Determinants of Income among Layer Bird Marketers in Imo State, Nigeria

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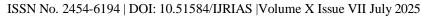*** Corresponding author**

ABSTRACT

The growing concern to encourage Layer bird farmers to increase production as a result of demand-supply gap evident in high cost of spent layers in the market is important to both consumers and suppliers. The study examined determinants of income among layer bird marketers in Imo State, Nigeria**.** It specifically described the socio-economic characteristics of the marketers; examined costs and return of the marketers, effect of socioeconomic characteristics of the marketers on income realized and constraints affecting marketing of layer birds in the area. Multi-stage sampling method was used to select 208layer marketers. Primary data were collected using structured questionnaire administered to the respondents by personal interview. Data collected were analyzed using descriptive statistics, enterprise budgeting techniques and multiple regression analysis. Gender distribution of the respondents shows female dominance of 58.7% with a mean age of 48 years, having household size of 4-6persons. Majority (63.5%) had marital responsibilities with a mean educational year of 10.9 and a mean year of experience of 14.8. Layer poultry marketing was profitable given the positive values of gross margin, net marketing income, mean net marketing income and net return on investment of ₦19,995,300, ₦15,944,440, ₦76,655.9 and 0.29. The significant determinants of income for layer marketers were purchases, selling price, and marketing cost at 1% and 5% probability level respectively. Government should provide of financial assistance and regulate feed prices to marketers through co-operative groups to ease their capital constraint and thus improve the income realized by the marketers since the result indicates that layer marketing is a viable venture in Nigeria.

Keywords: Income determinant, Profitability, Layer bird, marketing, Imo State, Nigeria

INTRODUCTION

In Nigeria, agriculture is the most important non-oil economic activity and it contributed 29.2% of National GDP in 2019 (Obianefo, Okafor, Bola-Audu and Umebali, 2019)), 24.1% in 2020 (National Bureau of Statistics (NBS), 2020) and 22.35% in 2021 (Food and Agricultural Organization (FAO), 2021). The sector is made up of several sub-sectors which offer prospects for an enormous number of different enterprises. The four main sub-sectors of the agricultural sector are: crop, livestock, forestry and wildlife, and fishery, of which the crop and livestock sub-sectors are the drivers of the agricultural sector with their respective growth share of 87.6% and 8.1% (NBS, 2021). And poultry sector according to Offiah et. al.(2024), has remarkable high economic impact, generating employment without requiring high expertise, yet with high market value.

Livestock sub-sector plays a crucial role in rural economy and livelihood. Livestock production constitutes an essential part of the agricultural economy of Nigeria. It provides meat, clothing, fuel, fertilizer and draught power to sustain the economy and one sector where the poor contributes to the growth directly instead of getting benefit from growth generated elsewhere (Olorunwa, 2018). In 2016 - 2020, poultry industry in Nigeria comprised about 180 million birds producing 65,000 tonnes of eggs and 300,000 tonnes of poultry meat (FAOSTAT, 2020). The improvement was largely due to increase in the number of broilers which produced more meat per bird. Their production costs per unit remain relatively low and the return on investment is high as a result of efficient

allocation of resources, otherwise, the market is said to have failed. The growth in the industry can remain inclusive and create opportunities for small-scale and emerging producers.

Poultry marketing would be highly beneficial to the society at large as it would eliminate the shortage in the supply of livestock products thereby bridging the gap between the demand and supply of the products in the market and at the same time serve as a source of income for those who engage in its production (Ettah et al., 2021). World Bank (2017) opined that the gap between demand and local supply is anticipated to widen in the future. Consequently, in meeting the anticipated greater demand for layer poultry, the poultry farms must function sustainably and achieve optimal profitability to ensure meat availability at a reasonable price.

Thus, the study; investigated the socioeconomic characteristic of layer marketers, profitability of layer marketing, the determinants of income of the marketers; and constraints to marketing of the product in the area.

METHODOLOGY

The study area was Imo State. It has three agricultural zones. Owerri is its capital and largest city. Its other major cities are Orlu and Okigwe. It occupies the area between the lower River Niger and the upper and middle Imo River Niger. Imo State is bordered by Abia State on the East, River State and Delta State to the West, Anambra State on the North and River State to the South (Adeyemi, 2011). Imo State covers an area of about $5,530km^2$ with a population of 5,167,722 according to the estimated National Population Census (NPC, 2020). The State lies within latitude 4° 45'Nand longitude 6° 50^1 N and 7° 25^{1E}with an area of around $5,100km^2$. The economy of the state depends primarily on agriculture and commerce. The chief occupation of the people is farming. The population for the study comprised all the layer poultry marketers in the area. Multi-stage, purposive and random sampling techniques were used to select the respondents. Two Agricultural Zones were purposively selected out of four Agricultural Zones in the State. The selection was based on the degree of concentration of layer poultry marketer evidenced from pre-survey study. Two poultry markets (one urban and one rural) were purposively selected from each of the selected Agricultural zones to arrive at four markets. The selected markets were majorly known for layer poultry marketing. Finally, a random selection of 52culled layer marketers were selected from each of the selected markets to arrive at 208 respondents for the study.

Structured questionnaire was used to collect primary data. Descriptive statistics, multiple regression analysis and budgetary method were used in data analysis to achieve the objectives.

The budgetary technique model deployed for the profitability assessment was given as:

$$NMI = \sum_{j=1}^{n} P_{Yj}Y_j - \left(\sum_{i=1}^{m} P_{Xij}X_{ij} + \sum_{i=1}^{r} F_{ij} \right)$$

$NROI = \dfrac{NMI}{TC}$

TC

Where:

NMI/Profit = Net Marketing Income

$\sum$ == sum,

Y = Output,

X= Input,

F= Fixed input,

j= Respondent,

n= Number of respondents,

m= Number of variable inputs,

r= Number of fixed inputs,

$P_{yj}Y_j$ = Unit price x quantity of jth respondent's output= Total revenue (TR) for j^{th} respondent.

$P_{xij}X_{ij}$ = Prices x quantities of jth respondent's variable inputs= Total variable cost (TVC) for j^{th} respondent.

F_{ij} = Depreciation of equipment, annual rent for store, interest on loan, etc of jth respondent = Total fixed cost (TFC) for j^{th} respondent.

TC= Total cost (TVC + TFC)

NROI = Net return on investment (NFI/TC)

The model for determinants of income is implicitly expressed as: MKI=f (AGE, GEN, MTS, HHS, EDU, EXP, PUS, SEP, MKC, e_i)

Where:

MKI　　= Marketing income (₦)

AGE　　= Age of marketer (years)

GEN　　= Gender (dummy: male = 1; female = 0)

MTS　　= Marital status (dummy: married = 1; otherwise = 0)

HHS　　= Household size (number of persons in a household)

EDU　　= Educational level (years of formal education)

EXP　　= Marketing experience in the business (years)

PUS　　= Purchases (numbers)

SEP　　= Selling price (₦)

MKC　　= Marketing cost (₦)

B_0-B_9 = Parameters to be estimated

e_i= Error term

Four functional forms of the regression model (linear, exponential, semi-log and double-log) were tried with data on socio-economic factors of the marketers. Output of the form with best result according to both economic and econometric a priori criteria was adopted as the lead equation. The explicit versions of the functional forms are stated as:

Linear: Mk1 = β_0+ β_1AGE + β_2GEN + β_3MTS + β_4HHS + β_5EDU+ β_6EXP + B_7PUS+β_8SEP +

$\qquad\qquad\quad$ β_9MKC + e_i

Exponential: InMk1= β_0+ β_1AGE + β_2GEN + β_3MTS + β_4HHS + β_5EDU+ β_6EXP +

$$\beta_7 PUS + \beta_8 SEP + \beta_9 MKC + e_i$$

Semi-log: Mk1 $= \beta_0 + \beta_1 InAGE + \beta_2 InGEN + \beta_3 InMTS + \beta_4 InHHS + \beta_5 InEDU + \beta6 InEXP +$

$$\beta_7 InPUS + \beta_8 InSEP + \beta_9 InMKC + e_i$$

Double-log: InMk1 $= \beta_0 + \beta_1 InAGE + \beta_2 InGEN + \beta_3 InMTS + \beta_4 InHHS + \beta_5 InEDU + \beta6 InEXP +$

$$\beta_7 InPUS + \beta_8 InSEP + \beta_9 InMKC + e_i$$

RESULTS AND DISCUSSION

Socio economic characteristic of layer marketers

Results on the socio-economic characteristics of the layer marketers are presented in Table 1. The results reveal that majority (58.7%) of the respondents were female. This implies that poultry marketing was dominated by female in the study area. This result disagrees the findings of Aminu and Hermanns (2021) and Owoeye et al. (2023) that reported male dominance but it agrees with the findings of Muojekwu et al. (2025) who revealed female dominance in their study area. Most (44.2%) of the respondents were within 41-60 years' age group, 33.7% were between 20 and 40 years while 22.1% were more than 60 years. The mean age of 48 years implies that the layer marketers were within their economically productive age group. Majority (63.5%) of the respondents were married with an average of 6 persons in their household. This shows that married respondents were more involved in the business because they are responsible for the well- beings of their households. Distribution by education reveals majority (89.4%) of the respondents had one form of education or the other, while only 10.6% had no form of education. This implies that the layer marketers were literates. This is in line with Aminu and Hermanns (2021) and Muojekwu et al. (2025) that high literacy could lead to increase in market sales and invariably more profit. Majority (51.4%) of the respondents had marketing experience that spans between 11 and 20 years. The mean year of experience of about 14.8 years implies that, the marketers were well groomed and experienced in their business. This is in tandem with the findings of Muojekwu et al. (2025) that higher experience is expected to translate to high level of sales as the marketers bring their experience to bear on the business.

Table 1: Socio- economic characteristics of layer poultry marketers

Variables	frequency	frequency	mean
Gender			
Male	86	41.3	
Female	122	58.7	
Age			
20-40	70	33.7	
41-60	92	44.2	48.0
Above 61	46	22.1	
Marital status			
Married	132	63.5	
Single	76	36.5	

Educational level			
No formal edu	22	10.6	
Primary (1-6)	38	18.3	
Secondary (7-12)	62	29.8	10.9
Tertiary (13-18)	86	41.3	
Marketing experience			
1-10	58	27.9	
11-20	107	51.4	14.8
21 and above	43	20.7	
0-3	52	25.0	
4-6	104	50.0	
7- 9	30	14.4	6person
Above 10	22	10.6	

Source Field Survey, 2023

Profitability of layer marketing

The enterprise budgeting analysis was deployed to determine the profitability of layer marketing in the study area. Results of the analysis indicating total revenue (TR), total cost (TC), total variable cost (TVC) total fixed cost (TFC), gross margin (GM), net marketing income (NFI), mean net marketing income (MNMI), and net return on investment (NROI) are presented in Table 2. The result indicated gross margin, net marketing income, mean net marketing income and net return on investment of ₦19,995,300, ₦15,944,440, ₦76,655.9 and 0.29 respectively. This implied that the marketers returned 29kobo for every ₦1.00 invested in the business. The result proved that marketing of the layer birds in Imo State was profitable. The results are in line with Muojekwu et al. (2025) and Ogbonna and Emerole (2018) who stated that poultry marketing was profitable in their area of study.

Table 2: Profitability of layer marketing

Variables	Amount
Revenue	**70,300,600**
Variable costs	337,983.6
Purchases	33,901,800
Drug/Vaccines	165,920
Ground/Stand Levy	790,800
Transportation	9,700,400

Feed	3,050,000
Off Loading Cost	1,215,000
Loading Cost	1, 034,500
Storage Cost	221,000
Govt tax	61,300
Feeding Cost & Market Information	164,580
Ave. TVC	**241,852.4**
Gross margin	**19,995,300**
Ave. Gross margin	**96,131.25**
Fixed costs	
Dep. Cage	2,650,420
Dep. Drinker	330,480
Dep. Feeders	230,400
Dep. Tables & Chairs	269,140
Dep. Shop rent	570,420
TFC	**4,050,860**
TC (TFC +TVC)	**54,356,160**
ATC	**261,327.7**
NMI (GM-TFC)	**15,944,440**
ROI $^{=TR}$/TC	**1.29**
NRIO ^{NMI}/TC	**0.29**
MNMI = ^{NMI}/n	**76,655.9**

Note: Source – Field Survey 2023. Dep. = depreciation

Determinant of income for layer bird marketers

The multiple regression analysis was adopted to estimate the effects of socio-economic factors of the respondents (predictors) on layer marketers' income (predictand). The predictors used were age of the marketers represented by (AGE), gender (GEN), educational level (EDU), marital status (MAS), marketing experience (EXP), household size (HHS), selling price (SLP), marketing cost (MKC) and cost price of bird (CPB). Four functional forms of the regression model (linear, exponential, semi-log and double-log) were fitted with the data and ran using the SPSS and Stata statistical package. Outputs of the linear regression analyses (Table 3) gave the best result in term of value of the coefficients, R^2 and Durbin Waston statistics and appropriateness for signs of the regression coefficients and therefore chosen as the lead equation

Findings indicated three variables (Purchases, selling price and marketing cost) influenced the marketing income at 5% and 1% probability levels respectively. The coefficient of quantity of birds purchased, selling price and marketing cost positively influenced the income which implies that an increase in each of them will lead to an increase in income. The result indicates that a marketer who buy higher quantity of layer birds with high marketing cost and equally sells at a high price will obtain more income. In general, the result shows that purchase of extra layer leads to ₦1216.60 increase in market income while everyone naira rise in selling price and marketing cost, leads to ₦161.18 rise and 84k rise in market income of the layer marketers in the study area. The finding is in tandem with Chikezie et al. (2021) who recorded that flock size significantly influence the income of egg marketers

Table 3. Determinants of marketing income for layer marketers

Variable	Linear	Exponential	Semi log	Double log
Age	0.663	217.05	1.945	0.8471
	(0.120)	(0.650)	(0.020)	(0.725)
Gender	-45.165	-350.65	-4.100	1.284
	(-0.360)	(-0.148)	(-0.030)	(1.004)
Edu level	-976.35	1209.40	-0.038	0.125
	(-0.770)	(0.140)	(-0.833)	(0.901)
Marital status	-51.670	-1967.79	0.085	0.017
	(-0.281)	(-0.658)	(1.277)	(0.474)
Experience	1148.890	-9187.46	0.097	-0.036
	(0.854)	(-0.415)	(0.128)	(-0.137)
Household size	3129.786	20885.23	0.412	0.430
	(0.720)	(0.720)	(1.190)	(1.237)
Purchases	1216.596**	41474.37***	1.220**	1.776
	(2.620)	(3.412)	(2.278)	(1.558)
Selling price	161.181***	27100.05**	0.900***	0.989**
	(7.830)	(2.030)	(3.440)	(2.345)
Marketing cost	0.844***	255.02	0.002**	0.151
	(6.304)	(0.754)	(2.220)	(0.372)
Constant	12.322***	-72.28	7.392**	-4.284
	(8.005)	(-1.767)	(1.375)	(0.386)
R^2	0.8070	0.6903	0.7989	0.6720

F stat	37.958***	5.771***	18.701***	3.067***
DW	1.937	2.210	1.922	1.667

Source: Field Survey, 2023. Figures in bold as well as figures before the brackets are the coefficients. Figures in brackets are the t values. *** and **indicate significance at 1% and 5% levels

Constraints to Layer Bird Marketing

The result collected on constraints to layer poultry marketing in the area is shown in Table 4. The result indicated inadequate capital as the major constraint because money facilitates acquisition of equipment, feeds, chicks and payment of labour. This is major reason why most marketers operate on small scale business and in turn affect the level of quantity sold and profitability in the State. This was followed by high cost of transportation, high cost of feed, price fluctuations and high cost of chicks and the last on the list was problem of poor storage facilities. This corroborates the findings of Baruwa and Idowu (2021) and Muojekwu et al. (2025) who reported that inadequate capital, high cost of transportation, price instability and high cost of chicks as most serious constraints affecting poultry marketing in their study areas.

Table 4. Constraints to layer poultry marketing

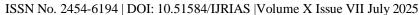| Constraints	Importance index	
	Indice	Rank
Inadequate capital	0.901	1
High cost of transportation	0.865	2
High cost of feed	0.722	3
Price fluctuations	0.672	4
High cost of chicks	0.621	5
Poor storage facilities	0.426	6

Source: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

Layer poultry marketing proved to be a profitable enterprise given the positive values of gross margin, net marketing income, mean net marketing income, net return on investment. Furthermore, the study has provided the variables that affects the income of the marketers. Policy measures must be directed toward the mitigation of the constraints identified by this study, especially inadequate capital and high cost of transportation. The marketers should form a co-operatives group to enable them obtain financial aid from Governmental bodies and equally appeal to the government to regulate the high price of feed. The State and local government should address the issues of bad/poor road network through constructing or rehabilitating existing road to enable the marketers minimize cost of marketing and earn more profits.

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