

CHEMICAL ANALYSIS OF GROUNDNUT SEED

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ABSTRACT:

Groundnut production & utilization in India has tripled in last some decades due to its high nutritive value the chemical quality & seeds of Indian groundnut are different from those of other country. This study was initiated to examine the nutritional quality of 20 groundnut varieties grown in India dry sample were examined for oil content, crude protein total carbohydrates, calcium, potassium, magnesium, sodium, zinc, copper, iron and manganese, result from these analysis show variations. There was a general decrease in the proximate composition after exposures to different heating methods but there was variation in the mineral content of the seeds after heating. Kopargoan variety groundnut is used for this analysis.

Keywords: Proximate composition, nutritional quality, variation, exposour.

INTRODUCTION:

Groundnut (*Arachis Hypogaea*) is also called as peanut. It grows about 19 million hectors of land in tropical region. Which is main protein source in Indian food it is cultivated in large scale throughout the world. It is herbaceous plant having different varieties. It is the member of family Leguminosae it is native to South America it grows generally 30-60 cm high with hard, angular stalks. About 88% production of groundnut are concentrated in india which is highest in five states. They are Andhra Pradesh, Gujrat, Karnataka, Tamil Nadu and Maharashtra. Generally 83% of groundnut is cultivated during rainy season and other 17% are cultivated during summer season. India is the second largest country who produce groundnut.

Groundnut provides a cheap source of high quality diatry protein and oil. Groundnut

seed contain 44 to 56% oil and 22 to 32 % protein in a dry seed and it is a rich source of Minerals i.e. Phosphorous, Calcium, Magnesium and Potassium. It also contains vitamins E, K and B group. The vegetable oil from the ground nut seed has made a important contribution to the diat in many countries. Serving good source of protein lipid and fatty acid for human nutrition. It contain carbohydrates about 9.5 to 19.0%.

The consumption of groundnut seed will help to supplement nutrients of stable carbohydrates foods of the poor who cannot afford enough protein foods of animal origin hence it is also called poor men's cashew nut.

It is seen that from past three decade's slight increase in the area under crop production also increased by 50% due to increase in yield. The cake has several uses in feed and infant formulations. Groundnut provides considerable amounts of mineral elements to supplement diatary requirement of humans and farm animals.



The chemical composition of groundnut seed has been evaluated in relation to protein level amino acid consumption and fatty acid consumption. Hence the objectives of this study is to investigate the quality of groundnut food with respect to protein fat, carbohydrates and other minerals in the cultivars ground in the country to from the bases for further breeding activity.

MATERIAL & METHOD:

Sample Preparation:

Groundnut (Arachi hypogeal) was bought at a local market of Marathwada region. Which is transported in polythene bag to the laboratory then the groundnut was divided into three parts of 100 g each one part was roasted, second part was sundried & the third part was used raw.

Proximate Analysis :

The chemical Analysis were determined by the method of soxhlet extraction by using n – hexane as solvent the optical density was measured by using spectrophotometer. The carbohydrates content was determined by difference subtracting the sum of moisture, ash, protein fat, crude fibre percentage from hundred.

Oil content:

Oil content was determined by nuclear magnetic resonance spectrometer also it is determined by soxhlet extraction method all to pearson all reading were taken on oven-dried samples.

Mineral Elements:

For the mineral content the dry ashing method was used the dry groundnut samples were weighed into a crucible and ash in furnace at 600⁰C for 4 hrs that the

after was cooled & dissolved in dilute HCl and few drops of conc nitric acid added the crucible was kept on a hot sand bath and boil. After that the content was allowed to cool and transferred to 50 ml volumetric flask.

The above Solⁿ was used for the estimation of Zn, Cu, Fe and Mn for Na, K. & Mg. 1 ml of the aliquot was diluted to 25 ml after adding 0.5 ml of Solⁿ for Ca, the step for K. Na and Mg were followed except that instead of using 1 ml for dilution, 5 ml was used after that the Solⁿ were sprayed into spectrophotometer to determine conc. of various elements with suitable standards.

RESULT AND DISCUSSIONS:

This determination are carried out for chemical composition of groundnut seed oil from this determination it is observed that there was significant difference among all of the cultivars oil content are ranges from 33.6 to 54.95% the previous composition studies in groundnut reported that higher oil content in new variety groundnut crude protein of seed ranged from 18.92 to 30.53% IGCS 44 & Kadiri contain highest amount of protein while karad 24 contain less amount of protein from this result it is also demonstrate that groundnut is the valuable source of protein with the increasing demand for products with less fat of oil ICGS & kadiri variety can be used for products which required low oil & high protein content.

It is also seen that carbohydrates differed between 20.12 & 28.10 with mean 24%. It is also indicated that groundnut is a good source and potassium, calcium, zinc and phosphorus. The availability and calcium, magnesium and phosphorus show that it is a rich source and minerals.



Variety	Oil	Protein	Carbohydrates	Zinc	Copper	Iron	Manganese yield
ICGS 44	51.09	28.17	26.16	6.2	2.6	3.9	2.9
Local (TMV2)	43.00	22.87	23.02	4.4	1.8	2.2	1.5
JL 24	48.60	24.77	19.28	5.1	2.0	2.6	2.4
Kadiri	54.65	30.53	27.16	6.5	2.2	3.7	1.9
ICGS 91117	52.20	25.78	21.53	5.8	1.9	2.6	1.7
Karad 4-11	33.60	18.98	24.72	5.3	1.7	2.9	1.6
Local (SB 11)	48.88	21.15	20.94	4.9	1.7	0.2	2.1
TMV 10	48.75	24.75	23.00	2.6	2.4	3.3	2.2
Kopargoon	45.80	20.09	20.86	0.3	2.1	3.2	1.5
ICGS 11	52.20	27.12	22.16	5.8	1.9	2.6	1.6
TAG 24	43.00	22.21	21.18	5.4	2.2	3.5	1.9
ICGS 49	49.61	25.29	19.12	4.6	1.8	2.1	1.3
UF 70 – 103	33.84	23.67	24.78	5.1	2.1	2.4	1.5

CONCLUSION:

Groundnut is the most important oil seed and cash crop of country. It serves as good source of protein lipid, minerals & carbohydrates fatty acid for human nutrition it provides food for human & livestock and in absence of meal from a valuable dietary protein component. It is shows that significant genetic variations were observed for the quality attributes studied among the groundnut varieties.

REFERENCES:

- Cetin, M., 2007. Physical Properties of Barbania Bean (*Phaseolus vulgaris* L. cv. 'Barbania') Seed. J.Food Engineering, 80: 353-358.
- Sessiz, A., R.Esgisi and S. Kizil, 2007. Moisture Dependent Physical Properties of Caper (*Capparis ssp.*) Fruit. J.Food Engineering. 79: 1426-1431.
- Reddy, B.S. and A. Chakraverty, 2004. Physical properties of Raw and Parboiled Paddy. Biosystems Engineering, 88 (4): 461-466.
- Aydin, C., 2002. Physical Properties of Hazelnuts. Biosystems Engineering. 82 (3): 297-303.
- Aydin, C., Ogut, H. and M. Konak, 2002 Some Physical Properties of Turkish Mahaleb. Biosystems Engineering. 82 (2): 231-234.
- Baraye, E.A. and B.K. Mangope, 2002. Some Physical Properties of QP-38 Variety of Pigeon Pea. J. Food Engineering, 56 (1): 59-65.
- Carman, K., 1996. Some Physical Properties of Lentil Seeds. J. Agricultural Engineering Res., 63 (2): 87-92.



- Aggrawal, K.K., B.L.Clary and E.W. Schroeder, 1973. Mathematical Model of Peanut Pod Geometry. Transactions of the ASAE, 16 (2): 87-92.
- Aydin, C., 2007. Some Physical Properties of Peanut and Kernel. J. Food Engineering, 79: 810-816.
- Joshi, D.C., S.K.Das and R.K. Mukherjee, 1993. Physical Properties of Pumpkin Seeds. J. Agricultural Engineering Res., 54 (3): 219-229.
- Shepherd, H. and R.K. Bhardwaj, 1986. Moisture Dependent Physical Properties of Pigeon Pea. J. Agricultural Engineering Res, 35 (4): 227-234.
- Yalcin, and C.Ozarslan, 2004. Physical Properties of Vetch Seed. Biosystems Engineering. 88 (4): 507-512.
- Balasubramanian, D., 2001. Physical Properties of raw Cashew Nut. J.Agricultural Engineering Res. 78(3): 291-297.
- Barku Atsu VY, Nyarko HD and Dordunu P. Studies on the Physicochemical Characteristics, Microbial Load and Storage stability of Oil from Indian Almond nut. Food Science and Quality Management, 8, 2012, 9-17.
- Odoemelam S.A. Proximate Composition and Selected Physicochemical Properties of the seeds of African Oil Bean (*Pentaclethra marcophylla*.) Pakistan Journal of Nutrition, 4 (6), 2005, 382-383.
- Asibuo JY, Akromah R, Safo-Kantanka oo, sei, Adu-Dapaah, Hanskofi OS and Agyeman A. Chemical Composition of Groundnut, *Arachis hypogaea* (L) landraces. African Journal of Biotechnology, 7 (13), 2008, 2203-2208.
- Savage GP and Keenan JI. The Composition and Nutritive Value of Groundnut Kernels. In Smart J. (ed) The Groundnut Crop, Scientific basis for improvement. London, Chapman and Hall, 1994, 173-213.
- Oke OL. Chemical Studies on Some Nigerian Pulses. West African Journal of Biology and Applied Chemistry, 9, 1967, 52-55.
- Woodroof JG. Peanuts Production, Processing, Products, Products, 3th ed. Avi Publishing Company Inc. Westport, Connecticut, 1983.
- Pearson D. The Chemical Analysis of Food. (6th ed.) JA. Churchill, Loindon. 1970, 510-515.
- Kirk R. and Sawyer R. Pearsons composition and analysis of foods. 9th edition, Addison Wesley longman ltd. England. 9-29, 1991, 608-640.
- Bowen H.J.M. Trace Elements in Biochemistry, Academic Press, London, 1966, 127.
- Adeyeye, A. and Ajewole, K. (1992). Chemical Composition and Fatty acid profiles of cereals in Nigeria. Food Chem. Vol. 44 pp. 41-44.
- Bansal, U.K.D.R. Satija and K.L. Ahula (1993). Oil composition of diverse groundnut (*Arachis hypogaea* L. genotypes relation to different environments. J. Sci. Food Agric. 63: 17-19.
- Crocker, W. and barton, L.V. (1957). Physiology of seed.



Chronica botanica Waltham, Massachusetts. Pp. 267.

- Ergul N. (1088). Peanut production. Mediterranean Agriculture Research institute, Ankara-Turkey, Publ. Nu.pp.308.
- International Institute of Tropical Agriculture (1989). The Cowpea, biotechnology and Natural Pest Control. IITA research Briefs, 9. 5-6.
- Oke, O.L. (1967). Chemical Studies on some Nigerian Pulses. West Africa J. bio Appl. Chem. 9: 52-55.
- Pearson, D. (1981). The Chemical Analysis of Food. (8th Ed.). J.A.Churchill, London, pp. 535.
- Rao S.K. Rao, SDT and Murti, K.S. (1965). Compositional Studies on India Groundnut – 111. India Oilseed J.9: 5-13.
- Young, C.T., Waller, G.R. and hammons R.O. (1973). Variations in total amino acid of peanut meal. J. Am. Oil Chem. Soc. 50: 521-523.