Nigerian Agricultural Policy Research Journal (NAPReJ) Agricultural Policy Research Network (APRNet)
Vol. 5. Iss. 1. Website:http:// www.aprnetworkng.org ©2018

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

Analysis of Broiler Production: Evidence from South East, Nigeria

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A R T I C L E I N F O

Key Words

Farm resource productivity

Livestock production,

Broiler Production

ABSTRACT

The study analyzed the profitability and effects of farm resources on broiler output in Nwangele Local Government Area of Imo State, South East Nigeria. A total of fifty broiler farmers were randomly selected from a list of 120 poultry farmers registered with Imo State Agricultural Development Programme Office. Data were collected using a set of structured questionnaire. Analytical tools used were descriptive statistical tools, net farm income and multiple regression models. Out of the three functional forms tried, double log model emerged as the lead equation because results indicated that 84% of the farmers used deep litter housing system in broiler production and 92% of them stocked 1000 birds or less in their farms. On the average, a farmer spent N289, 051.67 on purchase of variable inputs, out of which, cost of poultry feeds was N142, 405.34. A net income of N442,5281.36K was realized per annum which implied that broiler production is a profitable business. Multiple regression result indicated that stock size was positive and significant at 1% level while quantity of feeds used was significant at 5% but showed negative influence on broiler production. It is recommended that farmers should increase the number of day-old chicks and reduce labour and quantity of feeds used in broiler production

Introduction

Poultry has become a popular industry for the small holders that have great contributions to the economy. The industry has assumed great importance in improving employment opportunity and animal protein in Nigeria. Poultry industry has witnessed rapid expansion in the past years, increasing from 185,300 metric tonnes (MT) in 2001 to 268,000 MT in 2011. It was reported that very high input costs in 2008 and 2010caused flock expansion to decrease in 2008 and in 2011. Production of poultry meat in Nigeria increased from 43,200 tonnes in 1967 to 212,335 tonnes in 2016 growing at an average annual rate of 3.57 %.The demand for poultry meat in 2016 was 200 million tons birds while the supply was 140 million tons having a gap of 60 million tons shortage (Atlas Nigeria, 2018).
The agricultural policy on livestock subsector in Nigeria includes a statement on how available livestock resources could be put into best use (Federal Ministry of Agriculture and Rural Development, FMARD, (2016). This effort is expected to make Nigeria self-sufficient in the production of livestock products, improve the nutritional status of Nigerians through the domestic provision of high quality, protein rich livestock products and to provide locally all necessary raw material inputs for the livestock industry. According to the report, this would be achieved through increased production either by expanding the resource base and increasing the productivity of the existing resources through systematic improvement of the national production system.

Poultry production is unique because it offers the highest turnover and the quickest return to investment in livestock enterprises (Saani and Ogundipe, 2005).Okonkwo and Akubuo (2001) in Adebayo and

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

Adeola (2005) reported that 10% of Nigerians engaged in poultry production are mostly subsistence and small or medium sized farm. In Nigeria, types of poultry commonly reared are chickens, ducks, guinea fowls, turkeys, pigeons, and more recently ostriches and quails (Laseinde, 2000 in Saliu, Abdulrazaq and Eleke, 2015). Broiler production is carried out in all parts of the country with no religious, social, and cultural inhibitions associated with their consumptions. Specifically, investment in broiler enterprises is attractive because production cost per unit is low relative to other types of livestock. The rate of growth in production is the highest when compared with ruminants and other monogastric animals (Braekaert, Gavirial, Jalade and Seiders, 2000). It is the cheapest, commonest, and the best source of animal protein (Ojo, 2002).

Poultry meat is tender and broiler production has short production cycles. Owing to these obvious advantages of broiler enterprises, large numbers of farmers go into production for income generation purposes (Nwajiuba and Nwoke, 2000 in Ukwuaba and Inoni, 2012). High demand for poultry products, success of exotic breeds, and ease of mastering the techniques of poultry production, among other factors contributed to its development into a status of agribusiness in Nigeria.

In the past, many small-scale operators in poultry industry have been forced out of business due to problems ranging from shortage and high cost of feed and other inputs. Dziwornu and Sarpong (2014), reported that broiler producers could sell their product at a competitive price to make more profit if the cost of broiler production is reduced. Dziwornu and Sarpong found that cost of feed and day-old chick costs constituted about 66 percent of the total of variable input in the study area. They stressed that broiler producers need to efficiently utilize feed resources to reduce expenditure on feed in order to increase profitability. Inadequate management practices in feeding, housing, healthcare, and traditional methods used by broilers farmers among other factors are responsible for the low productivity.
In a study carried out by Shabu, (2013), it was reported that farm inputs such as farm size, fertilizer, herbicide /pesticide, planting seeds, farm labour and capital were the major predictors of productivity. It was advised that these resources could further be exploited to improve productivity level of rice farmers to boost the economic status of rice farmers in the area. Broiler production is an ongoing business in Imo State, previous studies on broiler enterprise were mainly focused on profitability and not much research have been done on the farm productivity. The quantum and resource mix used in poultry farms is important in assessing performance of farms at the same time finding empirical evidence on effects of resources used in broiler yield. Therefore, the study was designed to analyze the profitability and effects of farm resources in broiler output in Nwangele Local Government Area of Imo State, Nigeria.

Research Methods

The study was carried out in Nwangele Local Government Area (LGA) of Imo State. It is located on latitude of 50431N, 70451E and longitude of 5.7170N, 7.7500E which covered an area of 63km2 (2482m). The population of Nwangele LGA was 127,691 people as at the 2006 census and the projected figure in 2016 is 175, 800 persons (National Population Commission of Nigeria and National Bureau of Statistics, 2016).

A purposive sampling technique was adopted in the selection of five (5) communities in the study area because of concentration of broiler farmers in the locations. The communities are; Amaigbo, Isu, Agbaja, Dimnanume, Umuozu communities. 10 broiler farmers were randomly chosen from each community making 50 farmers with the aid of list of 120 poultry farmers complied by Imo State Agricultural Development Programme Office (ADP, 2017).

Primary data used for analysis was obtained through interview schedule and structured questionnaire administered to broiler farmers. Farm operations and records were also observed Questions asked were centered on unit cost of day-old chick, total number of day-old stock, unit cost of broiler feeds, total cost of feed, unit cost of rent, total cost of rent, mortality rate, number of table birds produced, unit price per broilers. Methods of broiler production used by farmers were observed and noted.

Net farm income model was employed to determine the profits in broiler production while ordinary least squares (OLS) multiple regression model was used to evaluate the effects of resource use on the profits from broiler production.

Model Specifications

Net Farm Income in broiler production was calculated as

$NI = TR - TC,$ Eq (1)

$TC = TVC + TFC$ Eq (2)

$TR = P. Q)$ Eq (3)

$NI = P (N) \times Q (kg) – (TVC+TFC)$ Eq (4)

Where ,

NI = Net Income in Broiler Production,

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

TR=Total Revenue realized from sales of table broiler birds, Q = quantity of table boiler birds produced in number, P =Unit price of broiler per naira (₦)TC = Total cost of broiler produced in naira (₦), TVC = Total variable cost incurred in naira (₦), TVC= Σ (CT+ CF+ CM+ CL +CT+ RB+ M + R)

Where; CT= Total amount spent in purchase day old chicks in (₦), CF= Total amount spent in purchase of broiler feeds in (₦), CM = Cost of medication (₦), CL= Cost of labour (₦), CT= Cost of transportation (₦), M=Miscellaneous in (₦), R= Annual rent on building in (₦), TFC =Total fixed cost = value of depreciation on fixed assets.

TFC= ∑DD +DF+DS+DW, where DD =depreciation on drinkers, DF =depreciation on feeders, DW=depreciation on shovels, DW = depreciation on wheelbarrows, depreciation =Purchase Price of asset- junk value ÷useful life of asset

Multiple Regression Model

Y = f (X_1, X_2, X_3+e) Eq 5

Implicit form of the model is given by

Y = b0+b1X1 + b2X2+b3X3+e Eq 6

Where; Y = quantity of broiler produced in kg

X_1, X_2 and X_3 are quantity of feed consumed by the broiler birds in kg, labour (mandays)and number of day-old chicks or stock of broiler birds (number) respectively.

β_1…… β_3= coefficients of Xs variables, b0=intercept and e = random error term

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The explicit forms of the multiple regression functiosn used are expressed as follows:

a. Linear function

Y = β0+ β1X1+ β2X2+ β3X3+e Eq7

b. Semi Log Function

Y = log β0+ β1logX1+ β2logX2+ β3logX3+e Eq 8

c. Cobb-Douglas function (double log)

Log Y = β0+ β1logX1+ β2logX2+ β3logX3+e Eq 9

The model with highest value of R -Square and highest number of variables with significant values was chosen as the lead equation.

Results and Discussion

Data in Table 1 presents the result of outlook of broiler production in Nwangele LGA of Imo State.

Table 1. Outlook in broilers enterprise in Nwangele LGA, Imo State

Stock size (count)	Frequency	Percent
Less than or equals 1000	46	92
1001-2000	4	8
Broiler production system		
Intensive system	49	98
Semi-intensive system	1	2
Housing system		
Battery cage system	8	16
Deep litter system	42	84
Total	**50**	**100**

Source: field survey, 2017

Result in Table 1 showed that 92% of broiler farmers stocked 1000 birds or less in their farms, 8% stocked 1001-2000 birds. This confirmed an earlier report by Okonkwo and Akubuo (2001) that poultry production is mostly at small or medium sized level. The result further found that 98% of the farms used intensive system in raising their birds, only 2% used semi intensive system in their farms. It was observed that 84% used the deep litter housing system in broiler farms. The use of deep litter system was common because many farmers used uncompleted building, by using wood materials and others in covering the windows and other opening. It was observed that using wood shavings on the floor of building was a common practice because they were readily available and cheap in the area. Data showed that 10% used rented building, 84% of them acquired land for broiler business through family inheritance which is a common method of land acquisition in the area while 6% used leased land for the business.

Results in Table 2 showed cost and returns in raising broiler chicks to table size in the study area. Table 2 results indicated that broiler farmers spent an average total variable cost of **₦289, 051.67** on broiler production during the period**.** Out of which, cost of poultry feeds was ₦142, 405.34 while cost of day of chick was ₦ 78,679.08 accounting for 76.49% of the total variable cost. This finding confirms the report of Dziwornu and Sarpong, (2014) which found that cost of feed and day-old chick costs constituted about 66 percent of the total of variable input in the study area. Average cost of labour and cost of veterinary services were ₦44, 360.00 and ₦12,337.50 respectively. However, average total revenue was ₦4,751, 096.25k. Gross margin was ₦4, 462, 044.58k and net profit of ₦4, 425, 281. 36. This

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

showed that broiler production is profitable in the study area. This agrees with Sani et al (2000) and Ukwuaba and Inoni, (2012) who reported that broiler production has been identified as a means of ensuring sustainable family income and a profitable business in a farming season respectively.

Table 2 Cost and returns in broiler production

Items	Amount Naira(₦)	Total Amount(₦)
Total sales		4751096.25
Day old chicks	78679.08	
Cost of feeds	142405.34	
Labour cost	44360	
Veterinary services	12337.50	
Cost of wood shaving	3146	
Cost of disinfectant	510	
Cost of detergent	357	
Kerosene	4189.2	
Transportation	3067.57	
Total variable cost (TVC)		289051.67
Gross margin(TR-TVC)		4462044.58
Depreciation on fixed assets	36763.217	
Total fixed cost(TFC)		36763.217
Net profit (GM - TFC)		4425281.36

Source: Field survey, 2017

Table 3 showed the regression result of broiler farms in Nwangele LGA in Imo State, Nigeria.

Table 3. Regression result showing effects of poultry resources on broiler output.

Variable	Linear	Semi-log	Double log
Constant	16.6847 (1.400)	5.78925*** (50.32)	0.970932*** (8.9332)
Stock size	2.37196*** (121.9)	0.001670*** (8.889)	1.03501*** (85.33)
Labour	0.52879 (0.1444)	0.056005 (1.584)	-0.002232 (-0.1884)
Feed	-0.026986 (-1.972)	0.0000178 (0.1346)	-0.04789** (-2.149)
R squared	0.999	0.882	0.998
Adjusted R-square	0.999	0.875	0.997
F ratio	17064.54***	115.156***	7885.921***

Source: Field survey, 2017

*Figures in parenthesis are T-ratios, *** = significant at 1% ,**: significant at 5%,*

Result in Table 3 showed the regression analysis of broiler production. Double log model was used as the lead equation because it had high R-squared ratio of 0.998 and highest number of significant variables. The result indicated that number of day-old chick (stock) was statistically significant at 1% and showed positive influence on broiler production while quantity of feeds used was significant at 5% but showed a negative influence on the broiler output. Stock size coefficient of 1.035, implies that a unit increase in the number of broiler stock, would increase broiler output by 1.035. The coefficient value of poultry feed which is -0.0479 implied that a unit increase in quantity of feed used in production will reduce the broiler output by 0.0479. This further explains that broiler production decreases with increase in quantity of poultry feed. This could explain the fact that poultry weight tends to reduce, if it attains the maximum weight, additional feeds would likely lead to reduction instead of weight gain. This finding contradicts the finding of Ukwuaba and Inoni (2012), which showed that labour and day-old chick were significant and showed inverse relationship with broiler production while quantity of feed showed positive effect on broiler output. Stock size which appeared to contribute positively to broiler weight as suggested by the data could likely be due to the breed of the stock and management practices adopted by the broiler farms in the study locations.

Problems associated faced by broiler farmers in the study area

Results in Table 4 showed problems faced by broiler farmers in the study area. It showed major problems encountered by broiler farmers in the study area. These include; Newcastle disease infection and seasonal fluctuation in the price of table birds whichindicated96% each. High cost of feeds was 92%. This is not surprise because, it has been reported earlier that high cost of poultry feeds constituted serious problem to the growth of poultry sector in Nigeria. This supported by the findings of Dziwornu and Sarpong, (2014), who reported that cost of feed and day-old chick costs constituted about 66 percent of the total of variable input. Broiler farmers also indicated that inadequate access to extension services was 92%. Also, low price of birds during sales was 92% while high mortality rate, high cost of day-old chicks, high transportation cost, price instability and inadequate finance for expansion were 88%,80%, 74%, 72% and 52%respectively. This showed that broiler production in the study area is seriously faced with myriad of problems which demands urgent attention.

NAPReJ
ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

Table 4 Constraints of broiler production in the study area

Constraints	Frequency	Percentage(%)
Disease infestation	48	96
Seasonal fluctuation in prices of table birds	48	96
High cost of feeds	46	92
Inadequate extension services	46	92
Low price of birds at sale	46	92
High mortality of broilers	44	88
High cost of day-old chicks	40	80
High cost of transportation	37	74
Inadequate finance for expansion	26	52
Total	381*	100

*Source: Field survey, 2017, * = multiple responses*

Conclusion

The study concludes that broiler production is profitable in the study area. More so, 98% of the farms used intensive system in raising their birds. Quantity of day-old chicks used in production increased broiler output while quantity of feed showed negative influence on output. Further, disease infection, seasonal fluctuations in the price of table birds and high cost of feeds were major problems in broiler production in the study area. Policy aimed at increasing poultry productivity should consider increasing farmers' access to day- old chicks. More so, available farm labour and feeding stuff will be optimally utilized if flock size is increased in the area. Support program in training farmers on poultry management techniques should be organized. This will enable poultry farmers acquire relevant skills in poultry management which will increase productivity and farm income. It was also found that Disease infestation and Seasonal fluctuation in prices of table birds were major challenges facing poultry production in the area. It is therefore recommended that policies aimed at providing veterinary services of high quality among the poultry farmers should be pursued. Wit fluctuating prices of commodities farmers would require agricultural insurance services to cover them from possible losses arising from low prices when prices tumble.

Acknowledgement: The authors wish to thank the Department of Agricultural Economics & Extension, University of Port Harcourt for providing the necessary supports for timely completion of the research. We also wish to thank all lecturers in the department who made useful criticisms and contribution which helped improved the quality of the work.

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