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Value Addition of Defatted Groundnut Cake

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Abstract

Objective of this study was to prepare defatted groundnut cake flour & develop value added products from it. Groundnut cake flour blends easily and enhances or enriches the nutritive value of products prepared from it. Value added products like laddoo and chutney were prepared from defatted groundnut cake flour. Laddoos were prepared by blending defatted groundnut cake flour with coconut powder in the proportion 55:45 as well as chutney was prepared by mixing defatted groundnut cake flour with roasted chana dal in the proportion 55:45. Nutritional quality parameters namely moisture, protein, fat, carbohydrate, total minerals, crude fiber and energy of defatted groundnut cake flour and its value added products were determined. This study proved that these products can be substitute fat rich and adulterated low quality food products which are often being marketed and consumed.

Keywords: groundnut cake, defatted flour, value added products, nutritional quality

Introduction

Groundnut (*Arachis hypogaea*) is a crop grown mainly for its edible seeds. It is classified as an oilseed crop because of its high oil content. Groundnut oil is edible oil produced from groundnut seeds. It is mild tasting excellent food oil with good flavor and high quality because of its low free fatty acid value. The groundnut oil can be extracted either by mechanical method or solvent method. Mechanical method is a most common method for groundnut oil extraction which includes groundnut pretreatment, screw pressing (expelling) and oil clarification.

Groundnut protein is increasingly becoming important as food and feed sources. According to the latest research, a diet rich in groundnut products can reduce the cholesterol, lowers the risk of heart disease and provide protection against cancer. The utilization of defatted meal into food products could be an excellent option for enhancing the consumption of groundnut protein in the diets of malnourished people in developing countries. Groundnuts are usually processed for oil and residue cake is used either as animal feed or as a fertilizer. De-oiled cake is a rich source of protein for vegetarians. Groundnut flour produced from de-oiled 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 as well as composite flour in bakery products, breakfast cereal flakes, snack foods, multipurpose supplement, infant and weaning foods, extruded foods or fabricated food.

Many researchers have demonstrated that oil extraction produces a protein rich by-product which may be used for human consumption, if processed from edible-grade groundnut seed by commercially accepted food processors. Defatted groundnut cake 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 as of groundnut but with less fat. Therefore, an attempt was made to identify the alternate use of this by product and to use it for development of various value added traditional and convenience food products. In view of this, the experiment was undertaken with the objectives to prepare defatted groundnut cake flour and to develop value added products (Laddoo and chutney) from it.

Methods

For making Laddoo, coconut powder (100 g) was used as an ingredient in savory and sweet recipe to prepare laddoo with coconut flavor. Jaggery powder (100 g) was used as a sweetening agent. Cardamom powder (2 g) was used as a flavoring agent in preparation of laddoo. Skimmed milk powder (20 g) was used to add flavor to the mixture of laddoo.

For making Chutney, Chana dal (100 g) was used in powdered form to prepare chutney powder. Red

Chilli powder (10 g) was used for mildly pungent taste and to give bright red color to chutney. Coriander powder (12 g) was used to add a mild flavor and aroma to chutney. Curry leaf powder (10 g) was used as taste enhancer in chutney. Amchur powder (12 g) was used as a souring agent in chutney. Turmeric powder (1 g) was used to provide the yellow color to chutney. Garlic powder (2 g) was used in chutney for flavor enhancement. Salt (10 g) was used for flavoring and preservation of food. Defatted groundnut cake flour was prepared as per the flow chart given in Fig. 1 as well as products namely Laddoo and Chutney were prepared using this defatted groundnut cake flour as shown in Fig. 2 & 3.

The nutritional quality in terms of moisture (% dry basis), protein, carbohydrate, fat, fiber, ash and energy content of the prepared samples as well as control samples was determined as per the procedure by AOAC, 2000. Sensory evaluation of the prepared products was made on 9 Point Hedonic Scale. The products were evaluated for their appearance, texture, taste, flavor and overall acceptability.

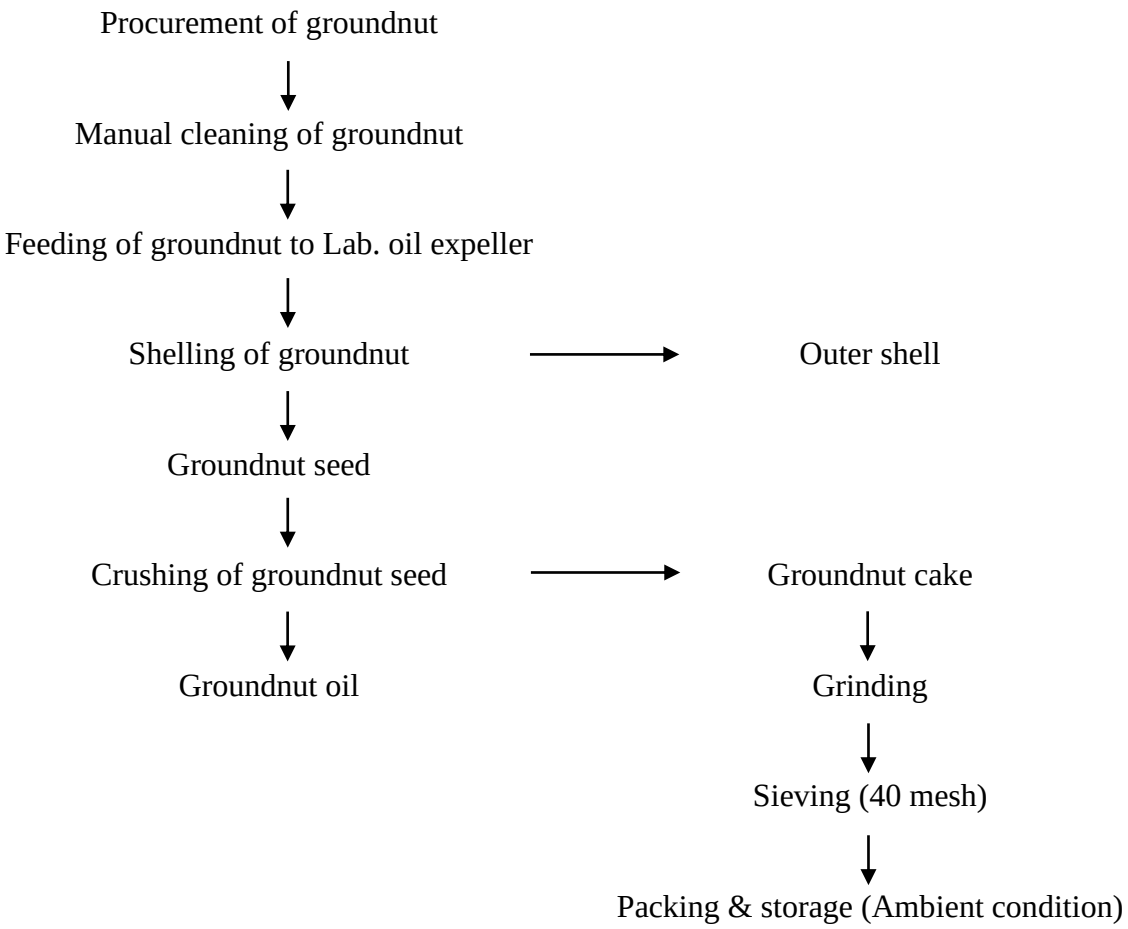


Fig. 1 Flow chart of preparation of defatted groundnut cake flour

Weighing of Jaggery powder

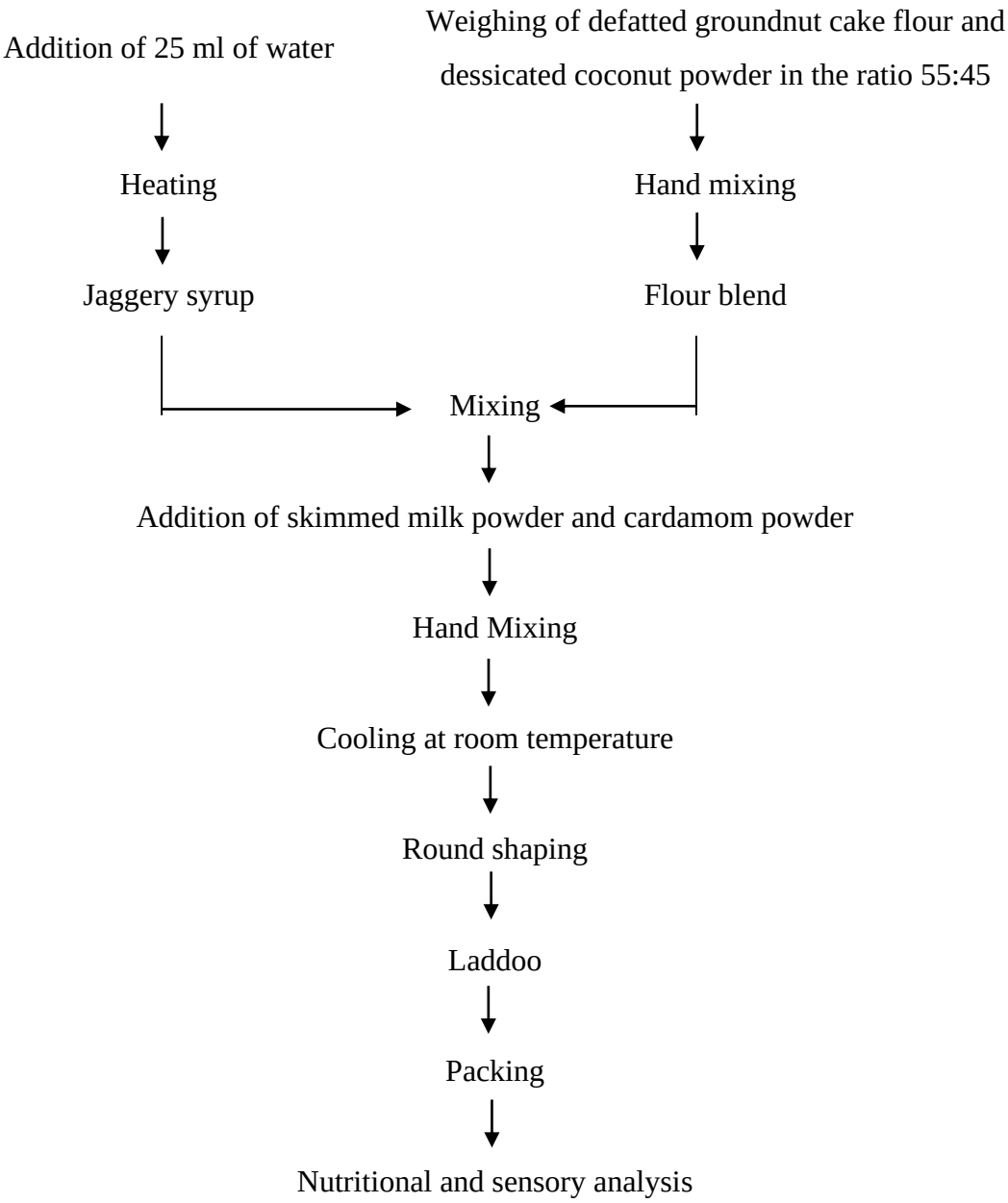


Fig. 2 Flow chart of preparation of laddoo from defatted groundnut cake flour

The treatments used for the experimentation were as follows.

T1 = Sample containing groundnut flour

T2 = Sample containing 55% defatted groundnut cake flour

Roasting of chana dal & defatted groundnut cake flour without oil

Roasting of red chillies & curry leaves in little oil + Roasting of coriander seeds, cumin

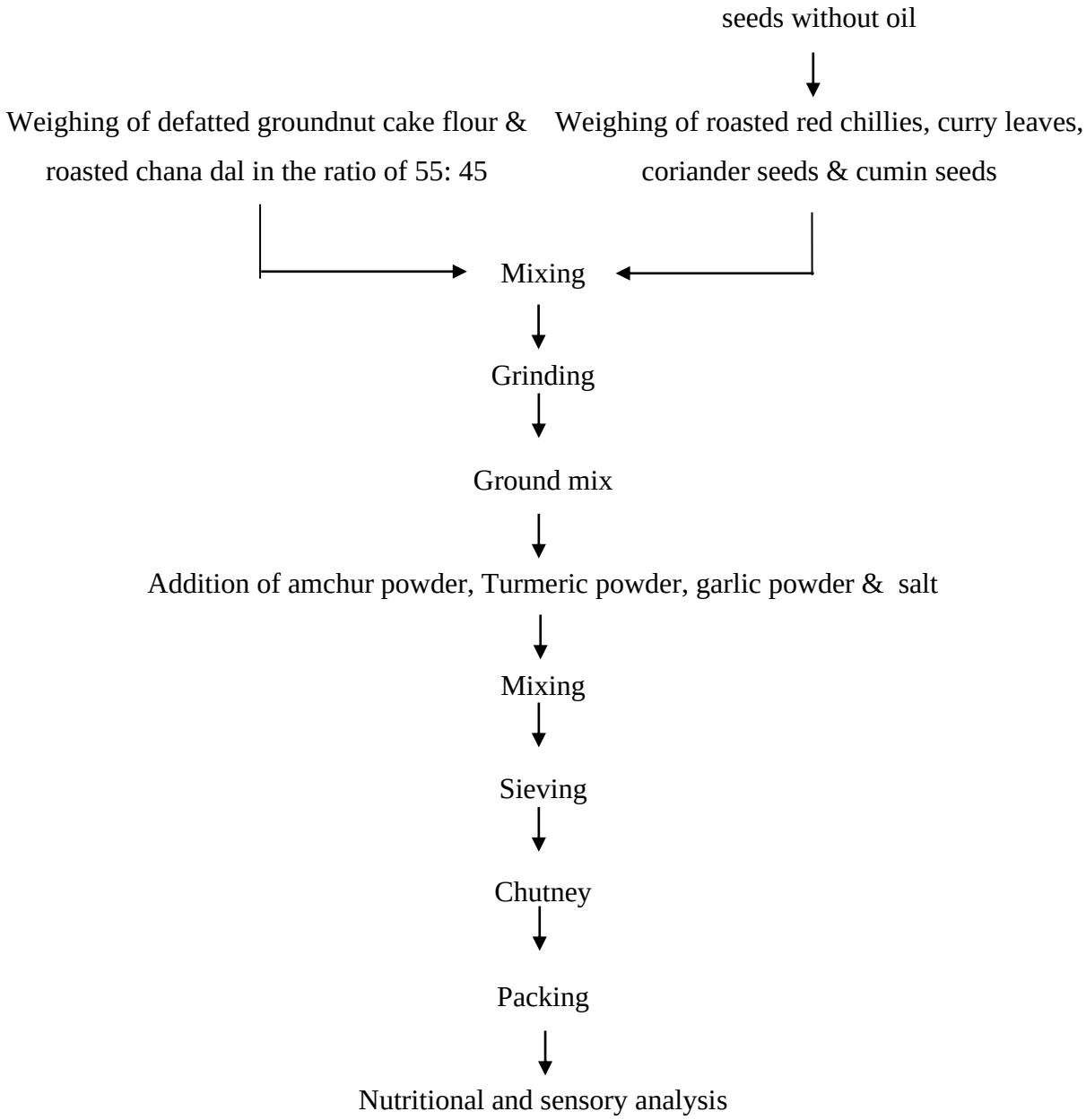
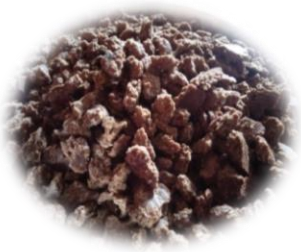


Fig. 3 Flow chart of preparation of chutney from defatted groundnut cake flour

Results

The defatted groundnut cake flour used for preparation of different products are shown in Fig. 4, whereas the products are shown in Fig. 5. It was observed that defatted groundnut cake flour had 7.86% moisture, 52.50% protein, 4.12% fat, 5.65% fibre, 4.02% minerals as shown in Table 1.



Defatted Groundnut Cake **Defatted Groundnut Cake Flour**

Fig. 4 Materials used for preparation of value added products

Laddoo **Chutney**

Fig. 5 Products prepared from defatted groundnut cake flour

High protein content in case of laddoo prepared with defatted groundnut cake flour might be due to the high protein content of defatted groundnut cake flour, whereas carbohydrate content in case of laddoo prepared with defatted groundnut cake flour was lower than control sample. Addition of defatted groundnut cake flour to desiccated coconut flour might have decreased the total carbohydrate levels while increasing the protein content of laddoo. But in case of product chutney, the opposite trend was observed. That means the nutritional content of chutney prepared from groundnut flour was observed to be more than that of chutney prepared with defatted groundnut cake flour, which might be due to the addition of different powders (coriander seed powder, cumin seed powder and curry leaves powder) in it during its preparation (Table1 & Table 2).

Also it was observed that, the products prepared from defatted groundnut cake flour (laddoo and chutney) were accepted by the people on hedonic scale, but its score was less than that of products prepared with groundnut flour. This proves that these products can be used to substitute fat rich and adulterated low quality food products which are often being marketed and consumed.

Table 1 Nutrient profile of defatted groundnut cake flour & products prepared from it

Sr. No	Nutritional Content (%)	Defatted Groundnut Cake Flour	Laddoo		Chutney	
			T1	T2	T1	T2
1	Moisture	7.86	5.86	7.58	6.28	5.90
2	Carbohydrate	26.04	52.99	46.26	56.61	53.07
3	Protein	52.50	9.67	10.90	24.65	20.58
4	Fat	4.12	28.52	32.28	6.14	4.99
5	Crude Fibre	5.65	10.34	11.23	17.25	15.14
6	Total Minerals	4.02	2.76	2.98	6.69	6.07
7	Total Energy (Kcal/100 gm)	-	507.34	519.15	380.30	379.51

Table 2 Paired t-Tests

Parameters	For Laddoo		For Chutney	
	Variable 1	*Variable 2*	*Variable 1*	*Variable 2*
mean	88.21	91.48	71.13	69.32
variance	34464.79	35908.56	18907.01	18992.32
df	6		6	
t cal	-2.17*		3.23^{NS}	
P (T<=t) one tail	0.03		0.01	
t table one tail	1.94		1.94	

*means significant value, ^{NS} means non-significant value

Conclusions

1) Flour made from defatted groundnut cake, which is a by product of oil extraction process of groundnut, can be a substitute source of protein for preparing food products.

2) The products prepared from 55% defatted groundnut cake flour have not only nutritionally rich but also acceptable by the sensory organs.

3) Therefore, the products prepared from defatted groundnut cake flour can be used to substitute fat rich and adulterated low quality food products that are often being marketed and consumed.

4) Considering the nutritional importance of defatted groundnut cake flour and its suitability of incorporation into traditional products, value addition of defatted groundnut cake could be a way in tackling the problem of protein malnutrition in the country.

References

1) Abhishek rajan, Denis DM, singhIshika and Kishorilal (2018). Technology for production of edible grade deoiled cake from groundnut and its diversified use in baked products. Journal of pharmacognsy and phytochemistry, 7(3), 1392-1397.

2) AP Gandhi, N Kotwaliwale , J Kawalkar , DC Srivastav, VS Parihar and Raghu N (2001). Effect of incorporation of defatted soyflour on the quality of sweet biscuits. J Food Sci Technol.; 38, 502–503.

3) Official Methods of Analysis (2000). Association of Official Analytical Chemists, Washington.

4) Purohit Chitra and Peram Rajyalakshmi (2011).Quality of products containing defatted groundnut cake flour; J Food Sci Technol., 48(1), 26–35.