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Standardisation, Nutrient Composition, Incorporation of Peanut (*Arachis hypogaea* L.) Butter into Baked Cookies

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Abstract: ***Nuts (tree nuts and peanuts) are nutrient dense foods with complex matrices rich in unsaturated fatty and other bioactive compounds: high-quality vegetable protein, fiber, minerals, tocopherols, phytosterols, and phenolic compounds. The present was undertaken to study the nutrient composition of the five major varieties of groundnuts (Arachis hypogaea L.) commonly consumed in the North part of Karnataka was investigated. Raw dry-shelled samples were analyzed for proximate (moisture, protein, fat, fiber, calcium and iron).Results showed that the groundnuts had 3.2% moisture, 28.3 % protein, 40.6% fat, 3.3% fiber, 9.2% calcium and 2.4% iron. The study on hydrogenated fat replaced with peanut butter to reduce saturated fatty acids in cookie was carried out. Cookies prepared with varied concentrations of hydrogenated fat and peanut butter. Cookies hardness was also increased with increasing concentration of peanut butter. Sensory studies showed that biscuits prepared with peanut butter had relatively harder texture and darker color than control. However, peanut butter gave palatable flavor and taste to biscuits.***

Keywords: ***Peanut butter, Nutrient composition, Incorporation in cookies, Sensory evaluation.***

I. INTRODUCTION

Peanut (*Arachis hypogaea* L.) is probably the most important oil bearing seed in the world and is rapidly becoming a valuable source of plant protein (Gajera *et al*., 2010).

Peanut (*Arachis hypogaea* L.) is an important crop grown worldwide. India is second largest producer of peanuts in world, with total production of approximately 7.131 million metric tons per year.

Groundnut is called as the 'King' of oilseeds. It is one of the most important food and cash crops of our country. While being a valuable source of all the nutrients, it is a low-priced commodity. Groundnut is also called as wonder nut and poor man's cashew nut. It is a low-priced commodity but a valuable source of all the nutrients. Peanuts are available in the retail market places in the form of raw nuts, salted nuts, roasted in shell nuts, peanut butter and confectioneries.

The seed has several uses including as a whole seed or processed to make groundnut butter, oil and other products. The groundnut cake has several uses in feed and infant food formulations.

Its seeds are rich sources of edible oil (43-55%) and protein (25-28%). Peanut oil contains mainly three fatty acids like Palmitic acid (10%), oleic and linoleic acid (80% combined).

Peanut oil contains of approximate 81% UFAs in which about 39% are PUFA. Because of this quality of high MUFA content it is ideal diet for lowering cholesterol. Other biochemical compound of various peanut is as followed Calories, Iron, Niacin, Calcium, Phosphorous, Riboflavin, Sodium, Vitamin A and Potassium.

The confectionery formulations contain Vanaspati (hydrogenated fat), which lowers the nutritional status due to presence of large amount of saturated fatty acids (SFA). The biscuits can be used for desirable and essential fatty acid supplementation by utilizing part of peanut butter (PB) in place of vanaspati. The present study was carried out to utilize PB as a source of desirable and essential fatty acids in biscuits.

II. MATERIALS AND METHOD

Five groundnut verities (DL86, TG37A, GPBD4, GPBD5, G252) commonly grown in North Karnataka were selected for the present study. The groundnut varieties were obtained from University of Agricultural sciences, Dharwad.

A. Nutrient Analysis of the Peanut

Fat, Protein, Fiber, Iron and Calcium of peanut butter were determined by the standard methods of AOAC.

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B. Preparation of Peanut Butter

Every 100 g of peanuts were heated at 100 °C in hot air oven for 8- 10 minutes and cooled to get uniform roasted product, peel removed, discolored seeds or other unnecessary parts were removed.

Whitened peanut kernel was ground at lower speed in a mixer for 1 to 2 minutes, pinch of salt was mixed in peanut powder which was transferred in vessels and kept for 4 to 5 hours till de oiling of peanut paste was noticed. Peanut butter was stored in airtight vessels and kept in cold condition (14 °C) to prevent rancidity.

C. Preparation of Cookies

Biscuits, having vanaspati to PB ratios of 100:00 (T1), 75:25 (T2), 50:50 (T3), 25:75 (T4), 00:100 (T5), were prepared as per standard recipe (AACC 1994). Refined wheat flour (maida) (100%) and skimmed milk powder (2%) were mixed and sieved twice to ensure homogenous blending. Sugar powder (30%), dextrose monohydrate (2%) and different ratios of vanaspati/ PB were creamed for 3–4 min in Hobart mixer (Model N-50, Troy, OH, 45374, USA). Salt (1%), ammonium bicarbonate (1%) and sodium bicarbonate (0.5%) were dissolved in 20 ml distilled water and added to the cream in the mixing bowl. The contents were mixed further for 1–2 min. The flour containing skim milk powder was added and mixed for 3 min. The dough obtained was sheeted on a metal platform to a thickness of 3 mm using wooden rolling pin. The dough was cut into circular shape using a metallic cutter and arranged on a baking sheet and baked in the oven preheated to 204°C for 8 min. The cooled biscuits were packed in polypropylene (40 µ thickness) pouches and quality evaluated after 24 h.

D. Sensory Evaluation

The samples were subjected to sensory evaluation to determine consumer preferences among the different samples for color, texture, flavor and overall acceptability.

E. Selection Of Panel Member

A panel of 10 members were selected based on sensory testes. The hedonic rating test was used to measure the consumer acceptability of food products. From one to four samples were served to the panelists at one session. They were asked rate the acceptability of the product on a scale, usually of 9points, ranging from “like extremely”and dislike extremely. Scales with different ranges and other experience phrases could also be used. The result were analysed for preference with data from large untrained panel.

III. RESULTS AND DISCUSSION

Table 1 Nutrient analysis of Peanut

Sr.No.	Nutrient Parameters	Result (gm/100 gm)
1.	Moisture	3.2
2.	Protein	28.3
3.	Fat	40.6
4.	Fiber	3.3
5.	Calcium	92
6.	Iron	2.4

Table no. 1 Shows that Peanut has a good source of Protein (28.3 gm/100 gms) followed by Fat (40 gm/100 gm), Fiber (3.3 gm/100 gm), Calcium (92 gm/100mg), Iron (2.4 gm/ 100 mg) and moisture (3.2 gm/100 gms).

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F. Sensory Evaluation Of Different Varieties Of Peanut Butter

Table 2 Sensory evaluation of Variety TG37A Plain

Sensory attributes	TG37A Plain
Appearance	8
Colour	8
Taste	9
Consistency	8
Flavors	9
Texture	8
Overall acceptability	8

Table no.2 Shows that in the above product, highest score was found in taste and flavor (9), followed by colour (8), consistency (8) and texture (8). The overall acceptability of the recipe was found to be (8).

Table 3 Sensory evaluation of Variety Dh-86 with Sugar

Sensory attributes	Dh-86 with Sugar
Appearance	7
Colour	8
Taste	9
Consistency	8
Flavors	9
Texture	8
Overall acceptability	9

Table no.3 Shows that in the above product highest score was found in taste (9) and flavor (9), followed by colour (8), consistency (8) and texture (8). The overall acceptability of the recipe was found to be (9).

Table 4 Sensory evaluation of Variety G252 with Honey

Sensory attributes	G252 with Honey
Appearance	9
Colour	8
Taste	9
Consistency	8
Flavors	8
Texture	7
Overall acceptability	8

Table no. 4 Shows that in the above product highest score was found in appearance (9) and taste (9), followed by colour (8), consistency (8) and texture (7). The overall acceptability of the recipe was found to be (8).

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Table 5 Sensory evaluation of Variety GPBD 4 with Cocoa powder

Sensory attributes	GPBD 4 with Cocoa powder
Appearance	8
Colour	9
Taste	9
Consistency	8
Flavors	9
Texture	8
Overall acceptability	8

Table no.5 Shows that in the above product, highest score was found in colour (9) and taste (9), followed by appearance (8), consistency (8) and texture (7). The overall acceptability of the recipe was found to be (8).

Table 6 Sensory evaluation of Variety GPBD 5 with Vanilla essence

Sensory attributes	GPBD 5 with Vanilla essence
Appearance	8
Colour	7
Taste	9
Consistency	7
Flavors	8
Texture	8
Overall acceptability	8

Table no. 6 Shows that in the above product, highest score was found in taste (9) followed by colour (7), consistency (7) and texture (8). The overall acceptability of the recipe was found to be (8).

G. Incorporation Of Peanut Butter In Cookies

Table 7 Sensory evaluation of Peanut butter cookies

Sensory attributes	Peanut butter cookies
Appearance	9
Colour	8
Taste	8
Consistency	9
Flavors	8
Texture	9
Overall acceptability	9

Table no. 7 Shows that in the above product, highest score was found in appearance (9), consistency (9), texture (9), followed by colour (8), flavour (8). The overall acceptability of the recipe was found to be (9).

H. Overall Acceptability

Table 8 Overall acceptability of all attributes among different varieties of Peanuts

Attributes	P1	P2	P3	P4	P5
Appearance attributes	8	7	9	8	8
Color attributes	8	8	8	9	7
Taste attributes	9	9	9	9	9
Consistency attributes	8	8	8	8	7
Flavour attributes	9	9	8	9	8
Texture attributes	8	8	7	8	8
Overall acceptability	8	9	8	8	8

Overall acceptability was scored maximum (8) in all product, product 2 scored (9).

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IV. SUMMARY AND CONCLUSION

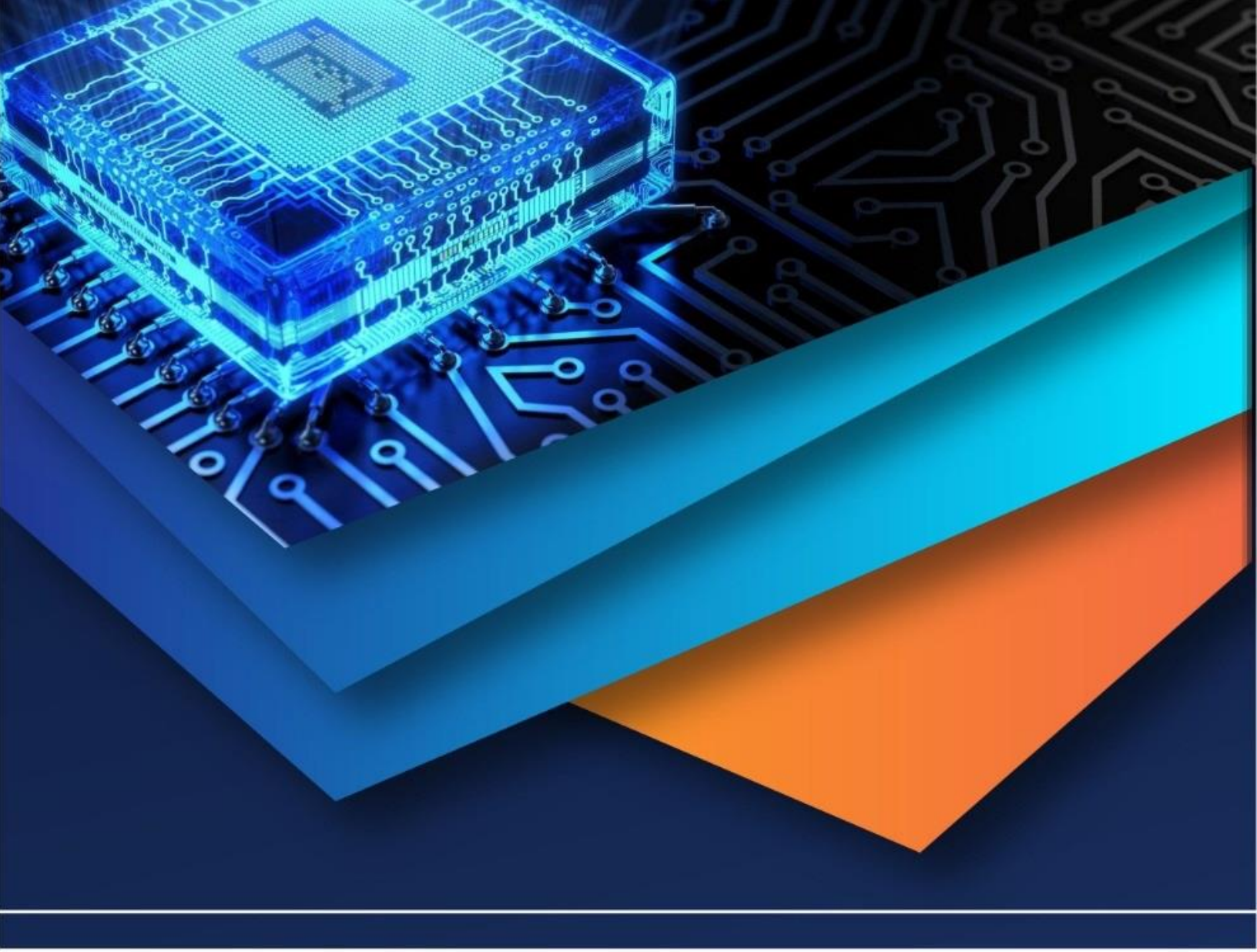
Peanuts are a great source of nutrition. They can be abundantly utilized especially in a country like India which is one of the leading producers of peanut but ironically also has largest counts of malnourished population. The butter prepared using the kernels of peanut yielded better firmness and spredability. Also, the butter prepared using this kernel was found superior while evaluating the flavor and other proximate. The hardness of cookies increased with increasing proportion of peanut butter. Cookies with 50 % vanaspati and 50% peanut butter had greater sensory acceptability.

Peanut is used amongst many traditional dishes in the country through the schemes of Mid-day meal and on the line of nut, the undernourished can be fed and the double burden of malnutrition and obesity can be reduced. the problems of hunger and malnutrition is widely spread across the world, especially in developing countries. With that as background, the development of by-product from peanut will make a significant contribution in all these areas in the years to come. It is clear that there is a huge scope for the commercialization of peanut products and the market trends look extremely positive owing to all the above mentioned factors. Also, there is a greater need of spreading awareness that peanut can prevent supplementation through non dietary sources on regular consumption in Indians, particularly.

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