Vol. 3 No. 1

NIGERIAN JOURNAL OF POST-HARVEST RESEARCH

www.nspri.gov.ng

EDITORIAL BOARD

JOURNAL MANAGEMENT COMMITTEE

Aims: The Nigerian Journal of Post-Harvest Research has its focus on the dissemination of information on the discoveries of new technologies through Post-harvest Research by publishing the manuscript of research.

Scope: The manuscripts of research to be accepted for publication would be from those disciplines whose spheres or relevant has its tentacles wallowing found the subject or Post Harvest Technology.

ISSN: 2630 - 7022

AWARENESS LEVEL OF NSPRI VEGETABLE BASKETS FOR POST-HARVEST HANDLING OF FLUTED PUMPKINS (*TELIFAIRIA OCCIDENTALIS*) AMONG VEGETABLE SELLERS IN OBIARKPOR LGA IN RIVERS STATE, NIGERIA

Elemasho*, M. K.; Abdulbaki, M. K.; Aneke, C. C.; Chugali A. J. C.; Alade, O. A.; Ugama, E. E.; Arohunmolashe, O. M*. and *Nwaubani, S. I.
Nigerian Stored Products Research Institute, Port Harcourt Zonal Office
Mile 4, Rumueme, Port Harcourt
**Corresponding author's Email: emulkat@gmail.com*

ABSTRACT

The study was conducted to determine the awareness level of NSPRI vegetable basket for post-harvest handling of fluted pumpkin (*Telifairia occidentalis*) in Obio/Akpor L.G.A. in Rivers State, Nigeria. A purposive technique and random sampling were used to sample 150 fluted pumpkins sellers in Obio/Akpor L.G.A. A well-structured questionnaire was used to obtain information from the respondents and analyzed using both descriptive and inferential statistical tools. The results revealed that the mean age of the fluted pumpkin sellers in the study area was 41 years. Majority (98.7%) of the respondents were females. Large percentage were married (68.0%). The study further shows that the mean for the business experience and household is 7.7years and 5persons respectively. The commonly used source of information for post-harvest handling is friends (Others) with 38% of the respondents. All the respondents (100%) in the study area did not belong to trade association, while 76% of the respondents were not aware of NSPRI vegetable basket. The most common traditional methods used in the study area for storage of fresh fluted pumpkin is by wrapping it in a sack with 52.9% of the respondents. The mean for the length of this traditional storage method is 2days and the level of awareness is very low only 24% of the respondents are aware of NSPRI vegetable basket in the study area. All socio-economic characteristic tested were not significant to level of awareness because, the P-value is greater than 0.05. The respondents' source of information has impact on their level of awareness with the P-value less than 0.05. The study recommended that awareness methods should be improved.

Keywords: Awareness, NSPRI vegetable basket, postharvest loss.

INTRODUCTION

In developing countries, most of agricultural produce are lost during post-harvest handling due to inadequate post-harvest handling and non-adoption of post-harvest technologies. Olayemi *et al.* (2011) revealed that post-harvest losses will lead to reduction in farmers' income, food insecurity, poor nutritional value, and lack of input for the next production. In addition, Owolade, (2011) also stated that 50-70% losses are estimated between production and consumption points of fruits and vegetables because of poor handling and non-adoption of post-harvest technologies. The principal causes of loss after harvest are known to be physiological deterioration, mechanical damage, diseases, and pest (Bolarin and Bosa, 2015). However, the primary cause of post-harvest food losses is mostly neglected, this includes lack of awareness on food losses and ways to prevent and reduce it.

Fluted pumpkins called "ugu" in igbo is a major vegetable grown and consumed in Nigeria, mostly in southern Nigeria. (Odiaka and Odiaka, 2011) This may be due to multifarious uses of the vegetable in many types of dishes and medicinal purposes (Adekunle, 2017). However fluted pumpkins are leafy vegetables that lose water quickly and perish very fast after harvest if not preserved, this may be due to the thin skin with many pores, lack of sufficient storage facilities, inadequate transport and processing facilities. The vegetable also contains 65% to 95% of water, which makes it highly perishable (FAO, 1989; Balogun and Ariahu, 2020). To extend the storage life of fluted pumpkins, the sellers need to be aware of technologies that can reduce the rate of water loss, maintain lower air temperature, and increase the high relative humidity for them to adopt the technologies. However, post-harvest technologies have been developed in Nigerian Stored Products Research Institute (NSPRI) since 1977 it came to being (Williams, 2013) this is based on the mandate of the institute to develop technologies for post-harvest handling of crops to extend their shelf life and to disseminate the developed technologies to the end users (Wiliams, 2012) This aimed at improving preservation of agricultural products that are highly perishable. One of the technologies developed for leafy vegetables is NSPRI vegetable Baskets. The basket can preserve leafy vegetables for 5-7 days and it will remain fresh as harvested from the farm (Babarinsa, 2001). Awareness has been created through exhibition, adopted villages, and adopted schools by the NSPRI zonal office located in the Obio/Akpor L.G.A in Rivers State but the technology still not popularly known by some potential users from this L.G.A. It is on this basis that, this study assessed awareness level of NSPRI vegetable basket for post-harvest handling of fluted pumpkins among the vegetable holders in Obio/Akpor L.G.A. in Rivers State, Nigeria.

The specific objectives are to; ascertain the socio-economic characteristics of fluted pumpkins sellers in the study area; identify the available information sources on post-harvest handling of fluted pumpkins in the study area; investigate the respondent's awareness of NSPRI vegetable Basket for post-harvest handling of fluted pumpkin in the study area; identify the traditional storage methods for fresh fluted pumpkins used by the sellers in the study area and determine the level of awareness of NSPRI vegetable basket by the fluted pumpkins sellers in the study area.

MATERIALS AND METHODS

The study was carried out in Obio-Akpor Local Government Area in Rivers State, Nigeria. Fluted pumpkin farmers constituted the population for the study. A purposive sampling procedure was used for this study. This involved purposive selection of five major markets from Obio/Arkpor where fluted pumpkins are commonly sold and random sampling was used to select 30 fluted pumpkins sellers from each market to make 150 respondents from 5 markets selected (Rumu osi, Rumuigbo, Oil-mill, Choba, Rumuokoro). Data were collected from the respondents through the use of structured questionnaire. It contained relevant questions based on the objectives of the study. The dependent variable for the study was awareness level on NSPRI vegetable baskets which was measured by rank order. The independent variables were, age measured at interval level, sex measured at nominal, years of formal education measured at ordinal, household sizes measured at interval and years of business experience was also measured at interval while the available information sources on post-harvest handling of fluted pumpkins, awareness of NSPRI vegetable Basket for post-harvest handling of fluted pumpkin, and the traditional storage methods for fresh fluted pumpkins were measured in nominal level. Descriptive statistics such as frequency, percentage and mean were used to categorize respondents based on their socio-economic

characteristics. It was also used for available information sources, awareness of NSPRI vegetable Basket for post-harvest handling of fluted pumpkin, and the traditional storage methods for fresh fluted pumpkins. Chi-square was used to establish a relationship between socio-economic characteristics of the respondents and awareness level of NSPRI vegetable baskets and also relationship between available information sources and awareness level of NSPRI vegetable Basket.

RESULTS AND DISCUSSION

Socio-economic characteristics:

Table 1 shows that 34% of the respondents were between 36-45 years, and 32.7% of the respondents were between 46-65years. The mean age was 41.0 years. This indicates that 67.1 % of the fluted pumpkins sellers were less than 50years.This implies that the fluted pumpkin sellers in the study area are still active and in their productive ages. The implication of this findings is that the younger people are very inquisitive about innovations than the older people, and awareness boost interest and increase the chances of making more enquiries about the innovation which could encourage adoption of the NSPRI vegetable basket. Majority (98.7%) of the respondents were females and only 1.3% of the respondents were males. Meaning that female dominated selling of fluted pumpkins in the study area, this could be as a result of the nature of the business which requires post-harvest handling and women are mostly found in agricultural post-harvest activities. This support Adejo, (2019) who stated that agricultural activities in Nigeria is based on division of labor by gender and women are found mostly engaged in post-harvest activities than men.

About 68% of the respondents were married and 25.3% were single, while 5.3% of the respondents were widowed and 1.3% of the respondents were divorced. This is in line with Olayemi *et al.,* 2012 who found out that majority (84.5%) of the respondents in his study area were married. The implication is on high level of social responsibilities, married persons have high level of responsibilities. Also 46% of the respondents had between 1-5years selling experience while 30.6% of the respondents had been selling fluted pumpkins between 6-10 years and the 23.4% of the respondents had been in the business more than a decade. The mean of the years of business experience is 7.7 years. Meaning that the sellers are experienced in the business, and they are more familiar with the challenges involve in the business which could have motivated them to make enquiries on solution to the problems through effective innovation awareness. This corroborates with Morris *et. al,* (2019) who stated that traders with higher experience level are more likely to be adopters than those with lower experience level. All the respondents (100%) respondents do not belong to the trade association. Meaning that there is no regulatory body inform of NGOs or government agencies managing the trade affairs of fluted pumpkin sellers, this could prevent the sellers from accessing vital information and benefits because the government will not attend to the sellers' interest and challenges individually except as a body and the business is opened and free to any interested person. This agreed with Fee, (2018) who explained that involvement in trade association allows other from around the country to share what works and what is not.

Table 1. Distribution of respondents according to socio-economic characteristics (N=150)

Socio-Economic Characteristics	Frequency	Percentage	Mean
Age (Years)			
16-25	9	6	
26-35	41	27.3	
36-45	51	34	41.0
46-55	36	24.	
56-55	13	8.7	
Sex			
Female	148	98.7	
Male	2	1.3	
Years of formal Education			
6years	52	34.6	
9years	8	5.4	3.09
12years	45	30	
15years	8	5.4	
17years	6	4	
Non formal	31	20.6	
House-Hold Size			
1-5	85	56.7	
6-10	55	36.7	
11-15	10	6.6	5
Marital Status			
Single	38	25.3	
Married	102	68	
Widowed	8	5.3	
Divorced	2	1.3	
Years of Business Experience			
1-5	69	46	
6-10	46	30.7	7.7
11-15	17	11.3	
16-20	13	8.6	
21-25	5	3.4	
Trade Association Belongings			
Yes	0	0	
No	150	100	

Source: Field Survey, 2020

Traditional Storage Methods of Fluted Pumpkins

Table 2 showed that 52.9 % of the respondents stored the fresh fluted pumpkins by wrapping it in a sack, while 20.3% of the respondents kept the fresh fluted pumpkins under shield. Also 18.7% of the respondents used morning dew for storage of the fresh fluted pumpkins and 8.1% used wetting with water. The implication of these methods is on nutritional value reduction and wilting of the leaves because the methods are not efficient enough to store the fluted pumpkins vegetables. This corroborates with findings of Oyeronke *et al.* (2015) that

the traditional technologies have low efficiency, time consumption and lack of quality assurance.

Table 2. Distribution of the respondents according to traditional storage methods for fresh fluted pumpkins (N= 150)

Traditional storage of fresh fluted pumpkin leaf	**Frequency (F)**	**Percentage (%)**
Morning Dew	46	18.7
Wrapping with Sack	130	52.9
Keep under Shield	50	20.3
Wetting with water	20	8.1
Total	150	100

Length of Storage Using Traditional Method

Table 3 shows that the traditional methods used for storage of fluted pumpkin in the study area has mean of 2-days capacity after which the vegetable will deteriorate rapidly. This corroborates with Oyeronke *et. al.* (2015) who stated that traditional technologies are low in efficiency

Table 3. Distribution of respondents according to the length of storage of fresh fluted pumpkins using traditional methods (150)

Length of storage	**Frequency (F)**	**Percentage (%)**
1-day	41	27.3
2-day	75	50
3-day	29	19.3
4-day	3	2.0
5-day	2	1.3
Total	150	100

Source: Field Survey, 2020. Mean of length of traditional storage method= 2-days

Sources of Information on Post-Harvest Handling of Fluted Pumpkins

Table 4 indicated that 38% of the respondents sourced post-harvest handling information on fluted pumpkins through others (Friends). Also, 32.8% used Radio as their source of post-harvest handling information while 5.6% of the respondents used extension agents and 4.8% used Television while 0.8 % made use of Newspapers. This shows that many of the respondents used other source (Friends) for getting information on post-harvest handling of fluted pumpkins. Meaning that the level of interpersonal relationship is high and makes communication effective among the respondents in the study area. The interpersonal method should be encouraged in extension services delivery such as phone calls, office visits and farm visits. This contradicts findings of Opara, 2008 that stated that 88.1% of the respondents in his study area used agricultural extension agents as source of information. Newspapers was found the least source of information with 0.8% of the respondents. This supports the findings of Elemasho *et. al.,* 2017 that reported low effectiveness of newspapers as source of information in the study area.

Table 4. Distribution of the respondents according to sources of information on post-harvest handling of fluted pumpkins (N= 150)

Source of information	**Frequency (F)**	**Percentage (%)**
Extension agents	14	5.6
Radio	82	32.8
Television	12	4.8
News Papers	2	0.8
Others (Friends)	95	38

Source: Field Survey, 2020

Awareness of the NSPRI Vegetable Basket for Post-Harvest Handling of Fluted Pumpkins

Table 5 revealed that majority (76%) of the respondents in the study area were not aware of NSPRI vegetable basket for post- harvest handling of leafy vegetables. Only 24% of the respondents were aware of NSPRI vegetable Basket. This shows that extension services were very poor in the study area, awareness is very important in adoption processes, respondents need to know that an innovation is in existence before adoption can be considered and lack of awareness could prevent adoption of a useful innovation. This supports the research findings of Atoma and Akeni (2017) that lack of information can prevent innovation from adoption.

Table 5. Distribution of the respondents according to awareness on NSPRI vegetable baskets (N= 150)

Awareness	**Frequency (F)**	**Percentage (%)**
Aware	36	24
Not Aware	114	76
Total	150	100

Source: Field Survey, 2020

Awareness Level of NSPRI Vegetable Basket

Table 6 showed low level of awareness, since majority (76%) of the respondents in the study area were not aware of the NSPRI vegetable basket existence for post-harvest handling of fluted pumpkins, while awareness level was high only within few (24%) respondents in the study area. This could be as a result of insufficient number of extension agent's ratio to the agricultural stake holders. Femi (2018) also confirmed the inadequacy of human resources in extension delivery system. He stated that the ratio of extension officers to farmers is insufficient, and that the ratio still remains one officer to one thousand two hundred farmers (1:1,200) in Nigeria. With this ratio, there is no assurance for economy diversification through agricultural extension agents because creation of effective awareness on technology and the dissemination of technology to farmers cannot be achieved with the available ratio of extension officer to farmers.

Table 6. Distribution of the respondents according to the awareness level of NSPRI vegetable baskets (N= 150)

Awareness Level	Frequency (F)	Percentage (%)
High	36	24
Low	114	76
Total	**150**	**100**

Source: Field Survey, 2020

Relationship between Socio-Economic Characteristics of the Respondents and their Awareness Level

The chi-square results in Table 7 showed no significant relationship between the selected socio-economic characteristics of the respondents and their awareness level of NSPRI vegetable baskets (P>0.05) Since the P – value is greater than 0.05. Meaning that male or female, Christian or Muslim and married or single has nothing to do with level of awareness of NSPRI vegetable basket for post-harvest handling of fluted pumpkins in the study area. Therefore, the null hypothesis is accepted.

Table 7. Relationship between selected socio-economic characteristics of the respondents and awareness Level of NSPRI vegetable basket.

Relationship	X^2	Df	P-value	Decision
Sex vs. level of awareness	1.951	3	0.583	NS
Marital Status	11.537	9	0.509	NS
Religion	11.894	6	0.064	NS

Significant at 0.05, S= Significant, NS= Not significant. Decision: P=value is significant when less than 0.05

Relationship between Sources of Information on Post-Harvest Handling of Fluted Pumpkins and Awareness Level

The chi-square results in Table 8 showed significant relationship between sources of information and awareness level of NSPRI vegetable basket in the study area since the p-value is less than 0.05. This implies that improvement on all sources of information in the study area could increase the level of awareness, from the previous discussion as shown in table 4 the respondents sourced for information mostly through friends (38%) and radio (32.8%) both the interpersonal and media sources of information can be enhanced and improved to increase the level of awareness. Extension agents as source of information has 5.6% of the respondents which is very low, this can be improved through adequate phone calls, office visit and result demonstration methods. This is in line with Elemasho *et. al*. (2017) who reported that 45.1% of the respondents used friends and relatives as source of information and Radio was also ranked second with 40.7% of the respondents in the study area. Therefore, the null hypothesis should be rejected.

Table 8. Relationship between sources of information and awareness level

Relationship	X^2	Df	P-value	Decision
Source of information vs Level of awareness	85.662	4	0.000	S

Significant at 0.05, S= Significant, NS= Non Significant. Decision: P-value is significant when less than 0.05

CONCLUSION

The study has shown that few of the respondents were aware of the NSPRI vegetable basket, extension agents as source of information on post-harvest handling of the vegetable is poor and farmers local methods of post-harvest handling of the crop is inefficient. In addition, the level of awareness of NSPRI vegetable basket is very low because majority of the respondents were not aware of NSPRI vegetable basket for post-harvest handling of fluted pumpkin. Based on the findings of the study, we recommend that NSPRI should improve on methods of creating awareness such as creating more adopted villages and adopted schools, organizing workshop and media advocating of institutes technologies in form of jingles. The research out- reach officers should encourage their clients to form association based on a unique or common interest to allow adequate flow of information in the study area.

REFERENCES

Adejo, P. E. (2019). Women participation in post-harvest processing of maize using indigenous Technologies: A Perspective of Kogi State, Nigeria. https://doi.org/10.5772/intechopen.88517

Adekunle, A. D. (2017). Use of fluted pumpkin (Telifairia occidentalis) leaf powder as feed additive in African Catfish (*Clarias gariepinus*) fingerlings. *Journal of Applied Animal Research*, 45(1), 566-569. https://doi.org/10.1080/09712119.2016.1233108

Atoma, C. N. and Akeni, T. E. (2017 April 23-26). Rural house-holds sources of information on organic farming in south-South Nigeria. AESON Book of Abstract 22nd Annual Conference, Port-Harcourt pp. 90

Babarinsa, F. A. (2001, April 20). NSPRI Coolers extend shelf-life to fruits and vegetables Nigerian Store Products Research Institute (NSPRI) Research News: Post-Harvest News *Number 2, p.1*

Balogun, A. A. and Ariahu C. C. (2020). Quality evaluation of fresh of fresh fluted pumpkin leaves stored in evaporative coolers. *Asian Food Science Journal*, 18(3):12-33. https://doi.org/10.9734/afsj/2020/v18i330218

Bolarin, F. M. and Bosa, S. O. (2015). Post-harvest losses: A dilemma in ensuring food security in Nigeria. *J. Natural Science Research*, 5(7). 151-154.

Elemasho, M. K., Alfred, S. D. Y., Aneke, C. C., Chugali, A. J. C. and Ajiboye, O. (2017). Factors affecting adoption of post-harvest technologies of selected food crops in Rivers State, Nigeria. *International J. of Agricultural Economics and Extension*, 5(5):295-301. https://doi.org/10.46882 /IJAE/1040

Fee Insurance, (2018, October 18). Why are industry trade associations important? https://www.feeinsurance.com/2018/`10/18/why-are-industry-trade-important

Femi, I. (2018, December 10). Researchers identify reasons for poor adoption of agric techs, better varieties. The Guardian. https://www.guardian.com/2018/12/10/researchers-identify-reasons- for- poor-adoption of agric-techs-better-varieties

Morris, K. J., Kamarulzaman, N. H. and Morris, K. I. (2019). Small- scale post-harvest practices among plantain farmers and traders: A potential for reducing losses in Rivers State, Nigeria. *Journal of Scientific African*, 4. https://doi.org/10.1016/j.sciaf.2019.e00086

Odiaka, E.C. and Odiaka, N. I. (2011). Gender perspectives in Telfairia production: Implication for effective Agricultural communication. *Journal of Horticultural Science*, 16*:49.*

Olayemi, F. F., Adegbola, J. A., Bamishaiye, E. I. and Awagu, E. F. (2012). Assessment of Post-harvest losses of some selected crops in eight local government areas of Rivers

State, Nigeria. *Asian Journal of Rural Development*, 2(1):13-23. https://doi.org/10.3923/ajrd201231323

Owolade, S. O. (2012). Promotion of food Security through reduction in post-harvest losses of horticulture crops in Nigeria. *HORT Magazine*, 1 (9):14 – 16

Oyeronke, A., Abass, A, Okoruwa, V. and Salman, K. (2015, September 16-18). An assessment of the use of post-harvest loss prevention technologies for cassava in Nigeria. Conference on international research on food security, natural resource management and rural development Berlin, Germany pg. 1. https://www.semanticscholar.org

Opara, U. N. (2008). Agricultural Information Sources Used by Farmers in Imo State, Nigeria. *SAGE Journals*, (24)4:289-295. https://doi.org/10.1177/0266666908098073

Williams, J. O. (2013). Welcome to Nigerian Stored Products Research Institute (NSPRI) Federal Ministry of Agriculture and Rural Development. (Pp. 5-45). ISBN: 978-978-51262-8-0