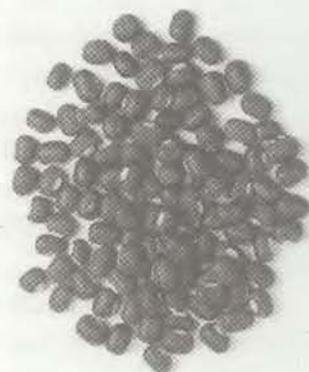


## Reducing tannins in Black gram

Legumes are an important source of protein in the diets. The presence of tannins, saponins, phytic acid and other antinutritional substances hinder their utilization in the human body. Tannins affect the availability of amino acids, utilization of protein and inhibit the activities of digestive enzymes. Soaking of legumes before cooking is a common practice to soften texture and hasten the cooking process. Soaking in salt solution results in a considerable reduction in cooking time and improvement in protein quality.

Black gram, *Vigna mungo* (Linn.) Hepper, Hindi- *Urd* is an important food legume. It contains 24% dietary protein but it is necessary to reduce tannins before use in order to increase their protein digestibility. Sodium chloride and sodium bicarbonate are the salts usually used in traditional soaking process or before cooking. Rehman and Shah from Pakistan studied the effects of varietal differences, and soaking and cooking methods on the tannin contents and protein digestibility of black grams.

Sodium bicarbonate soaking extracted about 2.5 times more tannins compared to tap water. Soaking temperature and time also played a significant role in the extraction of tannins. At 100°C, less time was required for the extraction of tannins than at 30°C. Soaking in water and salt solution also improved the protein digestibility. Significant reduction in tannins and improvement in protein digestibility of black grams was also observed after cooking the soaked black grams [Rehman & Shah, *Plant Food Hum Nutr*, 2001, 56(3), 265-273].



## Nutritious flour from red bean

Red beans, *Phaseolus vulgaris* Linn. are a potential source of proteins and complex carbohydrates. However, post harvest handling and storage under adverse conditions induce changes in their physicochemical properties, thus resulting in a reduction in their cooking, eating, and nutritional quality as well as consumer acceptance. Suggested use of alkaline salts to improve the cooking quality of beans has a limited advantage because their use tends to reduce the nutritional quality of cooked product.

Njintang and others carried out a study to determine the effect of germination and drying temperature on the *in vitro* protein digestibility and physicochemical properties of dry bean flours. A 2×3 factorial experiment with two treatments (germination and non-germination) and three drying temperatures was used for this purpose.

The effect of particle size on water absorption capacity of bean flour was investigated. They also studied the effect of incorporating soybean and cowpea into the red bean flour on functional properties.

Germination and the temperature of drying of red beans were observed to influence the nutritional and functional properties of flours produced from such beans. On average, germinated beans dried at a temperature of 60°C produced flours of better nutritional and functional properties as compared to those obtained from either ungerminated beans or germinated beans dried at lower temperatures. The particle size of flours was an equally important influencing factor on the rate of water absorption by bean flours. Incorporation of cowpea and soybean flours into germinated bean flour (GBF) further improved its functional



*Phaseolus vulgaris*

properties. A composite flour containing up to 60% GBF, 30% cowpea, and 10% soybean showed good functional properties and as such constitutes a potential good ingredient for the production of food products commonly made from whole cowpea flours [Njintang *et al*, *J Agric Food Chem*, 2001, 49(5), 2465-2471].

### Soy hull as a source of pectin

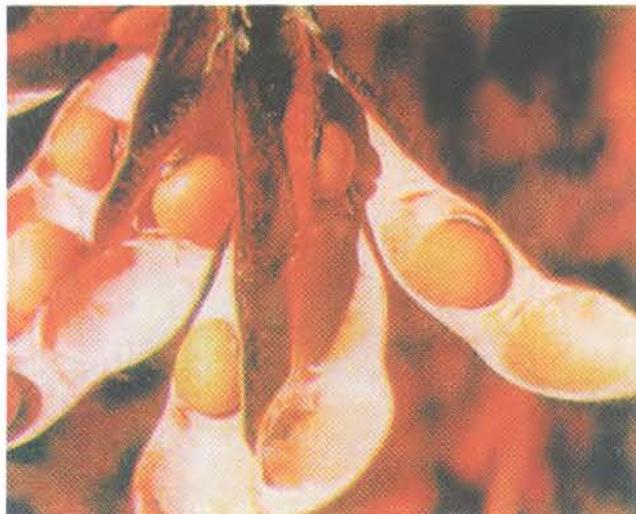
Pectin is a complex carbohydrate consisting of D-galacturonic acid linked by  $\alpha$ 1-4 glycosidic linkages. Pectin is used as gelling agent in jams, jellies, and fruit preparations and as stabilizer in confections, dairy products, bakery fillings, and icings. Medical applications include serum cholesterol lowering agents, antidiarrhoeal, detoxicant, demulcent, and emulsion stabilizers for water-in-oil emulsions.

Pectin is commercially extracted from citrus peels and apple pomace, with hot acidified water. Citrus peel and apple pomace contain about 25 and 12% pectin, respectively. Extraction of pectins from sugar beets, sunflower head residues, and dehulled rapeseed has also been reported.

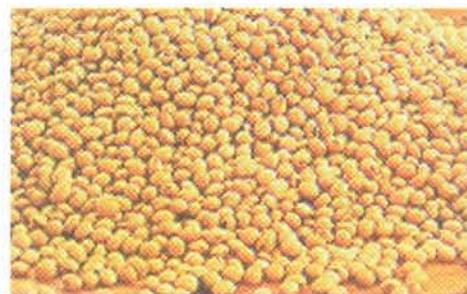
Soy hulls are major by-products of the soybean (*Glycine max* Merrill) processing industry; the insoluble carbohydrate fraction contains 30% pectin. Soy hull is potentially an

inexpensive commercial source of pectin. Citrus peel and apple pomace are difficult to process unless they are first dried. In contrast, soy hull can be stored and transported without further processing. Recently extraction of pectin from soy hull has been described. Monsoor and Proctor optimized the hull/solvent ratio for large-scale soy hull pectin preparation and evaluated the solubility and rheological properties of soy hull pectins relative to selected commercial food-grade pectins.

The pectin extracted showed a yield of 16% soy pectin with *c.* 68% galacturonic acid in pilot plant-scale production. The pectin content, yield, and functional properties of soy hull pectin were within the range of the commercial



Soybean pods



Soybean seeds

pectins and analytical-grade pectins [Monsoor & Proctor, *J Amer Oil Chem Soc*, 2001, **78**(7), 709-713].

## Therapeutics

### Antiulcer activity of *Artemisia*

*Artemisia annua* Linn. has been used in Chinese folk medicine for many centuries to treat malaria. The activity is attributed to artemisinin, a sesquiterpene lactone with an



*Artemisia annua*

endoperoxide group. Keeping this background in mind, Patricia Dias and others from Brazil studied the antiulcer activity of crude ethanol extract and purified fractions of this plant.

The crude ethanol extract of aerial parts and enriched sesquiterpene lactone fraction showed anti-ulcerogenic activity, when administered orally, on the indomethacin induced ulcer in rats [Dias *et al*, *Phytother Res*, 2001, **15**(8), 670-675].