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Formulation and evaluation of peanut flour incorporated cookies

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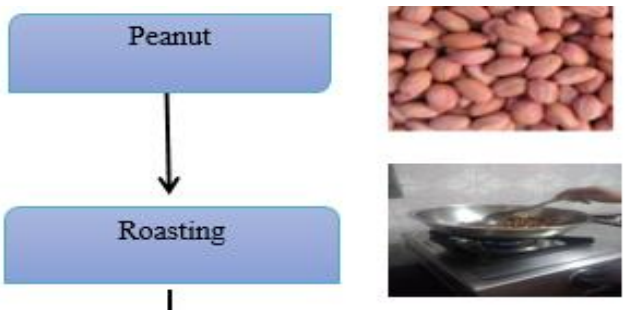
Abstract
Peanuts, largely accepted and affordable nut and oil seed, is well–known for its nutrients density. The protein, MUFA, iron and niacin are found in abundance and has various potential health benefits, including growth promotion and overpowering PCOS and infertility. The implication of value addition to the customarily celebrated snack product lies in the nutritional augmentation of a large community with great ease. Hence, this study is planned with the objective of incorporating the wellness of roasted peanut flour into the refined wheat flour and developing value added cookies, as it is a widely accepted food product by all age groups, with relatively long shelf life and convenient storage. The developed value-added cookies were subjected to nutrient evaluation and compared with the control.

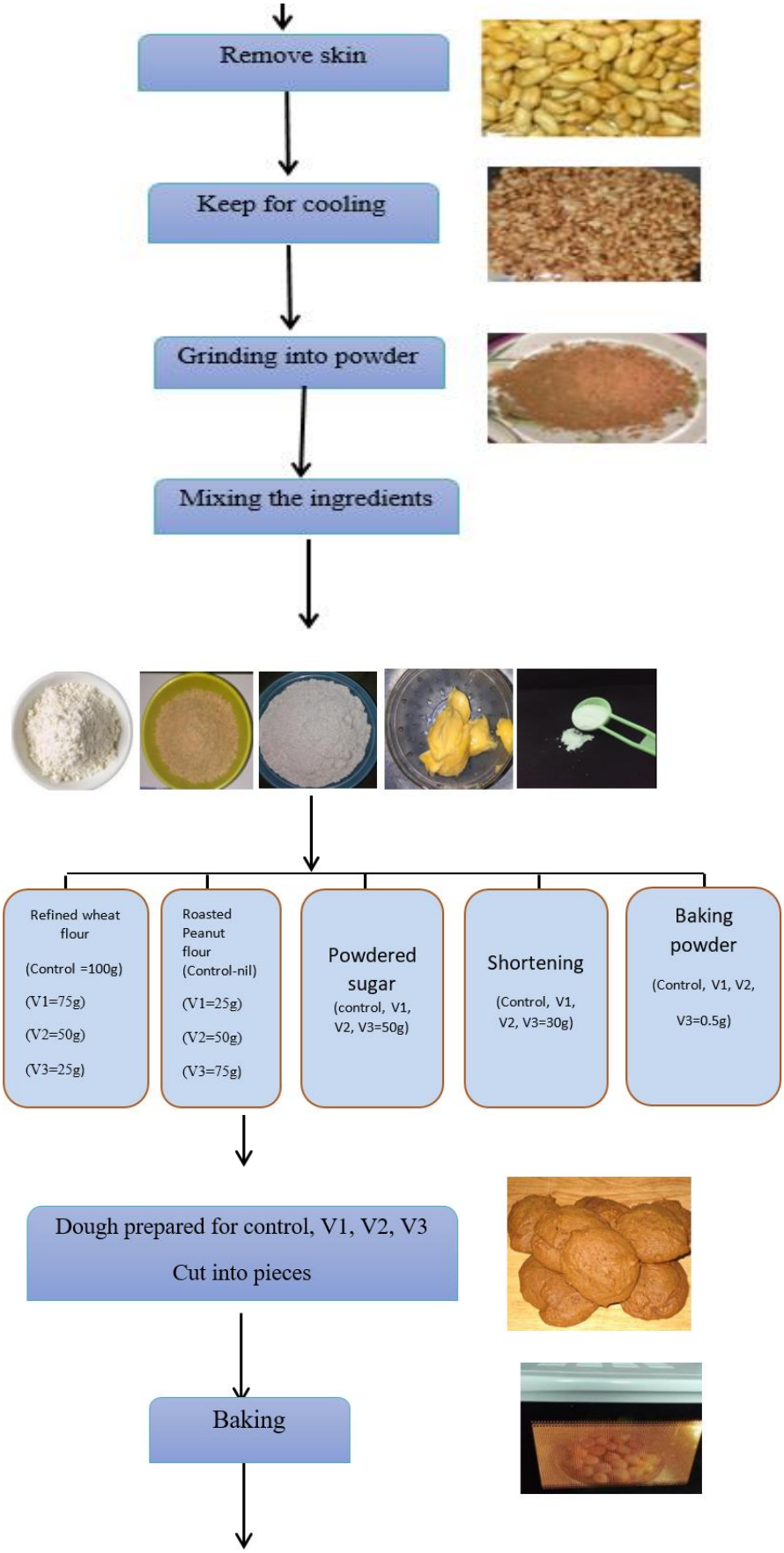
Keywords: value addition, peanut, roasting

Introduction
There is a perceptible variance in the intake design of peanut both in the developed and developing countries. Most of the peanut produced in the developing countries is exhausted for oil extraction required to meet the domestic needs, while in the developed countries it is mainly expended as a food source. Over the years, even in developing countries, the trend has shifted more towards food source with collective international market demands for confectionary grade peanuts and due to the availability of other cheaper alternative oil sources. Mostly, peanuts are consumed as roasted, boiled or raw and as peanut paste. To an extent confectionary peanut are consumed as roasted nuts or in packaged form as snack foods such as peanut candy. In western countries peanut consumption is mainly in the form of peanut butter, packaged snack nuts (salted, unsalted, flavored and honey-roasted) and peanut candies. Even among countries, diversity exists in terms of regional preferences. For example, the food consumption of peanut dominates in North America while in South America, the oil consumption is predominant. In East and West Africa, both food and oil uses take over while in South Africa the food use of peanut is overriding. Whereas in India, oil and cattle feed use is more significant over food use.

Objectives
The study is framed with the following objectives:
a) To develop the peanut flour from roasted peanut.
b) To formulate cookies by incorporating peanut flour in various proportions.
c) To analyse the nutritive value of peanut flour cookies.
d) To compare the nutrients of peanut flour incorporated cookies with the standard.

Methodology
Preparation of Roasted Peanut Flour and Development of Cookies
- The high quality shelled peanuts procured from local market were roasted in iron kadai at approximately 150º C for approximately 20 minutes with continuous stirring until it turns brown and aroma develops. The roasted peanuts were skinned, cooled and ground to fine powder.
- The dough was made with refined wheat flour, roasted peanut flour mixed in different proportions (as in Figure-1) and baking powder blended well with shortening and powdered sugar.
- The made dough was rolled and cut using biscuit cutter. Cookies were baked at 170 ºC for 15 minutes, cooled and evaluated for nutrients.




Remove skin
Keep for cooling
Grinding into powder
Mixing the ingredients
Refined wheat flour
(Control =100g)
(V1=75g)
(V2=50g)
(V3=25g)
Roasted Peanut flour (Control-nil)
(V1=25g)
(V2=50g)
(V3=75g)
Powdered sugar
(control, V1, V2, V3=50g)
Shortening
(Control, V1, V2, V3=30g)
Baking powder
(Control, V1, V2, V3=0.5g)
Dough prepared for control, V1, V2, V3
Cut into pieces
Baking

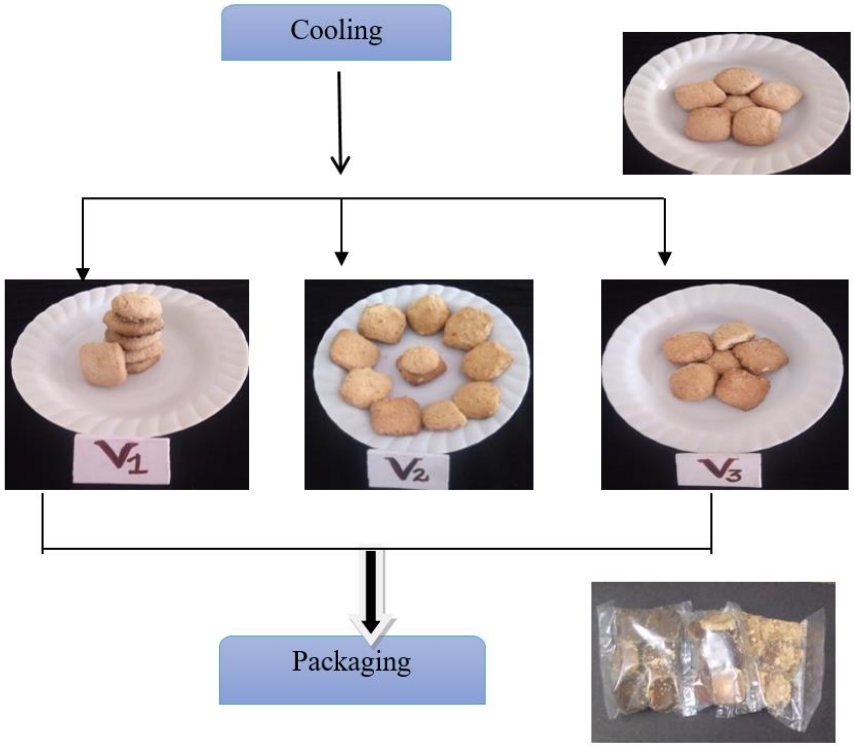


Fig 1: Formulation of Peanut Flour Cookies

Nutrient analysis of peanut flour cookies

The variations of cookies were formulated with different proportions of refined wheat four to roasted peanut flour, where in Control (4:1), V1 (3: 1), V2 (2:2), V3 (1:3). The prepared cookies were subjected to nutrient analysis and the results are depicted in the Table-1.

Table 1: Comparison of Nutrients in Different Variations of Cookies with Control

Parameters	Control	V-1 (25g)	V-2 (50g)	V-3 (75g)
Moisture content (%)	19	12.30	10.50	9.50
Crude fibre (%)	0.3	11.60	12.24	14.80
Protein (%)	11.05	36.80	38.50	42.48
Fat (%)	25.2	16.35	13.25	11.40
Carbohydrate (%)	123.6	37.25	27.01	21.32
Iron (mg /100g dry sample)	2.78	50.23	80.65	120.50
Calcium(mg /100g dry sample)	29	38.52	53.20	65.28
Vitamin A (IU /100g dry sample)	26.17	43.63	62.57	73.85
Sodium(mg)	21	15.75	10.50	5.25
Niacin(mg)	2.40	7.33	12.25	17.18
Thiamine(mg)	0.12	0.19	0.26	0.32
Riboflavin(mg)	0.07	0.09	0.10	0.12
Zinc(mg)	0.60	0.45	0.30	0.15

V1-Variation 1, V2-Variation 2, V3-Variation 3

From the above table it is clearly evident that as the peanut flour proportion increased crude fibre, protein and all the micronutrients levels have also shown a gradual increase.

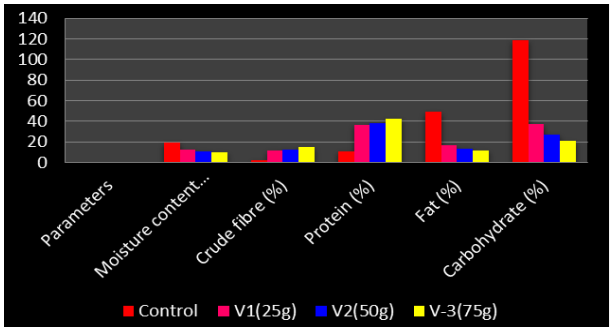


Fig 2: Comparative analysis of Macro Nutrients in V1, V2, V3 with control

It is apparent from the above figure that moisture, fat and carbohydrates are more in control cookies than rest of variations, due to the higher proportion of refined wheat flour in control cookies. Protein is present in highest quantity in variation -3 due to lesser proportion of refined wheat flour and highest percentage of roasted peanut flour.

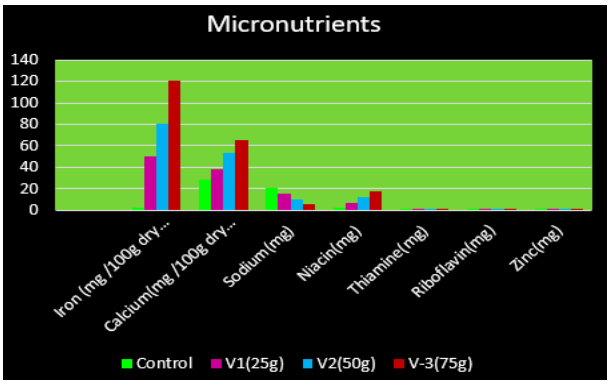


Fig 3: Comparative analysis of Micro Nutrients in V1, V2, V3 with control

The above figure reveals the comparison of micronutrients in all the variations with control, from which it is clearly seen that iron, calcium and niacin are highly present in variation 3 compared to other variations. So it can be concluded that the peanut flour cookies with 75g of peanut flour is a good source of micronutrients.

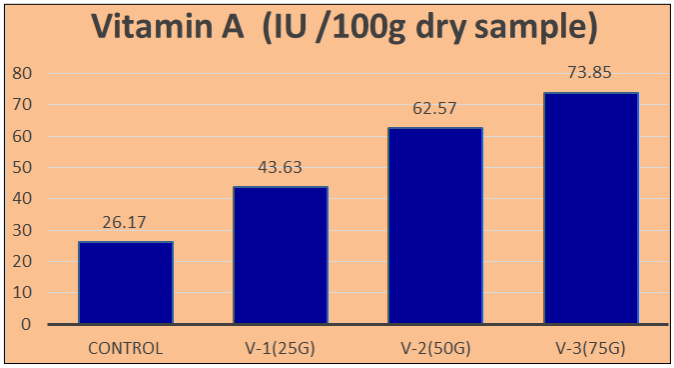


Fig 4: Vitamin A Content in Different Variations

The above table depicts that variation 3 (75 gms of peanut flour) has more amount of vitamin A compared to other variations.

Conclusion

As Cookies are considered as very convenient and inexpensive food products which are becoming very popular among both rural and urban population, this study has aimed at developing roasted peanut flour incorporated cookies in various proportions. The nutrient content of the three variations were evaluated; in which variation 3 had high amount of crude Fibre (14.80%), Protein (42.48%), Iron (120.50mg), Calcium (65.28 Mg),Vitamin A (73.85 IU), and Niacin (17.18 mg) compared to control and other variations. The peanut flour incorporated cookies at the level of 75gms can be used as a supplement snack to manage diabetes, combat protein energy malnutrition, Niacin deficiency and infertility concerns at low cost.

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