

Analysis of Profitability of Indigenous and Hybrid Poultry Birds Enterprises in Imo State, Nigeria

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Abstract

Hybrid poultry enterprises are becoming more preferred to indigenous poultry enterprises in Imo State Nigeria. This study in a bid to establish a reason for this development investigated the profitability of the two enterprises and the factors that influence their profitability. Primary data were collected using a set of structured questionnaires from 96 respondents drawn from 48 indigenous broiler farmers and 48 hybrid broiler farmers who were selected through multistage, purposive, and random sampling techniques. Data were analyzed using descriptive statistics, profitability ratios, and the ordinary least squares multiples regression technique. The results showed that most of the respondents were in their mid-forties with a mean age of 46 years and 45 years respectively. Female poultry farmers dominated in the indigenous birds-based poultry enterprises while male farmers were mostly involved in hybrid bird poultry production. The majority of the entrepreneurs had formal education with an average of 13 years and 14 years. The level of education ($P < 0.01$), stock size ($P < 0.01$), depreciation of capital assets ($P < 0.1$), amount of credit ($P < 0.01$), and total cost ($P < 0.01$) are factors that influence the profitability of indigenous birds-based poultry enterprises in the State. The age of the entrepreneur ($P < 0.01$), the level of education of the entrepreneur ($P < 0.05$), the stock size ($P < 0.1$), depreciation of capital assets ($P < 0.05$) influenced the profitability of hybrid birds-based poultry enterprises. The study recommended the extension of credit, better educational facilities to poultry enterprises and entrepreneurs in the State.

Keywords: Analysis; Poultry; Indigenous; Hybrid; Profitability; Enterprise

1. Introduction

Nigeria is currently facing an acute shortage of all types of food including poultry meat despite the fact that the Nigerian government is spending huge foreign exchange on the importation of various brands of poultry products. Poultry meat has been one of the earliest diets for human beings. Its protein represents one of the most important sources of essential amino acids for human beings [1]. Feeding on the food of animal origin is probably the fastest economic and nutritional route to improvement in the nutritional status. Foods from animal origin have the capability of providing 35 g per capita of animal protein per day [2]. Over the years, poultry meat production has been on the decline in Nigeria. The declining production and increasing demand have led to the importation of this important protein source. The demand for livestock products, including poultry, is expanding in West Africa as a result of population growth and increased urbanization. Trade liberalization has had differing effects on poultry markets in the region, with some countries experiencing large import flows of frozen poultry from the European Union and others receiving very little.

The hybrid breeds have high body weight and a fast growth rate but, one of the challenges farmers faces with this breed is their inability to withstand harsh conditions. The favorable traits in the indigenous chicken are the ability to withstand harsh weather conditions and diseases. One of the challenges facing the local breeds is that it is smaller in size, and it has a slow growth rate [3]. Many farmers are involved in poultry production, especially in Imo State Nigeria, but the level of productivity remains local and small-scale [4]. It is reported that there is a consensus that intensification of production of meat and eggs derived from prolific animals like poultry birds is germane to meet animal protein requirements from domestic sources.

Poultry farmers are faced with the problem of low productivity and profitability. These problems are a result of the intensive capital involved. Poultry farmers who operate on a small scale cannot afford the high cost of feeds, high cost of drugs and vaccines, high cost of building materials for the construction of poultry houses.

This study, therefore, seeks to achieve the following objectives:

- iii. Determine the socio-economic characteristics of the indigenous and hybrid poultry farmers in the study area.
- iv. Determine the profitability of indigenous and hybrid poultry production in the study area.
- v. Estimate the determinants of profitability for indigenous and hybrid poultry production in the study area.

2. Methodology

The study was conducted in Imo State. The State is located in the South-east geopolitical zone of Nigeria. It is bordered by Abia State on the east, River Niger and the Delta States to the west, Anambra State on the north, and Rivers State to the south. The State lies within latitudes 4°45'N and 7°15'N and longitude 6°50'E and 7°25'E of the Greenwich meridian. Imo State has an area of around 5,067.20sq km with a current population estimate of about 5,408,800 [5]. Random and purposive sampling methods were used to select the respondents. The first stage involved the random selection of two agricultural zones from the three zones in the State. At the second stage, two Local Government Areas from each zone were purposively selected due to the high

concentration of poultry producers in these areas. This gave a total of four (4) Local Government Areas for the study. In the third stage, purposive sampling was used to select three communities from each LGA where there are a considerable number of poultry producers. This gave a total of twelve (12) communities for the study. At the fourth stage, two villages were selected from each of the 12 communities giving a total of 24 villages. Finally, two (2) farmers each for local poultry producers and hybrid poultry producers were selected from a list of poultry producers in the area giving a total number of 96 poultry farmers for the study. Primary data were collected by the administration of questionnaires to the farmers. Descriptive statistics such as means, means and percentages were used to describe the socio-economic characteristics of the poultry farmers.

The profitability of the poultry enterprises was measured by the profitability index. The index is given as:

$$\text{Profitability index} = \frac{\text{NFI}}{\text{GR}} \quad (1)$$

Where

$$\text{Net farm income (NFI)} = \text{TR} - (\text{TVC} + \text{TFC}) \quad (2)$$

$$\text{Gross revenue (GR)} = \text{TR} - \text{TVC} \quad (3)$$

TR=Total revenue

TVC=Total variable cost

TFC=Total fixed cost

Other ratios that depict the profitability of the poultry enterprises include:

The operating profit ratio measures how much profit is made after paying for variable cost and is calculated as;

$$\text{Operating profit ratio} = \frac{\text{Operating income}}{\text{total revenue}} \quad (4)$$

$$\text{Debt-equity ratio} = \frac{\text{Total debts}}{\text{Total equity}} \quad (5)$$

The Ordinary Least Squares Multiple regression analysis models was used to estimate the determinants of profitability of the indigenous and hybrid poultry farmers. The model was implicitly specified as follows:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}) \dots \dots (6)$$

Where:

Y= profitability (Index)

X₁= Age (years)

X₂= Sex (Dummy; Male =1, female =0)

X₃=Marital status (Dummy; Married =1, otherwise =0)

X₄= Household size (number of persons)

X₅= Level of education (years)

X₆=Experience (years)

X₇=Stock size (number of birds)

X₈ = Depreciation (Naira)

3. Results and Discussion

3.1. Socio-Economic Characteristics of the Farmers

The result in (**Table 1**) showed that 41.67% of the indigenous poultry farmers were within the ages of (20-39) years of age while 43.75% of the hybrid poultry farmers were within the ages of (40-59) years. The mean ages of both farmers were approximately 46 years and 45 years respectively. This implies that these farmers were young and productive. Age is an important factor in labor- intensive farming enterprises including broiler production as the age of the farmer determines the vitality and ability to perform various activities on the farm. Younger farmers are likely to be more willing to put their strength

in production and adopt modern techniques that will help them to enhance the increase in production. This result agrees with those who reported that farmers within the ages of (41-45) years are more likely to adopt innovations faster than others in the other age brackets [6,7]. The results further show that 52% of respondents engaged in indigenous poultry production were females and 60% of those engaged in hybrid broiler production were males. This showed that indigenous poultry production in the area was females dominated while hybrid broiler production was male-dominated. This implies that both males and females engaged in poultry production for either household consumption or for sales

However, the dominance of males in hybrid poultry production may not be unconnected with its capital-intensive nature which females with leaner resources may not contend with. This result is in agreement with those who reported the dominance of males in both medium and small-scale commercial poultry enterprises in Imo State [7]. The Table also showed that 64.5% and 62.42% of respondents engaged in both indigenous and hybrid broiler poultry production was mostly married, 22.12 percent of the respondents for both indigenous and hybrid poultry farmers were single and 12.50 and 14.58 percent of indigenous and hybrid poultry farmers respectively were a widow. This implies that married people were mostly engaged in any poultry production activities than the single. This supports the findings of [7-9] who reported that agricultural activities in rural communities are mostly dominated by married persons.

The results also show that the mean household sizes of both respondents were approximately 5 persons per household. This showed that the average household has adequate labor for poultry production which is very crucial to reduce the cost of hired labor. This result differs slightly from the finding who reported an average household size of 4 persons among poultry farmers [9]. Furthermore, the results showed that the mean level of education represented by the numbers of years spent in

school among the respondents for indigenous and hybrid poultry farmers were approximately 13 years and 14 years respectively. This means that the farmers had up to secondary education and may therefore be more aware of the importance of the adoption of new technology to enhance their production. This supports the findings that educational attainment is very essential; since modern agriculture requires some level of literacy and technical knowledge both of which greatly influence the farmer's performance on the farm [10]. The result shows that the mean farming experience of the respondents was approximately 5 years and 7 years respectively for indigenous and hybrid poultry production farmers.

This revealed that hybrid farmers had been into poultry production for a slightly longer time than the indigenous poultry farmers. The length of time the farmer has spent in an enterprise may be a reflection of the amount of experience gathered in various aspects of that enterprise. This experience may come in handy in navigating difficult times in business which for a poultry farmer may include disease outbreaks and glut.

3.2. Profitability of Indigenous and Hybrid Poultry

The profitability of the indigenous and hybrid broiler enterprises was estimated and presented in (**Table 2**). The results showed that the average net returns and gross revenue of hybrid broiler farmers were higher than that of the indigenous poultry farmers; an indication that the hybrid broiler farmers performed better. The operating ratio of the indigenous and hybrid poultry enterprises was 0.54 and 0.47 respectively. The operating ratio measures how much profit is made after paying for variable cost and the lower the ratio, the higher the profitability of the enterprise. The implication is that the hybrid broiler enterprise tended to make more profit than the indigenous poultry farmers.

| Age (Year) | Indigenous Birds | | Hybrid Birds | |
|-----------------------------------|------------------|----------------|--------------|----------------|
| | Frequency | Percentage (%) | Frequency | Percentage (%) |
| 20-39 | 20 | 41.67 | 19 | 39.58 |
| 40-59 | 17 | 35.42 | 21 | 43.75 |
| 60-79 | 11 | 22.92 | 8 | 16.67 |
| Mean | 45.75 | | 44.92 | |
| Gender | | | | |
| Male | 23 | 47.92 | 29 | 60.42 |
| Female | 25 | 52.08 | 19 | 39.58 |
| Marital Status | | | | |
| Married | 31 | 64.58 | 30 | 62.5 |
| Single | 11 | 22.92 | 11 | 22.92 |
| Widow | 6 | 12.5 | 7 | 14.58 |
| Household Size (Number) | | | | |
| 1-5 | 32 | 66.67 | 27 | 52.25 |
| 6-10 | 16 | 33.33 | 21 | 43.75 |
| Mean | 4.67 | | 5.18 | |
| Level of Education (Years) | | | | |
| 0-6 | 5 | 10.42 | 1 | 2.08 |
| 7-13 | 21 | 43.75 | 20 | 41.67 |
| 14-19 | 22 | 45.83 | 27 | 56.25 |
| Mean | 12.56 | | 13.57 | |
| Farming Experience (Year) | | | | |
| 1-5 | 31 | 64.58 | 23 | 47.92 |
| 5-10 | 13 | 27.08 | 13 | 27.08 |
| 10-15 | 4 | 8.34 | 12 | 25 |
| Mean | 5.19 | | 6.85 | |

#Source: Field Survey Data, 2019

Table 1: Socio-economic Characteristics of the Respondents.

This result agrees with the findings of those who reported high profitability and viability of small and medium-scale poultry enterprises in Imo State [6].

3.3. Factors that influence Profitability of Indigenous and Hybrid Poultry Birds Enterprises

The result in (Table 3) shows that exponential functional form gave the best fit with the independent

variables accounting for about 93% of the variations in the profitability of indigenous poultry birds' enterprises. Also, the value of the F ratio is an indication of the appropriateness of the model for the data set. The number of significant variables and their signs as they align with a priori expectations were also used to select the lead equation. The coefficient of the level of education was significant ($p < 0.01$) and positively related to the profitability of indigenous birds' enterprises. This implied that the level of education is an important factor that enhances profitability. When a farmer is well

| Ratios | Indigenous farmers | Hybrid farmers |
|----------------------|--------------------|----------------|
| Ave. Net farm income | 115660 | 364015 |
| Ave. Gross revenue | 188360 | 466895 |
| Operating ratio | 0.54 | 0.47 |
| Debt equity ratio | 0.04 | 0.06 |
| Profitability index | 0.61 | 0.78 |

#Source: Field Survey Data, 2019

Table 2: Summary of financial ratios of indigenous and hybrid poultry farmers

informed on the new techniques of raising and managing his poultry farm, he will be able to manage the risk associated with poultry production. This is in line with the findings that farmers' education enables them to adopt new technology to enhance their broiler production reduced mortality rate and brought about an enhanced income [8].

The coefficient of stock size was significant ($p < 0.01$), positive, and directly influenced the profitability of indigenous poultry enterprises. This is expected since the stock size determines the number of birds that could be sold. A large stock size would imply more birds to be sold and hence more revenue and invariably higher profitability. The coefficient of depreciation of assets was significant ($p < 0.1$), negative and had an inverse relationship with profitability. This may imply the use of old and or inefficient production equipment that are no longer contributing to enhancing output and profitability in the enterprise.

The coefficient of the amount of credit accessed was significant ($p < 0.01$), positive, and directly influenced the profitability of the indigenous poultry enterprise. The credit provides entrepreneurs with much-needed funds to acquire equipment and other inputs that enhance the output, income, and profitability of the enterprise. Credit also enables the entrepreneur to expand the scale of production and acquire technology that could reduce cost while also boosting production, output, and profitability. The coefficient of the total cost was significant ($p < 0.01$), negative and had an inverse relationship with the profitability

of the indigenous poultry enterprise. This clearly shows that the higher the costs outlay of the enterprise, the lower the revenue and invariably the lower the profitability. Entrepreneurs in the poultry industry have had to contend with the rising cost of inputs such as feed and other inputs and these put pressure on the income of the enterprise.

The result in (Table 4) shows that the semi-log functional form gave the best fit for the estimation of factors that influence the profitability of hybrid poultry birds' enterprises. 70.4% of the variations in the profitability of the hybrid poultry enterprises were accounted for by the independent variables in the model. Also, the value of the F ratio is an indication of the appropriateness of the model for the data set. The number of significant variables and their signs as they align with a priori expectations were also used to select the lead equation.

The results show that the age of the entrepreneur was significant ($p < 0.01$), positive, and directly influenced the profitability of the enterprise. This implies that the older the entrepreneur, the higher the profitability of the enterprise. This may be accounted for on the premise that older entrepreneurs are more likely to have made higher investments in equipment and technology that could enhance output, revenue and profitability. This position is further strengthened by the experience they would have garnered over time would enhance expertise and specialization thereby giving rise to higher output, higher revenue, and higher profitability. There is a positive relationship between the viability

| Variable | Linear | Exponential+ | Semi Log | Double Log |
|------------|------------|--------------|-------------|-------------|
| (Constant) | 0.153 | -1.804 | -1.456 | -5.6 |
| | -1.501 | (-6.206)*** | (-5.251)*** | (-6.987)*** |
| Age | -0.002 | -0.018 | -0.003 | -0.026 |
| | (-.721) | (-.386) | (-.513) | (-.211) |
| Sex | -0.023 | 0.003 | -0.063 | 0.021 |
| | (-.532) | -0.156 | (-.533) | -0.34 |
| Mat stat | -0.024 | -0.006 | -0.096 | -0.048 |
| | (-.531) | (-.240) | (-.784) | (-.741) |
| Hhs | -0.007 | -0.012 | -0.025 | -0.09 |
| | (-1.161) | (-.643) | (-1.468) | (-1.737)* |
| Edu | 0.016 | 0.123 | 0.033 | 0.259 |
| | (3.530)*** | (4.681)*** | (2.630)** | (3.563)*** |
| Exp | 0.006 | 0.016 | 0.018 | 0.051 |
| | -0.998 | -0.806 | -1.034 | -0.943 |
| Stock Size | 0 | 0.343 | 0.001 | 0.785 |
| | (5.872)*** | (13.129)*** | -4.278 | (10.908)*** |
| Depre | -1.04E-06 | -0.061 | -1.18E-06 | -0.105 |
| | (-1.403) | (-2.021)* | (-.584) | (-1.252) |
| Credit | -5.38E-08 | 0.051 | -1.34E-07 | 123 |
| | (-1.230) | (2.793)*** | (-1.120) | (2.423)** |
| Total Cost | 5.26E-06 | -0.13 | 8.87E-06 | -0.228 |
| | (3.500)*** | (-5.455)*** | (2.165)** | (-3.478)*** |
| R2 | 0.722 | 0.928 | 0.591 | 0.891 |
| Adj R2 | 0.647 | 0.908 | 0.48 | 0.862 |
| F-stat | 9.623*** | 47.601*** | 5.346*** | 30.361*** |

#Values in parentheses are t-ratio, #***= significant at 1 %, #** = significant at 5%, #* = significant at 1%.

#Source: Field Survey Data, 2019.

Table 3: Factors that influence the profitability of indigenous poultry enterprises.

accruing from high profitability of poultry enterprises [6].

The result also shows that the level of education attained by the entrepreneur was significant ($p < 0.05$), positive, and directly influenced the profitability of the enterprise. This is expected since the educated entrepreneur is more likely to adopt top management practices and techniques that could enhance output, improve revenue, and boost profitability. Furthermore, when a farmer is well informed on the new techniques of raising and managing his poultry farm, he will be able to manage the risk associated with poultry production. This is in line with the findings that farmers' education

enables them to adopt new technology to enhance their broiler production reduced mortality rate and brought about an enhanced income [8].

The coefficient of stock size was significant ($p < 0.10$), positive, and directly influenced the profitability of the enterprise. This is expected since the stock size determines the number of birds that could be sold. A large stock size would imply more birds to be sold and hence more revenue and invariably higher profitability. The coefficient of capital depreciation was significant ($p < 0.05$), positive, and directly related to the profitability of the hybrid poultry enterprise. This implies that the capital assets being used in the enterprise are

efficient and aid in enhancing output, revenue, and productivity in the enterprise. This is in tandem with a prior expectations

4. Conclusion

The research was carried out to analyze the profitability of indigenous and hybrid poultry enterprises in Imo State. The study showed that female entrepreneur dominates the production of indigenous poultry birds and males dominate the hybrid poultry enterprises in the State. Furthermore, poultry enterprises in the State are profitable with the hybrid birds-based enterprises having higher profitability.

The profitability of the indigenous birds-based enterprises in the area is influenced by the level of education of the entrepreneur, the stock size, depreciation of capital assets, and amount of credit and total costs of production. The profitability of the hybrid birds-based enterprises is influenced by the age and level of education of the entrepreneur. It is also influenced by the stock size and the depreciation of capital assets.

| Variable | Linear | Exponential | Semi Log+ | Double log |
|------------|------------|-------------|-------------|-------------|
| (Constant) | -0.322 | -4.368 | -2.26 | -9.643 |
| | (-1.889)* | (-3.575)*** | (-6.431)*** | (-3.889)*** |
| Age | 0.009 | 0.473 | 0.018 | 0.937 |
| | (8.698)*** | (7.755)*** | (8.184)*** | (7.564)*** |
| Sex | 0.028 | 0.028 | 0.061 | 0.06 |
| | -1.104 | -0.298 | -1.192 | -1.105 |
| Mat stat | 0.036 | 0.044 | 0.081 | 0.099 |
| | -1.054 | -0.27 | -1.138 | -1.238 |
| Hhs | 0.001 | 0.009 | 0.003 | 0.024 |
| | -0.121 | -0.18 | -0.188 | -0.807 |
| Edu | 0.008 | 0.104 | 0.017 | 0.217 |
| | (2.103)** | (2.470)** | (2.092)** | -0.016 |
| Exp | 0.005 | 0.037 | 0.011 | 0.075 |
| | -1.392 | -1 | -1.356 | -0.327 |
| Stock Size | 0 | 0.325 | 0 | 0.591 |
| | -2.125 | (2.652)** | (1.757)* | -0.023 |
| Depre | 1.14E-06 | 0.026 | 2.34E-06 | 0.055 |
| | -2.215 | (1.919)* | (2.207)** | -0.055 |
| Credit | -1.07E-07 | 0.008 | -3.63E-07 | -0.004 |
| | (-.588) | -0.265 | (-.968) | -0.947 |
| Total Cost | -3.45E-08 | 0.004 | -1.19E-07 | -0.007 |
| | (-.414) | -0.12 | (-.693) | -0.913 |
| R2 | 0.723 | 0.66 | 0.704 | 0.648 |
| Adj R2 | 0.648 | 0.568 | 0.624 | 0.553 |
| F-stat | 9.667*** | 7.181*** | 8.805*** | 6.822*** |

#Values in parentheses are t-ratio. #***= significant at 1 %, #** = significant at 5%, #* = significant at 1%.

Table 4: Factors that influence the profitability of hybrid poultry enterprises

Source: Field Survey Data, 2019.

5. Recommendations

Based on the findings of the study, the following recommendations are made

1. The extension of government special focus to the poultry industry in terms of grants, credit, low interest's loans, and tax reliefs would enable entrepreneurs acquire equipment and technology as well as improved inputs that will further give impetus to the growing importance of the industry as a highly profitable sector which could lend itself to income generation among young to middle-aged adults in the community.
2. Women who dominate in the indigenous poultry industry should be encouraged through the extension of credit and training.
3. Exposure of poultry entrepreneurs to better educational and training facilities would enhance the performance of the industry.

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