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Consumers' Willingness to Pay for Value-Added Cassava Flour (*Pupuru*) in Akoko North-East Local Government Area of Ondo State, Nigeria

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Bolanle Aina Olumoyegun^{1*} and Adewumi Temidire Olumoyegun²

¹Department of Agricultural Economics and Extension, Ajayi Crowther University Oyo, Nigeria,

²Department of Agricultural Extension and Rural development, Adekunle Ajasin University, Akungba, Nigeria

*Correspondence and presenting author: b.aina@acu.edu.ng, +2348029059937, 0000-0002-9392-7029

²temidirepoint1@gmail.com,+2348039253180, 0000-0002-4912-283X

Abstract

Agricultural value chains in Nigeria are expanding rapidly to ensure national food security. Of the diverse locally made cassava products, pupuru (fermented cassava flour) is one of the most consumed in Ondo state. The constraint of high perishability necessitates additional processing and bio-fortification as the solution. Value-added bio-fortified pupuru hygienically packaged now adorns store shelves against the traditional pupuru sold in the open market. Information from 120 respondents, was selected through a multi-stage sampling procedure, using an interview schedule to determine their willingness to pay for value-added pupuru. Majority of the respondents consume pupuru (75.8%), at home (62.5%), whenever available (59.2%) and purchase it (51.7%) from the open markets. There is low knowledge, but favourable attitude based on its ease of consumption ($\bar{x}=3.95$), preservation ($\bar{x}=3.85$) and non-toxicity ($\bar{x}=3.80$). The majority (60.0%) are willing to pay the extra cost of value addition. The correlation showed a significant relationship between consumers' knowledge ($r=0.624$), perception ($r=-0.328$) and willingness to pay ($p<0.05$) for value-added pupuru. Availability, affordable price and endorsement from trusted people influenced their willingness to pay. Increased investment in value-added, popular local foods like pupuru shows great promise for higher income generation, strengthening household nutritional security and agricultural development.

Keywords: Cassava value chain development, Consumer behaviour, Consumer preference, Local foods

Introduction

Research has shown that a major challenge of Nigerian farmers is that, a greater portion of their farm produce is sold raw at the farm gate or market with limited or no capacity for the conversion of produce from its field-harvested form to other value-added products. This inability of the farmers to add value to their produce might be due to socio-economic, managerial, technical, environmental and technological constraints. This is consequently responsible for poor wealth creation capacity among farmers leading to insignificant farm and household incomes. Small-scale farmers are unable to get the full premium value for their produce, because of its easily destructible (perishable) attributes. Thus, giving the middlemen and off-takers undue advantage over them. The effect is that farmers do not get their full rewards either in cash or kind. The fact remains that over fifty percent of Nigerian farm produce is rural-based with low commercial value. Hence the intense spiraling chain of poverty, low returns, low

savings and poor productivity. However, there is the opportunity for improved yields and income from value addition in the agricultural sector, therefore adding value has become very important in the agricultural sector. This necessitates developing new product offers for higher value to the growing urbanized profitable retail markets.

Also, many indigenous, local foods are steadily growing in their acceptance among non-indigents; thus creating higher-value versions of such foods will provide increased income for producers. Given this, value addition to farm produce remains the major way of rescuing farmers from poverty, improving their livelihood and raising their share of farm product income. However, farmers in Ondo State have not fully tapped into this great opportunity. This is because most farmers lack adequate information and knowledge about post-harvest technologies and other information required to increase their yields and income. Inadequate knowledge of value-adding postharvest technologies and, consumer local food preferences driving market demand are major inhibitors for maximal profit-oriented production decision-making. Increasing their awareness and knowledge becomes imperative for market-oriented cassava processing and marketing. (Balakrishnan & Zaar, 2023; Udoye, Chukwuma & Ukamaka, 2022; Olajide *et al*, 2021; Adebo *et al*, 2020; Adeyemo & Okoruwa, 2018);

One of the major crops produced and consumed in Ondo State is cassava. It is one of the most resourceful stable food crops with notable all-inclusive usage and by this fact, cassava plays a significant role in combating food crises in Africa. Cassava remains a key source of calories in the tropics, with its cultivation and processing providing household food security, income and diverse employment opportunities. Cassava which is usually consumed in processed forms, can be processed into various food gels like other root and tuber food crops or consumed as boiled, fried or pounded food product (Olumurewa, Oluwamukomi & Alaba, 2020; Ogunyinka & Oguntuase, 2020; Oyewole & Eforuoku, 2019; Adejuyitan *et al*, 2019;). Apart from this, the peels of the tubers are used in ruminant livestock feeding. In addition to traditional foods, cassava can be processed into other products like dried chips and pellets, starch, glucose syrup, ethanol, high-quality cassava flour, and glue for industrial purposes. Some of these value-added products are highly demanded by some countries forming the basis for exportation and inclusion in the world market for countries like Thailand, Vietnam and Cambodia (Mafimisebi, Akinbobola & Awoyomi, 2023).

According to Adebo *et al* (2020), among all the cassava products in Nigeria especially Ondo state, pupuru now commands the highest price as its demand increases. Traditionally, pupuru is processed from cassava via peeling, soaking to ferment, dewatering, moulding into balls and eventually smoking to dry it. Unfortunately, the pupuru produced through this highly tasking process is smelly, has a low shelf life, and is poorly packaged; hence has low marketability. Even though it is a delicacy common among many households, the smell generated through traditional processing also affects its acceptability to non-indigent consumers. Extensive research has resulted in improved innovative processing methods that mitigate these inadequacies; to provide the public with the fine flour form of pupuru commonly found in the market which is further packaged to adorn high-end retail shops in urban areas in Ondo state and its environs. Apart from that, it is purely a carbohydrate food and it is a known fact that many people suffer from micronutrient deficiencies such as vitamin A deficiency. So, further value addition to the cassava flour through producer decisions to plant recently improved vitamin A cassava varieties; inclusion of additional vitamins during the processing of the dried fermented cassava flour, hygienic packaging (as shown in Fig

1) and proper safety labeling will help to improve the nutritional intake value potential, marketability in modern agri-food retail market systems and hence, generate significant additional income for the producers. Research has also dived into the possibilities of joint processing of pupuru with other nutritious food such as African yam bean, breadfruit, orange, flesh sweet potato and soybean cake in varying proportions to enhance its nutritional value. (Oladimeji, Otunola, & Adejuyitan, 2022; Adesola, Adejuyitan, & Idowu, 2021)



Figure 1: Samples of modern processed pupuru packed and sold in retail stores in Ondo State

As stated by Mafimisebi, et. al. (2023), value addition in agriculture remains an important and sustainable step to economic growth and investment. However, since cassava value addition is conceptualized as an agribusiness within the agricultural value chain, profit-making remains a major goal for any farmer or entrepreneur as this determines the survival of the business. So, it is necessary to assess the consumers' willingness to pay for the extra cost of the value-added product. Moreover, the benefits of value addition in agriculture have generated several pieces of literature. Yet there is little or no literature on consumers' propensity to demand for value-added regionally popular local foods such as cassava flour (pupuru). Based on this background, this study was conducted to uncover the consumer demand potential for value-added cassava flour (pupuru) in Ondo State. The specific objectives include the assessment of respondents' knowledge of pupuru; their perception and consumption pattern, willingness to pay extra cost for value addition; and what motivates their willingness to pay for higher-value local foods.

Methodology

The study was carried out in Ondo state which has a land area of 14.769 km square and between longitudes of 4.30° E and 6.00° E of the Greenwich and latitude 5° 45° N and 8° 15° N of the equator. The climate of the study area is tropical with adequate rainfall, humidity and temperature that is highly suitable for cassava production. Ondo State is one of the major cassava-producing states in Nigeria. The main cassava-sourced foods produced, processed and consumed include garri, pupuru and fufu of which pupuru is traditionally indigenous to the riverine Ikale-Ilaje tribe located in Ondo south senatorial district of the state. But is presently found in all areas of the state and consumed by several different tribes in all parts of the state for whom it is not originally their local food.

A cross-sectional survey design was used for the study. A multi-stage sampling procedure was employed to extract the sample for the study. This entailed purposive selection of Ondo North senatorial district because the local food pupuru is non-indigenous food there, yet it is widely consumed and sold. Akoko North-East Local Government Area (LGA) was randomly chosen from the six local government areas in the senatorial district, four (Ikare, Iboropa, Akunnu, and Ugbe) urban communities were randomly picked in the LGA, with thirty respondents systematically selected from each community, and thus, a total of 120 respondents were sampled for the study. Information required to satisfy the set research objectives was obtained using a semi-structured questionnaire.

Data collected from respondents include selected pupuru consumption-related characteristics measured at appropriate interval or nominal levels. Respondents indicated their knowledge of pupuru by answering (yes=1, no=0) questions and reasons for willingness to pay were assessed using 3-point rating scale (strong reason=2, mild reason=1, not a reason=0) to arrive at an overall computed weighted mean score of 1.04. While consumers' perception of pupuru was determined with the aid of a 5-point Likert type scale (strongly agreed=5, agreed=4, undecided=3, disagreed=2, strongly disagreed=1) resulting in a weighted mean score of 3.5, consumers were asked to choose from options yes=1 or no=0 to indicate their willingness to pay for value-added pupuru. Knowledge and perception item scores were summed and the mean was used as the benchmark to categorise respondents. Computed weighted mean was used to rank the items in each scale. The average for the weighted mean of each item was then used to rate the items based on whether they are above or below the calculated overall weight score mean. However, regression analysis was used to investigate the relationship between consumers' socio-economic characteristics, level of knowledge, perception and their willingness to pay for value-added pupuru in the study area.

Results and Discussion

Selected Pupuru Consumption Characteristics

The selected consumer characteristics presented in Table 1 shows that the majority of the respondents consumed pupuru (75.8%), purchased it from the open market (70.0%) and ate it whenever it is available to them (55.9%). It also shows high acceptability of pupuru as family meals as most (71.4%) eat it at home with their household. Obviously, it is no longer only consumed by the original owners which are the southern Ondo people Ikale-Ilaje tribe. Pupuru enjoys high patronage among all residents of the area which is the underlying reason it is viewed popularly as a food originating from Ondo state as a whole.

Table 1: Pupuru consumption characteristics

Consumption Characteristics	Percentage (n=120)
Where do you buy pupuru?	
Open market and street vendors	70.0
Supermarkets and Provision stores	22.7
Agri-chain outlets (Fadama, IFAD, cooperatives etc)	6.3
Where do you consume pupuru?	
Home	71.4
Restaurants	19.0

Social gatherings	9.5
How often do you eat pupuru?	
Daily	9.9
Weekly	34.2
Whenever possible	55.9

Source: Field Survey, 2023

Consumer Knowledge of Pupuru Attributes

Table 2 presents the knowledge of the respondents about value-added pupuru. The computed mean benchmark of the knowledge items was 0.54; revealing that there was high knowledge of the attributes of pupuru above that weighted mean. According to the results, the majority of the respondents knew of its smooth texture ($\bar{x}=0.74$); long shelf life ($\bar{x}=0.73$) and ease of preparation ($\bar{x}=0.73$), however there was low knowledge of its nutritional content such as protein content ($\bar{x}=0.32$), anti-nutrient content ($\bar{x}=0.41$) and other food uses ($\bar{x}=0.41$). This invariably means that the respondents have low knowledge about the attributes of this cassava product, which disagrees with the findings of Adebo et al (2020) that value-added cassava flour enjoyed a high level of acceptability, due to the high knowledge about its attributes. This difference may also be attributed to the fact that pupuru is a local food indigenous to the state and not as widely known and consumed as cassava flour which is popular in the entire southwest region of Nigeria.

Table 2: Consumers' knowledge of value-added Pupuru

Knowledge statements	Mean	Std. Dev
It has a smooth texture	0.74*	0.44
It has long shelf life 0.45	0.73*	
Ease of preparation	0.73*	0.45
It saves the stress of pounding	0.68*	0.47
It is free from microbial infestation if dried properly 0.59	0.48	
It is an excellent source of dietary carbohydrate and fibre 0.50	0.47	
It is nutritious and gluten-free 0.50	0.46	
It contains less anti-nutrients like cyanide, tannin and phytate 0.59	0.41	
It serves as crisp coating for frying food	0.41	0.49
It contains small percentage of protein	0.32	0.57

Source: Field Survey, 2023

***highly known attributes**

Consumers' Perception of Pupuru

Table 3 shows the perception of value-added pupuru in the study area. The computed grand mean score ($\bar{x} = 56$) dichotomized the sample. According to result, there was popular assent that the meal is easy to swallow ($\bar{x} = 3.95$), that flour can be easily

preserved ($\bar{x} = 3.850$) and that value-added pupuru is not toxic to the digestive system ($\bar{x} = 3.80$). Furthermore, the respondents concurred on it being a good taste ($\bar{x} = 3.64$). On the flip side, they asserted that it can be mixed with related flours like plantain flours and that it is nutritious with weighted mean scores of $\bar{x} = 3.63$ and $\bar{x} = 3.62$ respectively. This is based on the fact that their mean scores were greater than 3.5 which was computed and used as the benchmark for assessment. respondents are favourably disposed to the pupuru's digestability, long shelf life, varied use, ease of consumption and taste. This is expected to positively affect their willingness to pay premium for its value-added derivative; as found by Nimoh, Prah and Boansi (2022) that consumers' perception influences the consumption rate of a product.

Table 3: Consumers' attitude towards pupuru

Perception Statements	Mean	Std. Dev.
It can be mixed with related flours like plantain flours	3.63**	1.05
It is nutritious	3.62**	1.18
It does not have long shelf life	3.41**	1.25
It contains food preservatives dangerous to health	3.56**	1.23
It cannot be served in outdoor events	3.50**	1.26
It requires large quantities to serve	3.40	2.10
It does not absorb much water	2.99	1.20
It has attractive aroma	3.31	1.07
It is unsafe for diabetics	2.83	1.20
It is not too stodgy i.e it is not too heavy in the stomach	3.51**	1.16
It is not toxic to digestive system	3.80**	1.03
It is easy to swallow	3.95**	0.96
It can be easily preserved	3.85**	1.05
It has a good taste	3.64**	1.14
It is not recognized among highly nutritious meals	3.41	1.11
It forms dough easily	3.60**	1.07

Source: Field Survey, 2023

****≥ Mean 3.5 = Favourable perception**

Further analysis to categorise respondents into levels of perception showed an equal (50%) distribution of the population. This further implies that pupuru enjoys a general non-biased acceptance in the population. However, it is expected that favourable dispositions or attitudes will have a positive influence on their willingness to pay. There is no sharp difference with the findings of Ogunmola & Adekanmbi (2022) which further stated that favourable perception/attitude influences consumers' willingness to pay for Pro-vitamin A gari.

Willingness to Pay for Value-added Pupuru

Results in Table 4 show that about 60% of the respondents sampled for this study were willing to pay the extra cost to ensure value addition to the pupuru. Many realise the importance of eating nutritious food and are aware that purchasing higher quality goods will most likely come at a higher price. This agrees with Adebo *et al* (2020) that majority of the consumers were willing to pay for value-added cassava flour. The outcome also resonates with the findings of Alamu *et al* (2020) that consumers were willing to pay for extra costs on safer foods.

Table 4: Willingness to pay for value-added pupuru

Are you willing to pay more for value-added pupuru?	Percentage (%)
Yes	60
No	40

Source: Field Survey, 2023.

Consumers Reasons for Willingness to Pay for Value-added Pupuru

Results in Table 5 show various reasons for their willingness to pay for value-added pupuru. Their reasons for willingness to pay for value-added pupuru are divergent. The results revealed that its availability always (\bar{x} = 1.23) was the most important reason for their willingness to pay. This was followed by affordable price (\bar{x} = 1.18), endorsement from trusted people (\bar{x} = 1.16) and easy access to the products in the study area (\bar{x} = 1.12). With an established benchmark of Mean \geq 1.04 as a strong reason, income (\bar{x} = 1.10) was high and ranked the 5th reason. Availability, accessibility and affordability are core requirements for successful adoption of innovations. This finding corroborates the established principle of client behaviour, production of premium healthy foods must be supported by widespread distribution, and increased awareness of premium pricing. It is in agreement with Adebo *et al* (2020) and Ogunmola & Adekanmbi (2022) which revealed that affordability, the influence of close associates and income influence consumers' willingness to pay. It also agrees with Balogun *et al* (2020) that income and health benefits influence willingness to pay for well-packaged and labelled products. It shows that the higher their income with the influence of associates, the higher their preference (i.e. willingness to pay) for value-added foods, and vice versa.

Table 5: Reasons for willingness to pay and its determinants

Reasons	Mean	Std. Dev
It is always available	1.23**	0.79
Because the price is affordable	1.18**	0.84
Endorsement from trusted people	1.16**	0.87
There is easy access to the product	1.12**	0.89
Income	1.10**	0.83
It is a staple food in the area	1.09**	0.86
Because of the low selling price compared to other flours such as yam flour, and plantain flour	1.01	0.82
It is a common food in this area	0.98	0.86
Influence of the family	0.97	0.83
Because it has some health benefits	0.89	0.82

Because of marketing from reputable agents	0.69	0.86
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Source: Field Survey, 2023.

****Mean ≥ 1.04= Strong Reasons**

Determinants of Consumers' Willingness to Pay for Value-added Pupuru

Results in Table 6 present the influence of socio-economic characteristics, knowledge, and attitude on willingness to pay (WTP) based on the research. Results show that age has a positive and statistically significant influence on WTP, indicated by the positive B value (0.174) and a significance level of 0.004. The standardized Beta of 0.041 shows a moderate positive impact. The collinearity statistics (Tolerance close to 1 and VIF around 1) indicate that there is no multicollinearity problem. This suggests that as age increases, the willingness to pay also tends to increase. Also, household size also has a positive and statistically significant influence on WTP, with a B value of 0.048 and a significance level of 0.009. The Beta value of 0.235 indicates a stronger positive effect compared to age. Collinearity statistics show no multicollinearity issues, suggesting that larger household sizes are associated with a higher willingness to pay. Furthermore, the knowledge score has a positive but not statistically significant influence on WTP, as indicated by the B value of 0.017 and a significance level of 0.270. The Beta value of 0.105 shows a positive but relatively weaker impact. The collinearity statistics indicate no multicollinearity issues, suggesting that knowledge alone does not significantly drive WTP. Finally, the perception score has a positive influence on WTP, with a B value of 0.011, and the significance level is marginally non-significant at 0.097. The Beta value of 0.159 indicates a moderate positive impact. The collinearity statistics suggest no multicollinearity issues, implying that perception, although not highly significant, does have a moderate influence on WTP.

The model summary indicates that the variables collectively explain 10.7% of the variance in willingness to pay (R Square = 0.107). The F-statistic of 3.439 and its significance level of 0.011 suggest that the model is statistically significant. The Durbin-Watson statistic of 1.732 indicates that there is no serious autocorrelation in the residuals. Therefore, the findings show that age and household size are significant predictors of willingness to pay, with household size having a stronger positive effect. Knowledge and perception scores, while positive, do not significantly influence willingness to pay at conventional levels of significance. Overall, the model provides a modest explanation for the variance in WTP, indicating that other factors might also play a significant role.

Table 6: Influence of respondents' characteristics, knowledge and perception on willingness to pay

Variable	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig	Tolerance	VIF
(Constant)	-0.365	0.372		-0.982	0.328		
Age	0.174	0.074	0.041	2.351*	0.004	0.956	1.046
Household size	0.048	0.018	0.235	2.661**	0.009	0.996	1.004
Knowledge Score	0.017	0.016	0.105	1.108	0.270	0.863	1.159
Perception Score	0.011	0.007	0.159	1.671	0.097	0.855	1.169

Source: Field Survey, 2023 R = 0.327; R Square = 0.107; F = 3.439; Sig. = 0.011; Durbin-Watson = 1.732*Sign at 0.05 level of significance; ** Sign at 0.01 level of significance

Conclusions and Recommendations

The respondents have favourable perceptions towards value-added pupuru. There is no question of their knowledge and perception of its palatability, and perishability, also they inarguably have a proclivity to demand value-added pupuru if it is available, affordable and endorsed by trusted sources.

Governments and relevant agencies involved in cassava value chain development should invest resources in increasing the consumers' knowledge of value-added cassava flour's nutritional values and benefits. This will invariably influence their perception positively about it. Necessary sources that could supply adequate information to farmers and consumers should be made available and this can be achieved with the involvement of media houses and practitioners.

There is an obvious willingness to pay for this cassava value-added product, so agribusinesses, processors and investors should increase capital investment in the production and marketing of the product. Governments can work with financial institutions to make credits, grants or loans available and accessible to the producers, processors and possibly marketers for more investment to take advantage of the available market for value-added local foods.

References

- Adebo, G.M., Apata, O.M, Toluwase, S.O.W, Adekunmi, A.O., Ajiboye, A &Awoyemi, A.O (2020). Consumers Acceptability and Willingness to Pay For Value Added Cassava Flour in Ekiti State. *Stem Cell* 2020;11(2), 35-44. .doi:10.7537/marsscj110220.06.
- Adejuyitan, J. A., Abiona, O. O., Oyeleye, K.S. & Osunbade, A. O. (2019): Compositional Characteristics of *Pupuru uas* Influenced by Variation in Processing Methods. *Annals.Food Science and Technology*, 20 (3). www.afst.valahia.ro
- Adesola, M., Adejuyitan, J. & Idowu, O.O. (2021). Effect of Co-fermentation of Cassava and African Yam Bean on some Compositional and Sensory Properties of Pupuru. *Journal of Scientific Research and Reports*.29-35. 10.9734/jsrr/2021/v27i830421.
- Adeyemo, A.T. & Okoruwa, V.O. (2018). Value Addition and Productivity Differentials in the Nigerian Cassava System. *Sustainability* 10, 4770; doi:10.3390/su10124770
- Alamu, E.O., Maziya-Dixon, B., Olaniyan, B., Pheneas, N. & Chikoye, D. (2020): Evaluation of Nutritional Properties of Cassava-Legumes Snacks for Domestic Consumption— Consumer Acceptance and Willingness to pay in Zambia. *AIMS Agriculture and Food*, 5(3): 500–520. DOI: 10.3934/agrfood.2020.3.500
- Balakrishnan, U. & Zass, D. (2023), Challenges and Opportunities in Agricultural Value Chains. American Institutes for Research.
- Balogun, O.L., Olumide, M.D., Gbaiye, O.O., Ayo-Bello, T.A., Akinwole, O.T. &Ayantoye, K. (2020). Consumers' willingness to pay for packaged chicken eggs in Lagos State, Nigeria. *AIMS Agriculture and Food*, Volume 5, Issue 2, 204–217. DOI: 10.3934/agrfood.2020.2.204.
- Mafimisebi, O. E., Akinbobola, T. P. & Awoyomi, T. E. (2023). Comparative Analysis of the Profitability of Cassava Value Added products in Ondo State, Nigeria. *International Journal of Research and Scientific Innovation (IJRSI)* 5 (6), 231-2705. DOI: 10.51244/IJRSI
- Nimoh F. K, S., Prah, S. & Boansi, K (2022); Consumers' Perception and Willingness to Pay for Cassava Leaves as a Leafy Vegetable in the Ejisu - Juaben Municipality, Ghana. *AGROEKONOMI*, Vol 33, Issue.1, June 2022, Page. x-xx DOI <http://doi.org/10.22146/ae.70131>

- Ogunmola, O. O. & Adekanmbi, A. A. (2020). Awareness, perceptions and willingness to pay for pro vitamin A garri: evidence from Ido local government of Oyo State, *Nigeria. J. Agribus. Rural Dev.*, 1(55), 61–72. <http://dx.doi.org/10.17306/J.JARD.2020.01234>
- Ogunyinka, O. & Oguntuase, A. (2020). Analysis of cassava production and processing by various groups in support of cassava value chain in the south west of Nigeria. *ISABB Journal of Food and Agricultural Sciences*.9(1), 11-19, DOI: 10.5897/ISABB-JFAS2020.01113
- Oladimeji, T., Otunola, E., & Adejuyitan, .J. (2022), Quality Attributes of Pupuru Analogue Produced from Orange Fleshed Sweet Potato (OFSP) as Influenced by Fermentation with *Rhizopus oligosporus*. *International Journal of Biochemistry Research & Review*.1-10. 10.9734/ijbcrr/2022/v31i430312.
- Olajide, R.B., Sanni, L. O., Atser, G., Dixon, A. & Oladokun, I. O. (2021): Information Needs of Cassava Farmer-Processors on Cassava Value Addition Technologies in Oyo State, Nigeria. *Journal of Agricultural Extension*. Vol. 25 (3) July, 2021. <https://dx.doi.org/10.4314/jae.v25i3.4>
- Olumurewa, J., Oluwamukomi, M., & Alaba.J. (2020), Optimization of Fermentation Parameters for Pupuru" Flour Production. <https://www.authorea.com/users/295454/articles/424122-optimization-of-fermentation-parameters-for-pupuru-flour-production>. Accessed 27-02-2024.
- Oyewole, M. F. & Eforuoku, F. (2019): Value Addition on Cassava Wastes among Processors in Oyo State, Nigeria. *Journal of Agricultural Extension*, Vol. 23 (3) <https://dx.doi.org/10.4314/jae.v23i3.12>.
- Udoye, C. E., Okoro, J. C. and Dimelu, M. U. (2024): Employment Equity in the Poultry Value Chain of Commercial Agricultural Development Project in Enugu State, Nigeria. *Journal of Agricultural Extension*. 28(1) 110-124 <https://dx.doi.org/10.4314/jae.v28i1.12>