

COSTS AND RETURNS ANALYSIS OF BROILERS AND LAYERS ENTERPRISE IN UYO AGRICULTURAL ZONE, AKWA IBOM STATE, NIGERIA

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Abstract

The study analyzed the costs and returns of broiler and layer enterprises in the Uyo Agricultural Zone, Akwa Ibom State, Nigeria. Both primary and secondary data were used for the study. A structured questionnaire was employed to obtain information from sixty (60) broiler farmers and forty (40) layer farmers. Specifically, the study assessed the socio-economic characteristics of broiler and layer farmers in the study area, determined the gross margin of the enterprises, estimated the benefit-cost ratio and returns on investment for broiler and layer enterprises, and offered recommendations. Descriptive statistics, budget analysis, and business performance indicators such as Benefit-Cost Ratio (BCR) and Returns on Investment (ROI) were used to analyze the data. The results of the study showed that in broiler production, the average stock per batch was 860, while the average stock for layers per batch was 799 birds feed cost (₦3,580,00.00) was found to be the major variable cost indicating about 65.82% of the total cost of production in the broiler enterprise. For the layer enterprise in one production cycle the average feed cost was found to be ₦23,842,007.00, indicating 64.50% of the total cost of production. The gross margin for broiler production per batch was ₦2,800,815.20 with a benefit-cost ratio of 1.51 and a return on investment of 51%, while the gross margin for layer production was ₦17,233,940.50, with a benefit-cost ratio of 1.47 and a return on investment of 47%. The study therefore concludes that both enterprises had a positive gross margin but the returns on investment were higher in broiler production than in layer production and recommends that farmers should be advised to focus more on the production of broilers, as it has a higher return on investment than layers. Additionally, farmers should explore alternative sources and cheaper methods of producing feed to reduce feed costs.

Keywords: Broilers, layer birds, Protein, Enterprise.

Introduction

Poultry farming is one of the most significant agricultural activities in Nigeria. It represents an important source of high-quality protein with tender meat acceptable to consumers without any religious or ethnic restrictions (Ojabo *et al.*, 2020). It plays a key role in providing affordable protein in the form of chicken meat and eggs, which are major protein sources in many Nigerian households (Akpaeti & Agom 2020). Oyeniyi *et al.*, (2024) noted that poultry is Nigeria's most important component of the livestock sector. As the population grows and more people move to cities, the demand for poultry products continues to rise. This increasing demand has made poultry farming, particularly broiler and layer production, a popular choice for farmers looking to tap into a profitable and fast-growing sector.

As most farm households seek alternative income sources to reduce food insecurity (Okon, Onyia, Udo & Ukpe, 2016), poultry enterprises becomes a viable option. Also, the demand for animal protein has been growing steadily in recent years. According to Erdaw & Beyene, (2022), foods of animal origin are expected to grow by 70% (2005 – 2050), and the highest expected shares would be contributed by poultry meat (121%) and 65% for eggs. Broilers and layers are the two major types of poultry production in Nigeria. Broiler farming focuses on raising chickens specifically for meat production. These birds proliferate and can reach a market weight of two kilograms and above at about seven weeks of age or less (Tallentire *et al.*, 2016), making broilers a great option for farmers looking to earn a quick return on their

investment. On the other hand, layer farming is all about egg production. Layers start laying eggs when they are about 18 to 22 weeks old and can keep producing eggs for around 18 months, providing farmers with a steady, long-term source of income. The egg production layers are kept in cages during their production cycle. Once their productivity reduces, the birds are sold in the market as spent birds for consumption (MainaKumari *et al.*, 2022).

Broiler farming typically requires a higher upfront investment in feed and medication because the birds need to grow fast and stay healthy quickly. This makes broilers more expensive to raise, but since they are sold quickly, farmers can get their money back faster. On the other hand, layer farming takes longer to start generating income, but once the hens start laying eggs, the farmer has a reliable source of revenue that can last for over a year. However, feed is a major expense in both systems, making up about 70% of the total production costs (FAO, 2013).

Despite its leading position in the livestock industry, the poultry subsector is besieged with challenges which have caused a decrease in production (Oyeniyi *et al.*, 2024). Uzonwanne *et al.*, (2023) report that the livestock subsector's contribution to GDP has decreased over time, from 5.61% in 1960 to approximately 1.27% in 2023.

In Akwa Ibom State, the Uyo Agricultural Zone stands out as a key area for poultry farming. Many small and medium scale farmers here engage in broiler and layer production due to the region's favourable weather, availability of land, and easy access to markets. Despite the potential, there hasn't been much research on how the costs and profits of broiler and layer farms compare in this specific region. Most of the studies that exist focus on other parts of Nigeria, leaving farmers in Uyo with limited information to guide their business decisions.

Conducting a costs and returns analysis is essential for understanding which enterprise—broilers or layers—offers better profitability for farmers. While broilers can generate income faster, the high cost of feed and healthcare can reduce profit margins. Meanwhile, layers provide a more consistent income from egg

sales, but the long production cycle might not be ideal for farmers who need quick returns. A clear understanding of the profitability of both systems will help farmers choose the one that best suits their resources and goals.

It is on this premise that this study analyzed and compared the current production costs and returns of broiler and layer production in the Uyo Agricultural zone. Specifically, the study determined the Socio-economic characteristics of broiler and layer enterprises in the study area, analyzed and compared the cost structure and returns of broiler and layer production in the Uyo Agricultural zone, analyzed and compared the production performance of broiler and layer production in the study area. By providing a detailed comparison, the study will offer valuable insights that can help farmers make better investment decisions.

Methodology

Study Area

The study area Akwa Ibom State, is one of the states that produces poultry predominantly. In the state, Uyo Agricultural Zone was further selected, comprising Uyo, Uruan, Itu, Ibiono and Ibesikpo local government areas. However, Uyo, Itu and Ibiono local government areas out of the five earlier mentioned were purposively chosen due to the high concentration of cassava farmers in these areas. Akwa Ibom is one of the states in the Niger Delta of Nigeria located in the South-South geopolitical zone lying between latitudes 4°32'N and 5°33'N, and longitudes 7°25'E and 8°25'E with a land area of 6,900 sq Km. The state is in the rainforest belt and is prone to oil spillage, acid rain and increasing ocean encroachment. Some of the common food crops grown in the area are cassava, plantain, waterleaf, fluted pumpkin, white yam, cocoyam, maize and banana. The areas fall under the rainforest zone with a mean annual rainfall of about 2484mm, an annual temperature range of about 27°C and relative humidity ranges from 70 – 80%. Two distinct seasons are discernible; the dry season (November –March) and the rainy season (April – October). Economic activities of the inhabitants are farming, trading, fishing, crafts, hunting, transportation, artisans and civil service.

Sampling Technique and Sampling Size

Multi-stage random sampling was utilized to select samples for the study. The first stage was the purposive selection of all poultry communities in Uyo agricultural zone in the state which comprises 8 blocks. The second stage was the random selection of 5 blocks out of the 8 blocks in the zone. The last is the random selection of 20 farms in each of the 5 blocks to give a total of 100 poultry farms.

Sources and Type of Data

Data were sourced from 100 poultry farmers (60 broiler farmers and 40-layer farmers) in the Uyo agricultural zone of Akwa Ibom State. Primary data were used to gather first-hand information to achieve the objective of the study.

Method of Data Collection

The selected poultry farmers were visited and questionnaires were administered to obtain data on their production activities which consist of socio-economic characteristics, cost of production, management system adopted input-output data such as data on the output of broiler and layers production in numbers, source of labour as well as performances of both production.

Analytical Techniques

Data were subjected to statistical analysis using descriptive statistics such as percentage, mean tables and gross margin analysis as follows:

GM = TR – TC, Where:

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

This technique was employed to analyze the costs and returns structure of the poultry farm business. Also, a benefit-cost ratio was employed to evaluate the performance of broilers and layers production using the returns on investment model.

The model was as follows:

Where:

Benefit-Cost Ratio (BCR) = Total Benefit / Total Cost

The rule of thumb states that if the benefit is higher than the cost the project is a good investment. The higher the benefit-cost ratio, the better the investment.

$ROI = \pi / TC \times 100$

π = Profit

TC = Total cost

Profit is derived by Total Revenue (TC) – Total Cost (TC)

Results and Discussion

Socio-economic characteristics of broilers and layers enterprises in the study area

The results of the socio-economic characteristics of broiler and layer farmers are presented in Table 1. The results show that the majority of respondents (63.33%) involved in broiler production in the study area are male, while only 36.67% are female. Those involved in layer production include 75.00% males and 25.00% females. The distribution of the poultry farmers in the study area by age reveals a mean age for broiler farmers to be 34 years and for layer farmers as 32 years. According to a study by Onu & Okonkwo, (2019), a greater percentage of both the broiler and layer (egg) farmers (70.55%) fell within the age limits of 31-50 years with a mean of 42.59 years for broiler farmers while that of the layer hen farmers was 41.19 years. The majority of respondents (66.67%) are single, and 33.33% are married among broiler farmers, while 57.50% are single and 42.50% are married among layer farmers, respectively. The results also reveal that 4.66%, 40.00%, 36.67%, and 16.67% of the respondents have farming experience in the ranges of less than 1 year, 1-5 years, 6-10 years, and more than 10 years, respectively. A mean farming experience of 7 years is reported for broiler farmers. For layer farmers, 5.00% have less than 1 year of experience, while the others are as follows: 37.50% have 1-5 years, 45.00% have 6-10 years, and 12.50% have more than 9 years of experience. Regarding educational qualifications, the majority of broiler farmers (16.66%) completed primary school, 46.67% obtained secondary education, and 36.67% advanced to tertiary education, with a mean of 12 years of education. The results for layer farmers show that 12.50% completed primary school, 27.50% obtained secondary education, and 40.00% attended tertiary education, with a mean of 13 years of education. The household size distribution of broiler and layer farmers in the study area reveals that the majority (73.33%

for broiler farmers and 57.50% for layer farmers) have 1-4 members in a household, with means of 4 and 5 persons, respectively.

Table 1: Socio-Economic Characteristics of Respondents

Characteristics Gender(number)	Broiler Respondents		Layers Respondents	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Male	38	63.33	30	75.0
Female	22	36.67	10	25.0
Total	60	100	40	100
Age Distribution(years)				
<29	15	25.00	6	15.00
30-39	23	38.30	17	42.50
40-49	16	26.60	11	3.60
50-59	4	6.67	5	12.50
>60	2	3.33	1	2.50
Total	60	100	40	100
Mean		34 years		32 years
Marital status of the farmer (number)				
Single	40	66.67	23	57.50
Married	20	33.33	17	42.50
Divorced	0	0	0	0
Widowed	0	0	0	0
Total	60	100	40	100
Farming experience (years)				
<1	4	6.66	2	5.00
1-5	24	40.00	15	37.50
6-10	22	36.67	18	45.00
>10	10	16.67	5	12.50
Total	60	100	40	100
Mean		7 years		9 years
Educational qualifications (years)				
Non-formal	0	0	0	0
Primary	10	16.66	5	12.50
Secondary	28	46.67	19	27.50
Tertiary	22	36.67	16	40.00
Total	60	100	40	100
Mean		12 years		13 years
Household size of respondents (number)				
1-4	44	73.33	23	57.50
5-8	16	26.67	17	42.50
9-12	0	0	0	0
Total	60	100	40	100
Mean		4 persons		5 persons

Source: Field Survey, 2024.

Table 2 consists of the parameter of production cost. The results show that in broiler production, the average cost of stock per batch of production

(1,076,720.00) in naira, feed cost (3,580,000.00) in naira, medication cost (333,318.30) in naira, labour cost (145,000.00) in naira, electricity bill

(197,454.50) in naira, charcoal/fuel cost (27,692.00) in naira and mortality rate at 5% (79,000.00) which made up the average total cost of production (5,439,184.80). For layers at one production cycle, the average cost obtained are as follows: stock cost (878,900.00), feed cost (23,842,007.00), Cost of medication (4,803,291.50) labour cost (1,762,345.00),

electricity bill (5,326,045.00), charcoal/ fuel cost (69,101.00) and mortality rate at 12.87% (284,750.00) all in naira. This sums up the average total cost to (36,966,439.50). The entire result shows that layer production cost per cycle is higher than the cost of broiler production per batch.

Table 2: Average Cost Structure of Broiler and layer production in Uyo Agricultural zone (in Naira)

Cost of items	Broiler (860 birds at 2.0-2.5kg live weight)		Layer (Average no 799 birds)	
	Average per batch		1yr 5months Average per cycle	
Stock	1,076,720.00		878,900.00	
Feed	3,580,000.00		23,842,007.00	
Medication	333,318.30		4,803,291.50	
Labour	145,000.00		1,762,345.00	
Electricity	197,454.50		5,326,045.00	
Charcoal/fuel	27,692.00		69,101.00	
Mortality	5%	79,000.00	12.87%	284,750.00
Total	5,439,184.80		36,966,439.50	

Source: Field survey, 2024.

Table 3 shows the average revenue of broiler and layer production. For broiler production, the revenue generated was as follows: for sales of 860birds for 10,000 naira per at a 5% mortality rate, 8,170,000 naira is gained. For 50 bags (25kg) of manure sold at 1,400 naira per bag, 70,000 naira is realized making a total of 8,240,000.00 naira generated revenue for broiler

production per batch. For layer production per cycle, sales of eggs at 5200 nairas per crate for 311 crates (9354 eggs), generates 48,640,800 - naira revenue, realized. For 799 spent birds sold at 7,500 naira at a 12.87% mortality rate generated 5,227,500 naira revenue. For sales of layer manure at 1,400 per 237.2 bags (25kg) sold, 332,080 was generated.

Table 3: Average Revenue of Broiler and layer production in the Study Area (in Naira)

Broiler Production (one batch 8 weeks)			Layer Production (one cycle 1year 5months)		
Revenue item	Average Unit price in Naira	Amount	Revenue items	Average Unit price	Amount
Sales of birds	10,000	8,170,000	Sales of eggs	5,200	48,640,800
Sales of manure	1,400	70,000	Sales of spent	7,500	5,227,500
			Sales of manure	1,400	332,080
Total		8,240,000	Total		54,200,380

Source: Field survey, 2024

Table 4: Gross Margin Analysis of Broiler and Layer Production in the Study

Items	Broiler Per Batch	Layers
Total Revenue	8,240,000.00	54,200,380.00
Total Variable Cost	5,439,184.80	36,966,439.50
Gross Margin = (TR-TVC)	2,800,815.20	17,233,940.50

Source: Field survey, 2024

Comparative Analysis of Broiler and Production Performance in the Study Area

Table 5: Benefit-cost ratio for broilers and layers enterprises

	Broiler	Layer
Benefit Cost Ratio (BCR)	1.51	1.47

Source: Field survey 2024

Benefit-Cost Ratio Analysis

Benefit-cost ratio = total revenue / total variable cost

For broiler = $8,240,000 / 5,439,184.80 = 1.51$

This means that for every naira invested in broiler business, 0.51 is realized as a return on investment. This was quite high because the fixed cost was not included in the gross margin analysis. Also, it is reported that the poultry business is a high-risk business venture. This confirms the economic assertion that the higher the risk, the higher the return. This clearly shows that broiler production is a lucrative business. This is also confirmed in other studies. For instance, the findings of (Panwal, Taru, & Onah, 2020; Kalla, Barrier, Haruna, Abubakar, Hamidu, & Murtala, 2017) “evaluate the economics of broiler production at Miango, Plateau State, Nigeria using a – 9 years record (1992 – 2000)”. During the period, 76 batches of broilers were reared to point of slaughter. The results shows that the enterprise incurred an average total variable cost of N620,6333.31 out of which feeding cost, day old chicks (stock) and mortality cost represents 58.13%, 19.13% and of

9.64% of the total cost of production, respectively. Total revenue within the period was estimated to be N763,969.44 which was mainly generated from the sales of broiler birds. The gross margin was found to be N143,334.13 with N0.23 as the returns per naira invested in the enterprise. Thus the broiler production is a profitable venture in the study area.

Benefit-cost ratio (BCR) For Layers

For layers:

$BCR = TR/TVC$

$= 54,200,380.00 / 36,966,439.50$

$= 1.47$

This means that for every one naira invested, 0.47 is realized as a return on investment.

Returns on Investment

For broilers

ROI = $\frac{2,800,815.20 \times 100}{5,439,184.80 \times 1}$
= 51.00 %

For layers

ROI = $\frac{17,233,940.50 \times 100}{36,966,439.50 \times 1}$
= 47.00 %

Table 4.7: Returns on investment for broilers and layers enterprises

Return on Investment	Broilers %	Layers %
ROI	51.00	47.00

Source: Field survey, 2024

Table 4.8 shows the average percentage contribution of the different variable cost components. The cost of feed accounted for the largest proportion (65.82%). This resonates with

the research of Udo, Essien, Isip and Akpan (2023) who reported that the Cost of feed amounts to 93% of the total variable cost in layer production.

Table 4.8: Average Percentage Contribution of Different Cost Variables to Total Variable Cost of Broilers and Layers Production in the Study Area

S/N	Variables	Broilers		Layers	
		Amount (in naira)	Percentage cont. to (TVC) (%)	Amount (in naira)	Percentage cont. to (TVC) (%)
1	Stock	1,076,720.00	19.80	878,900.00	2.38
2	Feed	3,580,000.00	65.82	23,842,007.00	64.50
3	Medication	333,318.30	6.13	4,803,291.50	12.99
4	Labour	145,000.00	2.67	1,762,345.00	4.77
5	Electricity	197,454.50	3.63	5,326,045.00	14.41
6	Charcoal/fuel	27,692.00	0.51	69,101.00	0.19
7	Mortality	79,000.00	1.45	284,750.00	0.77
	Total	5,439,184.80	100	36,966,439.50	100

Source: Field survey, 2024

Conclusion and Recommendations

In conclusion, it can be said that the majority of the broiler and layer farmers in the study area operated on a small- scale. It was found that both enterprises had a positive gross margin but the returns on Investment were higher in broiler production than in layer production. The study,

therefore recommends that farmers should be advised to embark more on the production of broilers as it has a higher return on investment than layers. Also, alternative sources and cheaper methods of producing feed to reduce the cost of feed.

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