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Perception of Modern Processing Technology by Shea Butter Processors in Kwara State, Nigeria

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Abstract

The study examined the perception of Shea butter processors to modern processing technology in Kwara State. Multi stage sampling procedure was used to select 120 respondents. Data was collected using interview schedule and analysed with both descriptive and inferential statistics. Results revealed that 88.3% of the respondents were females between 40-50 years of age (47.0%) and have low level of education (83.1%). The household size of the respondents was 5-8 members (65.9%) and 1-10 years of experience (52.8%).

Respondents' level of awareness of modern processing technology was high (55.0%), pre-cleaner (98.3%) and storage tank (94.2%) being higher. The majority (62.5%) had favourable perception to modern processing technology, sixty per cent strongly agreed and 61.0% agreed that modern processing

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technology reduced drudgery and increase profit respectively. There was significant relationship (r= 0.182, p=0.046) between respondent's level of awareness and their perception. Information should be disseminated to the processors in local languages on the benefits and how to use modern processing technology.

Keywords: Shea butter processors, Shea butter modern processing technology.

Introduction

The Nigerian agricultural industries have the potentials to contribute significantly to the economic and industrial development of the nation, especially with the wide range of the nation's agro-produce like Shea trees (Garba, *et. al.,* 2011). Nigeria is abundantly blessed with Shea trees (*vitellaria paradoxa*) which could be harnessed for the industrial development of the country. The white ivory colour fat extracted from the nut is called Shea butter which has many uses in the edible oil, chocolate and beverage as well as pharmaceutical and cosmetic industries. The demand for the West African Shea butter has been on the increase in the recent time because of European Union approval of 5% inclusion of non-cocoa vegetable fat in chocolate manufacturing in 2000 (Harsch, 2001). Hence more industries in Europe and America are expressing interest in it.

Shea butter has similar chemical and physical properties with cocoa butter and uncertainty in the prices of cocoa butter in the world market makes Shea butter an instance alternative to cocoa butter. Cocoa butter equivalent (CBE) industries account for 90% of total Shea butter exports from West Africa while cosmetic and pharmaceutical industries absorb the remaining share (Yinug and Fetzer, 2008).

Nigeria having the largest Shea trees in the world (FAO Statistics, 2015) is expected to earn more foreign exchange likewise the processors are to earn more income from Shea butter. However, this is not so because of the decrease in demand for the country's Shea butter as a result of the use of

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traditional method of producing Shea butter which is characterised by poor quality and low quantity. This is supported by Ademola, *et al* (2012) that Shea butter is mostly processed manually in small villages in Nigeria by village women using traditional methods which are passed down through generations.

The extraction rate of Shea butter from the nuts correlates with the mechanical input (Addaquay 2004). He affirmed that comparatively, the extraction rate of Shea butter from *Vitellaria paradoxa* using the traditional method is about 20%, using semi-mechanised method is 35% to 40% and using the fully mechanized method is 42% to 50%. The transformation of Shea nuts into butter using traditional method is a difficult task because it is tedious and drudgery. The process involves intensive physical labour as well as considerable amount of time, water and firewood. It is estimated that the production of 1 kilogramme of Shea butter takes one person 20-30 hours and that 8.5- 10 kilogrammes of wood fuel is needed to produce it (Bonkoungou, 2005). In order to improve the quality and quantity of Shea butter production in the country, the use of mechanized method is desirable because it is expected to reduce the human time, material resources in terms of water and fuel wood as well as drudgery associated with the use of traditional method.

There are many technologies that have been developed to perform almost all the different stages of the traditional method. The equipment includes kneader, milling machine, crusher, hydraulic press etc. Government and Non-governmental agencies have responded to the problems by introducing the equipment to Shea butter processors' cooperative across the country through sensitization programmes on the benefit and the need to use modern processing technologies. The aim is to bring about increase in quality and quantity of Shea butter produced from the country and improves the income of processors as well as their living standard.

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Despite all these, the quantity and quality of Shea butter produced in Nigeria is still low and the country is not recognized as an exporting country in the world. The perception of the processors to utilize these technologies is yet to be determined. It is on this backdrop that the perception of Shea butter processors to modern processing technology in Kwara State was embarked on.

The general objective of this study is to examine the perception of Shea butter processors on modern processing technologies in Kwara State and the specific objectives are to identify the socio economic characteristics of Shea butter processors, identify the enterprise characteristics of the processors, determine the level of awareness of processors on modern Shea butter processing technologies and their disposition to modern processing technologies in the study area.

The hypothesis of the study was:

Ho: There is no significant relationship between the level of awareness of processors to modern Sheabutter processing technology and their perception ofmodern processing technologies.

Methodology

The study was carried out in Kwara State, Nigeria. Data were collected by using questionnaire which was administered to Shea butter processors in the study area. A multi – stage sampling procedure was used. Purposive sampling technique was used to select Agricultural zones A and C out of the four agricultural development zones in the State because of the large number of Shea butter processors in these zones. Kaiama and Baruteen LGAs were also purposively selected from Zone A while Ilorin West and Moro L.G.As. were randomly selected from Zone C. Random sampling technique was also used in selecting 30 respondents from the list of registered processors with the State ADP in each of the L.G.As selected from Zone A and C giving a

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sample size of one hundred and twenty (120) respondents. Data were subjected to descriptive and PPMC statistical analysis.

Measurement of variables. Both the socio-economic and enterprise characteristics were obtained from the respondents. The level of awareness was obtained by listing modern equipment and asking them to identify the ones they know. Score of 1 and 0 was assign to aware and unaware respectively. A maximum value of 10 and minimum of 0 was obtained. The mean value of 7.79 was used to categorise as high or low for values above 7.79 and below respectively. The perception was measured on a five point Likert type scale using 25 perception statements bordering around the merit and demerit of using modern processing technologies. A maximum value of 125 and minimum of 0 was obtained. The perception scores obtained were classified as high (favourable) for all the values from 75.85 and above while the values below the 75.85 were considered as low (unfavourable).

Results and Discussion

Respondents' Socio-economic Characteristics

The age distribution as shown on Table 1 shows a mean value age of 47.5 years with 47.0% of the respondents between the age ranges of 40-49 years and 34.4% between the age ranges of 50-59 years. This implies that younger people avoid Shea butter processing because it a tedious work but connect at later age to be able to meet their domestic needs. It is not about the physical strength but rather an inner motive that keeps one going no matter the odds. It could also explain why fewer men are involved in Shea butter processing despite their physical strength. The majority of the processors (88.3%) were females. Men cannot exercise patience to go through all the Shea butter processing stages. It shows that women were more involved in Shea butter processing which agrees with the finding of Julius (2007) which states that across the African Shea zone, women are the traditional custodian of the Shea resources, with responsibility and control over all the stages of

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processing from collection of the fruits to transformation and marketing of Shea butter.

The marital status of the respondents reveals that the majority (86.6%) were married. The majority of the respondents (72.6%) were Muslims. Table 1 also revealed that an average household size of 8 person with 65.9% of the respondents having a household size range of between 5 and 8 persons. Fakayode *et al.,* (2013) reported similar high value of between 6 and 10 household size (60.8%) of processors in Kwara State. This implies that processors use members of their household to assist them in the processing of Shea butter. The respondents' educational level was low (83.1%) with 31.4% of the respondents having primary education and 25.4% having adult education while 26.3% did not have formal education. This agreed with the findings of Salawu and Ayanda (2014) who reported low level of education (92.2%) with the respondents having 53.3%, 22.8%, 12.2% and 3.9% of no formal, Quranic, uncompleted primary and completed primary education respectively in similar study area. It means that the respondents may not be better exposed to modern processing technologies on Shea butter as they generally had low level of education.

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Table 1: Socio-economic characteristics of Shea butter processors

Variables	Percentage	Mean
Age		
20- 29	0.9	47.5
30- 39	11.2	
40- 49	47	
50- 59	34.4	
60 and above	6.5	
Sex		
Male	11.7	
Female	88.3	
Marital status		
Single	2.5	
Married	86.6	
Divorced	2.5	
Widowed	3.4	
Widower	2.5	
Separated	2.5	
Religion		
Christianity	24.8	
Islam	72.6	
Traditional	2.6	
House hold size		
1-4	2.6	8
5-8	65.9	
9-12	29.2	
13-16	2.6	
Level of education		
No formal education	26.3	
Primary	31.4	
Secondary	11.0	
Adult	25.4	
Tertiary	5.9	

Characteristics of Respondents Enterprise

The majority (66.2%) of the respondents used calabash as a measurement for Shea butter production. (Table 2) The use of calabash as a measurement for Shea butter production in the study area is in line with Paine (1996) who found

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that basically calabashes facilitate the carriage and protection of the products against risks such as damage, spoilage and theft in the storage and distribution channel. It is also reveals that 58.4% of the respondents produced 11-20 calabashes per week, while few (1.7%) produced 31- 40 calabashes per week which is regarded as high. This implies that most of them produce Shea butter at retail level. In terms of selling price, a larger proportion (49.1%) sold Shea butter between the prices ranges of ₦1000- ₦1500 per calabash, 41.6% sold between ₦2100- ₦2500, while only 0.8% sold between ₦2600- ₦3000. This variation in prices could be as a result of high cost of transportation caused by bad road, distance to market and cost of running the machines.

Table 2 also shows that 48.7% of the respondents used hired labour for Shea butter processing, 39.5% made use of their family while 11.8% used both hired and family labour. This implies that Shea butter processing is labour intensive and time consuming thus processors will require additional labour in order to meet the demand for the product. The majority (52.8%) of the respondents had 1-10 years of experience in Shea butter processing activities, while 32.2% had 11- 20 years of experience. Salawu and Ayanda (2014) also reported high values for years of experience of processors between 1-10 (21.1%) and 11-20 (36.1%) in Kwara State. This implies that the processors may not be having enough experience in processing activities thus they will require additional training to be able to function well. The majority of the respondents (66.8%) marketed their product at retail level. It means that their production is low.

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Table 2: Percentage distribution of respondents based on enterprise characteristics

Variables	Percentage
Scale of Measurement	
Calabash	66.7
Kilogram	33.3
Number of Calabashes Per Week	
1-10	25.8
11-20	58.4
21-30	14.1
31-40	1.7
Amount per calabash	
₦1000- ₦1500	49.1
₦1600- ₦2000	6.6
₦ 2100- ₦2500	41.6
₦ 2600- ₦3000	0.8
₦ 3100- ₦3500	1.7
Sources of Labour	
Family labour	39.5
Hired labour	48.7
Both	11.8
Years of Experience	
1-10	52.8
11-20	32.2
21-30	11.2
31-40	3.8
Marketing Channel	
Retail	65.8
Wholesale	33.3
Both	0.9

Awareness of Modern Processing Technologies

Table 3 shows that the respondents were aware of modern processing technologies. The majority of the respondents were aware of pre- cleaner (98.3%), Storage tank (94.2%), milling machine (84.2%) and crusher (84.0%) technologies. This implies that these technologies are mostly known by the respondents. This could be attributed to the fact that they are less expensive and readily available to them as compared to the other modern processing technologies.

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The categorization of the respondents on their level of awareness of modern processing technology from table 3 reveals that 55.0% of the processors scored 7.69and above and 45.0% scored below 7.69, indicating that most of the respondents were aware of the modern processing technologies in the study area. Though the percentage of the processors that were aware of the modern processing technologies was high but not as expected which could be attributed to their low level of education. This can be improved upon through sensitization of the processors on the benefit of using the technologies

Table 3: Distribution of respondents based on awareness of modern processing technologies

Modern processing technologies*	%	Scores
Pre- cleaner	98.3%	0.98
Crusher	84.0%	0.83
Screw hydraulic	67.5%	0.68
Vibrating screen	74.2%	0.74
Roaster	66.4%	0.66
Expeller	68.3%	0.68
Heated holding tank	64.2%	0.64
Storage tank	94.2%	0.94
Milling machine	84.2%	0.84
Kneader	69.2%	0.69
Mean of overall awareness	7.69 (range=0 -10) Sd. 2.04	

***Multiple responses** Source: Field survey 2012

Respondents' Perception of Modern Processing Technologies

Table 4 shows the perception of the respondents on modern processing technologies. Modern processing technologies might help to reduce drudgery has the highest mean score ($\bar{x}$= 4.36) with about two-third (62.9%) of the respondents strongly agreed, 61.0% of the respondents agreed that using modern processing technologies may increase profit (μ= 4.17) and 36.4% of the respondents believed that household income could improve with the use of modern processing technologies (μ=3.74). This profit increase may result from the fact that larger quantities of the product can be produced at a single

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production, which usually would help to reduce production cost. Similarly, modern processing technologies may address problems with processing stages (μ =4.04) and saves time (μ =3.61). This corroborates the saying that a machine makes work easier, faster and eliminates fatigue thereby ensuring optimal time usage.

However, 67.2% of the respondents agreed that customers may prefer traditionally processed Shea butter, while only 1.7% strongly disagreed ($\bar{x}$= 3.52). It follows that traditionally processed Shea butter still has an extra quality or edge with the respondents over modern technologies. The respondents agreed that lazy women appear to use modern processing technologies 47.5% ($\bar{x}$ =3.48), which serves to inform that the respondents cherish hard work but may need some enlightenment.

Table 4 also reveals that modern processing equipment are too expensive (44.9%), ($\bar{x}$ =2.25), about 43.0% ($\bar{x}$=2.28) of the respondents agreed that modern processing technology is only accessible to rich processors and 39.7% ($\bar{x}$=1.83) of the respondents believed that modern processing technology is difficult to handle. The categorization of the respondents' perception of modern processing technology from table 4 reveals that 62.5% ($\bar{x}$=75.85 and above) of the respondents had high perception towards the use of modern processing technology.

Despite the high cost of the machinery and lack of knowledge on the technical know-how of the machines, majority of the respondents had a positive perception towards the technologies and its utilization which can be attributed to their high level of awareness of the modern processing technologies. The perception can be improved through sensitization of the processors and Government can encouraging them to use the modern processing technologies by assisting them to acquiresome of the machines needed for processing.

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Table 4: Distribution of respondents based on their perception of modern processing technology

Statements	mean	SD.
Use of modern technologies may increase profit.	4.17	0.79
Using modern technology may lead to high losses	2.23	0.87
Using modern technology could lead to increase productivity	3.79	0.91
The cost of production in using modern technology is low	2.23	0.80
Modern technology saves time	3.61	0.95
It is very difficult to find	2.39	0.85
The use of modern processing technology will conserve processors energy	3.71	0.91
It could be less hygienic	2.29	0.88
It is only accessible to rich processors	2.28	0.85
Household income could improve with the use of modern technology	3.74	0.97
Lazy women appear to use modern technology	3.48	1.02
Traditionally processed Shea butter may have higher demand	3.52	0.99
Modern technology are operated on individual basis because of its complexity	2.52	1.22
Processors may use more of modern technology because of the stressful nature of traditional processing	3.65	0.92
Modern processing may be less hazardous	2.33	0.94
Modern processing equipment are expensive	2.25	0.88
Modern processing tech may enhance good quality butter	3.68	0.94
Large family size encourage processors to use modern tech	2.33	0.89
Modern processing are always easy	3.62	0.92
Traditional processing may be labour intensive	3.58	0.96
Modern processing appear not to be gender sensitive	2.28	0.95
Using modern processing might help to reduce drudgery	4.36	1.08
Customers may prefer traditionally processed Shea butter	1.95	0.75
Modern processing tech are difficult to handle	1.83	0.91
Modern processing may address problems with processing stages	4.04	1.04
Mean of overall perception	75.85 (range=0 -125)	
SD. 9.60		

Relationship Between Respondents' Level of Awareness and Perception of Modern Processing Technology

Table 5 shows that there was significant relationship between the level of awareness of the respondents and perception of modern processing technology (r= 0.182, p= 0.046). There was positive relationship between awareness and perception. It implies that as the respondents' level of

awareness of modern Shea butter processing technologies increases, their perception towards the modern processing technologies increases too.

Table 5: Relationship between the level of awareness of respondents and the perception to modern processing technology

Variable	r-value
Awareness perception	0.182*

* $p \leq 0.05$

Conclusion and Recommendations

The Shea butter processors' awareness level was high and they had a high positive perception towards the modern processing technologies which can be improved upon. The perception statements identify high cost and technical know-how as the major constraints to the use of the technologies.

Their level of awareness and perception can be improved upon through sensitization of processors on the benefits and training on how to use the modern processing technologies in the local languages for the people to understand and address the problem of technical know-how.

Government and NGOs should assist the processors to procure modern processing technology to help solve the problem of high cost. Lastly, the processors should be encouraged to form functional cooperative societies to enable them get a good bargain for their products as well as for easy procurement and distribution of credit, loan and processing inputs to the processors.

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