



Status of Shea Butter Processing, Storage, Acceptability and Utilization in Borgu Local Government Area (Kainji Area and its Environs), Niger State, Nigeria

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ABSTRACT

This study was designed to ascertain the status of shea butter processing, acceptability and utilization as an edible fat/oil in Kainji lake area of Nigeria. 300 questionnaires were distributed and 282 retrieved. The generated data were subjected to descriptive statistical analysis in form of frequencies, percentages and totals. Processing and selling of sheanuts are flourishing businesses among the indigenes. Traditional manual method of processing shea butter vary from place to place, gives low yield and unpleasant aroma product with low acceptance as an edible fat/oil. Forty percent of the respondents, mainly indigenes, accepted shea butter as edible fat while 60% did not. Stew, soup, jollof rice and beans, moinmoin, indomie, akara and masa are some foods prepared using shea butter in the area.

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Introduction

Globally, vegetable oils are in great demand for domestic and industrial uses. They are extracted from oilseed plants such as groundnut, soybeans, melon, sesame, palm, olive, corn plants by manual, solvent or mechanical expression and are sources of dietary energy, antioxidants, biofuels and raw materials for the manufacture of industrial products [1, 2]. Their pooled vegetable oils are not enough for the booming population and without importation of vegetable oils (which puts a heavy strain on the country's foreign exchange position), Nigeria cannot meet her domestic demand [3]. Vegetable oils are used locally in cooking, production of soap and cosmetics.

Sheanuts from shea butter tree, (*Vitellaria paradoxa* C.F Gartner) is an under-utilized economic oil crop with great potentials in the Nigerian economy and an asset for National Economic Development [3]. Adequate exploitation of it could make significant contribution to our country's Gross Domestic Production (GDP). Sheabutter plant is a perennial tropical oil-yielding tree belonging to the family Sapotaceae.[4] reported that shea butter tree is the second most important oil tree in Africa after oil palm. The tree grows naturally throughout Guinea Savannah region. The fruit is always a berry and could contain more than one seed but not more than three. The seed coat is hard, bony and shining. It has a small or large scar at the base or on one side and starts bearing fruit at maturity [5]. Flowering begins by early November with picking and gathering lasting from April to August every year in most places. When fully ripe, the fruit falls under its weight to the ground and it's handpicked. In some Northern parts of Nigeria, shea butter tree replaces the oil palm tree as a source of edible oil among many ethnic groups [6]. It is called Kadanya in Hausa, Karaje in Fulani, emi-emi in Yoruba, Osisi Okuma in Igbo and Kwara in Bussa and Kambari languages in Nigeria.

Shea butter tree grows in abundance in most Middle belt and Northern areas of Nigeria. In 1999, Nigeria was reported to have produced 58% of the African produce and 414,000MT in 2005. Nigeria was the largest producer of shea butter in 2008 in West Africa [3]. There is great demand for shea butter in the international market as cocoa butter substitutes in the confectioneries, pharmaceutical and cosmetic industries [7]. Most of the sheanuts in Nigeria are exported with less than 10% local utilization. A considerable proportion of the sheanuts are lost post-harvest and others sold in the market at low price for urgent cash need by local women in area of production. To maximize economic exploitation of the vast shea resources in Nigeria, the Federal government has included shea tree as a mandate crop to the Nigeria Institute for Oil palm Research (NIFOR) with the aim of improving its yield genetically [3]. Sheanut collection, processing and marketing are some of the main agricultural activities in areas where it grows.[8] reported that Niger State has the densest distribution of shea trees in Nigeria. According to [9] sheanuts contain up to 50% shea butter oil, a nutritious complex lipid of plant origin. It is rich in saturated, unsaturated and essential fatty acids – the triglycerides [7 10]. Shea butter is a lso, rich in stearic acids (48%) which have been reported to lower blood cholesterol [11, 12, and 13]. It is rich in saponifiable and unsaponifiable fractions, anti-oxidants, fat soluble vitamins, minerals, carotenes, cinnamic acid, has healing properties and it is a promising multi-functional fat [14]. Shea butter processing is done manually by women in the rural areas. The average % yield of the traditional methods is 20 to 30% according to [16, 17 and 18].

Statement of problem

Sheanuts are economic crops with great potential to the Nigeria economy. In most producing areas, shea butter is consumed only by the natives; others use it as a pain reliever. Shea butter is cheap, available and if properly processed, can

complement and compete with groundnut and other vegetable oils which have become too expensive for regular household use. The market prospect for non-solvent extracted shea butter is bright at the international scene [19, 3]. There is therefore the need for research on the status of shea butter processing and utilization in producing areas in Nigeria. Results from such survey could form baseline knowledge and information to improve its yield, qualities, acceptability, and utilization as an edible butter or oil through processing. This work aimed at investigating on the current status of shea butter processing and utilization in Borgu LGA (Kainji area) Niger state, Nigeria, where the shea trees grow in abundance.

Purpose of the Study

To ascertain the status of shea butter processing and utilization in Kainji area of Nigeria.

Methodology

The Study Area

Kainji in Borgu local government area of Niger state, Nigeria is situated between latitude 9° 50' - 10° 57' N and longitude 4° 25' - 4° 45' E with a surface area of 1,270 km². It lies at the border of sub-Saharan and Guinea Savanna. Average annual rainfall is between 900 mm - 1000 mm and last for seven months [20]. The climate favours the establishment and yield of shea butter and other economic and non-economic trees. The main inhabitants who are mainly farmers and fishermen are Bisan, Gungawa, Lopawa and Kambari, others include fishermen and traders from all over Nigeria including the neighbouring countries of Niger, Togo and Benin Republics. Good populations of the inhabitants of the area are Government workers because of the heavy presence of Federal and State establishments.

Survey

Investigation on the status of processing and utilization of shea butter in Kainji Area (Borgu Local Government Area) of Niger State, Nigeria was carried out using structured questionnaire, visits, personal observation and interviews. Some of the communities covered include Koro, Babana, Gadaoli, Guffanti, Lughigbe, Monnai, Faku, New Bussa, Wawa, Popo, Tamanai, Yangba, Karabonde and Dogongari.

Sampling Technique

Simple Random Sampling technique was used to draw samples from the population from each of the wards selected based on principles of Randomization. Sampling Districts were purposively selected based on areas where shea butter is processed and utilized while, wards and households were selected at random. 300 questionnaires were distributed.

Population, Sampling unit and area

Shea butter processors and users were the main target of research. Map and list of areas where shea butter is processed and consumed was obtained from the extension department of the Borgu Local Government Area and the population of the wards was obtained from the National population office based on 2005 population census.

Sampling Frame

A list of members of shea butter processors association and stakeholders was obtained. Users of shea butter did not have a list, therefore an inquiry of users was made and a list of them was constituted.

Sampling Size

Samples were drawn randomly from all the wards of the population totaling to 300 respondents for the study.

Survey instrumentation

Information for the study was gathered by means of survey. Primary data was obtained with structured and unstructured

questionnaire designed for nut sellers, processors, marketers and consumers. Face-to-face interviews and observations were employed throughout the process of data collection. Secondary data was obtained from journals, conference papers, textbooks, students research reports, Internet, and official records of the Library and the Local Government Area to complement the quantitative data that were generated in the field. These data provided clear base-line information that was used for the evaluation of the methods of processing and utilization of shea butter in Kainji lake (New Bussa) and its environs.

Data Analysis

Information gathered from the questionnaires administered was collated, checked and processed. This involved separating completed questionnaires from uncompleted ones, integrating responses particularly from open-ended questions, then identification and grouping of data with the respective statistical tools before it was analyzed. The data generated through questionnaires was subjected to both descriptive analyses using SPSS computer software version 16, taking into account the objective of study. Statistical analysis in form of frequencies, percentages and totals were used.

Results and Discussion

Unit Operations in the traditional processing of shea butter

Arising from the survey, visits and observations, unit operations for traditional processing of shea butter in Kainji area of Nigeria are as shown on Plates 1.1 to 1.24. The tree fruits and matures into lemon green fruits which drop especially on windy days (Plates 1.1 – 1.3). Women and Children trek to near and far places to pick them early in the morning and evenings (Plate 1.4). The good edible pulps are eaten or are left to ferment for days before washing off (Plate 1.5). The sheanuts are parboiled, washed, dried and the shells are removed before further drying and storage (Plate 1.6 -1.7). Parboiling of raw shea nuts helps to extend the shelf life of the seed.

The parboiled, dried and dehusked sheanuts are either stored till required or fried in previous shea butter at 180 ± 100 °C for about two hours before pounding for size reduction (Plates 1.9 – 1.11). The semi sheapaste is ground to a smooth fine chocolate brown paste using a local grinding machine (Plates 1.12 – 1.13). The hot paste is cooled (sometimes overnight) and vigorously hand-churned (Plate 1.14) with intermittent addition of warm water to obtain a brownish white fat which is washed (Plate 1.5 -1.6) and boiled (Plate 1.17) to become shea oil (Plate 1.19). Sometimes, the paste is heated till the oil oozes out and scooped to give shea butter on solidification (Plate 1.18). The shea oil is poured into calabash moulds (Plate 1.20) and left to solidify (Plate 1.21) before removal (Plate 1.22) for use, storage or sale (Plates 1.23 -1.24).

[21] reported that labour and capital inputs are over utilized in the traditional method of processing shea butter. [22] reported that traditional processing methods are not standardized and often lead to the production of poor quality butter, which attract low market prices. The authors also noted that physical pretreatment of sheanuts such as cooking, soaking and drying of sheanuts affects the quantity of sheabutter extracted and its quality.

Labour distribution

Table 1 shows that 55.6% of the total numbers of respondents on processing, storage, sales and utilization of shea butter in Kainji area were females and 44.4% were males. Men and women are therefore involved in shea butter activities in Kainji area though the women are more. Women and children are predominant at all stages from picking of shea fruits to the

sales of shea butter but both young and old participate in the shea butter processing activities.



Plate 1.10. Drying of washed sheakernels



Plate 1.11. Pounding of fried shea kernels



Plate 1.12. Grinding of sheakernels



Plate 1.13. Chocolate brown shea paste



Plate 1.14. Hand-churning of shea paste



Plate 1.15. Brownish extracted shea fat



Plate 1.16. Washed shea fat



Plate 1.17. Boiling of shea fat



Plate 1.18. Boiling of shea paste to extract oil



Plate 1.19. Shea oil



Plate 1.20. Calabash moulds



Plate 1.21. Solidified shea butter



Plate 1.22. Shea butter



Plate 1.23. Pricing of shea butter



Plate 1.24. Selling of shea butter

This is in agreement with [23] who reported that shea butter processing and trading are major income generating activities that offer employment to women. Some males especially boys help their mothers to dry and grind the sheanuts during the processing and sometimes in the sales. It is the general trend in different parts of Nigeria and other parts of West and East Africa where shea butter is produced [6, 25 and 7].

Age of respondents

Most of the respondents (32.8%) were between 20- 30 years (Table 1). They are closely followed by those within the age bracket of 31-40years (27.3%). These people are in the active age bracket and thus can withstand the rigorous and vigorous activities associated with the traditional processing of shea butter. The older ones gradually hand over to the younger ones as the profession is mostly inherited. It could also mean that the older and experienced workers left the shea butter processing activities due to poor income, neglect, ill health and lack of motivation.

Literacy and educational level of respondents

From Table 1, 76.8% of the respondents are literate and 47.0% of them attained tertiary education level. There is free education in Niger state but most of them grew up as farmers and often continue to farm due to unemployment or poor salaries of state civil servants.

Table 1. Demographic and socio – economic status of shea butter processing and utilization in Borgu Local Government Area of Niger state (Kainji area)

Category	Percentage (%)
Gender:	
Male	44.4
Female	55.6
Age:	
Below 20	8.1
21 – 30	32.8
31 – 40	27.3
41 – 50	12.3
Above 50	12.1
Literacy:	
Yes	76.8
No	23.2
Educational level:	
Primary	9.1
Secondary	20.7
Tertiary	47.0
None	23.2

Sources of income of respondent

Table 2 shows the sources of income of the respondents. 57.6% of them have no other source of income apart from shea butter and its activities. They are mainly villagers who depend solely on shea butter activities for their daily income. Majority of these are women who also contribute to the day to day running of their families. Improving the yield and acceptability of shea butter will boost their income and financial status. It is often said that to be financially free, a person needs at least four sources of income. This shows that majority of the respondents are not financially buoyant.

Sources of sheanuts

Table 2 further shows that 53% of the shea butter processors buy their sheanuts from the market, 21% from the bush and others from both sources. Selling of shea nuts is a flourishing business among the indigenes of Kainji Area. The different shea butter activities carried out by the respondents among the indigenes are also shown on Table 2. Approximately 74.3% of them pick the shea fruit from under the tree, dispose of the edible fleshy portion by eating, dumping them at a place and washing them off after 2-4 days fermentation, 10.8% eat them only and 15.9% eat and dispose them. The edible portion of the shea fruit has been reported to be nutritionally high [26, 27 and 28]. Other methods of its effective utilization are necessary to avoid wastage of valuable food nutrients. Processing sheanuts to shea butter is a very important economic activity among the natives in Niger state of Nigeria.[24]also noted this.

Sheanuts processing and storage:

Table 2 also shows that 87.8% of the respondents pick sheanuts, parboil and dry the sheanuts before removal of the shell, while 12.2 % dry without parboiling. 82.4% of those that parboil use stone to remove the now brittle shells while the rest use stick or stone to break the shell in a sack before winnowing to remove the shell. 89.2% of the 74 respondents on sheanuts storage, store sheanuts and 10.8% do not. Sheanuts storage is gradually increasing in Kainji area due to the surging interest of some cosmetics companies from Oyo and Abuja. The number of those storing sheanuts will increase if more companies spring up to process shea butter as an edible fat/cooking vegetable oil. It was observed during the survey that division of labour has

gradually set in. More people prefer to pick shea fruits and prepare them for sale than for processing. Most of the respondents (58%) parboil the raw sheanuts before further processing operations. Over 55% of those that store sheanuts store for less than a year, 12% for 12 months while 29% store up to 18 months. 3% claimed they could store it for up to 36 months (Table 2).

Dried and dehuskedsheanuts are stored in bags, containers, barnes, drums, sacks and plastics with or without covers (Fig.1). Most times (33.8%) sheanuts are stored in bags and drums. Fresh sheanuts are parboiled, dried and the shells are removed before further drying to a keeping moisture level of 7- 10%. 82.4% dry parboiled sheanuts to safety moisture content level and store, 19% in addition to sun drying apply chemicals before storage while 23% parboil, dry and use chemicals (Table 2). The demand and sales of sheanuts are increasing and might soon be a more lucrative and a less tedious activity than processing into shea butter. Interactions with the villagers reveal that dried shea kernels are stored with care in well ventilated dried places as these help to maintain the quantity of the shea oil/fats. [29] reported that careless storage reduces the percentage of the oil by the formation of free fatty acid. The indigenes know that drying is the most critical step in subsequent processing. Raw shea seeds spoil fast. Sun drying as well as application of some chemicals are done by some individuals to prolong the storage life of sheanuts. Apart from extending the shelf lives, drying makes the nuts suitable for cracking operation during processing and this reduces the volume for easy transportation, stabilizes the quantity and the quality as well as impacts resistance to insects and moulds as noted by [29]

Kainji area is an agrarian area where various storage chemicals are available. These chemicals may have negative effect on the nuts and human health and should be used with caution. Long storage of sheanuts might affect the oil yield, characteristics and sensory qualities. However, since sheanuts could store up to 36 months without spoilage its all year round availability for processing is assured. Prolonged storage of sheanuts might affect the oil yield, characteristics and sensory qualities.

Processing and storage of shea butter

The traditional method of processing shea butter is manual. The sheanuts are broken into pieces using mortar and pestle before grinding into paste using a locally fabricated grinding machine. [30] noted that grinding with grinding machine was the only mechanical operation in traditional processing of shea butter in Kainji area. The interests of the traditional processors appear to be waning perhaps due to the tedious nature of the work. Introducing more efficient and less tedious methods of processing may bring back more people into the art. Table 3 shows that only 33.9% of the respondents are presently actively involved in shea butter processing, 29.6% used to process shea butter in the last six months but no longer while 36.5% process shea butter some times. It further shows that 90.5% of the respondents that process sheanuts to the butter in the area fry the parboiled and dried sheanuts in previous shea butter before grinding into paste while 9.5% boil. Extraction of shea butter from raw fresh sheanuts is strange to the people. 23% of them that fry or boil pound very well before extraction and 77% pound and grind with grinding machine after size reduction using mortar and pestle. 83% of respondents' hands churn to extract shea butter and believe it gives higher shea butter than boiling of paste. 16.00% boil and the rest do either of them depending on the method of choice and age of sheanuts. None

claimed to use feet which is popular in Western Nigeria as reported by [31].

Table 2. Processing and storage of sheanuts

Category	Percentage (%)
Sources of income	
Only sheanuts and shea butter	57.6
Others	42.4
Sources of sheanuts:	
Market	53
Bush	21
Market and Bush	26
Treatment of shea fruits:	
Pick the fruits, eat and dispose at a place	74.3
Eat only	10.8
Eat and throw away	15.9
Preprocessing activities on sheanuts:	
Pick the fruits, parboil and dry before removal of shells	87.8
Sundry without boiling after removal of shell	12.2
Method of removing shells:	
Use stone after parboiling and drying	82.4
Use stone or stick to break nuts in sack before Winnowing	17.6
Treatment of sheanuts before storage:	
Parboiling, removal of shells and dry	58
Sun drying and use of chemicals	19
Parboil, dry and use chemicals	23
Duration of storage of sheanuts:	
< 12 months	56
12 months	12
18 months	29
36 months	3

Table 3 also shows the effect of storage period of sheanuts and method of extraction on the yield of shea butter. Eighty two (82%) of the respondents believe that new sheanuts gives more shea butter than old sheanuts and 4% believes that old sheanuts gives higher yield.

Storage of Shea butter

In Kainji area of Nigeria, shea butter is usually poured into calabash moulds to set. Sometimes iced water is used to facilitate the solidification. They are then stored in metal basins or calabash; 77% of the respondents from (Table 4) store shea butter in calabash and bowls with or without cover, 20.3% in pots, containers or plates and 2.7% store shea butter in calabash with cover only in a cool room to prevent melting. These methods of storage expose shea butter to oxidative or hydrolytic rancidity which could affect its chemical and microbiological characteristics as noted by [35]. From interaction and visits to the villagers, storage of shea butter depends on the available containers. Calabash of various sizes and any open mouthed container with or without cover could be used. [17]reported that traditionally extracted shea butters are mainly stored in calabashes. These are opaque containers and could effectively protect the butter from light if covered. They are however fragile, rigid, without uniform shapes and most times without cover. These make them difficult to stack. Figure 2 shows the duration of shea butter storage by the natives. 11% of the respondents store shea butter for less than a month. They produce or buy for immediate use or re-sale. 14.9% of the respondents store shea butter for up to 3 months, 27.1% of the respondents' store shea butter for between 3-24 months and 47% for 24 – 42 months at ambient conditions.

Table 3 also shows that 81.1% of the respondents believe that long term storage of sheanuts affects the colour of shea butter, 91.9% believes it affects the taste while 75% claimed it affects its flow or viscosity, 59.5% believes it affects the aroma and 40.5% claims it does not. The colour of shea butter varies

and most people in Kainji area prefers a natural yellow colour. This is due to the presence of β -carotene as reported by [33] and voluntary addition of root extract “Kwata” as also noted by [5] 68.9% of the respondents claimed that long term storage of sheanuts affects the acceptability of shea butter and 31.1% says it does not. These are subjective attributes which could differ from person to person. Personal observation on usage revealed that the older the sheanuts, the greasier and less viscous the shea butter. Thus new sheanuts produce a less greasy but more solid shea butter. Depending on the individual this quality may negatively or positively affect the acceptability of shea butter. The free flowing nature of East Africa shea butter has been attributed to the presence of a greater percentage of unsaturated acids such as oleic acid (Okulloet al., 2010). Perhaps, the saturated fatty acids content of shea butter from Kainji area of Nigeria decreases with the storage age of the sheanuts, hence the differences in the viscosity of fresh and old sheanuts butter.

Variations in Shea butter Colour

There are several causes of variation in colour of shea butter in the area. Most of the respondents do not add any colour to the shea butter during processing and few add a yellowish pigment powder ‘kwata’ for a deeper yellowish colour shea butter. Some of the processors claimed that the colour depends on the method of processing, some believe the colour vary from variety to variety and while others said it depends on how sheanuts were stored and the duration of storage. It was observed that most of the shea butter in Borgu local Government (Kainji lake Area) of Niger State of Nigeria is sold in the solid state and rarely in the liquid state. From observation, shea butter is only sold in the liquid state within the producing locality during the peak of the heat period when it is difficult for the shea butter to solidify. At such times, natives use ice water to facilitate solidification. Shea butters are hawked and sold early in the morning before the rising of intense sunshine which melts the shea butter.

Spoilage of Shea butter

From oral interviews, the natives claimed that shea butter never spoils unless it is poorly stored or forgotten for a very long time. 41.9% of the respondents claimed that spoilt shea butter could be identified by a change in the colour only, 21.6 % said by change in the colour, smell and taste while 4.1% identify spoilt shea butter by a decrease in quantity and and 6.1% of the respondents claimed that the flow and colour also change in spoilt shea butter (Fig.3). In general, like other fats and oils spoilt shea butter is detected by the deterioration of its organoleptic attributes [34]. Spoilt shea butter is used as fuel for lighting fire and/or in the local lanterns. Storage problems of shea butter from are mainly caused by weather (33.8%), poor storage facilities and infrastructures (25.7%), weather and poor infrastructure (29.5%) and unknown factors.

Acceptability and utilization of shea butter

Utilization of shea butter in Kainji is mainly among the natives. As noted by [30] most of the elites and students in the environment look down on shea butter as an edible fat/oil. In this study, 40% of the respondents accepted shea butter as an edible fat while 60% did not (Table 4). Up to 37% of the respondents have used shea butter for up to 15 years and more than 12% of the respondents for up to 30 years (Fig 4). This indicates that shea butter is not harmful and must have some nutritional benefits. With improved processing and packaging, it can contribute to the vegetable oils supply of the nation. More knowledge of its nutritive value, improved/adoptable processing technology and extension activities can boost its acceptability as an edible vegetable fat. Table 4 also shows the various foods that the indigenes of Kainji cook using shea butter.12.2% of the

utilizers prepare all foods with it, 11.7% use it mainly for frying, 17% for soup, 11.2% for cooking rice and beans, 7.3% for soup/moinmoin and 2% for indomie. Shea butter as an edible fat/oil can therefore be used in the preparation of most, if not all foods. Its acceptability and utilization will improve if some of the inherent limitations such as its characteristic unpleasant odour are taken care of and its yield improved through processing.

Table 3. Processing and acceptability of native shea butter as edible fat

Category	Percentage (%)
Involvement in shea butter processing in the last six months	
Actively involved	33.9
Used	29.7
Sometimes	36.5
Treatment of parboiled sheanuts before grinding to paste	
Frying	90.5
Boiling	5.5
Treatment of fried sheanuts before grinding	
Pounding of sheanuts only	23
Pound and grind with grinding machine	77
Effect of sheanuts storage period and method of extraction on shea butter yield	
Oil yield of New Sheanuts> old sheanuts	82
Oil yield of old sheanuts> new sheanuts	4
Not sure	14
Hand - churning	47
Boiling of paste	15
Factors affecting shea butter colour	
Processing method	23
Type of sheanuts	37
Storage period of sheanuts	3
No idea	36
Addition of a yellow pigment (kwata)	1
Acceptability of shea butter as an edible fat	
Acceptable	40
Unacceptable	60

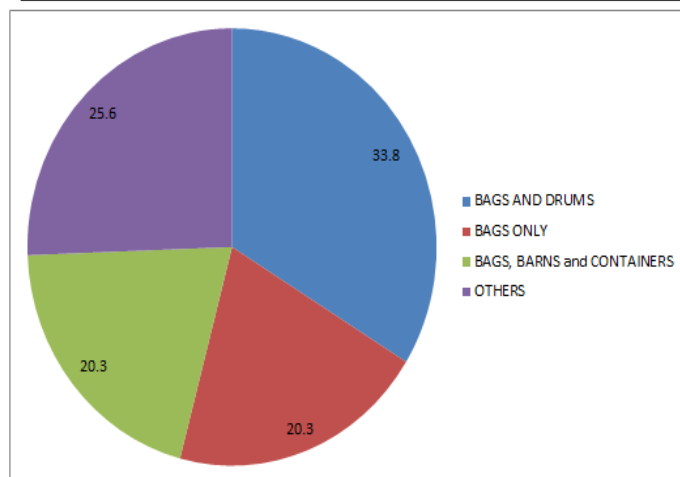


Figure 1. Method of storing of sheanut

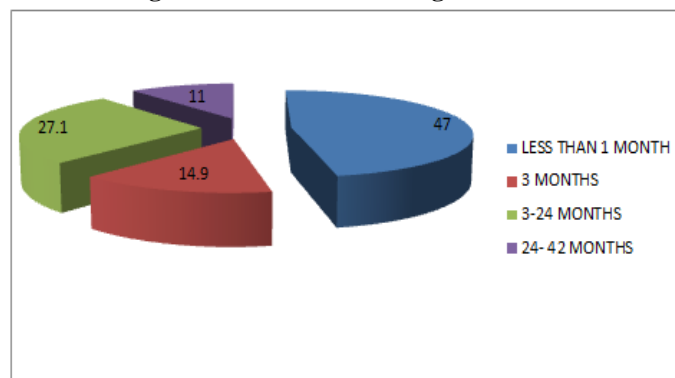


Figure 2. Duration of storage of shea butter at ambient condition

Table 4. Storage and utilization of shea butter

Category	Percentage
Storage of shea butter	
Calabash/ bowls with or without cover	77
Pots and containers	20.3
Calabash with cover only	2.7
Effect of long term storage on shea butter	
Affects the colour; does not	81.1; 18.9
Affects taste; does not	91.9; 9.1
Affects viscosity; does not	75; 25
Affects aroma; does not	59.5; 40.5
Affects acceptability; does not	68.9; 31.1
Acceptability of shea butter as an edible fat	
Acceptable	40
Unacceptable	60
Foods prepared using shea butter	
All foods	13
Frying	11
Stew	15
Rice and beans jollof	10
Soup and moinmoin	5
Indomie	1
Others	35

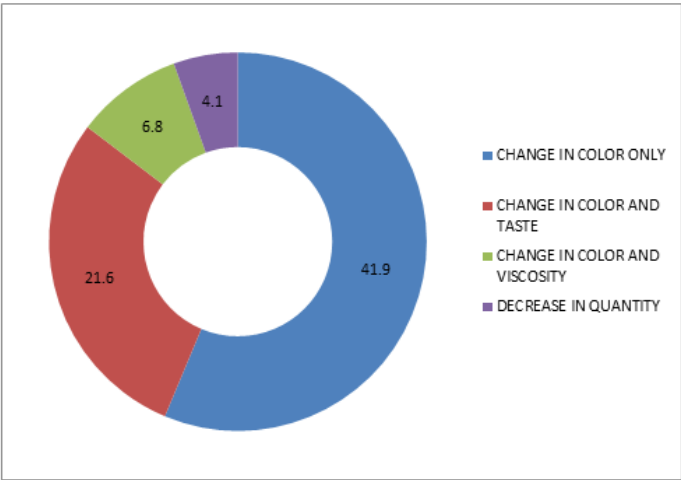


Figure 4.3. Methods of identifying spoilt sheabutter

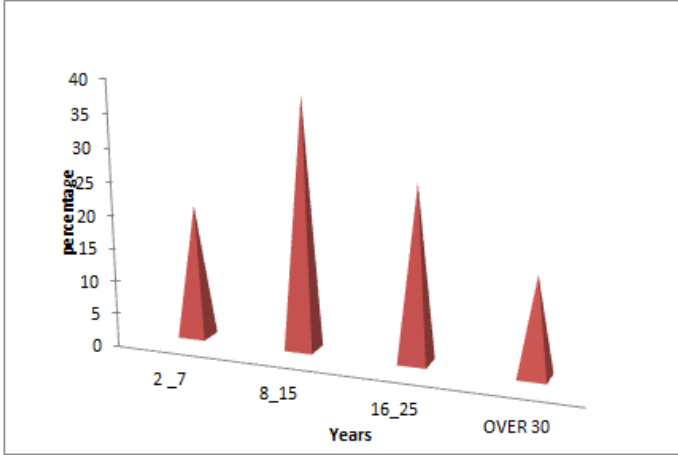


Figure 4. Years of experience in utilization of shea butter as an edible fat

Conclusion

The study revealed that shea butter processing in Kainji Lake area is a livelihood agricultural activity dominated by women and children on small scale levels. The traditional method of processing has not changed, grinding with local grinding machine is the only mechanized unit operation and percentage yield is small compared to the labour and time

inputs. Shea butter though accepted and utilized by the indigenes for years as an edible fat/oil is unacceptable to most non-indigenes due to the unpleasant product odour, variations in product characteristics, poor sensory and keeping qualities as well as poor packaging and presentation. Improvement of the yield, sensory quality and acceptability of shea butter using simple and adoptable technology will help to popularize shea butter as an edible fat. These are therefore recommended.

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