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

NPARR 3(1), 2012-026, **Processing of mungbean products and its nutritional and organoleptic evaluation**

Four mungbean products namely, whole fried namkeen, dehusked fried namkeen, roasted namkeen and salad were formulated using three different cultivars of mungbean viz. UPM 98-1, Pant Mung-5 and Pant Mung-2 and the effect of different processing methods on texture and nutrient composition were studied. All the products were found to be acceptable by the panel. Salad was found to be the most acceptable product with overall acceptability of 8.31 out of 10 followed by dehusked fried namkeen (7.80), whole fried namkeen (7.61) and roasted namkeen (7.02). Moisture and protein content increased significantly after germination for 24h. Fat content increased significantly for deep fried products. Total ash, crude fibre and mineral content decreased significantly after processing whereas in-vitro iron bioavailability and in-vitro protein digestibility increased significantly after processing. Texture analysis revealed that dehusked fried namkeen of Pant Mung-5 and roasted namkeen of Pant Mung-2 had maximum crispness and hardness, respectively, which are preferred attributes [Raghuvanshi, R.S., Singh, S., Bisht, K. and Singh, D.P. (Department of Foods and Nutrition, Department of Genetics and Plant Breeding, G.B. Pant University of Agriculture and Technology, Pantnagar-263 145, Uttarakhand, India), *International Journal of Food Science and Technology*, 2011, **46**(7), 1378-1387].

NPARR 3(1), 2012-027, **Chemical properties and sensory quality of ice cream fortified with fish protein**

Fish protein powder is a functional ingredient that can be used for enhancing the nutritional value of food products. In this study the effect of fortification with different levels of fish protein powder (FP) on chemical properties and sensory quality of Persian ice cream with 0% FP or 83, 69 and 51 g kg$^{-1}$ protein and 215, 204 and 181 g kg$^{-1}$ solid non-fat, respectively. All products had the same levels of fat, lactose, acidity and pH. They had similar sensory quality after production except for colour, but sensory properties of fortified samples changed significantly after 2 months of storage. Colour faded, cohesiveness decreased, sandiness/coarseness increased, sweetness decreased and fish flavour and off-odour increased. The control ice cream scored highest for additives odour and flavour.

Development of ice cream fortified with fish protein powder could be an effective way to enhance nutritional and functional value of ice cream. But studies on storage stability, consumers’ acceptance and attitudes are recommended if companies are planning to do so. [Gholam Reza Shaviklo*, Gudjon Thorkelsson, Kolbrun Sveinsdottir and Fereidon Rafipour (Correspondence: Gholam Reza Shaviklo, Iran Fisheries Research Organization, No. 325, West Fatemi, Tehran, Iran), *Journal of the Science of Food and Agriculture*, 2011, **91**(7), 1199-1204].

NPARR 3(1), 2012-028, **The allenic carotenoid fucoxanthin, a novel marine nutraceutical from brown seaweeds – A review**

Obesity and type 2 diabetes are pathologies with rapidly growing prevalence throughout the world. A few molecular targets offer the most hope for anti-obesity and anti-diabetic therapeutics. One of the keys to success will be the induction of uncoupling protein 1 (UCP1) in abdominal white adipose tissue (WAT) and the regulation of cytokine secretions from both abdominal adipose cells and macrophage cells infiltrated into adipose tissue. Anti-obesity and anti-diabetic effects of fucoxanthin, a characteristic carotenoid found in brown seaweeds, have been reported. Nutrigenomic studies reveal that fucoxanthin induces UCP1 in abdominal WAT mitochondria, leading to the oxidation of fatty acids and heat production in WAT. Fucoxanthin improves insulin resistance and decreases blood glucose levels through the regulation of cytokine secretions from WAT. The key structure of carotenoids for the expression of anti-obesity effect is suggested to be the carotenoid end of the polyene chromophore, which contains an allenic bond and two hydroxyl groups [Kazuo Miyashita*, Sho Nishikawa, Fumiaki Beppu,
Takayuki Tsukui, Masayuki Abe and Masashi Hosokawa (Correspondence: Kazuo Miyashita, Faculty of Fisheries Sciences, Hokkaido University, 3-1-1 Minato, Hakodate, Hokkaido 041-8611, Japan), Journal of the Science of Food and Agriculture, 2011 91(7), 1166-1174.

NPARR 3(1), 2012-029, Preliminary characterization of food tablets from date (*Phoenix dactylifera* L.) and spirulina (*Spirulina* sp.) powders

In this work, some physical properties (hardness, friability, disintegration time and erosion) of food tablets containing various food powders obtained from dates (*Phoenix dactylifera* L.), spirulina (*Spirulina* sp.) and oranges (juice and zest) were investigated. Also, experimental data related to the release kinetic of phycocyanin (antioxidant substance of spirulina) into different liquid mediums correctly fit the Korsmeyer–Peppas model since the coefficient of determination $R^2$ ranged from 0.84 (HCl 0.1N solution) to 0.98 (distilled water). So, the date and spirulina powder-based food tablets could be of various uses: 1) consumption as such by all categories of consumers, 2) feeding of patients for whom it is difficult to chew or swallow food, knowing that these tablets can be either sucked or swallowed, and 3) as natural and cheap drug delivery carriers [Benahmed Djilali Adiba, Benamara Salem*, Saidi Nabil and Meksoud Abdelhakim (Department of Food Technology (FSI), Laboratory of Soft Technologies, Valorization, Physico-chemistry of Biological Materials and Biodiversity (LTDVPMB), FS, University of Boumerdès, 35000, Algeria), Powder Technology, 2011, 208(3), 725-730].

NPARR 3(1), 2012-030, Effect of jam processing and storage on total phenolics, antioxidant activity, and anthocyanins of different fruits

Fruits have been widely recognised as an excellent source of bioactive phenolic compounds. The purpose of this study was to evaluate the effect of jam processing of strawberry, cherry, apricot, fig and orange on the total phenolics, antioxidant activity and anthocyanins during 5 months of storage at 25°C. Fresh strawberry had the highest contents of total phenolics (8503.1 mg GAE kg$^{-1}$) followed by cherry, apricot, fig and orange, respectively. Jam processing decreased the total phenolics, antioxidant activity, and anthocyanins of all fruits. Total phenolics of jam during storage decreased only in apricot, fig and orange. Fresh strawberry had the highest antioxidant activity (54.88% inhibition) followed by the other fruits. Antioxidant activity did not change in strawberry during jam storage, while there are reductions in the other fruits were observed. Fresh strawberry had the highest anthocyanins (2323.8 mg cya-3-glu kg$^{-1}$), followed by cherry and the other fruits, respectively. Results showed only a decrease of anthocyanins and pH in apricot and fig jams during 5 months of storage. Despite the reduction of these compounds in jam processing, it is considered a good method to maintain them during 5 months of storage [Taha M. Rababah*, Majdi A. Al-Mahasneh, Isra Kilani, Wade Yang, Mohammad N. Alhamad, Khalil Ereifej and Muhammad Al-u'datt (Taha M. Rababah, Faculty of Agriculture, Jordan University of Science and Technology, P.O. Box 3030, Irbid, 22110 Jordan), Journal of the Science of Food and Agriculture, 2011, 91(6), 1096-1102].

NPARR 3(1), 2012-031, Development and storage study of reduced sugar soy containing compound chocolate

Possibility of using full fat soy flour (FFSF) for replacer for whole milk powder (WMP), stevia-mannitol blend as replacer for sugar and soybean oil (SBO) as replacer for cocoa butter in chocolate manufacture without impairing the sensory quality characteristics of chocolate was explored. Data on the sensory evaluation of WMP, sugar and cocoa butter substituted chocolates revealed that 40% (w/w) of WMP, sugar and cocoa butter can be successfully substituted by FFSF, stevia-mannitol blend and SBO, respectively in the preparation of high protein and low sugar chocolate without impairing the sensory attributes. Lecithin was found to be optimum at 0.32% (w/w) level of chocolate mix. Protein content of optimized formulation increased by 21.8% over control. Storage study of the product indicated an increase in hardness, free fatty acid content, peroxide value, total plate count, yeast and mold count, whereas a decrease in moisture content, pH value and sensory scores. The optimized chocolate was found acceptable (score ≥7.0) after 90 days of storage at 16±1°C and ~65% RH [Pandey, A.* and, Singh, G.
Physicochemical and functional properties of a protein isolate produced from safflower (Carthamus tinctorius L.) meal by ultrafiltration

The protein isolate obtained from safflower meal by aqueous extraction and ultrafiltration was evaluated for its physicochemical and functional properties. Protein, ash and moisture contents of the safflower protein isolate were 901, 51 and 45 g kg\(^{-1}\), respectively. Its water and oil absorption capacities were 2.22 mL H\(_2\)O g\(^{-1}\) protein and 2.77 mL oil g\(^{-1}\) protein, respectively. Least gelation concentration was 20 g kg\(^{-1}\) at pH 2, 6, 8 and 10 but 100 g kg\(^{-1}\) at pH 4. Emulsifying properties were also affected by the pH: emulsifying activity and emulsion stability at pH 6 were 82.5 and 100% respectively. The highest foaming capacity (126%) occurred at pH 2; however, it increased by 104% with the addition of 0.25 g glucose g\(^{-1}\) protein to the foam system. In the light of its functional properties found in this study, safflower protein isolate produced by ultrafiltration is recommended for use as an ingredient in food products such as salad dressing, meat products, mayonnaise, cakes, ice cream and desserts [Ulloa, J.A.*, Rosas-Ulloa, P. and Ulloa-Rangel, B.E. (Centro de Tecnología de Alimentos, Universidad Autónoma de Nayarit, Ciudad de la Cultura Amado Nervo, 63190 Tepic, Nayarit, Mexico), Journal of the Science of Food and Agriculture, 2011, 91(3), 572-577].

Kinetics of colour change of bamboo shoot slices during microwave drying

The effect of microwave power on colour change kinetics of bamboo shoot slices was investigated during microwave drying. Colour changes were quantified by tri-stimulus Hunter L (whiteness/darkness), a (redness/greenness), and b (yellowness/blueness) system. These values were also used for calculation of total colour change (\(\Delta E\)), chroma, hue angle, and browning index (BI). Microwave drying as expected changed colour parameters because of browning. The values of L and b decreased, while values of a and \(\Delta E\) increased during drying. Mathematical modelling of colour change kinetics indicated that L, b, chroma and BI could be defined using a first-order kinetic model, while a, \(\Delta E\) and hue angle could be defined using a zero-order kinetic model. Considering together colour deterioration and quality of dried bamboo shoot slices at higher power reveals the need of process standardisation for getting good quality product [Bal, L.M.*, Kar, A., Satya, S. and Naik, S.N. (Centre for Rural Development and Technology, Indian Institute of Technology, Hauz Khas, New Delhi 110016, India), International Journal of Food Science and Technology, 2011, 46(4), 827-833].

Characterization and sensorial evaluation of cereal bars with jackfruit

The objective of this study was to elaborate a homemade and alternative cereal bar using dehydrated jackfruit and seed meal as fiber source, due to the availability of this fruit in the region, without reducing the nutritional values if comparing to those already existent in the market. In order to evaluate the centesimal content and the acceptance of the homemade bars, both light and traditional bars were used as reference. The results showed that the elaborated bar presented protein values very close with products already found in the market. However, the new bars presented higher content of fibers. Formulations of 30 and 40% of seed meal were the ones with the best acceptance [Santos, C.T., Bonomo, R.F., Da Costa Ilhéu Fontan, R., Bonomo, P., Veloso, C.M. and Fontan, G.C.R.* (Laboratório de Engenharia de Processos, Universidade Estadual Do Sudoeste da Bahia, Praga Primavera, 40, 45700-000, Itapetinga, Bahia, Brazil), Acta Scientiarum - Technology, 2011, 33(1), 81-85].

Bamboo shoot based fermented food products: A review

This paper reviews fermented bamboo shoots as a brilliant fixing to numerous delicious dishes, of not only the Indian subcontinent but also China, Thailand, Nepal and Bhutan. Low in calorie and high in carbohydrate, proteins and minerals, bamboo shoots are consumed in raw, canned, boiled, fermented, and stir fried forms. It is anticipated that process optimization with further validation will help to grow

NPARR 3(1), 2012-036, Effect of incorporation of corn byproducts on quality of baked and extruded products from wheat flour and semolina

The effect of blending level (0, 5, 10, 15 and 20%) of corn bran, defatted germ and gluten with wheat flour on the physico-chemical properties (protein, crude fiber, phosphorus, iron and calcium), baking properties of bread, muffins and cookies, and extrusion properties of noodles and extruded snacks prepared from semolina were examined. Blending of wheat flour and corn byproducts significantly increased the protein, crude fiber, phosphorus, iron and calcium contents. Breads from gluten blends had higher loaf volume as compared to bran and germ breads. Among corn byproducts, gluten cookies were rated superior with respect to top grain. Muffins from germ blends and gluten blends had higher acceptability scores than the bran muffins. Blending of corn bran, defatted germ and gluten at 5 and 10% with wheat flour resulted in satisfactory bread, cookie, and muffin score. Quality of noodles was significantly influenced by addition of corn byproducts and their levels. Corn byproducts blending had significant influence on cooking time, however, gruel solid loss affected non-significantly in case of noodles. Expansion ratio and density of extruded snacks was affected non significantly by blending source and blending level. However, significant effect was observed on amperage, pressure, yield and overall acceptability of extruded snacks. Acceptable extruded products (noodles and extruded snacks) could be produced by blending corn byproducts with semolina upto 10% level [Sharma, S.*, Gupta, J.P., Nagi, H.P.S. and Kumar, R. (Department of Food Science and Technology, Punjab Agricultural University, Ludhiana-141004, India), Journal of Food Science and Technology, 2011, 48, 1-7].

NPARR 3(1), 2012-037, Quality of products containing defatted groundnut cake flour

Defatted groundnut cake obtained from commercial oil processing units and that prepared in laboratory oil expeller (LOE) were analyzed for quality parameters. Defatted groundnut cake flour (DGCF) was incorporated at 15-100% levels in laddoo, chutney powder, fryums (deep fried crisp and crunchy item), biscuits, noodles and extruded snacks. The products were studied for sensory, physico-chemical and shelf-life quality. DGCF was creamish white with bulk density of 0.55±0.03 g/ml, water absorption capacity 135.6±1.97 ml %, oil absorption capacity 100.3±1.16 ml % and foam capacity 33±1%. Protein, fat and ash contents were 51.6±0.06, 4.5±0.05 and 4.2±0.11%, respectively. Tannins and aflatoxin B1 were not detected. The increase of protein due to incorporation of DGCF into the products ranged from 5.5 to 21.9%. Shelflife studies indicated the maximum storability for 90 days for all the products except laddoo, which could be stored for 30 days at ambient temperature (28±2°C). All the products were acceptable and the order of preference for the products as indicated by adults (fryums, chutney powder, extruded snacks, noodles, biscuits and laddoo) and children (biscuits, laddoo, extruded snacks, fryums, noodles and chutney powder) varied [Purohit, C. and Rajyalakshmi, P.* (Department of Foods and Nutrition, Post-graduate and Research Centre, Acharya N G Ranga Agricultural University, Rajendranagar, Hyderabad 500 030, India), Journal of Food Science and Technology, 2011, 48(1), 26-35].