

## COST AND RETURN STRUCTURE IN POULTRY EGG PRODUCTION IN OSUN STATE, NIGERIA

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### ABSTRACT

*This study was carried out among poultry egg farmers in Osun State, Nigeria. Data were randomly collected by the use of structured questionnaires for interview schedule from One hundred and five (105) poultry egg farmers using proportional random sampling techniques. Description statistics and budgetary techniques were used to analyzed the data obtained for the study. Results of the descriptive statistics analysis showed that 71.4% of poultry egg farmers had a mean age of 46.5 years which revealed that they are in their economically active age, 81.9% of whom were mainly males, 87% of them were formally educated, with a mean household size 5 members. Poultry egg production in the study area was profitable, showing profitability index for the large-scale, medium-scale and small-scale production per bird as 0.41, 0.37 and 0.40; internal rate of return on investment (IRR) was 68.4%, 59.7% and 66.1%; and operating ratio (OR) of 0.58; 0.41 and 0.59 respectively.. The study therefore recommended that poultry egg farmers should give attention to feed cost reduction and effective management practices (specifically use of battery cage) to maximize profit in poultry egg farming. In addition, farmers should also consider patronizing cooperative funds as an alternative investment/ management funds, and consider using locally compounded feeds to raise their stocks to reduce overall production costs. Government in its own part should consider giving subsidy on agricultural facilities and make sure that disbursing partners adhere to official regulations in interest rate and loan requirements.*

**Key words:** *Poultry, Farmers, Profitability, Egg production, Costs and Returns, Osun State, Nigeria.*

## INTRODUCTION

Poultry farming is an important subsector of the animal husbandry in many developing countries including Nigeria. Among livestock-based vocations, poultry production has assumed an important role as a commercial activity with enormous potential for rapid economic growth (Ekunwe *et al.*, 2006). As indicated by Assa (2012), poultry production is the fastest growing component of global meat production, with developing and transitional countries assuming a leading role. For instance, Nigeria is adjudged as leading producer of poultry eggs in Africa valued at N80 billion naira in 2015 (Sahel Capital Limited, 2015).

Poultry production in Nigeria has developed to the level of commercial enterprise involving thousands of birds. Large scale poultry units have emerged while more efficient strains of birds, balanced feeds, intensive housing and better poultry equipment and veterinary care are now available (Hassan *et al.*, 2004; Onwuka, et. al. 2017). The poultry industry has become a diverse industry with a variety of business interests such as egg production, meat production, hatchery and poultry equipment marketing. However, the decision to start any production type or enterprise depends on many factors including availability of capital, viability of the business and return on investment.

The poultry industry in Nigeria is important for employment generation, source of income and regular supply of protein for human consumption. The poultry industry has a huge potential for growth and has been identified as a key sector with the potential to create jobs and help address the short fall in the supply of animal protein. The growth of the sector has however been hampered by several factors such as lower per capita production of poultry product including poultry eggs. With the large number of agricultural graduates produced by the tertiary institutions in Nigeria, and given the high demand for poultry products, the number of poultry farmers in the country is expected to be larger particularly when one considers that the poultry production in the country is still relatively more primitive (Afolabi *et al.*, 2013; Okonkwo et. al. 2020) and labour-intensive.

Apart from the employment potential of poultry egg production, it is also a good source of protein as enumerated earlier. Nutritionally, eating an egg per day is a good way of putting proteins, fats, vitamins and minerals in human diet. According to Binuomote *et al.* (2008) a medium sized egg supplies about 80 calories of energy to our body. The author further asserted that egg contains not only a trace of carbohydrate, but it was also adjudged to be a replacement for meat as it contains all essential amino-acids in adequate proportion required by the body for general growth and repair. It is also a source of vitamin A which protects against night blindness and prevents skin infections (Folorunso *et al.*, 2016).

## Problem Statement

The call for able-bodied Nigerians to return to farm has been a recurring one since independence of recent, the economic recession experienced by Nigerians has reignited the call. The Nigerians who intend to heed the call have the option to choose between crop and animal production or engage in both enterprises. However, many of them are concerned about the profitability of going into poultry farming (Bukunmi and Yusuf, 2015) and require empirical information that could help them in making informed decision. Moreover, the poultry sub-sector of the economy in Nigeria remains chiefly

primitive. This is because government, at all levels, has neglected it for a long time. The poultry industry in Nigeria currently has about 10% of the population, and is responsible for less than 15 to 18% employment opportunities, due to the fact that the industry is mainly subsistent. According to Afolami *et al.* (2011; Okonkwo, & Ugwa, 2015), poultry egg in comparison with other livestock products (e.g. beef, mutton, pork), is considered to be more palatable, having lower level of cholesterol and high protein value. Egg, a product of the industry, gives about 3.5 g of the total 7.2 g animal protein requires for individual dietary need per day (Folorunso *et al.*, 2016). For developing countries, poultry contributes just about 15%, of total animal protein intake, with approximately 1.3 kg of poultry products consumed per head annum (Hamra, 2010). The World Health Organization (WHO) and Food and Agriculture Organization (FAO) recommended 3.6 kg per capita intake of poultry products per annum. Therefore to meet the basic minimum of the dietary needs of Nigerians, the country requires an annual production of 10 to 20 billion eggs and 0.3 to 0.6 million tonnes of poultry meat (Hamra, 2010; Ugwa, & Okonkwo, 2015). Besides, the default goal of many farm enterprises is to make profit (Afolabi *et al.*, 2013). Profit is not only essential to bring about growth, it also important to organizational survival in the face of growing competition. It is important for an investor who wishes to take over poultry farms towards making investment or divestment decision. Towards providing empirical information to this end, many studies in Nigeria have assessed the profitability of the poultry enterprise (Afolabi *et al.*, 2013; Afolami *et al.*, 2013; Folorunso *et al.*, 2016; Otaokpukpu, et. al. 2017). However, only few studies have done this by focusing exclusively on profitability of small-scale poultry egg production. The general focus has been on large and medium-scale enterprises (Sahel Capital Limited, 2015). This creates a vacuum in knowledge which this study is intended to fill.

*In addition, the business of rearing livestock especially poultry is cost – sensitive. Feed cost, for instance, account for between 65% and 70% of the total cost of raising poultry (Bamiro et al., 2001). Understanding the cost and return structure can help current and intending farmers to make better preparation prior to actual poultry egg production. For instance, when the farmers understand the critical effect of feed cost on its investment in poultry and the proportion of feed cost to total production cost, he can make adequate provision on time while minimizing risk of loss in the process. To this end, this study will provide empirical information on the profitability of small-scale poultry egg production in Osun State, Nigeria. Unlike many previous studies on the subject matter, this study will decompose the profitability, cost and return statistics based on geographical locations of the poultry farms within the study area. In order to achieve this study objective, it becomes helpful to provide answers to the following research questions: What were the socio-economic characteristics of poultry egg farmers in the study area? What sources of finance were available to poultry egg farmers in the study area? What was the cost and return structure of poultry egg production? What were the determinants of profitability in poultry egg enterprises? What were the factors militating against profitability of poultry egg production in the study area?*

### **Research Question**

- i. *Do socio-economic characteristics factors affect poultry egg production in Osun state?*
- ii. *What are the sources of finance used by the poultry egg farmers in the study area?*
- iii. *What determines the cost and return as well as profitability level in poultry egg production in the area?*

### **Objective of the Study**

*The broad objective of this study is to examine cost and returns of poultry egg production in Osun-State. The specific objectives are to;*

- i. *describe socio-economic characteristics of poultry egg farmers in the study area;*
- ii. *identify sources of finance used by the poultry egg farmers in poultry egg production;*
- iii. *determine the cost and return as well as profitability level in poultry egg production in the area.*

## **REVIEW OF RELATED LITERATURE**

### **The Concept of Cost-Benefit Analysis**

A cost-benefit analysis is a systematic process that businesses use to analyze which decisions to make and which to forgo, Adam H, (2023). The cost-benefit analyst sums the potential rewards expected from a situation or action and then subtracts the total costs associated with taking that action. cost-benefit analysis is the process used to measure the benefits of a decision or taking action minus the costs associated with taking that action. Its analysis involves measurable financial metrics such as revenue earned or costs saved as a result of the decision to pursue a project. It includes intangible benefits and costs or effects from a decision such as employees morale and customer satisfaction.

### **Understanding Cost-Benefit Analysis**

Before building a new plant or taking on a new project, prudent managers conduct a cost-benefit analysis to evaluate all the potential costs and revenues that a company might generate from the project. The outcome of the analysis will determine whether the project is financially feasible or if the company should pursue another project, Adam H, (2023).

In many models, a cost-benefit analysis will also factor the opportunity cost into the decision-making process. Opportunity costs are alternative benefits that could have been realized when choosing one alternative over another. In other words, the opportunity cost is the forgone or missed opportunity as a result of a choice or decision.

Factoring in opportunity costs allows project managers to weigh the benefits from alternative courses of action and not merely the current path or choice being considered in the cost-benefit analysis, (Adam H, (2023; Okafor & Okonkwo, 2022). By considering all options and the potential missed opportunities, the cost-benefit analysis is more thorough and allows for better decision-making.

## METHODOLOGY

The research work employed the survey design.

### *Sources and Method of Data Collection*

*The data for the study was collected from both primary and secondary sources. Primary data were obtained through the administration of structured questionnaire to capture relevant information from the sampled small-scale poultry egg farmers in the study area. Secondary data were however, sourced from published journal materials and other publications relevant to poultry egg production in the state. Pertinent information obtained from the poultry egg farmers included poultry production inputs and costs, sales, management practices and challenges, among others.*

### *Sampling Technique*

Osun State was selected for this study due to the large concentration of poultry farmers in some of the major villages and towns in the state. Proportional random sampling technique was used to select One hundred and five (105) poultry egg farmers in the study area. Number of poultry farmers in the agricultural zones were identified through an informant model. The chairmen of Poultry Association of Nigeria (PAN) of each of the 3 Agricultural zones were contacted from which the list and location of poultry farms were collected. The poultry manager or his/her representative was interviewed through structured questionnaire.

**Table 1: Sampling Procedure**

<b>Agricultural zone</b>	<b>Number of identified poultry farmers</b>	<b>Poultry egg only</b>	<b>30% of the poultry farms Selected for the study poultry farms. (egg production only)</b>
Osogbo	158	137	41
Iwo	129	115	35
Ife-Ijesha	116	97	29
Total			105

**Source: Preliminary Survey, 2022**

### *Methods of Data Analysis*

*Both descriptive statistics and econometric methods were used to analyze the data for this study.*

### *Socio-economic Characteristics of Poultry Egg Farmers*

*Simple descriptive statistics were used to describe the socio-economic characteristics of the poultry egg farmers. This included the use of frequency distribution table and percentages; measures of central tendencies were used in analyzing the study.*

### ***Sources of Finance used by Poultry Egg Farmers in Poultry Egg Production***

*This objective was analyzed with the aid of descriptive statistics including frequency distribution tables and percentages as well as measures of central tendencies.*

### ***Cost and Return Structure and Profitability in Poultry Egg Production***

Budgetary analysis was used to determine the cost and return structure of the poultry egg production. The model is specified below:

#### **Gross Margin Analysis**

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

$$GM = \sum PQ - (\sum R_j X_j + S_c + U_c) \quad (2)$$

Where:

$GM$  = Gross Margin

$TR$  = Total Revenue

$TVC$  = Total Variable Cost

$P$  = Market price of egg sold (₦/crate)

$Q$  = Quantity of egg produced and marketed (in crate), where a crate contains 30 units of eggs.

$R_j$  = unit price of the  $i$ th variable input used in the production of egg (such as feed, vaccines/drugs, and labour);

$X_j$  = quantity or number of each variable input utilized in the production of egg

$S_c$  = Cost of stocked birds

$U_c$  = Other associated cost incurred in the production of egg (such as transport cost, electricity and water bills, etc)

A positive  $GM$  indicates that the operating cost is being covered and the business can be sustained. In this study, the  $GM$  analysis is targeted at the 12 months poultry egg production cycle, i.e.

#### **(a) Net Income Analysis**

Net income is the difference between the total revenue ( $TR$ ) and total cost ( $TC$ ). Mathematically,

$$NI = TR - TC \quad (3)$$

where,

$NI$  = Net Income or Profit (₦)

$TR$  = Total Revenue made from the sale of egg

$TC$  = Total Cost computed as the sum of TVC and TFC

$TVC$  = Total Variable Cost.

$TFC$  = Total Fixed Cost

Empirically,  $NI$  is conventionally computed as the difference between the gross margin and the total fixed cost ( $TFC$ ).

$TFC$  = cost of all fixed items in the farm, captured by the depreciation cost on farm tools and equipment (such as pen, cages, trough, interest on loans, etc.). The straight line method of depreciation valuation was adopted for computing the fixed cost given as:

$$D_t = \frac{P - L}{N} \quad (4)$$

$D_t$  = annual depreciation value on fixed cost items (₦/annum)

$P$  = original cost of item (₦)

$L$  = salvage/scrap value of fixed cost items (₦), and

$N$  = economic life expectancy (shelve life) of the farm equipment/tool (years)

### (c) Enterprise Performance Ratio Analysis

The following business performance ratio were computed, namely:

$$1. \quad \text{Profitability Index (PI)} = NI/TR \quad (5)$$

$$2. \quad \text{Operating Ratio (OR)} = TVC/TR \quad (6)$$

$$3. \quad \text{Rate of Return on Investment (RRI)} = \frac{NI}{TC} \times 100\% \quad (7)$$

$$\frac{\text{Total Revenue} - \text{Total Cost}}{\text{Total Cost}} \times 100\%$$

$$4. \quad \text{Rate of Return on Variable Cost (RRVC)} = \frac{TR - TVC}{TVC} \times 100\% \quad (8)$$

## RESULTS AND DISCUSSION

This chapter presents the analysis, interpretation and discussion of findings in the line with the objectives of the study. In this chapter the result of the research is presented, analyzed and discussed. The first subsection presents the socio-economic characteristics of the poultry farmers such as sex, age



distribution, major occupation, level of formal education attainment and so on. The second subsection addressed the various sources of financing used by the poultry egg farming enterprises. The third subsection captures the cost and return structure as well as profitability of the poultry egg farms.

### Socio-economic Characteristics of Surveyed Poultry Egg Farmers

**Table 2: Distribution of Poultry Farmers by their Socio-economic Characteristics, n = 105**

Variable	Value	Frequency	Percentage	Cumulative frequency
Sex	Male	86	81.9	81.9
	Female	19	18.1	100.0
Age (Mean = 46.5; SD =11.2)	≤30	20	19.0	19.0
	31-40	15	14.3	33.3
	41-50	40	38.1	71.4
	51-60	15	14.3	85.7
	Above 60	15	14.3	100.0
Marital status	Single	10	9.5	9.5
	Married	84	80.0	89.5
	Divorced	7	6.7	96.2
	Widower	4	3.8	100.0
Household size (Mean = 5; SD =2)	1-3	12	11.4	11.4
	4-6	66	62.9	74.3
	7-9	12	11.4	85.7
	10-12	15	14.3	100.0
Farming experience (years) (Mean = 11.4; SD =7.5)	≤5	21	20.0	20.0
	6-10	47	44.8	64.8
	11-15	17	16.2	81.0
	16-20	10	9.5	90.5
	>20	10	9.5	100.0
Educational level (years) (Mean = 13.5; SD =5.2)	No formal education	14	13.3	13.3
	Primary	10	9.5	22.8
	Secondary	26	24.8	45.6
	OND/NCE	29	27.6	73.2
	HND/BSC	26	24.8	100.0
Management system	Battery cage	85	81.0	81.0
	Deep litter	20	19.0	100.0
	>900,000	50	47.6	100.0
Annual non-farm income (Mean = ₦352,201; SD = ₦361,308)	≥100,000	42	40.0	40.0
	100,001-300,000	7	6.7	46.7
	300,001-500,000	14	13.3	60.0
	500,001-700,000	15	14.3	74.3
	700,001-900,000	10	9.5	83.8
	>900,000	17	16.2	100.0

**Source: Field Survey, 2023**

The respondents were analyzed and the results showed that vast majority (81.9%) of the respondents were male with majority (71.4%) of them were at most 50years old with an average of 46.5 years per



farmer. The study findings also showed that vast majority (80.0%) of the respondents were married with (62.9%) of the respondents had between 4-6 persons as household size with an average of 5 persons per household. The findings likewise revealed that only 20.0% of respondents had between 1-5 years of experience implying that 80% of the respondents had more than 5 years of experience in poultry egg production and 52.4% had tertiary education. This shows that majority 86.7% of the farmers had some formal education which is predominantly at the tertiary level. It is evident in the Table 2 that majority of the respondents (81.0%) used battery cage management system while the minority (19.0%) of the respondents used deep litter management system.

Alabi et al. (2007), state that a farmer with profitable supplementary income source could become early adopter of new technology that may reduce their business risk and increase their production as well as profit. Engagement in non-farm income generating activities may enhance farmer's ability to finance his farm better when compare to farmers' without non-farm income. In order to augment household income, the farmers also engaged in other non-farm activities mainly trading and artisanship, which invariably increase their annual total income. The findings revealed that the farmers earned an average non-farm income of ₦352,201 per annum with standard deviation of ₦361,308. The standard deviation also showed that the farmers' non-farm income varied widely which may have implication on investment in poultry egg production and its profit potential.

### *Sources of Finance used by Farmers in Poultry Egg Production*

**Table 3: Distribution of the farms by sources of funds used in poultry egg production**

Source of funds	Frequency	Percentage
Ploughed back profits	59	56.2
Cooperative loan	15	14.3
Commercial banks	5	4.7
friends and relatives	15	14.3
Ploughed back profit and cooperative loan	8	7.6
Ploughed back profit and friends & relatives	3	2.9
Total	105	100

**Source: Field Survey, 2023**

Finance is an important factor in production. It is important to understand the sources of finance of the farmers with a view to recommending policy measures to ensure continuous access to the source or provide viable alternatives. The findings revealed that majority (56.2%) of the poultry farmers financed the farm through their ploughed back profit. Other sources of financing the poultry egg production include cooperative loan (14.3%), loan from commercial bank (4.7%), friends and relatives (14.3%) and a combination of ploughed back profit and either cooperative loan (7.6%) or friends and relatives (2.9%).

**Table 4: Cost and Return and Profitability of the surveyed poultry egg production farms**

REVENUE (*2N/prod. cycle)	LARGE-SCALE OPERATION (N= 29 farms)	MEDIUM-SCALE OPERATION (N= 35 farms)	SMALL-SCALE OPERATION (N= 41 farms)
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		₦	₦	%	₦	₦	%	₦	₦	%
<b>Eggs</b>	Extra large eggs	16,748,500			9,047,250			4,804,250		
	Large eggs	8,148,750			7,062,500			3,669,500		
	Small eggs	16,940			8,750			7,840		
	Cracked eggs	4,510	24,918,700	77.8	2,470	16,120,970	83.2	1,950	8,483,540	82.4
<b>Spent Layers</b> (estimated @ ₦ 3,000/bird)			7,125,000	22.2		3,252,000	16.8		1,817,000	17.6
<b>Total Revenue (TR)</b>			<b>32,043,700</b>	100.0		<b>19,372,970</b>	100.0		<b>10,300,540</b>	100.0
Bird cost (est. @ ₦800/bird at point-of-lay)			4,449,540	21.6		2,960,078	22.7		1,279,400	19.0
Feed			13,222,690	64.3		8,857,300	67.9		4,467,621	66.3
Labour			2,408,000	11.7		1,013,500	7.8		837,500	12.4
Transport			303,000	1.5		121,400	0.9		98,500	1.5
Medication			171,950	0.8		101,000	0.8		60,400	0.9
<b>Total Variable Cost (TVC)</b>			<b>20,555,180</b>	100.0		<b>13,053,278</b>	100.0		<b>6,743,421</b>	100.0
Depreciation			340,326			250,602			197,289	
Energy			122,590			100,700			87,800	
Repairs			46,509			5,000			4,000	
<b>Total Fixed Cost (TFC)</b>			<b>509,425</b>			<b>356,302</b>			<b>289,089</b>	
<b>Total Cost (TC)</b>			<b>21,064,605</b>			<b>13,409,580</b>			<b>7,032,510</b>	
<b>Net Income (NI)</b>			<b>10,979,095</b>			<b>5,963,390</b>			<b>3,268,030</b>	
<b>Gross Margin (GM)</b>			<b>11,488,520</b>			<b>6,319,692</b>			<b>3,557,119</b>	
<b>Profitability Index (PI)</b>			0.34			0.31			0.35	
<b>Operating Ratio (OR)</b>			0.64			0.67			0.65	
<b>Rate of Return on Investment (RRI)</b>			52.12%			44.47%			46.47%	
<b>Rate of Return on Variable Cost (RRVC)</b>			55.89%			48.41%			52.75%	

**Source: Field Survey, 2023**

\* To arrive at the feed cost per farm, the respective total feed cost in each category of farm operation was divided by the corresponding number of farms

\*Scale operation used in the study: small-scale farms: 100-4999 birds in stock; medium-scale farms: 5000-9999 birds in stock; large-scale farms: 5000 birds and above in stock

\*<sup>1</sup> Mortality rate of 5% was assumed in making the revenue returns for the farms; \*<sup>2</sup>Estimates used for computation in this study relate to the active egg-laying period of 12 months, adjusting for the cost of raising birds to point- of-lay.

## Cost and Return Structure and Profitability Analysis in Poultry egg production

Budgetary analysis was used to analyze the cost and return structure and profitability for the surveyed poultry egg farms in the study area. Simple measures of profitability were computed for the poultry farms, namely Gross Margin (GM), Net Income (NI), Profitability Index (PI), Rate of Return on Investment (RRI), Rate of Return to Variable Cost (RRVC) and Operating Ratio (OR). The results obtained were presented in Table 4. The analysis decomposed the cost, return structure and profitability based on the scale of operation (as large-scale, medium-scale and small-scale). A cursory look at the results on Table 5 revealed that egg sales generated the highest revenue (between 77.8%-83.2% of the total revenue) for the farmers while feed cost gulped the lion share (64.3%-67.9% of the

total cost) irrespective of the scale of operation. Average feed cost per farm was estimated at ₦455,955; ₦253,066 and ₦108,966 among surveyed large-scale, medium-scale and small-scale poultry operators, respectively\*. The total variable costs for large-scale, medium-scale and small-scale farmers respectively, were estimated as ₦20,555,180 (₦708,799 per farm), ₦13,053,278 (₦272,950 per farm) and ₦6,743,421 (₦164,473 per farm) over the egg laying period, constituting over 95% of the total production cost in all cases. This showed that total variable cost constituted the larger proportion of cost of production of the farmers. In addition, total revenue (TR), Gross Margin (GM) were also generated as ₦11,488,520 (₦796,156 per farm); ₦6,319,692 (₦180,563 per farm) and ₦3,557,119 (₦86,759 per farm) respectively, for the egg laying period of 12 months.

Profit per feed cost is a measure of feed use economics, which has very strong relationship with profitability. The economics of feed use may relate to feed use and feed cost efficiencies. Profit per feed cost (i.e. respective net income per feed cost) was estimated for each of the scale-operation, as large-scale: 0.83; medium-scale: 0.67; and small-scale: 0.73, implying that large-scale and small-scale poultry egg farmers need to be particularly concerned about feed use and/or feed cost efficiencies in order to improve on their profitability potentials.

Generally, the positive Net Income margin for the farmers indicates that poultry egg production is profitable in the study area. For instance, the results on Table 5 indicate good profitability measures for the large-scale, medium-scale, and small-scale egg production as profitability index (PI = 0.34; 0.31 and 0.35); rate of returns on investment (RRI = 52.12%; 44.47%, and 46.47%); and operating ratio (OR = 0.64; 0.67, and 0.65), respectively. Rate of returns on investment (RRI = 52.12%; 44.47%, and 46.47%); and operating ratio (OR = 0.64; 0.67, and 0.65), respectively. This implies that on every ₦1.00k invested in poultry egg production in the study area, a minimum return of about ₦0.31kobo was realized as profit.

## SUMMARY, CONCLUSION AND RECOMMENDATIONS.

### Summary of Findings.

Sex has been found to influence access to productive resources. The genders of the respondents showed that vast majority (81.9%) of them were male while only (18.1) of the respondents were female. In term of age, the majority (71.4%) of respondents were at most 50 years old with an average age of 45.6. On marital status majority (80.0%) of the respondents were married while only 9.5% were single. Besides, 6.7% were divorced while 3.8% of the respondents were widower. Majority of respondents (62.9%) had between 4 and 6 persons or members with an average of 5 individuals per household. The farmers' poultry egg production experiences were considerably high with a typical farmer having 11.4 years of experience. Likewise, the farmers' level of education was high. As many as 27.6% and 24.8% of the farmers possessed OND/NCE and HND/BSC certificates. In term of management system, the majority of the farmers (81.0%) used battery cage management system while (19.0%) of them used deep litter system. Also, majority (47.6%) of them earned an average of ₦1,292,060 with high standard deviation of ₦2,124,432 from farm sources. From non-farm sources, an average farmer earned ₦352,201 with a standard deviation of ₦361,308.

An assessment of the sources of funds for poultry egg production in the study area, revealed that ploughed back profit constituted the main source of finance. Other sources of finance include cooperative loan, commercial banks, family and friends. Results showed that irrespective of the agricultural zones, poultry egg production was profitable in the study area. As well, the feed cost constituted the largest proportion of production cost. Feed economics promises to be a critical factor in profitability of the farms. Egg sales provides the larger share of the revenue realized from farms while revenue from spent layers was generally below 20% of the total farm revenue.

## Conclusion

Arising from the research findings, poultry egg farming is a profitable venture in the study area while economics of feeds (use and cost) are critical to profitability of poultry egg production in the study area. In terms of sources of funds, the farmers relied heavily on ploughed back profit which might not be unconnected to lack of access to loan or high interest charges associated with loan procurement.

## Recommendations

Based on the study conclusions, it is recommended that;

1. The poultry egg farmers should attach much more importance to feed cost and management because they are critical to profitability of the business.
2. The poultry egg farmers should consider forming a cooperative that can backward-integrate into feed making to reduce the feed cost while serving as alternative income source.
3. Specifically, the small-scale poultry egg farmers in Iwo Agricultural Zone should consider alternative feed sources if high cost is responsible for their relatively poorer profit per feed and be more prudent in feed use if usage is the cause.
4. Government should continue to subsidize agricultural loan and make sure that disbursing partners adhere to official interest rate and loan requirements.
5. Government should create enabling environment to further boost patronage of poultry eggs production among the farmers.

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