



# Effect Of Roasting On Groundnut Quality

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**Abstract:** Groundnut, a legume largely consumed by most populations in the world, is widely grown as a food crop. Groundnut seed is a rich source of protein and fat. Hence, may be employed in animal feeds and human diet. Roasting of groundnut, which is a traditional processing method, can affect its nutrient properties. This study was aimed at assessing the effect of some selected traditional processing methods (roasting in local kiln with pretreatments like salt concentration, dipping time, drying time and groundnut: sand ratio) on the protein and fat composition of groundnut. Standard procedures were employed in the determination of the nutrient composition of raw groundnut samples with emphasis on the fat and protein content. The results for nutrient composition of the roasted groundnut was observed to be significant ( $P < 0.05$ ) for protein, fat, moisture and ash content when compared with the raw groundnut sample. The moisture content of the raw groundnut samples was significantly higher than that of the processed samples. The result indicated that roasting of groundnut with pretreatments significantly enhanced the nutrient quality of groundnut. Hence, the traditional processing method of groundnut could effectively enhance the nutritional value of groundnut and for industrial/commercial purposes.

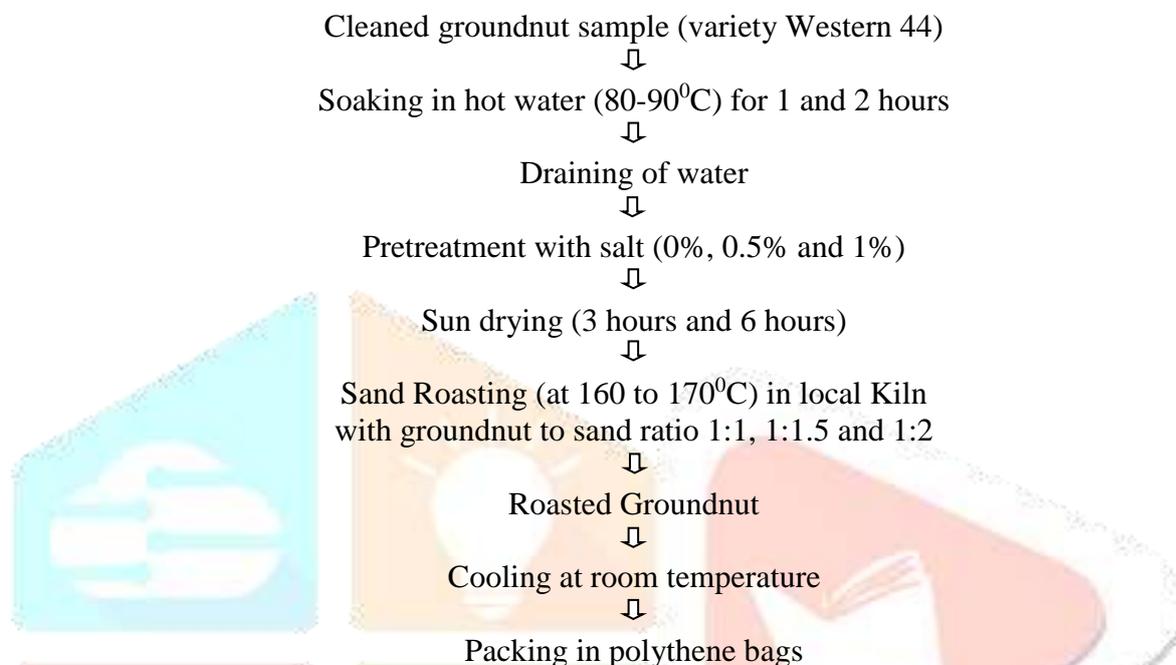
**Keywords** – Groundnut, pretreatment, roasting, nutrient quality

## I. INTRODUCTION

Groundnut (*Arachis Hypogea*) also known as Earthnut, Peanut, etc. is the sixth most important oilseed crop in the world. It is a stable food in many developing countries and rich in protein with sufficient quantity of carbohydrate and fat. This legume crop is the best protein source in the plant kingdom and is relatively cheap as compared to animal protein source, so inclusion of it as a main protein in the meal may be alternative for the same. Nutritionally, groundnut seeds are rich in oil, protein, niacin, fiber, magnesium, vitamin & phosphorus. In India, 30% of production of groundnut is used for domestic purpose, which is commonly used in the form of roasted and salted groundnuts, boiled or raw groundnuts, groundnut oil and groundnut butter. For efficient utilization & consumer acceptance of the groundnut, the study of its desirable nutritional properties is important. Roasting of groundnut is a common method which can affect its nutritional properties like protein, fat and ash. Roasting dries the groundnut and causes them to turn brown with development of a pleasant flavor, which makes it more acceptable for consumption. Roasting also enhances better extraction as it reduces the oil viscosity, release oil from intact cell. There are two primary methods of roasting of groundnut, dry roasting and oil roasting. In dry roasting, natural gas-fired, drum shaped revolving oven is used for roasting with the temperature approximately 430°C for 40 to 60 minutes. In most of local areas of Maharashtra, roasting of groundnut is commonly done in kiln (Bhatti). In kiln roasting, different pretreatments such as salt concentration, dipping time, drying time and sand (Reti) proportion are carried out on the groundnut before roasting. But as there is no standardization of above parameters in this method, it directly affects the quality of roasted groundnut. As no such study has been reported on the effect of these pretreatments on nutrient properties of the groundnut, the present study was undertaken to study the effect of roasting on the nutrient quality of groundnut.

## II. MATERIALS AND METHODS

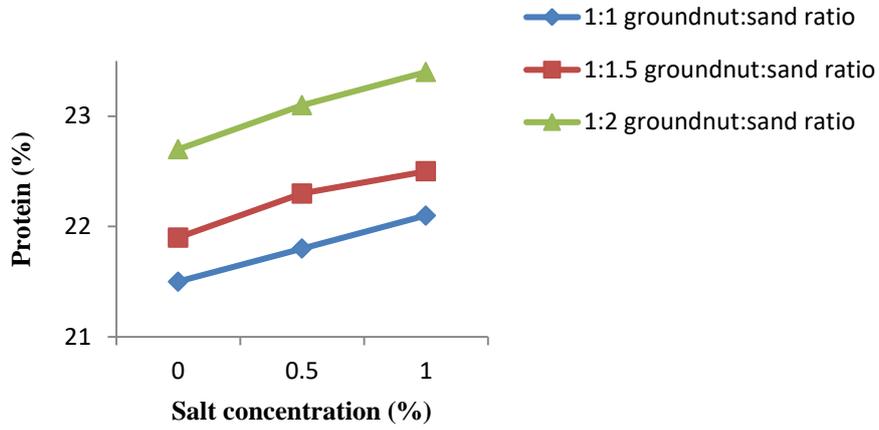
Groundnut seeds of variety Western 44 were collected from the local market. The moisture (wet basis), protein, fat and ash content of raw and roasted groundnut were determined by standard AOAC method (2000). The four pretreatments such as salt treatment (0%, 0.5% and 1%), soaking time (1 and 2 hours), sun drying (3 and 6 hours) and groundnut to sand proportion (1:1, 1:1.5 and 1:2) were applied before roasting of raw groundnut. In kiln (Bhatti), roasting of groundnut was done with the help of sand having temperature of 160 to 170°C as shown in Fig. 1. Effect of pretreatments on quality of roasted groundnut was analyzed by varying one pretreatment where as keeping other pretreatments constant. All values obtained are means of three replicates. The data were subjected to two way analysis of variance (ANOVA) and significant differences between treatment means were determined at 5% confidence level.



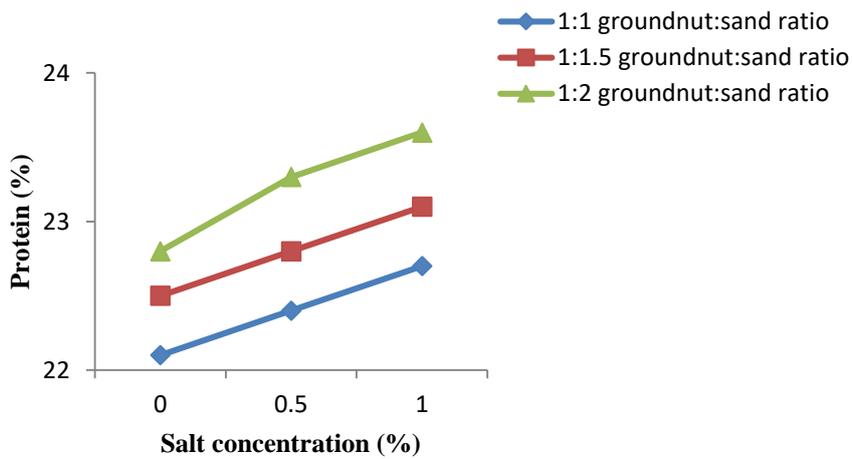
**Fig. 1 Flow process chart of groundnut roasting in local kiln**

## III. RESULTS AND DISCUSSION

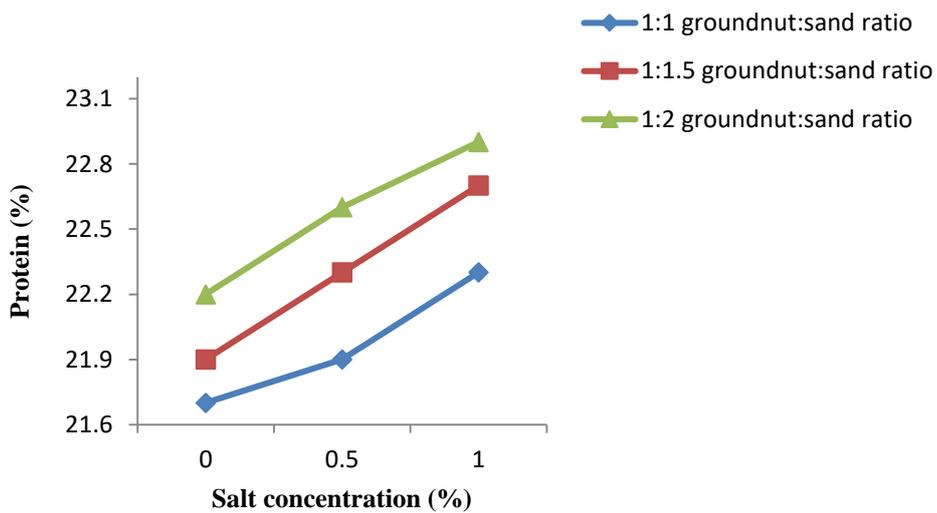
The nutritional composition of the raw groundnut (variety Western 44) was obtained as 4.68% moisture (wet basis), 20.9% protein, 48.2% fat and 2.48% ash. Fig. 2 and 3 represents the effect of salt concentration on protein and fat content of roasted groundnut for various groundnut sand ratios. From that, it can be seen that there was significant increase in protein and fat content for all the groundnut sand ratios at all the dipping and drying time (Table 1 & 2). The nutrient composition of the groundnut, indicated a significant difference ( $P < 0.05$ ) among the raw and roasted groundnut samples. Maximum protein and fat content in the roasted groundnut was found when treated with 1% salt, 2 hour dipping and 1:2 groundnut sand ratio. Pretreatment before roasting might have enhanced the nutritive levels of the seed along with reduction of the anti-nutritional factors though this was not appraised in the present study.



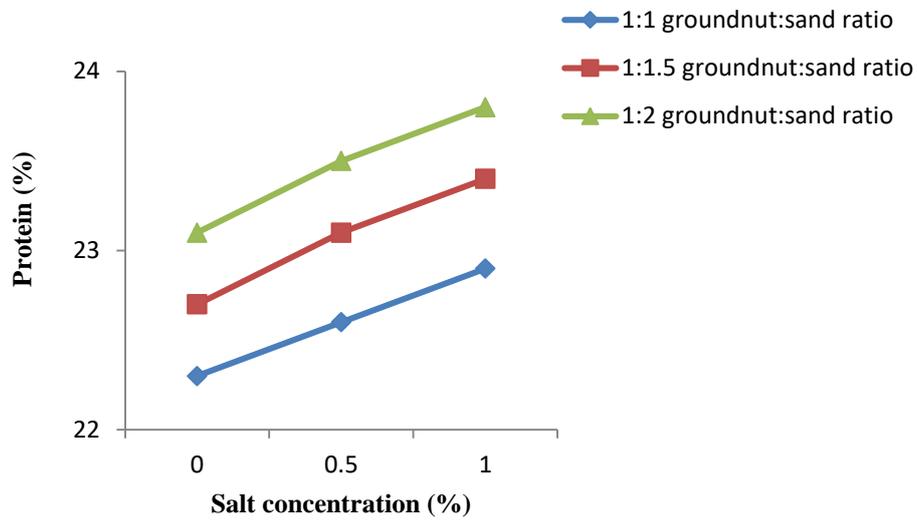
**At 1 hour dipping and 3 hours drying**



**At 1 hour dipping and 6 hours drying**

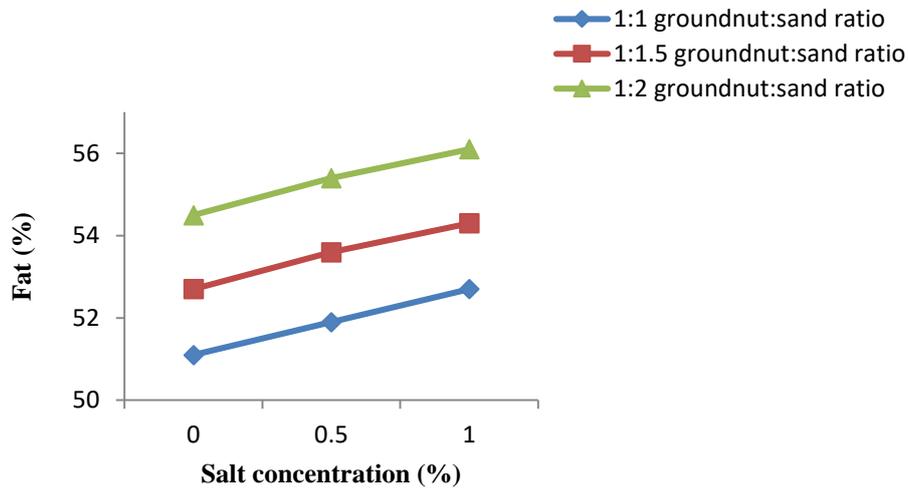


**At 2 hour dipping and 3 hours drying**

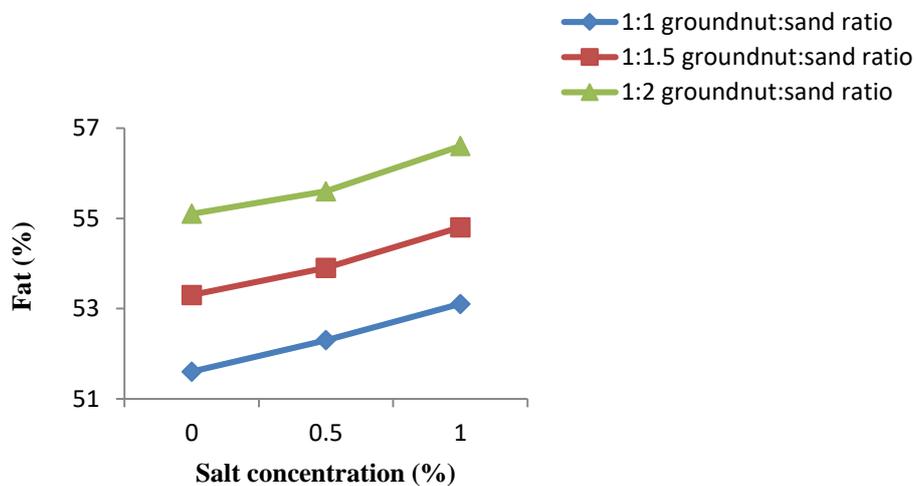


At 2 hour dipping and 6 hours drying

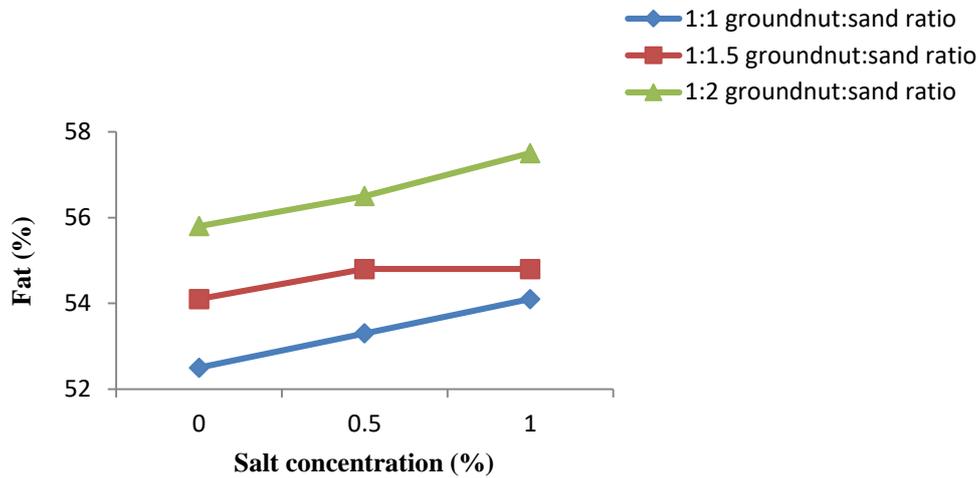
Fig.2 Effect of salt concentration on protein content of roasted groundnut



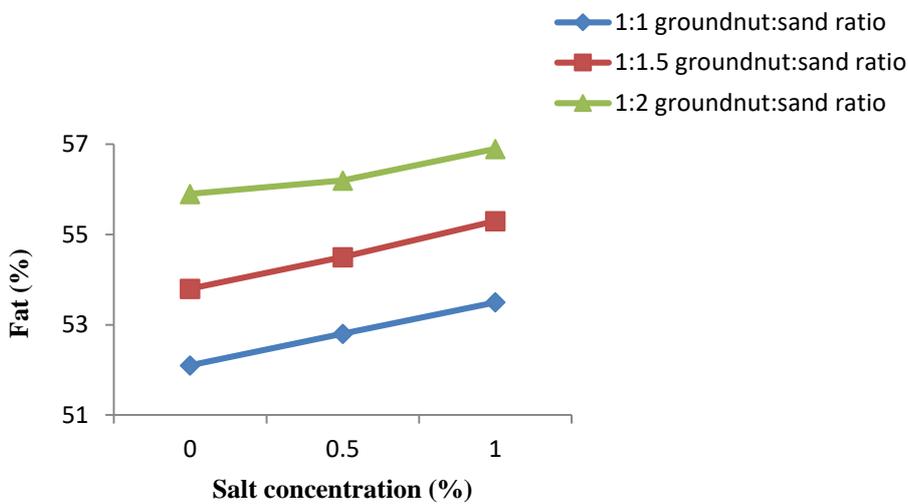
At 1 hour dipping and 3 hours drying



At 1 hour dipping and 6 hours drying



**At 2 hour dipping and 3 hours drying**



**At 2 hour dipping and 6 hours drying**

**Fig.3 Effect of salt concentration on fat content of roasted groundnut**

**Table 1. ANNOVA for effect of roasting on protein content of groundnut**

SV	SS	df	MS	F	P-value	F critical
Rows	3.374379	9	0.374931	1.990261	0.102278	2.456281*
Columns	3222.312	2	1611.156	8552.564	1.57E-27	3.554557
Error	3.390891	18	0.188383			
Total	3229.077	29				

\*Denotes significant value at 5% level

**Table 2. ANNOVA for effect of roasting on fat content of groundnut**

SV	SS	df	MS	F	P-value	F critical
Rows	23.7642	9	2.640466	1.280086	0.312218	2.456281*
Columns	19384.84	2	9692.419	4698.839	3.41E-25	3.554557
Error	37.12907	18	2.062726			
Total	19445.73	29				

\*Denotes significant value at 5% level

Table 3 represents the effect of salt concentration on moisture content of roasted groundnut for various groundnut sand ratios. From that, it can be seen that there was significant decrease in moisture content of roasted groundnut for all the groundnut sand ratios at all the dipping and drying time. The raw groundnut has the highest moisture content of  $4.68 \pm 0.11\%$  when compared with the roasted groundnut that ranged from 2.34% to 2.63%. This result suggests that the moisture available in the raw samples may have reduced by the heat applied during roasting. Ash content is an indication of the total amount of minerals present in the food sample. From Table 3, it was observed that ash content was significantly different ( $P < 0.05$ ) in all the roasted groundnut samples. The roasted samples had ash content within the range of (2.79 to 2.88%), since ash is the inorganic residue that remains after water has been removed by heating the presence of oxidizing agent, which provides a measure of total minerals within a food. It was observed that ash content increased after roasting for all the groundnut sand ratios at all the dipping and drying time, which could be because during processing, some of inorganic components may have leached out of the seed and as such some of the inorganic components were lost.

**Table 3. Effect of dipping time and drying time on moisture and ash content of roasted groundnut at various salt concentrations**

	Moisture (%)	Ash (%)
<b>Raw groundnut samples</b>	$4.68 \pm 0.11$	$2.48 \pm 0.03$
<b>Roasted groundnut samples</b>	$2.49 \pm 0.15^a$	$2.83 \pm 0.04^a$

<sup>a</sup>Denotes significant value at 5% level

## V. CONCLUSIONS

- 1) Roasting of groundnut in local kiln increases its nutrient quality in terms of protein and fat.
- 2) Roasting of groundnut improves the nutrient potentials of leguminous seeds by reducing the level of anti-nutrient factors.
- 3) However, taking the choice of consuming roasted groundnut and human health into consideration, it may be recommended that pretreated roasted groundnut is best suitable choice for consumption due to improvement in its nutrient content.

## VI. REFERENCES

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