

Use of de-oiled groundnut cake flour as an alternate source of nutrition

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■ **ABSTRACT** : De-oiled cake is a rich source of protein for vegetarians the utilization of meal or defatted meal into food products could be an excellent vehicle for enhancing the consumption of groundnut protein in the diets of malnourished people in developing countries. Groundnut flour produced from cake blends easily and enhances or enriches the nutritive value of wheat and other flour. The study was conducted in Pacific College of Pharmacy, PAHER University, Udaipur. Value added products namely *Laddoo*, Chutney powder, Seviyan, fryums and biscuits were developed and their nutritional richness and organoleptic evaluation was done. All the products were well accepted by the people and can be marketed and produced. This proves that these products can be used for substituting fat rich and adulterated low quality food products that are often being marketed and consumed.

■ **KEY WORDS** : Groundnut, De-oiled cake flour, Value added products, Protein rich

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Groundnut seeds serve as an important dietary ingredient in many countries, but owing to its richness in high quality dietary protein and oil it helped to reduce malnutrition in many developing countries. The relation between food, nutrition and health give rise to healthy population and promotes development of the people through satisfaction of needs. Owing to seeds richness in high quality dietary protein and oil groundnut helps to reduce malnutrition in the developing countries and tries to supplement the essential nutrients of the basic carbohydrate food of the needy who cannot afford enough protein food of animal origin.

In India oil cakes are prepared by two methods: Mechanical and solvent extraction. Among mechanical methods also, ghani pressed cake is more nutritious as compared to expeller pressed and is widely used by

farmer in village. The cake contains 45–60 per cent protein, 22–30 per cent carbohydrate, 3.8–7.5 per cent crude fibre and 4–6 per cent minerals (Desai *et al.*, 1999). Special care is needed in preserving these feeds because they are more susceptible to fermentation action and mould growth. But this type of cake contains more percentage of crude protein than other cakes.

According to the method of processing, the cakes can be classified as:

- Ghani pressed cake- Contain 10-12 per cent ether extract.
- Expeller pressed cake- It contain 6-8 per cent ether extract.
- Solvent extracted cake- It contain less than 1 per cent ether extract.

Previous research has shown that the seeds are a

potential source of food-grade protein for the fortification of food products. Such protein could be concentrated from residual cakes and flours through industrially applicable techniques (Rhee *et al.*, 1972 and 1973; Quinn and Beuchat, 1975; Kim *et al.*, 1992 and Yu *et al.*, 2007). The amino acid profile of the residual flours showed that it could be an ingredient for protein fortification (Yu *et al.*, 2007). Groundnut protein concentrates were obtained using raw and roasted, fermented and unfermented peanut flours (Yu *et al.*, 2007).

These authors obtained groundnut protein concentrates with 85 per cent protein versus 50 per cent protein in the defatted groundnut flour. Partially defatted groundnut flour is an inexpensive and underutilized waste product from the groundnut oil industry which is rich in protein and offers the same health and dietary benefits of groundnuts but with less fat. Thus, in countries like Argentina, where groundnut protein is available in abundance, it could replace animal proteins for product formulation. Therefore, an attempt was made in this study to identify the alternate uses of this by product and to use the hygienically extracted de-oiled groundnut cake in varieties value added traditional and convenience food products.

■ METHODOLOGY

De-oiled cake is a rich source of protein for vegetarians the utilization of meal or defatted meal into food products could be an excellent vehicle for enhancing the consumption of groundnut protein in the diets of malnourished people in developing countries. Groundnut flour produced from cake blends easily and enhances or enriches the nutritive value of wheat and other flour. It has potential to be used as low fat groundnut concentrate,

composite flour, in bakery products, breakfast cereal flakes, snack foods, multipurpose supplement, infant and weaning foods, extruded foods or fabricated food (Venkataraghavan, 1998 and Gopala Krishna, 2007).

Nutritional composition of groundnuts and de-oiled groundnuts cake flour groundnuts are usually processed for oil and residue cake is used either as animal feed or as a fertilizer. Many researchers have also demonstrated that oil extraction produces a protein-rich co-product which may be used for human consumption, if processed from edible-grade groundnut seed by commercially accepted food processors (Cherry, 1990).

The study was conducted in Pacific College of Pharmacy, PAHER University, Udaipur. De-oiled cake which is rich in proteins, vitamins and minerals was ground to fine powder. Value added products namely *Laddoo*, Chutney powder, *Seviyan*, fryums and biscuits were developed and their nutritional richness and organoleptic evaluation was done. The basic ingredient used for all the products was flour made along with other ingredients.

■ RESULTS AND DISCUSSION

The prepared value added products having de-oiled groundnut cake flour as their main ingredients were tested in Pacific College of Pharmacy lab, Pacific University, Udaipur to get their nutritional profile. The nutritional profile of de-oiled groundnut cake flour value added products is given in Table 1.

A sample of 100 individual which included faculty members and students of Pacific University were selected to conduct the test for organoleptic verification of varieties of food products developed and prepared from the byproduct of groundnut produced after

Table 1: Nutrient profile of defatted groundnut cake flour (de-Oiled groundnut cake flour) value added products		Moisture (%)	Protein (%)	Fat (%)	Ash (%)	Carbohydrate (%)	Energy (Kcal/100 g)
Sewaiyan	Control	6.8	7.8	1.4	0.52	82.9	483.9
	De-Oiled groundnut cake flour	7	16.4	2.1	1.2	73.2	549.9
Fryums	Control	5.8	0.42	0.36	1.3	92	483.9
	De-Oiled groundnut cake flour	5.7	5.9	0.82	1.7	85.6	549.9
Biscuits	Control	2.6	9.2	39.6	0.7	47.4	583.3
	De-Oiled groundnut cake flour	2.6	17.8	40.4	1.5*	37	583.2
Chutney Powder	Control	5.4	28.2	6.7	3.4	54.2	323.7
	De-Oiled groundnut cake flour	5.6	50.1	6	4.5	30	344.2
Laddoo	Control	14.8	14.8	2.9	1.6	92	338.6
	De-Oiled groundnut cake flour	14.5*	20.4	2.7	1.5	85.6	368.3

* indicate significance of value at P=0.05

Table 2: Organoleptic evaluation of de-oiled groundnut cake products

Sensory characteristics	Products evaluated on a scale of 10				
	Laddoo	Chutney powder	Sewaiyan	Biscuits	Fryms
Appearance	8.5	8.9	7.2	8.1	6.8
Touch/texture	9	8.4	6.4	9.7	8.4
Odour	9.1	9.4	9.3	9.1	8.9
Taste	8.8	8.3	8.2	8.7	8.9
Acceptance	8.4	8.2	8.5	8.7	8.1

extraction of oil here in the campus of the Pacific University itself. This was done to detect the taste and acceptance of the products, the sensory characteristics like appearance, touch/texture, odour, taste and acceptance were evaluated on the sale of 10. The results of the evaluation are given in Table 2.

Table 2 clearly shows that the products made from de-oiled groundnut cake that are *Laddoo*, chutney, sewaiyan, biscuits and fryms were well accepted by the people and can be marketed and produced. In terms of appearance chutney powder and *Laddoo* were preferred, where as in terms of texture biscuits and *Laddoo* were preferred. But in terms of taste and odour all the products were at par and were given a good score in acceptance as food products by the evaluators. This proves that these products can be used for substituting fat rich and adulterated low quality food products that are often being marketed and consumed.

Conclusion :

It has been proved from the study that dried de-oiled cake generated from the pressing of groundnuts from which oil are produced are rich in proteins, vitamins and minerals when ground to fine powder by nutritional analysis of the products. Organoleptic evaluation helped us to prove that the products prepared from de-oiled groundnut cake were not only nutritionally rich but also acceptable by the sensory organs.

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