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SHEA-BUTTER A NUTRITIONAL VALUE IN RELATION TO ANALYTIC EXTRACTION BY EVALUATION AND STANDARDIZATION OF POLYSACCHARIDES FOR DOMESTIC USE

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ABSTRACT: *A nutritional value in relation to analytic extraction by evaluation and standardization of polysaccharide (Shea-butter) for domestic use was carried out. Indeed, this butter, which is an extract from the Shea-nuts, has a lot of nutritional value contained in it. Questionnaires were employed on the community around on the process they adopt in the extraction of this butter. Thus, that same method was used for this research work but with some analytic modification for the purposes of obtaining better and more reliable results. The method employed in the extraction of this oil was by crushing, grinding and boiling of the paste. The experimental designed was used in the analysis of this research work and from the analysis shows that Shea-butter contained Carbohydrates, Vitamins, Proteins, Fats and Oils. The oil can be used for domestic purposes and also medicinal as it is known for relieving sprain constipation etc. Based on the nutritional & medicinal value of this Shea-butter, it can be processed and exported in commercial quantity to earn a good living to this community and even to the State and the Country at large.*

KEYWORDS: Shea-Butter, Nutritional, Polysaccharides, Analytic Extraction, Domestic Use

INTRODUCTION

Background of the Study

Shea-butter is oil gotten from Shea-nut, (*Butyrospemum raradoxurn)*, the oil is popularly known as (mai-kede in hausa), but its usefulness lies in the production of fats and oil. The principal sources of vegetable or plants fats and oils are coconuts, soya beans, groundnuts, olives, palms, cottonseeds, castor beans, pea-nuts, Benniseeds and Shea-nuts (Salunkhe,D.K. 1992).

Animal fats and oils include beef or mutton lard from pork meat. Fats and oil are naturally occurring esters used as energy storage compounds by plants and animals. They are nonvolatile and insoluble in water, also it contains protein, carbohydrates, and fats. The Egyptians used these oils and fats as lubricant in moving heavy building materials, but the terms oils are used in generic sense to describe all substance that are greasy or oily fluids (Lawson, H.W. 1994).

The main source of fats and oils are used in cooking, soap making, also serves as the main source of glycerol, the higher fatty acids are used in making candles and grease. The oils and fats also help in the body regulation of body temperature of animals by keeping it warm, they are stored under the skin in mammals.

Shea-butter itself is of the glycerol esters of palmitic and oleic acids, together with a few percentages of the glycerines of butyric and other similar fatty acids.

Hoffmann, G. *(*1989) a French chemist demonstrated the chemical nature of fats & oils. Oil gotten from Shea-nuts is largely known to be of great importance in many ways, as in other fatty acids, Shea-butter is also widely used in soap making because of its low melting points, it is used in cooking, also as pomades. In pharmaceuticals industries, Shea-butter is used in manufacturing of medicine such as menthol, sulphur ointment & nerol.

Shea-butter is locally used as liniment for the treatment of dislocation and also used in treating boils, cough, rheumatism and ulcer. Extraction of oil is a process in which oil is extracted by treating another substance locally or mechanically. Although the extraction of oil has been long in existence, the method of extraction and procession locally has remained unsatisfactory. It is probably due to the method used, the equipments or materials and other activities evolved.

As early as 1400BC, different kinds of oils &, fats has been extracting only for human use, but today fats & oils is appreciated in the developed and developing world.

The aims are to determined analytic extraction of Shea-butter from the Shea-nuts and to specifically ascertain the nutritional value of the oil and to standardize this Shea-butter for human and domestic use as well as export.

Study Area

The approach used for the analysis and extraction is by the application of questionnaires. The questionnaires were administered to Shabu community area who are predominantly peasant farmers in Lafia North Development Area of Nasarawa State. While the predominant ethnic tribe in this area are the Kwandaras, whose one of the pre-occupations that earn them a living is on this Shea-butter. The questionnaires were distributed to the locality to seek their views on how this extraction is being carried out and how best we can improve in the method, since the benefits from the butter is enormous.

Method: Extraction of Shea-Butter

The method of extraction of the Shea-butter was first done by the collection of the Shea-nuts from the bush. Therefore, one bucket full of Shea-nuts was collected from the bush in other to get an appreciable quantity of the Shea-butter for good analysis.

Extraction of Shea-Butter Assay

The Shea-nuts were divided into two portion which is A & B. A- was boiled while B- was soaked in water for three days, and all the two portions were cracked manually to produce or remove nut, then crushed in the mortar with pestle and grinded on the stones into a fine paste.

In sample A, the first container, cold water was added little and kneaded to attain a soft dough, then in excess water, raw fats floats on the surface of the water. So also, in second container, well water was added little and kneaded to attain a soft dough then in excess, little oil floats at the surface of the water.

Also, in sample B, into the first container cold water was added little and kneaded then in excess, little fats floats at the surface of the water. And in the second container of the sample, hot water was added little and kneaded then in excess, fats did not float at the surface of the water but fats are suspected in the sample.

RESULTS AND ANALYSIS

In this present analysis four portions produced different results First portion, contained boiled, crushed and grinded Shea-nuts yielded much oil with cold water, and the second portion yielded little oil with well water. Third portion, which contained soaked, crushed, grinded Shea-nuts yielded little oil with cold water, and the fourth portion yielded no oil but oil suspected with hot water (table 1).

Table 1: The Analytic Extraction of Shea-Butter from Sheanuts by Boiling and Soaking

Portions	Type of Assay	Type of Water	Extracts
First portion	Boiled	Cold water	Much oil presents
Second portion	Boiled	Well water	Little oil present
Third portion	Soaked	Cold water	Little oil present
Forth portion	Soaked	Hot water	Oil suspected

When the oil has been extracted and kept for 30 minutes, it solidified or hardened, thus indicating the presence of saturated fatty acid, since all oil, which is solid at room temperature are saturated fatty acids. Therefore, it was noticed that, when Shea-nuts were boiled, crushed and properly grinded and cold water was used, it yielded much oil than any other portions. It also shows that, Shea-butter can only be extracted at lower temperature.

Tests on classes of food was carried out on the Shea-butter to evaluate some of these foods that contained oil (tables 2, 3 and 4)

TABLE 2: Test for Proteins

Test	Observation	Inference
Shea-butter + million's reagents	White precipitate was formed on heating	Protein present
Shea-butter + NaOH(aq) + $CuSO_4$(aq) Biuret test	Violet colour obtained on heating	Protein present

NB:
NaOH = Sodium Hydroxide
$CuSO_4$ = Copper Sulphate

Table 3: Test for Carbohydrates

Test	Observation	Inference
Shea-butter + few drops of conc. H2SO4(aq) and warm (solid state)	The solid chaired with evolution of gases, leaving a black residue of carbon	Starch is present
Shea-butter + few drops of iodine solution (Aqueous soluble of the substance)	Turned blue-black colour disappear on heating and reappears on cooling	Starch present

N.B
H_2SO_4=Sulphuric acid

Table 4: Test for Vitamins

Test	Observation	Inference
Dil HcI(aq) was titrated against KoH + shea-butter and phenolphthalein	White precipitate was formed Vitamins present. and it is milky	Vitamins present

N.B
Hcl = Hydrochloric acid
KoH = Potassium hydroxide

The Shea-butter has the **PH** value of 6.6 and it is approximately 7 and it is neutral to

litmus paper, therefore it is a neutral compound. The experiments also revealed the presence of the classes of food as indicated in the tables 2,3, and 4 above. The oil does not contain much impurity, once the oil has been extracted, even if there are, it is again being boiled to a very high temperature while the impurities come up in form of fumes it is removed, and the oil is highly appreciated. The experimental design applied has significantly given the desire result needed for the research work.

DISCUSSION

In conclusion, the crushing and grinding of Shea-nuts by extraction yielded much oil, on leaving the oil to rest, it becomes solid at room temperature. Also, in the test for the classes of food, it was discovered that Shea-butter contained protein, fats and oils, carbohydrates and vitamins in different proportion. From the study, it was discovered that the production of this oil is not as difficult as people would have thought. The only problem there in is that of crushing and grinding of the Shea-nuts that needs a lot of energy and time. Apart from cooking, the Shea-butter could be use in processing other items such as soap, pomades, candles, cosmetics and margarine at commercial quantity. From the research work, we therefore recommend that the materials/equipment used for the extraction and analysis of Shea-butter should be cheap and affordable to reduce fatigue in the processing of Shea-butter. Since the oil serves for medicinal and nutritional purposes, the government should invest

more in the processing of this oil. Also, the oil should be made known to areas that are not yet aware of the important contents of this she a-butter, by massive publicity through the various media.

Investors should be encouraged to invest in the raw materials of shea-nuts adequately because of the vitamins contents in the oil which can be incorporated into the production of house whole products. Indeed, research could still be carried out for more findings in the processing of shea butter.

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REFERENCES:

E.A (1978): *The Encyclopedia America*, International edition, Burna to Cathway, vol.5 Pp. 67-68
E.I (1977): Encyclopedia International, Volume 13 Lexicon publication.
E.M.B. (1976): *The New Encyclopedia Britanica*, Macropedia knowledge in dept. vol. 13. 15th edition Pp 522-528.
Finar I.L. (1976): *Organic chemistry, volume 12,* the fundamental principles 6th edition
Gurr, M.I. (1992), Role of fats in Food and Nutrition. Chapman & Hall, London, New York.
Hoffmann, G. (1989), The Chemistry and Technology of Edible Oils and Fats and Their High Fat Products. Academic Press, San Diego, CA.
Howards R.A. (1979): *West African Crops*, University press, Chicago.
John H. (1982): *Comprehensive chemistry* 3rd edition Pp. 708-709.
Kuby P. (1977): *An Agricultural Atlas* of Nigeria by Aghoola S.A Pp 118.
Lawson, H.W. (1994), Food Oils and Fats Technolog, Utilization and Nutrition. Chapman & Hall, London, New York.
Lewick T. (1974): *West African food in the middle ages.* Cambridge university press Pp. 105-108
M.S.E. (1979): *Merit Students Encyclopedia vol. 14* Macmillan educational cooperation.
Olatunji A.G.B (1979): *General Agriculture*, for West Africa, University of Ibadan George Allen inc UNWIN. Pp. 86
Salunkhe, D.K. (1992), World Oilseeds: Chemistry, Technology, and Utilization. Chapman & Hall, London, New York.