Nigerian J. Anim. Sci. 2020, 22 (1): 225-232

Economics of Egg Production among Poultry Farmers in Oyo State, Nigeria

***Hamzat O. A., Taiwo, O. D. and Ogunleye, B. T.**

Department of Agricultural Extension and Management, Federal College of Animal Health and Production Technology, P.M.B. 5029, Ibadan, Oyo State

****Corresponding Author:** hamzatolatunji22@gmail.com, GSM: +2348133620016*

***Target Audience:** poultry farmers, extension agents*

Abstract

The study was conducted to examine the economics of egg production in Oyo state, Nigeria with a view to not only estimate the cost and return but to also identify the relationship between inputs and output of egg production. The population of the study consisted of registered poultry farmers with Poultry Association of Nigeria (PAN), Oyo state branch. Multi stage sampling techniques were used to select 120 poultry farmers for the study. Well structured questionnaires were used to collect data and the data were analyzed using descriptive, multiple regression and gross margin methods. The descriptive statistics which measured the socioeconomic characteristics showed that majority (78.3%) of the respondents were male with mean age of 48 years. The findings further showed that feed ($p<0.01$), medication ($p<0.05$) and flock size ($p<0.01$) significantly affected egg production in Oyo state and all the significant variables had positive relationship with layers production. The cost and return analysis showed that egg production is a viable foray with profit margin of ₦316,080 per production season (100 layers). The major constraints of egg production were identified as high cost of inputs, limited finance and disease outbreak. Therefore, credit granting institutions should be strengthened to render special financial services to poultry farmers at low interest rate in order to enhance the viability and sustainability of the egg production in Oyo state.

***Key words:** Egg production; poultry farmers; economic analysis; Oyo state*

Description of Problem

Within the past few years, layers production has increased significantly, the growth rates of layers production has increased but not impressive. The level of output still remains low compared to the input put into production (1). Poultry is heavily dependent on grains and other feed ingredients frequently used by man. They therefore compete directly with man for feeds but grain production in Nigeria is far less than demand. A change in output of maize and its price shows immediate change in poultry feed price and prices of poultry products and consequently its profitability (2). Poultry feed being the single input with the highest cost in poultry production, the increase in its price would affect the total profit of the farmers because the increase in poultry products price could not be commensurate with feed price increase especially due to the dwindling purchasing power of the populace (3).

In Nigeria, the national policy on poultry production is aimed to attain self-sufficiency and become the foremost exporter of poultry products in Africa. But recently, the performance of poultry industry in Nigeria has fallen below expectation due to high cost of feed arising from fluctuations in feed supplies, rising prices of ingredients, poor feed ingredients qualities and inefficiency in production (4).The cost of production may be too high, hence the enterprises are not profitable (5). (6) in their study revealed that the poultry

sector in Nigeria have the potential of meeting the envisaged growth in demand as well as to improve the income of the farmers. However, there is paucity of empirical evidence regarding cost and return as well as on the input/output relationship of egg production among farmers in Oyo state, Nigeria. Hence, based on the aforementioned problems, this study proffered answers to questions such as:

1. What are the socio economic characteristics of the respondents in the study area?
2. What are the input-output relationships of egg production in the study area?
3. What are the cost and return of egg production in the study area?
4. What are the constraints faced by farmers in egg production in the study area?

Materials and Methods

Study Area

The study was conducted in Oyo State. The selection of this location was due to the preponderance of farmers who engaged in egg production.

Study Population

The population of the study consists of registered poultry farmers with Poultry Association of Nigeria (PAN), Oyo state.

Method of data collection

The main source of data was through primary sources. Questionnaires and interview guides were administered to the poultry farmers who engage in egg production.

Sampling procedure and sample size

A multi- stage random sampling techniques were used in selecting the respondents that were utilized in the area of study.

Stage I: This involve purposive selection of Poultry Association of Nigeria (PAN), Oyo state chapter to access poultry farmers.

Stage II: This involved the collection of list of registered poultry farmers from (PAN), Oyo state chapter

Stage III: This involved the use of simple random technique to select 120 farmers from two hundred and seven (207) registered poultry farmers.

Method of data analysis

Analytical tools that were used to analyze the data collected from the study area are;

- Descriptive statistics: This involves the use of frequency, mean, median, and percentage to present the result. This method of data analysis was used to profile the socio economic characteristics of the layers farmers and constraints faced by farmers in the study area.
- Multiple Regression: Multiple regression is a statistical method of analysis that estimates the relationship between one or more independent variables and a dependent variable. It was used for the input/output relationship of egg production in the study area.

Model specification

The functions have the following forms.

$Y=\beta_0+X_1\beta_1+X_2\beta_2+X_3\beta_3+X_4\beta_4+e$

Where;

Y is egg output (crate)

X_1 is labour used (man-hour)

X_2 is flock size (number of birds)

X_3 is amount of feed (₦)

X_4 is medication cost (₦)

A Cobb-Douglas function was chosen as the functional form base on the following;

1. Apriori expectation of signs and magnitude of the regression model
2. Statistical t-value
3. The coefficient of multiple determination (R^2)

Table 1: Socio Economic Characteristics of Poultry egg farmers in Oyo State, Nigeria

Variable	Frequency	Percentage	Mean
Age			
21-30	4	5.3	
31-40	21	17.5	
41-50	53	44.2	48 years
51-60	30	25.0	
61 and above	12	10.0	
Marital status			
Single	16	13.3	
Married	96	80.8	
Divorced	3	2.5	
Widow	5	4.2	
Household size			
1-5	62	51.7	5
6-10	58	48.3	
Educational Status			
No formal education	9	7.5	
Secondary Education	29	24.2	
Tertiary education	82	68.3	

Field Survey, 2019

Table 2: Inputs/output relationship of egg production in Oyo State, Nigeria

Variable	Estimated parameters	B	Std. Error	T value	Sig
(Constant)		27863.109	31651.355	0.880	0.0381
Feed	X_1	1.004	2.556	0.393	0.001***
Labour	X_2	-0.580	0.228	-2.543	0.678
Medication	X_3	0.092	0.040	2.286	0.024**
flock size	X_4	12.372	1.878	6.590	0.001***

*significant at 1%, **significant at 5%, ***significant at 10%, R square = 0.83, Adjusted R square=0.85F=166.3

Budgetary technique

Budgetary technique was used to estimate the cost and return of layers production in the study area. The indicators used include Net Farm Income (NFI) and profitability index. NFI is represented by:

$$\sum_{i=1}^{n} PiYi - \sum_{j-1}^{m} PxjXj - \sum_{k=1}^{k} FK \ldots\ldots\ldots (1) -$$

Where:
NFI = Net Farm Income (per 100 birds)
Yi = Output (in Crates per 100 birds)
Pi = Unit price of outputs (₦/Crate)

Xj= Quantity of variable input per 100 birds (where j = 1, 2, 3,…, m)
Pxi= price/unit of variable input (₦)
Fk = Cost of fixed inputs (where K =1, 2, 3… k fixed inputs)
∑ = Summation sign.

Profitability index (rate of return on an investment) was employed to explain the extent to which a Naira invested into the business will contribute to total value of outputs. The rate of return of investment into an enterprise is the ratio of net income to total cost of egg output.

Table 3: Cost, return and profitability of egg production in Oyo State, Nigeria

Items	Average costs per 100 birds	Percentage
Variable costs		
Cost of day old chicks	45,735	95.5
Cost of feed	901,115	
Veterinary cost	3,928	
Cost of litter	1,424	
Cost of debeaking	506	
Transportation cost	700	
Cost of water	691	
Labour cost	97,410	
Cost of electricity	2,308	
Repair maintenance	2,605	
Total Variable Cost	**₦1,056,422**	
Fixed cost		
Cost of pen	35,491	4.5
Cost of crates	436	
Cost of feeder	1,920	
Cost of drinker	1,299	
Other cost	11,612	
Total Fixed Cost	**₦50,758**	
Revenue		
Quantity in crates	1592	
Price per crates	789	
Revenue from egg	**1,256,088**	
Revenue for manure	**1,754**	
Quantity of spent layers sold	91	
Amount sold	1,260	
Revenue from spent layers	**114,660**	
Total Revenue	**₦1,372,502**	
Total cost	**₦1,107,180**	
Gross profit margin	**₦316,080**	
Net profit margin	**₦276,662**	

Field Survey, 2019

Table 4: Constraints faced by farmers in egg production

Constraints	Very severe	Severe	Not severe	Mean	Rank
ited finance	26(21.7)	60(50.0)	34(28.3)	2.08	2nd
High cost of inputs	26(21.7)	79(65.8)	15(12.5)	2.09	1st
Poor quality of day old chick	17(14.2)	53(44.2)	50(41.7)	1.73	8th
Scarcity of raw materials for chicks, farmers, building equipment	13(10.8)	57(47.5)	50(41.7)	1.69	11th
Lack of storage facilities	22(18.3)	53(44.2)	45(37.5)	1.81	5th
Marketing of products	17(14.2)	64(53.3	39(32.5)	1.82	4th
Lack of extension services	13(10.8)	58(48.3)	49(40.8)	1.70	10th
Theft	16(13.3)	53(44.2)	51(42.5)	1.71	9th
Seasonal egg glut	22(18.3)	44(36.7)	54(45.0)	1.73	8th
Diseases outbreak	24(20.0)	53(44.2)	43(35.8)	1.84	3rd
Adverse weather Condition	21(17.5)	52(43.3)	47(39.2)	1.78	7th
Inadequate feed formulation ingredients	12(10.0)	38(31.7)	70(58.3)	1.52	13th
Unavailability of raw material	19(15.8)	36(30.0)	65(54.2)	1.62	12th
Inadequate Improved technology	16(13.3)	52(43.3)	52(43.3)	1.79	6th

Field Survey, 2019

Result and Discussion

The socio economic characteristics of poultry egg farmers in Oyo State, Nigeria is presented in Table 1.The descriptive statistics showed that (78.3%) of the respondents were male while 21.7% of the respondents were female which implies that male farmers dominated and male farmers tends to carry out rigorous activities associated with layers production and this coincided with the findings of (7) that there were more males in the business of layers production than their female counterparts. It also showed that 44.2% of the respondents were between the ages of 41-50years, 25.0% were within the age of 51-60 years, and 17.5% were within the age of 31-40 years. The mean age of farmers engaging in layers production was 48years. This implies that poultry farmers in Oyo state are still in their productive age which was supported by (8). Also, 80.0% of the respondents were married, 13.3% of the respondents were single. The implication of this finding is that majority of the respondents can be considered to be responsible in taking rational decision that can improve productivity and income. Educational status revealed that 68.3% of the respondents had tertiary education, 24.2% had secondary education while 7.5% had no formal education. This implies that majority of the respondents were literates. Educational level of farm owners is very important in the management of poultry and it is known to affect their farming activities. This is in tandem with the findings of (9). On household size, the descriptive statistics showed that (51.7%) of the respondents had 1-5 household members while 48.3% had 6-10 household members. The mean household size is 5. The implication of this is that poultry egg farmers in Oyo state make use of household members as their source of labour which contributes to reduction in total cost and in turn higher profit.

In Table 2, the inputs/output relationship of egg production in Oyo State, Nigeria is depicted. Multiple regression model was used to identify the relationship between the inputs and output of egg production in Oyo state, Nigeria. The number of egg crates obtained by the farmers were regressed against variables such as labour, flock size, feed and medication cost. It was evident from the table

that flock size, feed and medication cost significantly influence egg output. The result showed that the amount of feed was found to be statistically significant at 10%. The coefficient of the amount of feed used was 1.004. The amount of feed used significantly but positively influence egg output. This implies that a one percentage increase in the amount of feed used will increase layers output by one crate. In other words, increase in this factor would lead to higher output. This result is in consonance to that of (10). Flock size was found to be statistically significant at 10% with a positive value of coefficient 0.092. This implies that the higher the number of birds, the more the poultry egg. The findings also showed that medication cost had a positive and significant relationship with the egg output. This implies that the higher the medication cost, the higher the egg output.

The result of cost, return and profitability of egg production by farm sizes in Oyo State, Nigeria was presented in Table 3. It was found that 95.5% of the cost of production was on the variable inputs. The data in Table 3 shows that the total revenue was ₦1,372,502, total fixed costs was ₦50,758 and total variable costs was ₦1,056,422 per production season. The total cost per production season was ₦1,107,180 while the gross profit margin was ₦316,080 and net profit margin of ₦276,662 per production season. The return on investment was 0.30 for egg production in the study area. The result showed that egg production is a profitable enterprise because for every ₦1 invested in the business, it yielded ₦0.30. This finding is almost in agreement with the findings of (11), who reported ₦1.20 as returns per naira invested on egg marketing in Bauchi Metropolis of Bauchi State, Nigeria.

Table 4 showed the constraints faced by farmers who engage in egg production in Oyo state. The results indicates that high cost of inputs (mean=2.09) had the highest and was ranked first, other constraints include limited finance (mean=2.08), diseases outbreak (mean=1.84), marketing product (mean=1.82), lack of storage facilities (mean=1.81) were ranked 2nd, 3rd, 4th and 5th respectively. Unavailability of raw materials (mean=1.62) and inadequate feed formulation ingredients (mean=1.52) were the least constraints and were ranked 12th and 13th. Respondents rated high cost of inputs and limited finance as the most important problem. This could be the reason why farmers could not acquire the necessary inputs especially fixed inputs for large scale production which attracts higher profit and efficiency. Supporting this assertion, (12), in his work found that technical efficiency was highly influenced by financial constraints. This is because in addition to the quantity of inputs used, the timing of input usage also affects farm output.

Conclusion and Application

1. Majority of the farmers involved in egg production in Oyo state were literate adult male with the mean age of 48 years.
2. The use of feed, medication and flock size influences egg output.
3. Furthermore, egg production in Oyo State is a profitable venture with a gross profit margin of ₦316,080 per production season (100 layers).
4. However, high cost of inputs, limited finance and disease outbreak are the major constraints of layers production. Therefore, credit granting institutions should further be strengthened and encouraged to render special financial services to poultry farmers at low interest rate in order to enhance the viability and sustainability of egg production in Oyo State.

Acknowledgements

The authors wish to appreciate the Poultry Association of Nigeria (PAN), Oyo state chapter for providing the necessary data used in this study.

References

1. Ajibefun, I.A. and A.G. Daramola, (2000). *Measurement and Sources of Technical Inefficiency in Layers Production in Ondo State*, Nigerian Journal of. Rural Economy, 10: 85-93.
2. Sani, I. (2015). *Analysis of Efficiency of Poultry Feed Production in Nigeria*. Unpublished PhD Dissertation. Postgraduate School, Ahmadu Bello University, Zaria, Nigeria.
3. Hassan, A. A. (2014). *Profitability and Production Efficiency of Commercial Layers Enterprise in Kaduna State, Nigeria*. Unpublished PhD Dissertation. Postgraduate School, Ahmadu Bello University, Zaria, Nigeria.
4. Olatunji, S. and Ifeanyi-Obi, S. (2011). *Relative Difficulties Experienced by Framers in Obtaining Agricultural Production Inputs in Abia and Akwa-Ibom States of Nigeria*, Journal of Agricultural and Social Research (JASR), 11(1): 185.
5. Adene, D.F. and Oguntade, A.E. (2009). *The structure and importance of the commercial and village-based poultry industry in Nigeria*. FAO (Rome) Study. 66 pp.
6. Heinke, H., Alexandia, C., and Ludwig, T (2015). *The Poultry Market in Nigeria: Market Structures and Potential for Investment in the Market*. International Food and Agribusiness Management issues, 18(5).
7. Ajala, M.K., Nwagu, B. I., Sekoni, A. A. and Adesehinwa, A. O. K. (2007). "*The Profitability of Turkey Production in Zaria, Kaduna State, Nigeria*." Asian Journal of Information Technology, 6(1):27-33.
8. Onwumere, O.M and Obasi, D.T (2010). *Investigating Technical Efficiency and Potential Technological Change in Dutch Pig Farming*. Agriculture Systems, 79,353-367.
9. Iheanacho, A.C. (2005). *Structural Characteristics and Performance of Retail Marketing of Eggs in Maiduguri Metropolis of Borno State, Nigeria*, Journal of Sustainable Development and Agricultural Environment Issues:1(1)
10. Clauer E (2010). *Small—scale poultry production; raising fowl in Urban Areas*. Ag Communication and Marketing, the Pennsylvania State University; 2010.
11. Haruna, U., Sani, M.A., Danwanka, H.A and Adejo, E. (2012). *Economic Analysis of Fresh Tomato Marketers in Bauchi Metropolis of Bauchi State, Nigeria*. Nigeria Journal of Agriculture, Food and Environment, 8(3):1-8.

12. Liu, Y. (2006). "*Model selection and implication in Stochastic Frontier Analysis: Maize production in Kenya*. Michigan State University International Development Working Paper.