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Profitability and Determinants of Edible Insects Marketing in Oji-River and Udi Local Government Areas, Enugu State, Nigeria

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ABSTRACT

The study examined the profitability and determinants of edible insects marketing and utilization in Oji-River and Udi Local Government Areas, Enugu State, Nigeria. Specifically, it described the socio-economic characteristics of the respondents, estimate the profitability of edible insect marketing and determined the influence of socio-economic characteristics of the respondents on net marketing income. Purposive sampling technique was used to select 120 respondents and data collection was on primary source using well structured questionnaire and were analyzed using descriptive statistics, enterprise budgeting, Shepherd-Futrell and multiple regression techniques. Finding on socioeconomic characteristics showed that majority of the marketers (35.83%) are within the age bracket of 41-50 years with mean age of 39% and there is female (80.83%) dominance in the enterprise. Profitability indicators such as; net marketing income (₦,736,952.83), input cost (cost of harvesting and marketing) (₦3,223,247.15), return on investment (₦2.159), net return on investment (₦1.15) and coefficient of marketing efficiency (0.463) proved the enterprise profitable. The implication of the net return on investment figures revealed that the marketers return ₦1.15 for every 1 naira invested in the business. Findings also indicated marketing efficiency level of 46.30%. It implies that the marketers are less efficient in marketing of edible insect. Age, gender, household size, other source of income and marketing cost significantly determined net marketing income realized by the edible insect marketers. However improvement in the marketing strategy which will benefit the harvesters/marketers and provision of modern storage and preservative facilities by the union and other relevant agencies for a longer period of time were recommended.

Keywords: Profitability, determinants, marketing and edible insects

INTRODUCTION

Insects are classified as one of the most successful group of animals on earth constituting about 76% of all known species of animals; found in nearly all environments; and widely distributed across aquatic ecosystems, farm lands and forests (Adegbola, Awagu, Arowora, Ojuekaiye, Anugwom, and Kashetu, 2013).

Adeoye, Oyelowo, Adebisi and Akinyemi (2014) stated that consumption of edible insects by humans as food is known as Entomophagy and it is indigenous to Nigerians and most other countries. People throughout the world have been eating insect as a regular part of their diet for ages. Zabentungwa, Rob and Thinadavha (2021) reported that consumption of edible insects is a traditional practice in many African Countries. According to Schluter, Rumpold, Holzhauser and Roth (2017) edible insects have been projected as a potential 'new' protein source in order to combat nutritious food crisis. However, Insects can be divided into edible and inedible insects. Edible insects are source of rich variety of protein;

open for distinct food experiences, high biological value protein, optimal fatty acids and several favorable micronutrients like copper, iron, magnesium, riboflavin and biotin. Huis (2013) stated that edible insects are used as food, feed, and medicine. Insects also provide humans with a variety of other valuable products like; honey and silk.

Farming and consumption of edible insects therefore are seen as an important tool in improving the animal nutrient supply in the country (Alamu, Amao, Lawa, Nwokedi and Oke, 2013). Xian (2012) reported that edible insects surpass animal production in terms of environmental and nutritional benefits which include an overall reduction in the greenhouse gas emissions, decreased agricultural use of land and water, improved prevention and management of chronic diseases like diabetes, cancers and cardiovascular diseases and enhanced immune function. Edible insects have the potential to act as a more environmentally friendly and sustainable nutrient source in human diets than widely consumed animal nutrient sources (Halloran, Christopher, Paul and Arnold, 2014). Isibor, Nkamigbo and Ekeke (2021) reported that marketing involves all processes in the movement of products that consumers need from the point of production to the point of purchase. Marketing is concerned with all stages of operation which facilitate the movement of commodities from farm to the consumers. Marketing can contribute to economic development in Nigeria by stimulating production and consumption, facilitating specialization and capital formation, generating income to individuals and foreign exchange earnings to the nation (Anzuka and Achike, 2010). Marketing helps producers to bridge the gap between the needs of producers and consumers. Agricultural marketing is the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production till it gets to the hands of the final consumer (Osondu, Nwadike, Udah and Ugboaja, 2014). Therefore, agricultural marketing involves; assembling, storing, packaging, wholesaling, financing, retailing, market information, pricing, market organization, competitive relationship, bargaining, selling, procurement, product and process innovation and exporting of products of farm origin.

MATERIALS AND METHODS

The research was carried out in two Local Government Areas of Enugu State comprising of Oji River and Udi. Oji River is located at Latitude 06˚16N and Longitude 07˚16E with Altitude of 140m above sea level. The mean annual rainfall is 2000mm, while the annual temperature ranged between 26.8˚C and 32.5˚C; the average Relative Humidity is 84%. The major water body in the area is a fast flowing Oji-River, a tributary of Anambra River which itself is a major tributary of the River Niger. The study area of Udi is located at Latitude 06˚180N and Longitude 07˚090E, with the average annual rainfall of 2497mm while the average annual temperature is between 26.3˚C and 33.7˚C. The area of study is predominantly forest region with clearly identified farm levels of which 50% is cropped and the other 50% is occupied by forest trees. Oji-River is bounded to the south by Anambra state. Oji-river has one of the oldest and largest running leprosy rehabilitation settlements in the south-east of Nigeria. The people of the study area are mainly farmers and the area is well suited for the production of permanent crops like (oil palm, plantain and cashew) and arable crops such as yam, cassava, groundnut, maize, melon. The topography of Oji-River and Udi Local Government Areas is characterized by rocky, hilly, forested ridges with steep valleys characterized by sandy soils (Ugwuanyi, 2015). The major economic activities in the two Local Government Areas are farming (crop and livestock) and trading, with majority of the farmers engaged in subsistence farming mainly for family consumption while the excess farm products is taken to the market for sale. However, the two local government

areas have several daily markets where agricultural products are sold including edible insects. Edible insect is a thriving business in the two local government areas due to its nutritional and medicinal values, economic returns. It is either sold in wholesale or in retail.

The major towns in Oji-River are: AchiAgu, Achi Uno, Inyi, Awlaw, Akpugoeze and Ugwuoba. Among the listed towns in Oji-River, Achi is the largest town in Oji-River. It is made up of twelve (12) villages and it is surrounded by some other towns: Isuochi in (Abia State), Obeagu in (Awgu Local Government Area) of Enugu state and some part of Udi Local Government Area of Enugu state. The major towns in Udi Local Government Area that are: Nachi, Umuaga, Umuabi, Obinagu, Amokwe, Ihe-Agbudu, Udi, Ngwo, Nsude, Abia, Obioma, Awhum, Abor, Affa, Amaeke, Umulumgbe, Egede, Ebe, 9th mile corner, Eke, Ezedike, Okpatu and Neke.Udi Local Government Area is known for hilly topography and the popular Awhum waterfall is also located in the area of study.

Population of the study

The population of the study is made up of all the people involved in the marketing and utilization of edible insects. The study areas are located in Oji-River and Udi Local Government Areas, Oji-River has a population of one hundred and twenty six thousand, five hundred and eighty seven (126,587) (NPC, 2006) while Udi has a population of three hundred and seventy thousand and two (370,002) (NPC, 2006). All the households involved in harvesting, marketing and utilization of edible insects formed population for the study and is therefore infinite. Data collected were analyzed by use of descriptive statistics (frequency, percentage and mean ratio), enterprise budgeting, marketing efficiency and multiple regression.

Sampling Techniques and Sample Size

The two LGA (Oji-River and Udi) were purposively selected for this study because they share the same ecology, soil type and vegetation that support the natural breeding and rearing of these edible insects. In each of these LGAs, four (4) towns were those insects naturally breed and rear and the indigenes have the potentials for harvesting, marketing and utilization of these edible insects were purposively selected. They include; Oji-River – Achi-uno, Achi-agu, Awlaw and Inyi; Udi – Obinagu, Umuabi, Amokwe and Nachi. Also, in each of these towns, one popular market where these edible insects are sold was purposively selected, namely; Achi-uno (Eke-Uzudaa), Achi-agu (Eke-Ajala), Awlaw (Eke-Egbu), Inyi (Nkwo-Inyi), Obinagu (Eke-Amusha), Umuabi (Nkwo-Amufiagu), Amokwe (Nkwo-Agu) and Nachi (Nkwo-Nachi). Finally, fifteen (15) respondents that are popularly involved in harvesting, marketing and utilization of these edible insects were purposively selected giving a total sample size of 120 respondents.

Table.1 Sample of LGA, Towns, markets and respondents

LGA	Town /Communities	Markets	Respondents
Oji-River	Achi Uno	Eke-Uzudaa	15
	AchiAgu	Eke-Ajala	15
	Awlaw	Eke-Egbu	15
	Inyi	Nkwo-Inyi	15
Udi	Obinagu	Eke-Amusha	15
	Umuabi	Nkwo-Amufiagu	15
	Amokwe	Nkwo-Agu	15
	Nachi	Nkwo-Nachi	15
Total: 2 LGA's	8 communities	8 Markets	120 respondents

Source: Field survey, 2021.

Measurement of Variables

The budgetary tools were used to determine the profitability of edible insect marketing.

The budgetary technique is expressed as:

$NER = \Sigma Pxij = Yni(\Sigma 1\ PxijXij + \Sigma\ Fij)$

Where:

NER/Profit = Net Returns/Profit

Σ=sum
PyjYj= Unit price x quantity of jthrespondent's sales = Total revenue (TR) for the jth respondents
PxijXij = Prices x quantities of jth respondents variable's inputs = Total variable costs (TVC) for jth respondents
Fji = Depreciation values of equipment, annual rent for store, interest on loan, for jth respondents = Total Fixed Cost (TFC) for j^{th} respondents.
TC = Total Cost (TVC + TFC)

According to Ugwumba et al.(2010) in their study of price spread and the determinants of catfish marketing income in Anambra state, Nigeria.

The marketing efficiency of edible insect was determined using Shepherd-Futrell technique which is considered as an accurate marketing efficiency. Coefficient of marketing efficiency is the total cost of marketing to total revenue expressed in percentage term. It is specified as:

$$ME = \frac{TC}{TR} \times \frac{100}{1}$$

Where:
ME = Coefficient of marketing efficiency

TC = Total marketing costs incurred
TR = Total value of product sold
(Olukosi et al .2016).

The multiple regression model was used to determine the influence of socioeconomic characteristics on net marketing income of the respondent namely; age is represented by (AGE), gender (GEN), educational status (EDU), marital status (MAS) Household size (HOS), marketing experience (MEXP), other source of income (OTS), product price (PDP) and marketing costs (MC) on net marketing income is given as:
NMI = F (AGE, GEN, EDU, MRS, HOS, MEXP, OTS, PDP, MC + e).
Where: NMI = Net Returns (₦)
AGE =Marketers' age in years
GEN = Marketers' gender (dummy: male = 0, female = 1).
EDU = Marketers' education (years of schooling obtained)
MRS = Marketers marital status (dummy: single = 0, married = 1, widowed/divorced = 2)
HOS = Household size (number of persons in a family)
MEXP = Marketers experience in the business (years)
OTS = Marketers alternative sources of income (dummy: Crop production = 0, animal production = 1, both = 2
PDP = Product price (₦)
MC = Marketing costs (₦)
e = Stochastic error term
Four functional forms of the regression models (linear, exponential, semi-log, and double log)
Stated as:
Linear:
NMI`= β0+β1AGE+ β2GEN+ β3MRS+ β4EDU+ β5HOS + β6MEXP + β7OTS+ β8PDP+ β9MC + e1
Exponential:
InNMI= β0 + β1AGE+ β2GEN+ β3MRS+ β4EDU+ β5HOS + β6MEXP +β7OTS + β8PDP +β9MC +e1
Semi-log:
NMI = β0+ β1InAGE+ β2InGEN+ β3InMRS+ β4lnEDU+ β5lnHOS+ β6InMEXP +β7InOTS + β8InPDP +β9InMC+ e1
Double-log:
InNMI = β0 + β1InAGE+ β2GEN+ β3InMRS+β4InEDU+ β5lnHOS+β6InMEXP+ β7InOTS + β8InPDP +β9InMC + e1

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Respondents

Socioeconomic characteristics of the respondents in Table 2 revealed that majority of the marketers (35.83%) are within the age bracket of 41-50 years with mean age of 39.09. This implies that the marketers are in their middle ages and therefore very productive, ready to make an impact in their source of living. The result revealed female dominance in the enterprise

(80.84 %).This agrees with Akanni, Salako, Kolade, Olumide and Oyetoki, (2020) who revealed female dominance over male in the structure and efficiency of trade in wild snail in Oyo state. Aderounumu, Oyewo and Oke (2019) reported a female dominance of 94.3% against male 5.7% in snail marketing in Oyo state. However, this is at variance with Nkamigbo, Ovuamarie (2014) who reported a dominance of male (87%) against female (13%) in catfish production in Isoko, Delta state.

The table shows majority (58.33%) of the respondents have spent 7-12 years in school with mean years of 8.31. This agrees with the findings of Meludu and Onoja (2018) who revealed that majority of the respondents (74.4%) had at least primary educational experience. Ebenebe, Amobi, Udegbala, (2017) also agrees with this that majority (86.20%) of the respondents had formal education against (13.2%) that are illiterates. This implies that the respondents have taken to such menial job of harvesting and selling edible insects.

Majority (77.5%) of the respondents are married with mean household size of 6.5. The indication is that the respondents had large family size to feed. This is why majority (79.16%) indicated that their other source of income include both crop production and animal rearing to argument their income and food source for feeding such a large family size. This implies that majority of the edible insect marketers in the study area are responsible and could take genuine decision that could enhance the success of their business together with their spouses. Aderounumu et al. (2019) also agreed with this in the study of economic analysis of snail marketing in Oyo state. This is against Obianuju and Asa (2016), who reported that 73.3% of snail farmers are single in Itu LGA of Akwa-Ibom state. This agrees with Abebe and Hossein (2018) in the study of fish value chain and its impact on rural household's income, who reported that fishing contributed 55% improvement in incomes of households. In areas where land is scarce and access to irrigation is minimal, fishing is considered as an alternative income source used to diversify livelihood strategies.

Table 2 Socio-economic Characteristics of the Marketers.

Variable	Frequency	Percentage (%)	Mean scores
Age			
< 20	7	5.83	
21 – 30	22	18.33	
31 – 40	31	25.83	
41 – 50	43	35.83	
51 – 60	11	9.16	
61 >	6	5	
	120	**100**	**39.09**
Sex			
Male	23	19.16	
Female	97	80.84	
	120	**100**	
Education			
0- 6	35	29.16	
7 – 12	70	58.33	
13 >	15	12.5	
	120	**100**	**8.31**
Marital status			
Single	12	10	
Married	93	77.5	
Widowed/divorced	15	12	
	120	**100**	
Household size			
0-5	66	55	
6 – 10	34	28.33	
11 >	20	16.66	
	120	**100**	**7**
Harvesting/Marketing/Utilization Experience	21	17.5	
1 – 5	68	56.66	
6 – 10	31	25.83	
11 >	**120**	**100**	**9.06**
Other sources of income (OTS)	15	12.5	
Crop production	10	8.33	
Animal rearing	95	79.16	
Both	**120**	**100**	

Source: Field survey, 2021.

Table 3 revealed that out of the total cost of ₦3, 223, 247.15 spent in the enterprise, purchases constituted 91.34% while the least expenses was on recharge card 1.85%. This implies that the most important cost of the business is the purchases while the least is on recharge card. This is in tandem with Ligbade, Justine and Owoeye (2019) revealed that cost of purchasing snail covered 95.92% of the total cost indicating that snail does not involve much fixed input.

On enterprise profitability, the marketers realized ₦6, 960, 200 after spending a total variable cost of ₦2, 970, 680 and a total cost of ₦3, 233, 247. 15. This generated a gross margin of ₦3, 989, 520 net marketing income of ₦3, 736, 952. 85, return on investment of 2.15, net return on investment of 1. 15. Gross ratio of 0. 463 and marketing efficiency of 46.30%. From the result, marketers returned ₦1.15 for every 1 naira invested in the business. The profitability indicators (gross margin, net marketing income, mean net marketing income and net return on investment values) proved that edible insects marketing is a profitable venture in the study area. Ezeano and Ohaemesi (2020), attested to the profitability of broiler and turkey in Anambra state. Offor, Okpala and Ibeagwa (2017), also attested to the profitability of fish marketer's in Rivers state which has a return on investment of ₦1.17. The result of the analysis revealed the marketing efficiency of 46.30%. This implies that the respondents have a better efficiency due to the respondents source their products (edible insects) from nearby market/supplier thereby reducing transport costs. This is in tandem with Onyewuwa (2012) who reported that fish marketers in the River state had a marketing efficiency of 12.5%.

Table 3 Estimated Monthly Profitability of Edible Insects

Variable	**Profits (₦)**	**Total cost (TC) %**
Total Revenue / Annual income (TR)	**6, 960, 200**	
Variable Cost (VC)		
Water	267, 943	9.01
Kerosene	763, 165	25.66
Gas	472, 155	15.80
Salt	226, 547	7.62
Electricity bill	983, 670	33.28
Transportation	107, 500	3.64
Nylon bags	94, 500	3.19
Recharge cards	55, 200	1.80
Total variable cost (TVC)	**2, 970, 680**	**100**
Fixed Cost(FC)		
Depreciation cost of equipment; Plastic container/gallon, plastic basin, stove/gas cylinder, frying pan, frying spoon, wooden tray, harvester, measuring cup, mobile phone and refrigerator/dryer	**252, 567. 15**	
Total fixed cost (TFC)	**252, 567. 15 100**	**100**
Total cost (TC) = TVC + TFC	**3, 223, 247.15**	
Gross Margin (GM) = TR – TVC	3, 989, 520	
Net Marketing Income (NMI) = GM – TFC	3, 736, 952 .83	
Return on Investment = TR / TC	2.159	
Net Return on Investment = NMI / TC	1. 151	
Gross Ratio = TC / TR	0.463	
Marketing Efficiency = TC/TR X 100/1	46. 30%	

Source: Field survey, 2021

The result indicated that the output of the semi-log form gave the best result in terms of number of significant predictors, signs and sizes of the predictor as well as the values of F-statistics, R2and R2 adjusted was chosen as the lead equation. The coefficient of multiple determination (R2) 0.89 meant that 89% of the variation in the profit from edible insect marketing was explained by the variations in the independent variables while the remaining (11%) was due to error. The F-statistic value of 90.27 was significant and confirms the overall significance of the regression analysis. The regression equation is given as; NMI = -272.5 + 7.27AGE + 2.97 SEX -923MRS -998EDU -2.76HOS +1.62MEXP +3.19OTS +4.51PDP +23.78 MC.

Out of the nine (9) independent variables included in the model, age (7.27), sex (2.97), household size (-2.76), other source of income (3.19) and marketing cost (23.78) statistically and significantly influenced net marketing income earned by the marketers. The remaining four (4) marital status (-923), education (-998), marketing/utilization experience (1.62), and product price (4.15) were not significant.

The coefficient of age (7.27) had positive and statistically significant effect on the net marketing income at (5%) probability level. This implies that the respondents are young, energetic, vibrant and ready to take the hustle of the market demand. This is in agreement with Anyawale and Oluwasola, (2008) and Iwuchukwu, Eke and Udoye (2017) who reported that youth influences net income in their study area. This is at variance with Simonyan (2015) and Oladejo et al. (2019) who stated that increase in age led to increase in revenue.

The coefficient of sex (2.97) had positive and statistically significant effect on the net marketing income at (5%) probability level. This implies that the business is gender sensitive because women perform better in gender related enterprise. This is in tandem with Olufemi, Rabirou, Fakunle and Ojo (2017) who reported a female dominance in goat marketing in their study area.

The coefficient of household size (-2.76) had positive and statistically significant effect on the net marketing income at (10%) probability level. This implies that large family size tends to make much return from this enterprise as all members of the family may have selling outlets that increases their rate of turnover. This is at variance with Ugwumba et al. (2016) who reported that small household has potential of high savings than large family size in their study area.

The coefficient of other source of income (3.19) had positive and statistically significant effect on the net marketing income at (10%) probability level. This implies that majority of the marketers were involved in other enterprise that generate income because edible insect is seasonal. Also, the generated income from other sources helps to boost their purchasing power which increases their net returns.

The coefficient of marketing cost (23.78) had positive and statistically significant effect on the net marketing income at (1%) probability level. This implies that marketers who spend less in the cost of marketing their products tend to make much profit and vice versa. This agrees with Ugwumba et al. (2016) who stated that increase in marketing cost decreases net return while decrease in marketing cost increases marketing revenue.

Table 4 Influence of Socio-economic Characteristics on Net marketing Income

Predicator	Linear	Exponential	Semi-log	Double log
Constraints	-9.03 (0.61)	1.88 (0.03)	-272.5 (0.04)	-7.18 (0.15)
AGE	0.25 (0.002)**	0.31 (0.001)**	7.27 (0.008)**	0.38 (0.000)***
SEX	2.25 (0.053)*	-0.001 (0.98)	2.97 (0.008)**	0.03 (0.53)
MRS	-0.75 (0.54)	0.05 (0.43)	-923 (0.45)	0.04 (0.43)
EDU	0.30 (0.17)	0.03 (0.01)*	-998 (0.56)	0.100 (0.13)
HOS	-0.47 (0.13)	-0.03 (0.06)*	-2.76 (0.03)*	-0.16 (0.001)**
MEXP	0.094 (0.93)	-0.003 (0.74)	1.62 (0.22)	0.03 (0.60)
OTS	2.07 (0.001)**	0.01 (0.001)**	3.19 (0.02)*	0.16 (0.003)
PDP	-0.052 (0.79)	-0.0002 (0.41)	4.51 (0.78)	-0.32 (0.59)
TMC	-9.03 (0.000)***	0.00005 (0.000)***	23.78 (0.000)***	1.14 (0.000)***
R^2	0.8778	0.8515	0.8923	0.9184
R^2 adjusted	0.8666	0.8378	0.8824	0.9109
F-Statistic	78.30	62.48	90.27	122.66
Root MSE	4.4299	2.1548	4.1597	0.15971

*Key Note: *= significant at p<0.10; **= significant at p>0.05; ***= significant at p>0.01; Source: Field survey, 2021*

SUMMARY AND CONCLUSION

The result of profitability and determinants of edible Insects marketing and utilization in Oji-River and Udi Local Government Areas, Enugu State, Nigeria revealed that the business is having more of youths than old people and it has been a generational trend also there is a female dominance in the enterprise. The findings on profitability using enterprise budgeting showed that purchases is the most important cost of marketing having represented 91.34% and the least expense on recharge card 1.85%. Net marketing income ₦3, 736, 952.85, return on investment ₦2.15, net return on investment ₦1.15 and gross ratio 0.463 proving that edible insect marketing is a profitable venture in the study area. Multiple regression analysis revealed that age, sex, household size, other source of income and marketing cost statistically and significantly determined net marketing income while marital status, education, marketing experience and product price were not significant. There is need for market union to provide modern storage and preservative facilities for edible insects to last for a longer period of time, Non-governmental organizations (NGO) should play a significant role in increasing awareness of entomophagy, as well as in promoting insect rearing as a diversified livelihood strategy and non-governmental organizations (NGO) can assist in technical training for rural households on market linkages, entrepreneurship and the domestic rearing of insects were recommended.

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REFERENCES

1. Abebe, E., and Hossein, A. (2018). Fish Value Chain and Its Impact on Rural Households' Income. International Journal of Food and Sciences, 8(7), 305-30.
2. Adegbola, J., Anugwom, U., Awagu, E., Arowora, K., Kashetu, R. and Ojueaiye, O.(2013) Entomophagy: A Panacea for Protein Deficient – Malnutrition and Food Security in Nigeria. Journal of Agricultural Science, 5(6), 110-116.
3. Aderounmu, A. F.Oyewo, I. O. and Oke, O. O. (2019). Economic Analysis of Snail Marketing in Ibadan, Nigeria. Asian Journal of Agricultural Extension, Economics and Sociology, 34(4), 232-274.
4. Adeoye, O. T., Oyelowo, O. J., Adebisi, T. A. and Akinyemi, O. D. (2014). Eco-Diversity of Edible insects of Nigeria and its Impact on Food security. Journal of Biology and Life Science, 5(2), 175-187.
5. Akanni, O. F. Salako, B. A. Kolade, R. I. Olumide-Ojo, O. and Oyetoki, O. A. (2020). Structure and Efficiency of Trade in Wild Snail in Selected Markets in Ibadan Metropolis, Oyo state, Nigeria. International Journal of Applied Science, Environment and Management. 24(4),315-321. ISSN: 597-600
6. Alamu, O. T., Amao, A. O., Lawa, I. O., Nwokedi, C.I. and Oke, O. A. (2013).Diversity and Nutritional Status of Edible Insects in Nigeria. International Journal of Biodiversity and Conservation, 5(4), 215-222.
7. Anyawale, A. B. and Oluwasola, O. (2008). Socio-economic Determinant of fish production in Osun State. International Journal of Agricultural Sciences. 4(5), 45-56.
8. Anzaku, T. A. K. and Achike, A. (2010). Socio-Economic Determinants of Market Performance among Sesame Farmers in Nasarawa State, Nigeria. International Journal of Agricultural Rural and Development, 1(6), 21-28.
9. Ebenebe, C.I., Amobi, M.I., Udegbala, C., Ufele, A. N. and Nweze, B. O. (2017). Survey of Edible Insect Consumption in the South-Eastern Nigeria; Journal of Insects as Food and Feed. 3(4), 241-252.
10. Ezeano. C. I. and Ohaemesi, C.F. (2020). Comparative Analysis on Profitability of Broiler and Turkey Production in Anambra State, Nigeria. International Journal of Science and research, 9(2), 511-515.
11. Halloran, A., Christopher, M., Paul, V. and Arnold, V. H. (2014). Insects in the Human Food Chain: Global Status and Opportunities. 1 (3). pp. 10-22.

12. Isibor, A.C., Nkamigbo, D.C. and Ekeke, N.C. (2021). Performance of farmers using social network in advancing agribusiness in Anambra State, Nigeria. Intl Journal of Science and Research,10(8),633-637.
13. Iwuchukwu, J. C. Eke, J. N and Udoye, C. E. (2017). Practices of Farmers in Processing and Marketing of Crayfish in Akwa-Ibom state, Nigeria. African Journal of Agricultural Research. 12 (44).pp. 169-180,ISSN: 1991-637X
14. Meludu, T. N. and Onoja, M. N. (2018). Determinants of Edible Insects Consumption Level in Kogi State, Nigeria Journal of Agricultural Extension. 22 (1). pp. 156-170.
15. Nkamigbo, D.C., Ovuamarie, O. S., Inoni, O. E., and Isibor, A., C. (2014). The Effect of Specific Economic Inputs and Efficiency of Resource Utilization in Catfish Production in Isoko area of Delta State, Nigeria. 1(2). pp. 41-47
16. Offor, E. I, Okpara, B. O. and Ibeagwa, O. B. (2015). Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, Abia state, Nigeria. 403-412
17. Oladejo, J. A., Arowolo, O. V. and Oguntoye, T. O. (2019). Profitability of Snail Marketing in Ogo Oluwa Local Government Area of Oyo state, Nigeria. International Journal of Agriculture and Earth Science, 5(3), 22-30.
18. Olufemi, A. Y., Rabioru, K., Fakunle, J. A. and Ojo, M. A. (2017). Market Analysis of smallholder Goat enterprise under tropical conditions. Agricutura TropicaEtSubtropica, 3(50), 121-127.
19. Osondu, C.K., Nwadike, F.C., Ijeoma, J.C., Udah, S.C, and Ugboaja, C.I., (2014). Marketing Performance of Salad Vegetables: The Case of Cabbage Marketing in Abia state, Nigerian International Journal of Agricultural Science Research and Technology in Extension and Educational System, 4(3), 151-162.
20. Schluter, O., Rumpold, B., Holzhauser, T. and Roth, A. (2017). Safety Aspects of the Production of Foods and Food Ingredients from Insects. Journal of Nutrition and Food Research, 1(61), 189-203.
21. Simonyan, J. B. (2014). Michael Okpara University of Agriculture, Department of Agricultural Economics, Umudike, Abia state. pp. 1-52
22. Ugwumba, C. O. A. and Okoh, R. N. (2010). Price Spread and the Determinants of Catfish Marketing Income in Anambra state. Journal of Agriculture and Social Sciences, 6(4), 73–78.
23. Ugwumba, C. O. A., Obiekwe, J. N. and Ozor, M.U. (2016). Marketing of African Giant Snail (achantinaachantina) in Anambra state. Journal of Dental and Medical Sciences (IOSR-JDMS, 6(1), 57-66.
24. Ugwuanyi, I. K. (2015). Cytotaxonomic Identification of Similiumdamsosom Complex (Dipteral Simulidae) in Oji-River Area, Enugu State, Nigeria. Journal of Entomology and Zoology Studies,3 (3), 34-39.
25. Zabentungwa, T., Hlongwane., Rob, S. and Thinandavha, C. Munyi.(2021). Indigenous Knowledge about Consumption of Edible Insects in South Africa. Journal of edible insects. 12(2), 21-28.

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