



## **PROFIT EFFICIENCY OF POULTRY FARMERS IN IREPODUN LOCAL GOVERNMENT AREA OF KWARA STATE, NIGERIA**

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### **ABSTRACT**

The study was conducted to determine the profit efficiency of poultry production in Irepodun Local Government Areas in Kwara State, Nigeria. A total of 85 poultry farmers were selected using a two-stage sampling procedure. Primary data were collected with a structured questionnaire. Descriptive statistics, farm enterprise budgeting technique and stochastic profit frontier model were used to analyze the data collected. Poultry farming was profitable in the area with a gross margin, net farm income and gross ratio of ₦204,692.76, ₦193,492.78 and 0.4923, respectively. Number of brood stock, price of produce, cost of labour and feed, farming experience, access to extension and borrowed capital were significant factors influencing the level of the farmers' profit efficiency. About 66% of the poultry farmers were profit efficient. The most prevalent constraints faced by the farmers by weighted mean were high cost of feed (3.89), high cost of acquiring credit facilities (3.87), climate change variability (3.87), limited capital (3.52), middlemen exploitation (3.42) and inadequate extension and advisory services (3.41). The study concluded that the farmers were not profit efficient. Thus, it was recommended that farmers should reallocate their resources to attain profit efficiency.

**Keywords:** Poultry, Profit, Efficiency, Farmers, Irepodun LGA.

### **INTRODUCTION**

The Nigeria's livestock population consists of 16.3 million cattle; 40.8 million goats; 27 million sheep; 3.7 million pigs and 151 million poultry (Nasiru *et al.*, 2012). Following this statistic, poultry constitutes more than 60% of the total livestock population, indicating the dominance and importance of poultry sub-sector in the livestock industry. Unites State Department for Agriculture (USDA, 2013) in Sahel Capital (2015) has rated Nigeria as the leading Africa country with respect to egg production but the fourth in broiler production. Poultry production is gaining popularity in most developing countries due to the role it plays in bridging the protein malnutrition in their diets. Poultry is ranked fourth among the sources of animal protein for human consumption in Nigeria and it also contributes about 27% of the national meat production and 42% of the total livestock output (Bukunmi and Yusuf, 2015). This is so because, compared to other groups of livestock such as rabbit, sheep, goat and cattle, poultry has the fastest rate of economic returns. Asides from the nutritional importance of poultry products, the economic importance of poultry industry cannot be underestimated. It creates employment for a considerable percentage of the population. Poultry production is practiced at all levels ranging from the subsistence (small scale) to the commercial (large scale) operations.

Poultry farming is a lucrative and profitable agricultural enterprise. Small scale poultry production is nonetheless affected by diverse factors and production constraints and has suffered a great deal of losses. Many small-scale operators in the poultry industry have been



forced out of business due to myriads of factors such as diseases, shortage and high cost of quality feed. Farmers' characteristics, lack of proper management and traditional methods used by poultry farmers among other factors are responsible for the low productivity in Nigeria. Some other challenges faced by poultry farmer is lack of quality feed, outbreak of disease, middlemen exploitation and climatic change which has affected their production inefficiencies. But to optimize production and ensure profitability and, there is need for efficient allocation of the resources employed in the enterprise. However, little or nothing has been done to look at the profit efficiency and factors influencing it among poultry farmers in Irepodun Local Government Area of Kwara State, Nigeria. In order to design appropriate policies that will bring about an efficient poultry production, there is need to carry out a study on efficiency in poultry production in the area and Nigeria as a whole. Therefore, this study sought to estimate the profit efficiency of poultry farmers and identify those factors that determine their level of profit efficiency in the area.

The outcome will enable policy makers to identify areas for potential improvement considering the need to enhance production efficiency and profitability among the small-scale poultry farmers in Irepodun local government area of Kwara State. Particularly, this study helped to understand the levels of profit efficiency or inefficiency and identified the associated socio-economic factors and management practices that can be addressed to improve profit efficiency among farmers under study. It equally contributed to the general body of knowledge and provided basis for future research on the subject matter in the study area.

## **MATERIALS AND METHODS**

### **The Study Area**

The study was conducted in Irepodun Local Government Area of Kwara State, Nigeria. The LGA is located on Latitude 8°20'N and Longitude 4°59'E. It shares boundaries with Ifelodun LGA to the North, Osun State to the South, Ekiti and Offa LGAs to the East and West respectively. The LGA is dominated by Yoruba (Igbomina) people. According to 2006 National Population Census (NPC, 2006), the population of the LGA is 148,610. It has a total land area of 737 square kilometer. It is endowed with savannah/rain forest vegetation that supports agriculture. Major crops grown include maize, cassava, rice, sorghum, cashew, yam and cocoa among others.

### **Sampling Procedure**

A 2-stage sampling procedure was used in selecting poultry farmers from the local government area. At the first stage, seven (7) communities where poultry production is prevalent were purposively selected. At the second stage following Adewumi *et al.* (2018), 10% of the farmers were proportionately selected from each of the villages. This gave a total sample size of 85 for the study.

### **Method of Data Collection**

Primary data were used for this study. The data were obtained from the respondents with the use of structured questionnaire which was complemented with the interview schedule. Two well-trained and resident enumerators from each of the selected communities assisted in the administration of the questionnaire.

### **Method of Data Analysis**

The analytical tools used were descriptive statistics, farm enterprise budgeting technique and stochastic profit frontier model. Descriptive statistics which include mean together with a 5-point Likert type scale were used to analyze farmers' production constraints.



The farm enterprise budgeting technique adopted from Ibeun *et al.* (2018) and Durba *et al.* (2019) was used to estimate the gross margin and the net farm income accruing to the poultry producers in the study area. The model for estimating the GM and NFI is represented below.

$$GM = TR - TVC \quad \dots(1)$$

$$NFI = TR - TVC - TFC \quad \dots(2)$$

where;

NFI = Net farm income (Naira)

GI = Gross income (Naira)

TVC = Total variable cost (Naira)

TFC = Total fixed cost (Naira)

TR = Total revenue

A prototype stochastic profit frontier model adopted from Sadiq (2015) was used to analyze the profit efficiency of the poultry farmers. The Cobb-Douglas stochastic frontier production function was used for this study because it has been widely used in agricultural studies and because of its mathematical simplicity. It is specified thus:

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + v_i - u_i \quad \dots(3)$$

where;

Y = Poultry profit (Naira)

X<sub>1</sub> = Number of brood stock (number of birds)

X<sub>2</sub> = Cost of labour (Naira)

X<sub>3</sub> = Cost of water (Naira)

X<sub>4</sub> = Cost of feed (Naira)

X<sub>5</sub> = Cost of medication/vaccination (Naira)

X<sub>6</sub> = Unit price of produce (Naira)

V<sub>i</sub> = random or statistical disturbance term which captures the effect of weather and other factors outside the control of the farmer.

U<sub>i</sub> = farmer and farm specific characteristics related to production efficiency (profit inefficiency effects).

The model below was used to estimate the inefficiency model.

$$-U_i = \partial_0 + \partial_1 Z_1 + \partial_2 Z_2 + \partial_3 Z_3 + \partial_4 Z_4 + \partial_5 Z_5 + \partial_6 Z_6 \quad \dots(4)$$

where;

-U<sub>i</sub> = Profit inefficiency of the i<sup>th</sup> poultry farmer

Z<sub>1</sub> = Farming experience (years)

Z<sub>1</sub> = Education (years of formal education)

Z<sub>1</sub> = Access extension visits (number of visits)

Z<sub>1</sub> = Sex (male = 1, female = 0)

Z<sub>1</sub> = Age (years)

Z<sub>1</sub> = Access to borrowed capital (Naira)

β<sub>0</sub>, ∂<sub>0</sub> = Constant

β<sub>1</sub>-β<sub>6</sub> = Coefficients of efficiency variables

∂<sub>1</sub>-∂<sub>6</sub> = Coefficients of inefficiency variables

X<sub>1</sub>-X<sub>6</sub> = Efficiency variables

Z<sub>1</sub>-Z<sub>6</sub> = Inefficiency variables

Ln = Natural Logarithm



## RESULTS AND DISCUSSION

### Profitability Analysis of Poultry Production in the Study Area

The result of the profitability analysis of poultry farmers in the study area is presented in Table 1. It revealed that the total variable cost per 100 birds produced was ₦176,443.19. The cost incurred on feed, brood stock, and labour were ₦96,356.89, ₦25,270.92 and ₦21,207.68 respectively. The total fixed cost incurred was ₦11,199.98 while the total cost of production and total revenue were estimated to be ₦187,643.18 and ₦381,135.96, respectively. The gross margin and net farm income were ₦204,692.76 and ₦193,492.78. The gross ratio of 0.4923 implied that 49.23% of the total revenue was sufficient to cover the total cost of producing 100 poultry birds in the study area. This result is similar to those of Bamiro *et al.* (2015) and Adewumi *et al.* (2021) who reported that livestock farming is profitable in Nigeria. The finding revealed that aside the fact that poultry farming was profitable in the area, it also showed that it is very economical to start up a farming as a business and hence, could serve as a source of employment opportunity and livelihood to teeming population of unemployed youths in the area and Nigeria as a whole.

**Table 1:** Profitability analysis of poultry production in the study area

Cost items	Average (₦/100 birds)	% of total cost
<b>Variable cost (VC)</b>		
Purchase of birds (brood stock)	25,270.92	13.47
Labour	21,207.68	11.30
Feed	96,356.89	51.35
Transportation	7,534.73	4.02
Medication/vaccination	19,748.70	10.52
Water	6,324.27	3.37
Total variable cost (TVC)	176,443.19	94.03
<b>Fixed cost (FC)</b>		
Interest of credit	9,046.15	4.82
Depreciation on farm tools	2,153.83	1.15
Total fixed cost (TFC)	11,199.98	5.97
Total Cost (TC = TVC+TFC)	187,643.18	100.00
Total revenue (TR)	381,135.96	
Gross margin (GM = TR-TVC)	204,692.76	
Net farm income (NFI = TR-TC)	193,492.78	
Gross Ratio (GR = TC/TR)	0.4923	

Source: Field survey data, 2021

### Level of Profit Efficiency Among the Poultry Farmers

The profit efficiency indices were estimated using computer programme Frontier 4.1. The indices in Table 2 showed that the profit efficiency of the sampled poultry farmers was less than 100%, which implied that all the farmers in the study area were producing below the maximum efficiency frontier. However, the mean profit efficiency of 0.6612 (66.12%) implied that on the average, farmers in the study area were able to obtain about 66% of poultry profit from a given mix of production inputs. The average profit efficiency level of 66.12% for the poultry farmers in the study area was lower than the 83.62% and 82.99% reported by Akanbi (2014) for cultured fish production by fish farmers in Kwara and Kogi States of Nigeria,



respectively. The maximum value of 95.35% obtained showed that some farmers operated very close to the optimum frontier level while the minimum of 24.29% showed that there was still room for the improvement of the profit inefficient farmers.

**Table 2:** Estimates of the level of profit efficiency

Profit efficiency class score	Frequency	Percentage
< 0.31	4	4.71
0.31 - 0.40	6	7.06
0.41 - 0.50	12	14.12
0.51 - 0.60	10	11.76
0.61 - 0.70	11	12.94
0.71 - 0.80	13	15.29
0.81 - 0.90	21	24.71
0.91 – 1.00	8	9.41
Total	85	100.00
Mean	0.6612	
Minimum	0.2429	
Maximum	0.9535	

Source: Field survey data, 2021

### Factors Influencing the Profit Efficiency of the Farmers

The estimates of the parameters of stochastic profit frontier model are presented in Table 3. Estimates of the parameters of the stochastic frontier production model revealed that the estimated coefficients of number of brood stock and price of produce of the profit efficiency function were positive and significant at 1% and 5% levels of significance, respectively. This implies that the farm level profit of the poultry farmers is being influenced by these variables. Specifically, a unit increase in number of brood stock and price of produce will lead to increase in the profit of the farmers by 0.0017 and 0.0015, respectively. This result is similar to that of Sadiq (2015) who reported that scale of operation and price of output influences the level of profit in agricultural production in Niger State.



**Table 3:** Estimates of factors affecting the profit efficiency of the poultry farmers

Variables	Coefficient	t-ratio
<b>Profit efficiency model</b>		
Constant	7.6481	5.42***
Number of brood stock	0.0017	2.61***
Cost of labour	-0.0021	-3.40***
Cost of water	-0.0013	-0.42
Cost of Feed	-0.2948	-5.82***
Cost of medication/vaccination	0.0006	1.24
Sale price/unit	0.0015	2.06**
<b>Profit inefficiency model</b>		
Constant	-2.2929	-0.78
Farming experience	-0.0040	-1.97**
Education	0.0337	0.58
Access extension visits	-0.2392	-1.88*
Sex	0.6280	0.76
Age	0.0376	0.75
Access to borrowed capital	-0.0009	-2.05**
<b>Diagnostic statistics</b>		
Sigma-squared	0.7038	3.13***
Gamma	0.9761	7.06***

Note: \*\*\*, \*\* and \* implies significance at 1%, 5% and 10% levels, respectively.

Source: Field survey data, 2021

The coefficients of cost of labour and cost of feed were negative and significant at 1% and 1% levels of significance respectively in influencing the farm level profit of the poultry farmers. This implies that a unit increase in cost of labour and feed will likely reduce the profit of the farmers. This further suggest the high cost of production inputs will significantly suppress the level of profit in poultry farm enterprise in the area.

The results (Table 3) further revealed that profit inefficiency effects existed in poultry production in the study area. The estimate of the sigma-square (0.7038) was significantly different from zero at 1% level of significance, attesting to the goodness of fit of the model. The estimated gamma (0.9761) was also significant at 1% level of significance implying that 97.61% variation in poultry profit was due to the profit inefficiencies of the farmers in the area. The inefficiency model indicated that the farming experience, access to extension and access to borrowed capital were negatively signed and significant at 5%, 10% and 5% levels of significance, respectively. This means that an increase in these variables will likely reduce the profit inefficiency of the poultry farmers in the area. Increase in amount of credit accessed will enhance the acquisition of more production inputs required for production expansion; more years of farming experience means more perfection in application of skills and allocation of scarce resources and more extension contact implies more enlightenment on best farming practices that can collectively positively influence the profit efficiency of the farmers in the area. This finding is similar to those of Ojo *et al.* (2009); Ogunniyi (2011); Oladeebo and Oluwaranti (2012) and Sadiq (2015) who reported that farming experience, access to extension services and borrowed capital have significant influence on for farmers profit inefficiencies in agricultural production in Nigeria.





### Production Constraints to Poultry Farmers in the Study Area

The result of the production constraints encountered by the poultry farmers in Irepodun LGA or Kwara State is presented in Table 4. It revealed that the poultry farmers were faced with many production constraints. The most prevalent constraints as perceived by the farmers in order of severity by weighted mean were high cost of feed (3.89), high cost of acquiring credit facilities (3.87), climate change variability (3.87), limited capital (3.52), middlemen exploitation (3.42), inadequate extension and advisory services (3.41), low and unattractive prices for produce (3.38), high cost of acquiring breed stock (3.20) and inadequate co-operative or farm association (3.01). A critical assessment of these constraints and how they interplay and influence the poultry farmers' production activities calls for concern. These constraints combined together if not alleviated are a great threat to the productivity and livelihood of the poultry farmers in the study area. This result is similar to those reported by Bamaiyi (2013), Dambatta *et al.* (2016), Jacob (2019) and Adewumi *et al.* (2021) for livestock farmers in Nigeria.

**Table 4:** Constraints to poultry production in the area

Constraints	Weighted Sum	Weighted Mean	Remark
High cost of feed	331	3.89	Severe
High cost of acquiring credit facilities	329	3.87	Severe
Climate change variability	329	3.87	Severe
Limited capital	299	3.52	Severe
Middlemen exploitation	291	3.42	Severe
Inadequate extension and advisory services	290	3.41	Severe
Low and unattractive prices for produce	287	3.38	Severe
High cost of acquiring breed stock	272	3.20	Severe
No co-operative or farm association	256	3.01	Severe
Inadequate processing/storage facilities	253	2.98	Not Severe
High cost of medication	251	2.95	Not Severe
Difficulty in getting good quality breed	249	2.93	Not Severe
Inadequate access to quality water	248	2.92	Not Severe
Inadequate market information	245	2.88	Not Severe
Poor feed quality	244	2.87	Not Severe
Limited livestock capacity	242	2.85	Not Severe
High mortality rate	241	2.84	Not Severe
High incidence of disease	235	2.76	Not Severe
Pilfering/theft	209	2.46	Not Severe

Source: Field survey data, 2021

### CONCLUSION AND RECOMMENDATIONS

The study concluded that the enterprise was profitable Irepodun LGA of Kwara State, Nigeria despite the constraints to effective and efficient production faced by the poultry farmers. The farmers were not profit efficient. Poultry farming experience and access to extension services increase the farmers' profit efficiency in the enterprise significantly while costs of labour and feeds significantly reduce it. The following recommendations were made:

1. Farmers should reallocate their resources to attain profit efficiency.



2. Government should establish agricultural banks close to the farmers with minimum (single digit) interest rate and as well help the poultry farmers in stabilizing the price and create conducive market environment most especially during the festive periods.
3. Competent extensionists should be employed to visit and enlighten poultry farmers on the technicality of production processes and how they can formulate feeds for their birds. This will not only enhance the skills of the farmers but also create employment opportunity mainly to the youth and profoundly increase their incomes.

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