

# Profitability and Constraints of Poultry Egg Enterprise in Ogun State, Nigeria

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## Abstract

Poultry is an important sub-sector in the livestock sector of any economy and it plays a very significant role in economic development. The study sought to reveal the profitability of the three scales of poultry layer production in Ogun State, Nigeria. The study employed multistage sampling procedure to select 180 respondents. Data was obtained from the farmers with the use of well-structured questionnaire. Profitability analysis was carried out using budgeting technique where the farmer's revenue, variable cost, fixed cost and other profitability ratios were estimated. It was shown that all the three levels of enterprise were profitable and the level of profitability increases as the scale of production increases. Constraints were analysed using the Importance ranking indices matrix where it was discovered that majority of the farmers rank inadequate finance as the most important constraints followed by high cost of feed, low and fluctuating price of egg followed on the list of importance. The industry is very lucrative, so new entrance should be encouraged by providing enabling environment for both existing and new in order to reduce poverty level and protein deficiency in the country.

**Key words:** Profitability; Constraints; Poultry egg production; Nigeria; Ogun State

## Introduction

Livestock industry is of importance to Nigeria economy and millions of rural and urban poor depends on it as source of their livelihood (Akpabio *et al.*, 2007). The sector contributes to the health and nutrition of the household, supplementing incomes, supply necessary inputs, source of employment to the populace and store of wealth when needed. Poultry a sub-sector in livestock industry contributes immensely to the rapid economic growth (Ekunwe and Soniregun, 2007). Advantage of poultry over other livestock cannot be overemphasized. Poultry birds convert feed into meat and eggs which are sources of protein. Poultry products are highly acceptable and prefer by consumers. It is an enterprise widely carried out in all part of the country, with ready market for the products due to no socio-cultural and religious barriers associated with its consumption (Ojo, 2003). Poultry has always been an important livestock sector and provides abundant relatively cheap food of high quality (Bosnjak and Rodic, 2008; Alders and Pym, 2009). Provision of meat and egg, are the major output of poultry which added to animal protein consumption of households. Poultry production outshine other livestock production sectors in many economic advantages, such as higher rate of capital turn over, ease of management and quick return to investment (Torki and Al-Sharafat, 2013). High rate of population growth (2.83%) has led to increase in demand for food (3.5%) while food production increases at the rate of 2.5% this causes a widening gap between domestic food production and total food requirement. Thus increasing in food importation and hike in food prices. To solve this problem, the level of profitability of various scales of poultry egg production and how it can be increased should be looked into since maximization of profit is prime goal of business enterprises and dependent on how efficient the productive resources are utilized.

Profitability connotes ability to make profit from all business activities of an organization, company, firm, or an enterprise. It shows how efficiently the management is in combining market inputs at his disposal. Average cost of production per unit declines as the scale of operation grows. Therefore, farms grow in size to benefits from economic use of inputs capable of increasing output with less labour. Economies of scale result from spreading fixed costs over a large number of units of production. Fixed cost per unit declines as the number of units produced increases which will result in total cost per unit declining.

Farm classification is based on the particular environment been considered and measure of size to be used depends on the objectives of the farm size comparison needed (Adesimi, 1982). In view of this, this research work classified the poultry farm into three based on the size of the farm in the following order: farms with less than 1,000 birds is small scale farm, those that have below 5,000 is medium scale farm while those with 5,000 and above is large scale farm. The major constraint facing poultry egg enterprise had been considered as high cost of feed, high cost of medicine and vaccine, non-remuneration price for eggs, supply of poor feed and feed ingredients and in availability of easy access funds, cost and type of fuel/ energy. (Rajendran and Mohanty 2003; Ekunwe and Soniregun, 2007, Sefeedpari et al, 2013)

In line with the above, this paper seeks to undertake an analysis of the profitability and constraints in various scales of poultry egg production in Ogun State, Nigeria. The specific objectives however are to: analyze the costs and returns of poultry egg farmers of different scales of production and identify and rank the constraints encountered by poultry egg farmers in the study area.

## Materials and Methods

Abeokuta, the state capital of Ogun State in south-west Nigeria has a land mass of about 1.7 million hectares. Ogun State shares a boundary with the Republic of Benin in west and Oyo State in north, Lagos State in South and Ondo State in East (Yusuf and Malomo, 2007). The population of the state stands at 3.7 million and has about 2.5 per cent of the Nigerian population (NPC, 2006). Ogun State lies within latitude 6°N and 7°N and longitude 2.5°E. The state has two distinct seasons, rainy season and dry season with two main types of vegetation, namely, derived savannah and guinea savannah. The state has heavy concentration of the poultry production, particularly layers production. Three-stage sampling technique was used to select poultry (egg) farms for this study. The first stage involved the selection of two agricultural zones in Ogun State as defined by the Ogun State Agricultural Development Programme (OGADEP). These are Abeokuta and Ikenne Zones. The second stage involved random selection of three Local Government Areas (LGAs) in each of the agricultural zones. These are Abeokuta North, Abeokuta South and Ewekoro LGAs in Abeokuta zone; Sagamu, Remo North and Obafemi-Owode LGAs in Ikenne zone. The last stage involved purposive selection of 30 poultry egg farms in each of the LGAs, where farmers were stratified into small scale farmers (farmers having less than 1,000 birds); medium scale farmers (farmers having between 1,000 and less than 5,000 birds); and large scale farms (farmers having 5,000 and above birds). Altogether, a total of 180 farmers were interviewed.

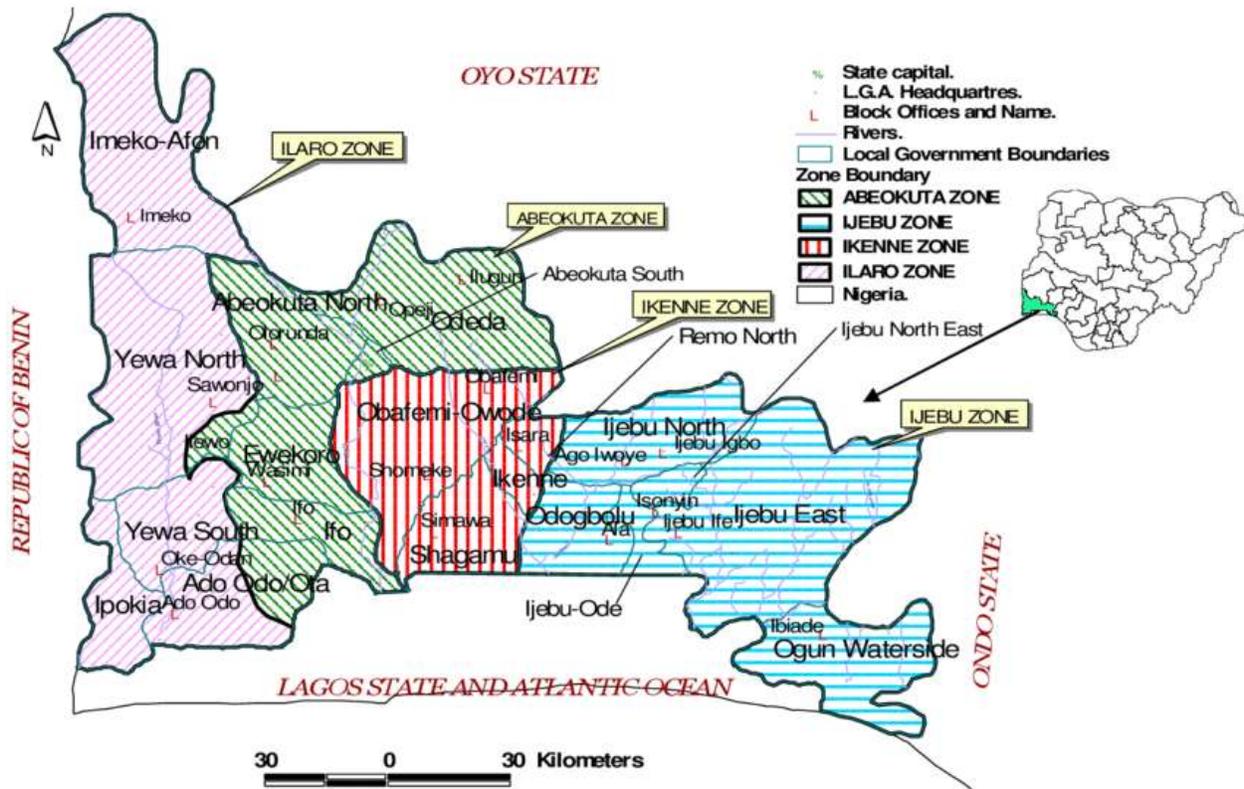


Fig 1: Map of Ogun State ADP Zones showing the study area

Primary data were collected from poultry egg producers using a survey method involving a pre-tested structured questionnaire. Data collected includes demographic characteristics of poultry egg farmers, quantity and price of inputs and outputs, constraints to poultry production among others. A budgetary technique was employed to estimate the profitability of egg production, the various types of inputs used and their costs implication using enterprise budget analysis. The costs were divided into variable costs and fixed costs. The variable costs include the cost of labour, day old chicks, veterinary services, transport, feeding, rent charges on land used and general management on birds. Fixed costs include depreciation on fixed assets (e.g. building, battery cage, water tanks, etc.); this was charged using straight-line method. The enterprise budget equations are;

$$\text{Gross Margin, } GM = p_i q_i - r_i x_i \dots \dots \dots (1)$$

- Where:
- $p_i$  = average price of eggs in tray and culled layers (₦)
  - $q_i$  = average quantity of eggs sold in tray and culled birds (₦)
  - $r_i$  = average price of variable inputs (₦)
  - $x_i$  = average quantity of variable inputs used (kg)

Subsequently, a net return was obtained from gross margin.

$$\text{Net returns} = GM - \text{TFC}$$

Where, TFC = Total Fixed Cost.

Economic ratios employed to measure economic performance of the three groups of farms are: Rate of Return on Investment (ROI); Operating Expenses Ratio (OER); Profitability Index (PI) and Capita Turnover (CTO) were used to measure economic performance of the three groups of farms.

(i) Rate of Return on Investment (ROI) shows the amount gained on every naira (₦) invested. It is measured as:

$$ROI = \frac{NFI}{TC} * 100 \dots\dots\dots (2)$$

Where: NFI is Net Farm Income  
TC is Total Cost.

(ii) Operating Expenses Ratio =  $\frac{TotalVariableCost}{GrossRevenue} \dots\dots\dots (3)$

(iii) Profitability Index =  $\frac{NFI}{TR} * 100 \dots\dots\dots (4)$

(iv) Capital Turnover ratio is one of the concepts of discount method of project evaluation

$$CTO = \frac{TotalRevenue}{TotalCost} \dots\dots\dots (5)$$

**Importance Indices**

Importance ranking index was used in order to identify the relative importance of constraints to poultry production in the study area. This study employed the method by Alimi *et al.*, (2001). For construction of the indices, poultry farmers were asked to list and rank the constraints to poultry production in an ordinal scale (1 was assigned to the most important, 2 the next important and sequentially in descending order of importance) and it is specified as:

$$A = \begin{vmatrix} f_{11} & f_{12} & \dots & f_{1n} \\ f_{21} & f_{22} & \dots & f_{2n} \\ \vdots & \vdots & & \vdots \\ f_{m1} & f_{m2} & \dots & f_{mn} \end{vmatrix} \dots\dots\dots (6)$$

$$B = \begin{vmatrix} W1 \\ W2 \\ . \\ . \\ Wm \end{vmatrix} \dots\dots\dots (7)$$

$$C = AB = \begin{vmatrix} f_{11} & f_{12} & \dots & f_{1n} \\ f_{21} & f_{22} & \dots & f_{2n} \\ \vdots & \vdots & & \vdots \\ f_{m1} & f_{m2} & \dots & f_{mn} \end{vmatrix} \begin{vmatrix} W1 \\ w2 \\ . \\ . \\ Wm \end{vmatrix} = \begin{vmatrix} C1 \\ C2 \\ . \\ . \\ Cm \end{vmatrix} \dots\dots\dots (8)$$

Matrix A gives the distribution of poultry farmers on each type of constraints facing poultry enterprise according to constraint type ranking. The matrix indicates that there are ‘m’ constraint types to be put in ‘n’ categories of rank. Matrix B is the weight attached to each of the ranks, W1 is the weight attached to rank j where i=j, i= 1, 2...m and j=1, 2 ...n. W1 is the weight attached to rank 1, W2 to rank 2 etc.

Matrix C gives the product of matrices A and B (AB). It is the total value of importance attached to each constraint types. For example C2= f<sub>21w1</sub>+ f<sub>2nwm</sub> = total value of impotence attached to constraint type 2. C1 is the total value of importance attached to constraint type i.

Importance rating for constraints type i=  $\frac{1}{\lambda_1} C1$

Where  $\lambda_1 = f_1$  = total number of farmers selecting constraint type I as important.

$$Importance\ index = \frac{C1}{f_i} \times \frac{f_{i1}}{\sum_{i=1}^m f_{i1}}$$

**Results and Discussion**

**Costs and returns (₦) to small, medium and large-scale poultry egg enterprise**

The estimated costs and returns to the enterprises on a unit of bird stocked were ₦ 4,712.69 and ₦ 6,293.72 respectively for small scale, ₦ 4,674.32 and ₦ 6,470.23 respectively for medium scale and 4,150.93 and 5,904.12 respectively for large scale (Table1). The variable production inputs were feeds, chicks, drugs and medication, labour, transport, utility and other costs. Feeds constituted the highest percentage of the costs, accounting for 66.65 per cent of the total cost for small scale, 67.99 for medium scale and 70.97 for large scale production. These is in line with Oladeebo and Ojo (2012) which claimed that feed cost is the largest single variable cost item associated with poultry egg production. This is followed by the cost of labour, medication and cost of chicks stocked respectively while utility and other necessary costs constituted the least in the cost of production.



Fig 2: Small scale enterprise



Fig 3: Medium scale enterprise



Fig 4: Large scale enterprise

The value of sales from egg accounted for 85.97 per cent in small scale production, 88.07 per cent in medium scale and 85.56 per cent in large scale production of the total revenue. The Net Farm Income (NFI) per bird from

the enterprise were ₦1, 581.03, ₦1,795.91 and ₦1,753.19 respectively while the gross margin was ₦1,765.5, ₦1,964.54 and ₦1,874.95 respectively. The profitability index was 0.25, 0.28 and 0.30 respectively while the rate of return on investment was 33.55, 38.42 and 42.24 percent. This implied that for every naira invested in poultry egg production enterprise in this categories, there was a return of 33.55 per cent (₦ 33.55) , 38.42 percent (₦38.42) and 42.24 percent (₦42.24) to the enterprise respectively and the operating ratio for small scale was 71.95 per cent which indicated that about 72 per cent of gross revenue was used to cover the operating expenses and the remaining 28 percent is for farmer's equity, this also goes for the medium and large scale with the values of 69.64 and 68.24 respectively. The capital turnover value implied that for every naira invested in the various scales of poultry egg production, ₦1.34, ₦1.38 and ₦1.42 were returned to the farm as revenue respectively. This measure of performance showed that the three scales of poultry egg enterprise were viable.

Table 1: Costs and returns (₦) to small, medium and large scale poultry egg enterprise

S/N	Item(s)	Small Scale	Medium Scale	Large Scale
		Mean amount (₦)	Mean amount (₦)	Mean amount (₦)
1	Revenue			
I	Egg	5,410.74 (85.97 )	5,698.52 (88.07)	5,051.55 (85.56)
li	Spent layers	846.84 (13.46 )	750.83 (11.60 )	823.54 (13.95 )
lii	Empty bags/manure	36.14 (0.57)	20.88 (0.32)	29.11 (0.48)
A	Total Revenue (TR)	6,293.72	6,470.23	5,904.12
2	Variable costs:			
I	Stocking	140.79 (2.99)	155.32 (3.32)	150.53 (3.63)
li	Feeding	3,140.80 (66.65)	3,177.99 (67.99)	3,140.80 (70.97)
lii	Labour	709.02 (15.04)	651.30 (13.93)	487.30 (11.74)
Iv	Transport	119.91(2.54)	101.30 (2.17)	74.28 (1.79)
V	Medication	322.48 (6.84)	339.29 (7.26)	311.30 (7.50)
Vi	Utility and other costs	95.21 (2.02)	80.49 (1.72)	59.78 (1.44)
B	Total variable costs (TVC)	4,528.21 (96.09)	4,505.69 (96.39)	4,029.25 (97.07)
C	Gross margin (GM) = (TR – TVC)	1,765.51	1,964.54	1,874.95
3	Fixed costs:			
I	Depreciation on building	83.69 (1.76)	75.18 ( 1.61)	57.82(1.39)
li	Depreciation on cage	82.89 (1.76)	50.07 (1.07)	40.23 (0.97)
lii	Depreciation on other fixed inputs	17.90 (0.38)	43.38 (0.93)	23.63 (0.57)
D	Total fixed costs (TFC)	184.48 (3.91)	168.63 (3.61)	121.68 (2.93)
E	Total costs (TC) = (TFC + TVC)	4,712.69	4,674.32	4,150.93
F	Net Farm Income (NFI) = (TR – TC)	1,581.03	1,795.91	1,753.19
G	Rate of return on investment (ROI) = f/e*100	33.55	38.42	42.24
H	Operating Expenses Ratio (OER) = b/a*100	71.95	69.64	68.24
I	Capital Turnover (CTO) = a/e	1.34	1.38	1.42
J	Profitability Index (PI) = f/a	0.25	0.28	0.30

Figures in parentheses represent percentage.

#### Performance ratios for the three categories of poultry farmers

From the results of performance ratios of poultry egg enterprise by farm size in Table 1 and 2, it was found that over 90 per cent of total cost of production was on the variable inputs. The results also revealed that the large farm had the lowest cost of production per unit bird and as the farm size decreases, the total cost of production increases. This result supports the findings of Olagunju (2007) which claimed that the differences in the cost incurred by the farmers were as a result of economies of scale which was more favourable to the large scale producers than others. The net farm income (NFI) per bird from the enterprise for small farm was ₦1,581.03 and that of medium and large farm size were ₦1,795.91 and ₦1,753.19 respectively. It was observed here that medium scale had the highest NFI; this may be due to marketability and effect of middle men marketers. Also, the large scale farms when oversupplied may be ready to dispose eggs at lower prices due to the fear of losing them overtime. This is affirmed by Scherer, (1980) who stated that profitability is not solely a function of largeness; it reflects the overall suitability of farm's

size in relation to its market environment and not just production and cost.

Rate of return to investment per unit bird from small farm size, medium and large were found to be 33.55 per cent, 38.42 per cent and 42.24 per cent respectively (Table 1). The implication of this is that for every naira invested, 34 kobo, 38 kobo, 42 kobo was returned to the respective scale producers. The large scale producers had highest percentage of returns due to advantage of scales. The capital turnover (CTO) values were ₦1.34 for the small farm size, ₦1.38 for medium farm size and ₦1.42 for the large size respectively. This is close to the report of Afolabi *et al.*, (2013) who reported return on capital of ₦ 1.43 in the study area. As a rule of thumb, project with capital turnover greater than one, equal to one or less than one indicates profit, breakeven and loss respectively. A ratio greater than one, is an indication of the profitability of the enterprise. It is therefore possible to have higher value of CTO with increased capital and skilled labour in both small and medium scale just as the case of large scale producers.

The operating ratio for small scale was 71.95 per cent, while that of medium and large scale was 69.64 per cent and 68.24 per cent respectively. It was discovered here that large scale had the lowest operating ratio which mean they were able to minimize operating expenses better than other two scales. Profitability index for small farm size, medium farm size and large farm size were ₦0.25, ₦ 0.28 and ₦0.30 respectively. The profit ratios reported for each categories of farms

Table 2: Summary of performance ratio

Ratio	Small scale	Medium scale	Large scale
ROI	33.55	38.42	42.24
OER	71.95	69.64	68.24
CTO	1.34	1.38	1.42
PI	0.25	0.28	0.30

ROI: Rate of Return on Investment, OER: Operating Expenses Ratio, CTO: Capital Turnover, PI: Poultry Profitability Index.

were well higher than the agricultural interest rate of 8 per cent and the average commercial interest rate of 21 per cent. Higher ROI; CTO; and PI of 42.24 per cent, ₦ 1.42 and ₦ 0.30 respectively were obtained by the large scale poultry farmers and also they had lowest operating ratio of 68.24 per cent. Thus, in terms of Net Farm Income, medium scale poultry egg enterprise performed better than other two categories meanwhile from the performance ratios, it was revealed that large scale enterprise had highest profit followed by medium and small farm size. From the above, it was evident that poultry egg production at any scale of operation is viable business, meanwhile the viability increases as the farm size increased. With the revelation above government should try to help and encourage the small scaled farmers to becoming medium and medium scaled farmers to becoming large so as to be able to feed the teeming Nigerian households and the nation as a whole, to make protein deficiency and poverty a thing of the past in Nigeria.

Going through the list of constraints faced by the three scales of poultry production, it was observed that they all have similar constraint giving reason for using a generalized table of constraints to poultry production. Among the constraints identified by poultry farmers, inadequate funding was ranked highest because money facilitates acquisition of equipment, feeds, drugs, chicks and payment of labour (Table 3). This is major reason why most farmers operate on small scale and in turn affect the level of egg production in the state. Next in order of importance was high cost of feed, the cost of feed is increasing by the day and constitute a problem, this affects their profit at the end of production. Ranking third was disease outbreak, occasionally the farmers said they face outbreak of diseases that are not reported because the farmers affected are not recognized by extension agents. Poor quality and high cost of chicks followed, and the last on the list was problem of high cost of drugs and vaccine and inability to take their farm products to other states and countries where there is appreciable market for their produce. This corroborates the findings of Benjamin *et al.*, (2013), who worked on profitability of broiler and layer production in the Brong Ahafo region of Ghana.

Table 3: Relative ranking of poultry production constraints

Constraints	Importance index		
	Mean ± SE	Index	Rank
Inadequate funds	5.29±0.04	59.44	1
High Cost of feed	3.77±0.03	24.44	2
Disease outbreak	3.29±0.03	3.89	3
Poor quality and high cost of chicks	2.62±0.03	2.22	4
High cost of drugs and inability to export	2.44±0.03	5.00	5

### Conclusions and Recommendations

Based on the findings from the study, it can be concluded that largest proportion of poultry-egg producers in the area operated on a small-scale and that poultry-egg production was a profitable venture across scale of operation. It is therefore recommended that people should get involved in poultry egg production starting from the small scale to medium and large scale, also government and research institutions are employed to encourage and create new breeds, low cost feed of high nutritional value and credit at low or no interest rate for the people in the industry since it is profitable. The Government and other organizations concern can look into finding the best approach to solve the problems identified by these people most especially provision of fund. This will make source of protein affordable for the masses in Nigeria.

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