Buckwheat flour proteins are safe for coeliac patients

Buckwheat, *Fagopyrum esculentum* Moench flour is occasionally used in India to prepare puree, puddings, etc. Depending upon variety, its flour contains 8.51 to 15.8% protein. The difference regarding protein fractions between buckwheat flour and wheat is that buckwheat is rich in albumin and globulin but very low in prolamin (about 1.9% only) and glutelin content is also much lower than that of wheat flour. However, it is reported that buckwheat flour contains antinutritive effect and allergen activity for sensitive patients. Studies carried over at Hungary demonstrate that properly hulled buckwheat flour did not react with anti-wheat germ lectin (Wga) immune serum and therefore, suitable to be used in the diet of coeliac patients (Aubrecht & Biacs, *Acta Aliment.*, 2001, 30, 71-80).

that soaking for 20 hours in tamarind pulp extract or sodium bicarbonate solutions followed by autoclaving causes loss of α-galactosides to the extent of 68-71 and 68-70%, respectively. The oligosaccharides are also markedly reduced when subjected to natural fermentation processes (62-68%). However, the authors have concluded that, of the various processing methods, sprouting for 48 and 72 hours seems to be the best for reducing the α-galactoside (77-94%) levels in this pulse. Adoption of such viable and cost-effective processing methods in conjunction with removing the flatus-producing factors may further enhance the utilization of such a potential protein source (Siddhuraju & Becker, *J Sci Food Agric.*, 2001, 81, 718).

**Fruit**

Casein coating for increasing shelf-life of Kinnow

During experiment Kinnow fruits after washing (by 0.5% bleaching powder) and wiping by muslin cloth were coated with casein (dipping for 2 minutes). After overnight drying, fruits were treated with sodium acetate buffer then dried and packed in 200 gauge LDPE and HDPE bags at 18 to 28°C temperature and 55 to 65% relative humidity for 10, 20 and 30 days. On quality parameters measurement it has been found that the casein film delayed the loss of firmness with minimum loss in physiological weight and juice level during storage. It also extended the shelf-life of Kinnows by 20 days (Alam & Paul, *J Food Sci Technol.*, 2001, 38, 235-238).

**Hurdle technology to preserve fruit chunks**

Fruit chunks are generally stored in syrup containing high concentrations of preservatives but it is noticed that the covering syrup not only increases the bulk but also increases the cost of the product. Therefore, in a study done at Central Food Technological Research Institute, scientists explored the possibility of preserving fruit chunks of some fruits such as pineapple, mango and papaya in a cost-effective method. Hurdle technology i.e. using a combination of treatments such as blanching, osmo-dehydration, addition of chemical preservatives, modification of pH and appropriate packaging, is known to enhance the shelf stability of minimally processed products. Chemical analysis, nutrient retention studies and sensory evaluation carried over along with hurdle technological studies concluded that pineapple and mango fruit chunks, blanched in syrup at 85°C for 5 minutes, dipped in syrup containing 340 mg potassium metabisulphite/kg and 413 mg sodium benzoate/kg for 8 hour and packed in 150 gauge polypropylene pouches have a shelf-life of up to a period of 30 days at 27°C and 60 days at 2°C, whereas the papaya chunks treated with increased level of preservatives i.e. 680 mg potassium metabisulphite/kg and 826 mg sodium benzoate/kg have exhibited good storage stability up to 90 days at 2°C and ambient temperature (Vijayanand et al, *J Food Sci Technol.*, 2001, 38, 26).
Debittering of Kinnow juice

Kinnow (Citrus nobilis x Citrus deliciosa) owing to its wider adaptability, higher yield, and quality attributes has assumed importance among North Indian citrus growers and a large area is being brought under its cultivation, particularly in Punjab, Haryana, Rajasthan, and Himachal Pradesh. Though the fresh fruits are quite delicious they cannot be stored for longer duration. It is also well known that the processing of fruits results in the development of bitterness in the juice and this sort of taste is not liked by the consumers, particularly in India, which makes it difficult to prepare and market kinnow juice and its products. Thus the bitterness of kinnow juice is one of the serious hindrance in its processing.

Limonin and naringin are the bitterness causing compounds. However, in Kinnow juice, treated with Amberlite XAD-16 resin the reduction of limonin and naringin to an extent of 85.71 and 65.32 per cent, respectively, has been reported. Kaushal and Thakur from Dr Parmar University of Horticulture and Forestry, Nauni, Solan, Himachal Pradesh undertook the investigation to debitter the juice on pilot scale (9.6 L/hr) and to process it to overcome the problem of bitterness.

Use of adsorbent Amberlite XAD-16 packed in glass column was standardized to debitter the kinnow juice. The XAD-16 was regenerated after each lot by washing with 2 per cent sodium hydoxide solution. The reduction in limonin and naringin contents in the first lot (0-10L) was to an extent of 98.3 and 88.5 per cent, respectively, which decreased with its repeated use [Kaushal & Thakur, J Sci Industr Res, 2001, 60(11), 896-899].

Fuel

Alternative to diesel

Pongamia pinnata Pierre, Pongam Oil Tree grows wildly in waste places of Rajasthan, Gujarat, Madhya Pradesh and nearly throughout northern and southern plains. Its seeds yield a fatty oil, Pongam oil, used in tanning industry, preparation of washing soaps and candles and as a lubricant for heavy engines. Rajasthan State’s Department of Science and Technology is planning a large-scale plantation of this tree. The reason being collection of more seeds for extracting more oil which has been found to be a substitute for diesel. The oil has successfully been used to run diesel-based generators and pumping sets in Bangalore. This can also be used in cars without any modification of its engine. The use of the oil is economic also as one kg oil costs Rs. 10.50 against Rs. 17.50 per litre of diesel (Hindustan Times, 22 June, 2001).