matter) and natural antioxidants (50.7–121.8 µmol Trolox equivalent g\(^{-1}\) dry matter). The decoction process extracted some soluble carbohydrates, ash and some extractable polyphenols. The DF content changed in the dried residues, which could be considered as high-DF materials with a high proportion of soluble DF (~20% of total DF) and considerable antioxidant capacity. These by-products could be used as an antioxidant DF source [Sonia G Sáyago-Ayerdi*, Carolina Velázquez-López, Efígenia Montalvo-González and Isabel Goñi (Sonia G Sáyago-Ayerdi, Laboratorio Integral de Investigación en Alimentos, División de Estudios de Posgrado, Instituto Tecnológico de Tepic, Av. Tecnológico 2595, CP 63175, Tepic, Nayarit, Mexico), *Journal of the Science of Food and Agriculture*, 2014, **94**(5), 898–904].

**NPARR, 6(3 & 4), 2015-153** Bread enriched with quinoa leaves – The influence of protein–phenolics interactions on the nutritional and antioxidant quality

This paper investigates the functional and potential biological properties of bread fortified with quinoa leaves (QL) in the light of protein–phenolic interactions. The addition of QL changed the textural properties of bread crumb. With the replacement of wheat flour by QL (1–5%), a linear increase in crumb hardness, cohesiveness and gumminess was observed. Fortification positively affected antioxidant properties and phenolic contents; however, in some cases experimental values were significantly lower than those predicted. The QL addition affected nutrient content and digestibility. The starch digestibility of the bread investigated in this study was inversely proportional to the percentage content of QL (the changes in protein digestibility were not so pronounced). Increasing peak areas of extracts obtained after digestion of fortified bread and the significant reduction of free amino groups confirm the presence of interactions between phenolics and proteins. The quality of fortified bread is strongly affected by phenolic compounds and food matrix interactions [Michał Świeca*, Łukasz Sęczyk, Urszula Gawlik-Dziki and Dariusz Dziki (Department of Biochemistry and Food Chemistry, University of Life Sciences, Skromna Str. 8, 20-704 Lublin, Poland), *Food Chemistry*, 2014, **162**, 54–62].

**NPARR, 6(3 & 4), 2015-154** Nutritional quality of rice bran protein in comparison to animal and vegetable protein

Rice bran protein (RBP) was prepared by alkali extraction and isoelectric precipitation from defatted rice bran. The protein quality of RBP was evaluated and compared to two vegetable proteins [soy protein (ISP) and rice endosperm protein (REP)] and two animal proteins [whey protein (WPI) and casein]. RBP contained 74.93% of protein and its pepsin
digestibility and KOH solubility were 89.8% and 91.5%, respectively.

In Sprague-Dawley rats, RBP showed protein efficiency ratio, net protein ratio, net protein utilisation, and biological value of 2.39, 3.77, 70.7, and 72.6, which were comparable to the qualities of animal proteins. The true digestibility of RBP (94.8%) was significantly higher than that of REP (90.8%), ISP (91.7%) and WPI (92.8%) and the same as that of casein. Protein digestibility corrected amino acid score (PDCAAS) of RBP was 0.90. These results suggest that rice bran protein appears to be a promising protein source with good biological values and digestibility [Sung-Wook Han, Kyu-Man Chee and Seong-Jun Cho* (Ingredients R&D Center, CJ Cheiljedang, 636 Guro-dong, Guro-gu, Seoul 152051, Republic of Korea), Food Chemistry, 2015, 172, 766–769].