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UTILIZATION OF SWEETPOTATO-BASED CONFECTIONERIES AMONG RURAL HOUSEHOLDS IN ABIA STATE, NIGERIA

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ABSTRACT
This study examined the utilization of sweetpotato-based confectioneries among rural households in Abia State, Nigeria. Specifically, the study described selected socio-economic characteristics of the respondents, ascertained respondents' awareness of sweetpotato-based confectioneries, examined respondents' level of utilization of sweetpotato-based confectioneries, and identified constraints to the utilization of sweetpotato-based confectioneries in the State. Multi stage random sampling technique was used to select one hundred and thirty-two (132) rural households from the State. Data were collected using a structured questionnaire and analysis was done using descriptive statistics, Linear regression and z-test. Results revealed that the majority of respondents (80%, 75%, 86%, 55% & 96%) were female, did not have extension contact, did not have access to credit, were not members of social organizations and did not realize any income from utilizing sweetpotato-based confectioneries respectively in Abia State. Additionally, the mean age, household size and level of formal education of the respondents were 48, 6 and 8 respectively. More than 60% of the respondents were not aware of sweetpotato-based confectioneries while the level of utilization was low (1.16). The major constraining factors against utilization of sweetpotato value-added innovation include, lack of funds ($\bar{x}$= 2.72), insufficient knowledge of practices ($\bar{x}$= 3.40), lack of equipment/facilities ($\bar{x}$= 2.13) and lack of follow-up trainings ($\bar{x}$= 3.42). Level of utilization of sweetpotato value added innovation was significantly influenced by some socio-economic factors like level of education (10%), income from sale of products (1%) and 'produce for sale' (1%). There is therefore, the need for massive promotion and popularization of sweetpotato value-added innovation in the State in order to increase its awareness and subsequent utilization.

Keywords: Utilization: Sweetpotato; Confectioneries; Rural households

INTRODUCTION

Sweetpotato (*Ipomea batata)* is a food security crop that is grown in most parts of Africa. It is a versatile, drought resistant, high yielding crop with a short maturity period of three to five months, adapting well to wide ecological conditions (Laurie *et al*. 2012). As a result, it is a main staple of poor people in Africa and also a major source of calories (Lebot, 2019). Sweetpotatoes in the fresh form have a limited shelf-life (Ray *et al*., 2010). They are bulky and perishable with a high weight- to- value ratio. As a result, the distance over which it can be economically transported is limited. According to Abidin *et al*., (2016), bulkiness and perishability affect

postharvest system of sweetpotatoes as it has a shelf life of about one week after harvesting. Huntrods (2009) and Westby *et al.* (2003) noted that unprocessed sweetpotato has short shelf life leading to storage losses and reduced food security thus processing, freezing or drying may extend shelf life thereby benefiting producers and processors through increased market feasibility**.** Hence, it is imperative to process sweetpotato into storable products (Ndunguru, 2003).

Lately, recognition has been given to the economic potentials of sweetpotato. Consequently, National Root Crops Research Institute, Umudike developed technologies in sweetpotato utilization aimed at diversifying the uses of the crop in Nigeria. Sweetpotato can be processed into a variety of products like flour, dried chips, juice, bread, noodles, candy, cream, chin-chin, doughnut, cake, biscuit and other confectioneries. These technologies have been disseminated to the rural households through different channels. There was therefore the need to ascertain its utilization.

The broad objective of the study was to ascertain the utilization of sweetpotato value added innovation among rural households in Abia State, Nigeria. The specific objectives: describe selected socio-economic characteristics of the respondents; examine the awareness of sweetpotato value added innovation among the respondents; ascertain the level of utilization of sweetpotato-based confectioneries among the respondents; identify constraints to the utilization of sweetpotato-based confectioneries

METHODOLOGY

The study was conducted in Abia State, Nigeria. Abia state is located between lat 4˚49.30'N - 6˚02'N and between long 7˚08'E -8 ° 04'E in the south- eastern part of Nigeria. Multistage sampling procedure was used to select 132 rural households. Purposive sampling technique was used to select 2 agricultural zones (Umuahia amd Ohafia zones) from the State and 2 LGAs from each selected agricultural zone. The selection was based on areas where sweetpotato value-added innovation has been extensively disseminated. Additionally, simple random sampling technique was used to select 3 communities from each LGA and 11 rural households from each community. Structured questionnaire was used to collect data from the respondents. Data collected were analyzed with descriptive statistics like frequency and mean as well as inferential statistics like Linear regression.

Analytical Techniques

Level of utilization of sweetpotato value added innovation was determined using 5 point-type Likert scale. Values were assigned to the various levels of use as follows: Never = 1; Rarely = 2; Occasionally = 3; Most times = 4; Always = 5. Thus, scores for utilization level of sweetpotato value added innovation was obtained by multiplying out accrued number of respondents by the point attached to each level and then divided by the total number of respondents. Moreover, level of utilization of the innovation was categorized into three: high, medium and low. The categories were obtained by dividing the five spaces in the 0-5 point scales into three parts as employed by Onu and Obibuaku (1987) in Ekwe and Onunka (2006). This gave a unit interval of 1.67. This unit interval was then subtracted successively from maximum point downwards to obtain the lower-class marks. Therefore, categories of utilization were classified as follows: High =5 - 3.33; Medium = 3.32 – 1.65; Low = 1.64 and below.

To find out respondents' perceived constraints to the utilization of sweetpotato value added innovation, a list of possible constraints was provided and the respondents asked to indicate their perceived constraints. From these responses the mean scores below 2.0 were regarded as not serious constraints while mean scores equal to 2.0 or above were regarded as serious constraints to the adoption of sweetpotato value added innovation. Linear regression model was used to analyse factors influencing utilization of sweetpotato value added innovations in the study area. The implicit form of regression model is specified as follows:

$$Y = F (X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12}, X_{13}, e)$$

Where,

Y = Level of utilization of sweetpotato value-added innovation (measured with mean scores)

The independent variables are:

X_1 = Age of respondents (No. of years of age); X_2 = Sex of respondents (Male = 1; Female = 0); X_3 = Level of education (No. of years of schooling); X_4 = Extension contact (No. of extension visits received by farmers in a yr); X_5 = Access to credit (Amount of money received in the form of credit); X_6 = 'Produced for sale' (Yes= 1; No = 0); X_7 = Income from technology use (monthly earnings from sweetpotato value added products); e = error term.

RESULTS AND DISCUSSION

Table 1 revealed that the mean age of the respondents was 48 years. This implies that the farmers were still in their active age which was likely to favour utilization of sweetpotato value-added innovation. In addition to that, their mean household size was 6 persons. Family labour is important to small-scale farmers because the subsistence farm households are resource poor and depend on family labour for agricultural activities like processing which in most instances is labour intensive (Idrisa, 2009). With regards to education, the mean number of years spent in school was 8.24 years which implies that majority of the farmers were literate.

In terms of sex, majority (74.49%) of the respondents were females. This implies that women dominated food crops processing in the State. As regards extension contact, majority (63.13%) of the respondents had contact with extension agents while 36.87 percent had none. This agrees with the findings of Mbanaso, (2011). This means that most of the respondents were expected to be more exposed to agricultural innovations like sweetpotato value-added innovation.

The analysis on income realized from sale of product showed that majority of the respondents (88.63%) realized no income from sweetpotato value-added products. This implies that majority of the respondents produced these products for consumption only.

Table 1: Socio-economic characteristics of the respondents

Variable		Frequency	Percentage
Age (Years)			
22- 31		12	9.09
32 – 41		24	18.18
42 – 51		43	32.58
52 – 61		31	23.48
Above 61		22	16.67
Mean (Years)	**48**	**132**	**100**
Household size (Number)			
1 – 5		46	34.85
6– 10		82	62.12
11 – 15		4	3.03
Mean	**6**	**132**	**100**
Level of formal education			
No School		19	14.4
Primary		47	35.6
Secondary		53	40.2
Tertiary		13	9.8
Mean (years)	**8.24**	**132**	**100**
Gender			
Female		106	80.3
Male		26	19.7
		132	**100**
Extension contact			
Yes		33 (25.0)	25.0
No		99 (75.0)	75.0
		132	**100**
Access to Credit			
Yes		19	14.4
No		113	85.6
		132	**100**
Income realized from sale of products (Monthly)			
No income		127	96.2
Less than 10,000		4	3.0
10,000 – 20,000		1	0.8
		132	**100**

Source: Field survey, 2021

Awareness of Sweetpotato value-added innovation in Abia State, Nigeria

Table 2 shows respondents' awareness of sweetpotato value-added innovation. The result revealed that only 37.9%, 36.4% and 33.3% of the respondents were aware of sweetpotato flour, sweetpotato chin-chin and sweetpotato chips respectively in the State. This finding is consistent with the findings of Udemezue *et al*., (2018) and Amamgbo *et al,* (2010) revealed that awareness of sweetpotato value added innovation was low in Anambra and Imo States respectively.

Table 2: Respondents' Awareness of Sweetpotato Value-added Innovation in Abia state, Nigeria

Innovation	Aware		Unaware	
	Frequency	Percentage	Frequency	Percentage
Processing of Sweetpotato into flour	50	37.9	82	62.1
Production of confectioneries from Sweetpotato flour	48	36.4	84	63.6
Production of crisp/chips from Sweetpotato	44	33.3	88	66.7

Source: Field survey, 2021

Level of utilization of Sweetpotato Value-added Innovation

Table 3 shows respondents' level of utilization of sweetpotato value added innovations. According to table 3, the respondents had low level of use of sweetpotato value-added innovation ($\bar{x}$ =1.16). According to some of the respondents, the low level of utilization of sweetpotato value added innovations in the State was due to lack of funds and equipment required to process sweetpotato into diverse value-added products.

Table 3: Level of utilization of Sweetpotato Value-added Innovation

Innovation	Never	Rarely	Occasionally	Most times	Always	Mean	Remarks
Processing of Sweetpotato into flour	128 (128)	2 (4)	1 (3)	1 (4)	0 (0)	1.05	**Low**
Production of confectioneries from Sweetpotato flour	128 (128)	2 (4)	1 (3)	1 (4)	0 (0)	1.05	**Low**
Production of crisp/chips from Sweetpotato	108 (108)	8 (16)	9 (27)	3 (12)	0 (0)	1.39	**Low**
Grand mean						**1.16**	**Low**

Source: Field Survey, 2021; N = 132; Key: High =5 - 3.33; Medium = 3.32 – 1.65; Low = 1.64 and below.

The low level of utilization of sweetpotato value added innovations could also be attributed to low expected benefits from the practice or factors such as farmers' characteristics or technology factors (Ajibefun, 2006; Bawa & Ani, 2015). In this case, processing of sweetpotato into value added products requires high labour and might not be easy for the beneficiaries to practice. In other words, it might not have relative advantage over their usual practices.

Factors constraining the utilization of Sweetpotato value-added innovation

The result on table 4 reveals that the respondents agreed that five out of the nine constraints mentioned in the table seriously affected utilization of sweetpotato value-added innovation in the State.

Table 4: Factors constraining the utilization of Sweetpotato value-added innovation

Constraint	$\bar{x}$	SD
1) Lack of ready market	1.36	0.669
2) Lack of fund	2.72	0.811
3) Insufficient knowledge of the practices	3.40	0.654
4) Lack of equipment/facilities	2.13	0.842
5) Lack of follow-up training	3.42	0.652
6) Lack of extension contact	1.93	0.839
7) Busy with other activities and thus have no time for processing	2.11	0.633
8) Lack of interest	1.00	0.000
9) Rejection of innovation	1.24	0.632

Source: Field survey, 2021; Mean score = 2.00; N = 132

The table shows that the major constraints encountered by rural households in the utilization of sweetpotato value added innovation were lack of funds (χ=2.72), insufficient knowledge of practices (χ=3.40), lack of equipment/facilities (χ=2.13), lack of follow-up training (χ=3.42) and busy with other activities (2.11). Our findings corroborate the findings of Agoh *et al.,* (2020) who found that high cost of sweetpotato processing equipment, low farmers knowledge on sweetpotato value addition, inadequate finance, inadequate extension service and inadequate credit access were the major challenges to the adoption of sweetpotato value addition in Imo state Nigeria. Furthermore, Amadi (2018) identified the challenges to the adoption of cassava value addition in Imo state as inadequate knowledge of innovation, lack of funds, lack of equipment/facilities, lack of readily-organized market for their products, and lack of access to credit.

Determinants of utilization of sweetpotato value added innovation in Abia State

Table 5 shows Linear regression analysis of factors influencing utilization of sweetpotato value added innovation. R^2 value (0.5714) and the highest number of significant variables (R^2 measures the proportion of variation in Y explained by X). This indicates that about 57% of the variation in level of utilization of sweetpotato value added innovation was explained by variables included in the model.

Table 5: Linear model estimates of factors influencing utilization of sweetpotato value-added innovation

	Unstandardized Coefficients		Standardized Coefficients	T
	B	Std. Error	Beta	
(Constant)	2.069	.341		6.068***
Age	-.003	.004	-.065	-.763
Gender	-.162	.099	-.125	-1.642*
Education	.005	.009	.045	.541
Extagent	-.047	.089	-.040	-.527
Credit	-5.054E-7	.000	-.057	-.754
Prod4sal	1.743	.287	.759	6.066***
Income	-.801	.265	-.376	-3.021***

Source: Field survey, 2021; ***, ** and * are significant levels at 1%, 5% and 10% respectively

From the result of the regression analysis as shown in Table 5, the regression coefficient of processing experience was positive and significant at 10% level of probability. This implies that processing experience of respondents was a significant factor in the level of utilization of

sweetpotato value added innovation. This is possibly because as processors acquired more experience, they would have more information and better knowledge to enable them utilize the innovation. This is in agreement with *a priori* expectation. This finding is in agreement with Ainembabzi & Mugisha (2014) and that of Adegbola *et al.,* (2019).

Extension contact was negative and significant at 1% level of probability. Contact with extension agents is not only important to provide farmers with information about a new innovation, but also the method through which the information is delivered. However, this result is contrary to *a priori* expectation. Extension contact had a negative effect on level of utilization of sweetpotato value addition. This result is in line with the findings of Adegbola *et al*., (2019) The reason could be that the respondents received the training through extension agents but did not assimilate it or probably because there was no follow-up training.

Channel of technology transfer was positive and significant at 5% level of probability. This implies that the channel through which sweetpotato value-added innovation was disseminated had a positive effect on respondents' level of utilization of the innovation. This means that respondents who accessed the innovation through NRCRI or ADP trainings utilized the innovations more than others. The reason is not far-fetched. This innovation was mainly disseminated through NRCRI and ADP trainings.

CONCLUSION AND RECOMMENDATIONS

Majority of the respondents were not aware of sweetpotato-based confectioneries while the level of utilization was low. The major constraining factors against utilization of sweetpotato value-added innovation identified in the study included lack of funds, insufficient knowledge of practices, lack of equipment/facilities and lack of follow-up trainings. Level of utilization of sweetpotato value added innovation was significantly influenced by some socio-economic factors like level of education, income from sale of products and 'produce for sale'.

Based on the findings of the study, the following recommendations are made:

1. There is need for massive promotion and popularization of sweetpotato value-added innovation in the country to ensure proper diffusion.
2. Farmers' socio-economic factors like age, sex and level of education should be put into consideration when designing extension intervention strategies. This will ensure that the right programmes are targeted at the right people.
3. Research should put the felt needs of rural people into consideration when developing technologies in order to develop tailor-made technologies.

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