Original Research Article

Profitability Analysis and Factors Influencing Profit Level of Small-Scale Broiler Farmers in Nigeria

ABSTRACT

Broiler birds are widely raised for its palatability and nutritious values which are mainly for meat purpose, and also serves as source of income to many households in Nigeria. The broiler industry is faced with high cost of production thereby reducing the farmers profit.

The study was conducted in three Geopolitical zones in Nigeria. A multistage sampling technique was adopted for this study for the selection of 540 broilers farmers out which 392 returned a well filled questionnaire where data were extracted for the study. Data for this study were analysed using descriptive (frequency and percent) budgetary analysis and inferential (Logit regression) statistics.

Factors affecting the profit level of broiler farmers were age (γ_1= -0.145, p= 10%), households size (γ_3= -5.477, p=10%), educational status of the farmers (γ_4= 0.228 , p= 5%), number of birds (γ_7= 0.575, p= 5%), cost of feed (γ_8= -1.022, p= 1%), cost of water (γ_9= -1.277, p= 1%), cost of drugs (γ_{10}= -1.640, p= 5%) and cost of chick (γ_{11}= -7.104, p= 1%).

Young people should be encouraged to be involved in production of broiler, since agriculture has aging population and help in employment creation. Farmers should maintain a low number of households so as to increase their profit. The farmers should have some forms of education on the production of broilers so as to enhance their profit.

Keywords: *Broiler production, Factors, Logit regression, Profitability, Profit level, Small-scale.*

INTRODUCTION

Agriculture remains the pillar of the Nigerian economy for growth, development, poverty alleviation, contribution to GDP, employment and income generation (1). It is very important amongst the most vital segments of the economy; it utilizes more than 60% of the working populace and contributes with livestock, forestry, and fisheries and in terms of real Gross Domestic Product (GDP); agriculture contributes around 42% between 2003 - 2007 and the sub sector became averagely 7.4% over the same period (2). Livestock production constitutes a critical and basic part of the agricultural economy of Nigeria, a contribution that goes beyond direct food production however incorporates the generation of employment, source of income to farmers, development of a country's economy, source of vocation to farmers and other multipurpose uses. Poultry is a noteworthy sub sector in the livestock industry, which contains chickens, turkeys, ducks, quails, peafowl, guinea fowls etc. however chicken alone constitutes as much as 95% of all poultry kept on the planet (3). Poultry production is unique in that it offers the highest turnover rate and the quickest returns to investment outlay in the livestock enterprises (4). The industry has been described as the fastest means of solving the problem of protein deficiency in Nigeria.

Poultry can be referred to all domesticated birds which provides economic value to man as a protein source. The poultry industry has a great potential to provide the daily needed protein of human through meat or egg. According to (5), poultry goes a long way in providing animal protein for the populace because it yields quickest returns and provides for meat and eggs in a very short time. (6) reported that proteins are required for the growth of young ones, formation of gametes in reproduction, formation of digestive juices, repair of worn-out tissues or cells, production of anti-bodies as well as enzymes and hormones in the body. (7)

reaffirmed that animal proteins are more “biologically complete” than vegetable proteins with regards to their amino-acids composition.

According to (8), the consumption of poultry products in developing countries has grown by 5.8% per annum, faster than that of human population growth, and has created a great increase in demand. Due to the increase demand, broilers production will require more farmers in the industry to meet these demands.

According to (9), the market demands and economic potentials do not determine merely the volume of activities and their cost-benefit relations, but also the used type and body weight along with market age, the method of processing, product types and packaging. During the last decades, eating habits have globally changed, with a strong preference for meat cuts and processed meat, and consequently the market of chicken cuts has exceeded the whole-bird market (10). (11) claims that in the coming ten years chicken meat will remain the most favourite and cheapest meat, satisfying consumer demands in the form of chicken cuts. This has led to later-finishing birds for the production of commercial cuts because larger birds present higher yield and higher added value (10).

The profit of the broiler farmers depends on not only the cost of producing the birds but also the feed conversion ratio (FCR) of the birds. The FCR is majorly determined by the genetical composition of the birds and also the quality of the feeds fed to the birds.

Apart of the protein contribution of the industry to human, some studies conducted in Asian revealed that broiler industry is one of the profitable agro-industries which can effectively tackle the problems of unemployment and underemployment in the rural areas, particularly of small and marginal farmers. It has been transformed from the traditional small-scale backyard farming to large-scale commercial farming in India, with an annual growth rate of 11.44 percent, production of 3.725 million tons and employment of 4.29 million people (12).

An increase in per capita consumption of poultry meat can create employment for about 26,000 persons per year (13). Poultry meat production increased from 0.069 million tons in 1961 to 3.725 million tons in 2014.

Despite these enormous contribution of this industry to individual and the economy at large, the industry is faced with various challenges ranging from high cost of feed, lack of veterinary personnel's, poor market structure. For instance, during the lockdown period (March 2020 – June 2020), poultry produce suffered a lot of setbacks leaving the farmers with little or no profit. This study thereby investigated the impact of socio-economic characteristics on the profit level of small-scale broiler farmers in Nigeria.

MATERIALS AND METHODS

Research Design

The study was conducted in three Geopolitical zones in Nigeria. Nigeria is situated in the West African region and lies between longitudes 3 degrees and 14 degrees and latitudes 4 degrees and 140 degrees. It has a land mass of 923,768 sq.km. It is bordered to the north by the Republics of Niger and Tchad. It shares borders to the west with the Republic of Benin, while the Republic of Cameroun shares the eastern borders right down to the shores of the Atlantic Ocean which forms the southern limits of Nigerian Territory. The about 800km of coastline confers on the country the potentials of a maritime power. Land is in abundance in Nigeria for agricultural, industrial and commercial activities. The country's population is about two hundred million (14)

Temperature across the country is relatively high with a very narrow variation in seasonal and diurnal ranges (22-36t). There are two basic seasons; wet season which lasts from April to October; and the dry season which lasts from November till March. The dry season commences with Harmattan, a dry chilly spell that lasts till February and is associated with lower temperatures, a dusty and hazy atmosphere brought about by the North-Easterly winds blowing from the Arabian peninsula across the Sahara; the second half of the dry season, February – March, is the hottest period of the year when temperatures range from 33 to 38 degrees centigrade. The extremes of the wet season are felt on the south-eastern coast where annual rainfall might reach a high of 330cm; while the extremes of the dry season, in aridity and high temperatures, are felt in the north third of the country. In line with the rainfall distribution, a wetter south and a drier northern half, there are two broad vegetation types: Forests and Savanna. There are three variants of each, running as near parallel bands east to west across the country. Forests Savanna Saline water swamp Guinea Savanna Fresh water swamp Sudan Savanna Tropical (high) evergreen Sahel Savanna.

There is also the mountain vegetation of the isolated high plateau regions on the far eastern extremes of the country (Jos, Mambilla, Obudu). The savanna, especially Guinea and Sudan, are the major grains, grasses, tubers, vegetable and cotton growing regions.

The Tropical evergreen rain forest belt bears timber production and forest development, production of cassava; and plantation growing of fruit trees – citrus, oil palm, cocoa, rubber, among others.

Sources and Types of Data

Primary data was used for this study. Data collected were on households' demographic and socioeconomic characteristics such as age, educational level, marital status, sex, income, household size as well as data on cost of producing broilers and the total revenue. The data

were collected through the administration of a well-structured questionnaire on a cross-section of surveyed broilers farmers in the study area.

Sample Size and Sampling Technique

A multistage sampling technique was adopted for this study for the selection of broilers farmers. The first stage involved purposive selection of three Geo-Political zones in Nigeria out of the six Geo-Political zones. The Geo-Political zones are North Central (which consist of Benue, FCT, Kogi, Kwara, Nasarawa, Niger and Plateau State), South (which include Akwa-Ibom, Bayelsa, Cross-River, Delta, Edo, Rivers State) and South West (Ekiti, Lagos, Osun, Ondo, Ogun, Oyo State). The second stage was purposive selection of three states each based on the concentration of poultry farmers. Thirdly, six Local Government Area were randomly selected from each of the state making a total of fifty-four (54) LGA. Lastly, ten broilers poultry farmers were randomly selected, making a total of five hundred and forty (540) broilers poultry farmers for the study.

Method of Data Analysis

The analytical tools employed in this study were descriptive and inferential statistics. The descriptive statistical tools used consisted of frequency, percentages, while Logit regression models was used for analysing the affecting the profit level of the poultry broilers farmers. Profitability ratios were used to capture the profitability of the venture.

Profitability ratio is a class of financial metrics that helps investors assess a business's ability to generate earning compared with its expenses and other relevant costs incurred during a specific period. Some examples of profitability ratios are listed and explained below:

Expense structure ratio (ESR) = FC/VC

Where,

FC = Fixed cost and VC = Variable cost

Rate of Return on Capital Invested (RORCI) = π/TC

Where, π = Profit (TR - TC)

Gross Ratio (GR) = TFE/GI

Where, TFE = Total farm expenses and GI = Gross income.

Logit regression was adopted to analyze the factors affecting the profit level of the farmers.

The model is specified as

$Y_i = \gamma_0 + \sum \gamma_j x_j + \varepsilon_j$ ……1

$Y_i = \gamma_0 + \gamma_1$ age + γ_2 sex + γ_3 hhs + γ_4 edu + γ_5 ms + γ_6MOPA+ $\gamma_7$farsize + γ_8COF + γ_9COW + γ_{10} COD + γ_{11}COC + ε_i

Where:

Y_i = Profit

Age = Age of Farmers [in years]

Sex [Male = 1, Female = 0]

Hhs = Household Size [Number]

edu = Educational Status [in years]

Marstatus = Marital status [Married = 1, single = 0]

MOPA = Member of Poultry Association [yes = 1, no = 0]

Farsize = farm size [numbers]

COF = Cost of Feed

COD = Cost of Drugs

COW = Cost of Water

COC = Cost of Chicks

ε_i = Random term

RESULTS AND DISCUSSION

Table 1 shows the age distribution of the broiler's poultry farmers. The age of the farmers ranges from twenty-one (21) years to above sixty (60) years. Majority of the farmers were within the age range of 31 – 50 years, which implies that the farmers are still in their active age. Since agriculture is labour intensive, activeness of the farmer may contribute to his/her productivity thereby contributing to their profit level. According to (15), age is an important factor in traditional Agriculture. It determines farmer's productive ability and consequently his output. This is because farming is still labour intensive in this part of the world and traditional agriculture production system relying on rudiments implements powered by human muscle.

Table 1: Distribution of Farmers by Age

Age (in years)	Frequency	Percent
21 – 30	25	6.4
31- 40	157	40.1

41 – 50	77	19.7
51 – 60	104	26.6
>60	29	7.4
Total	392	100.0

Source: Field Survey (2020)

Table 2 shows the sex distribution of the farmers. It was observed from study that male (60.2%) poultry farmers are more predominant in Nigeria than their female (39.8) counterpart. This finding is in line the study of (16), who found that male is more involved in farming compare to their female counterpart. This could be attributed to the labour demanding nature of the agricultural sector.

Table 2: Distribution of Farmers by Sex

Sex	Frequency	Percent
Male	236	60.2
Female	156	39.8
Total	392	100.0

Source: Field Survey (2020)

Table 3 shows the household size of the farmers. It was observed that majority (60.2%) of the respondents had a household of between 5-6 people, while 26.6% had a household size of 6 and above, and 13.3% of them had less than 4 persons in their household. This study conforms with the recent findings of the National Bureau of Statistics (17), which opined that an average Nigerian household is made up of 5.05 persons.

Table 3: Distribution of Farmers Household Size

	Frequency	Percent

< 4	52	13.3
4 – 6	236	60.2
>6	104	26.5
Total	392	100.0

Source: Field Survey (2020)

Table 4 shows the educational status of the poultry farmers. The farmers with primary school education were 26.5%, 41.1% had secondary school education while 32.4% of them had tertiary form of education. This implies that most of the farmers are educated. According to Afodu et al; (2019), education is an investment in human capital which may raise the qualities of skills of a man, narrow his/her information gaps and increase his allocative efficiency that leads to more productive performance.

Table 4: Distribution of Farmers by Educational Status

	Frequency	Percent
Primary	104	26.5
Secondary	161	41.1
Tertiary	127	32.4
Total	392	100.0

Source: Field Survey (2020)

Table 5 shows the marital status of the respondents. It was observed that 29.4% of the farmers were single, 61.7% of them were married while 8.9% of them responded to the others group.

Table 5: Distribution of Farmers by Marital Status

	Frequency	Percent
Single	115	29.4
Married	242	61.7
Others	35	8.9
Total	392	100.0

Source: Field Survey (2020)

Table 6 shows broiler farmers that are members of poultry association. It was observed that 53.1% of the broiler farmers belong to the poultry association while 46.9% were not members of poultry association

Table 6: Distribution of Farmers by Member of Poultry Association

	Frequency	Percent
Yes	208	53.1
No	184	46.9
Total	392	100.0

Source: Field Survey (2020)

Table 7 shows the number of sales outlets the farmers adopted for the sales of their produce. It was that 40.3% of the farmers uses a single sales outlet for the sales of their produce, 46.9% of them made used of double outlets while 12.8% of them applied multiple sales outlets for the disposal of their produce.

Table 7: Distribution of Farmers by Sales Outlets

	Frequency	Percent
Single	158	40.3
Double	184	46.9
Multiple	50	12.8
Total	392	100.0

Source: Field Survey (2020)

Table 8 shows the distribution of farmers based on the quantity of stock. It was deduced from table 8 that a large proportion (28.6%) of the small-scale broilers' farmers kept between 601-800 broilers, 22.4% had the range of 401 – 600, 20.4% had between 801 – 1000 stock of broiler birds.

Table 8: Distribution of Farmers by Quantity of Broiler Stock

	Frequency	Percent
< 50 – 200	56	14.3
201 – 400	56	14.3
401 – 600	88	22.4
601 – 800	112	28.6
801 – 1000	80	20.4
Total	392	100.0

Source: Field Survey (2020)

Table 9 shows the budgetary analysis of the farmers. The budgetary table showed the cost and return analysis where the total fixed cost and total variable cost represents 20.7 percent and 79.3 percent of the total cost of production respectively for the broiler farmers. This finding is in accordance with the study (18), who opined that the huge percent of the variable cost could be due to the high cost of feed. The value (N96,291,436) of the gross income and

the value (N41,309,010) of net farm income reveal that the venture is profitable. The profitability of the venture may be due to increase in price per kilogram of the matured broiler most especial the period when this study was carried out.

Table 9: Budgetary Analysis

Item	Amount (N)
Total Revenue (TR)	307,000,000
Total fixed Cost (TFC)	54,982,435
Total Variable Cost (TVC)	210,708,564
Total Cost	265,690,999
Gross Income (TR - TVC)	96,291,436
Net Farm Income	41,309,010

Source: Field Survey (2020)

Table 10 shows the profitability ratios of the farmers. The expense structure ratio 0.26 shows that 26 percent of the total cost of the broiler farming enterprise was made up of fixed cost items. The rate of returns of the broiler farmers was 0.065. This implies that for every one naira invested, 0.065 kobo was gained. This profit margin could be due to the ban of importation on some of the agricultural produce, poultry products inclusive. The gross revenue ratio of 0.314 indicates that for every N1.00 returns to broiler enterprise, N0.314 is being spent. The gross margin ratio of 0.314 further confirm that the business is profitable to the broiler farmers

Table 10: Profitability Ratio

Expense structure ratio (ESR) = TFC/TVC	0.261
Rate of Return on Capital Invested	0.065

(RORCI) = π/TC	
Gross Ratio (GR) = GI/TR	0.314

Source: Field Survey (2020)

Regression Result

Table 11 shows the regression analysis of factors influencing the profit level of broiler farmers in Nigeria. The R^2 values of 0.86 for broiler farmers implies that about 86% of variations in the profit level of the broiler enterprise is explained by the specified explanatory variables in the model. From the table it was observed that the age of the farmers was significant with a negative coefficient, implying that the profit level decreases as the farmers age increases. This finding is in accordance with the study of (19) which looked at effect of livelihood diversification and its determinants on rice farming households in Ogun state opined that the age of the farmers is inversely related to the level of their diversification. This shows that as the age of the broiler farmers increases, their profit level decreases.

The household was also significant with a negative coefficient implying that as the household size increases the profit of the farmers may decreases.

The coefficient of educational status was significant and positively contributed to the profit level of the broiler farmers. This is in line with the findings of (20, 21), they find out that education level determines the degree of opportunities available to improve living conditions. It also affects level of exposure to new ideas, managerial capacity in production, and the perception of household members on how to adopt to, and integrate, innovations. The positive relationship between educational status and profit level of broiler farmers shows that farmers with higher educational status enjoy higher profit compared to their counterparts with lower educational status.

The number of birds the farmers kept had a positive coefficient and was also significant. This shows that farmers with a greater number of birds are more likely to have more profit than their counterpart. This may due to the farmers with a larger stock take advantage of scale in getting their inputs.

The variables of cost of production (such as Cost of Feed, Cost of Water, Cost of Drugs) were all significant but with negative coefficients, owing that an increase in cost of production will reduce the profit level of the broiler farmers. This in line with the a priori expectation that cost of production is inversely related to the profit level of the farmers.

Table 11: Factors Influencing the Level of Broiler Farmers Profit

Parameters	Coefficient	Std. Error	t-value
(Constant)	.9489**	.3061	3.099
Age	-.1450*	.7900	-1.836
Sex	-.2160	.2227	-.097
HHS	-5.4770*	3.198	-1.713
Edu	.2281**	.1148	1.986
MS	.1827	.1907	.9578
MOPA	-.1161	.2097	-.554
Number of birds	.5745**	.1941	2.961
Cost of Feed	-1.022***	.2800	-3.65
Cost of Water	-1.277***	.4010	-3.185
Cost of Drugs	-1.640**	.7160	-2.291
Cost of Chicks	-7.104***	2.089	-3.401

R^2 = .862,

Adj. R^2 = .859

Number of cases predicted correctly 353 (90.0%)	

Source: Field Survey (2020). ***Significant at 1%, **Significant at 5%, *Significant at 10%

CONCLUSION AND RECOMMENDATIONS

The study focused on the profit level and factors influencing profit level of small-scale broiler farmers in three geo-political zones in Nigeria. Broilers production is mainly for its consumption, and Nigeria is one of the highest producers of broilers chicken in West-Africa. The broiler venture is a lucrative business which can provide both protein source food and also income to the farmers. The results of the study indicate that educational status and the number of sales outlets has direct significance on the farmers' level of profit.

Recommendation

Based on the findings of the study, the following recommendations were being made:

1. Young people should be encouraged to be involved in production of broiler, since agriculture has aging population.
2. Farmers should maintain a low number of households so as to increase their profit.
3. The farmers should have some forms of education on the production of broilers.

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