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Profitability of Small Scale Broiler Production in Onitsha North Local Government Area of Anambra State, Nigeria

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Abstract: This study was carried out to establish the profitability of small scale broiler production in Onitsha north local government area of Anambra state, Nigeria. The specific objectives are to determine the effects of socioeconomic characteristics of broiler producers on output and to estimate the returns of broiler enterprise in the study area. Primary data were collected from one hundred and thirty five (135) broiler farmers by use of well structured questionnaire. Descriptive and inferential statistical tools such as means, percentages and multiple regression analysis as well as enterprise budget were applied to analyze the data collected for the study. Findings indicated that most of the respondents (70%) were males and same were aged between 36-55 years while most of the farmers have long years of experience in broiler production. Regression estimates indicated that six variables including experience in broiler production, farming status, access to credit, labour, number of Day-old chicks and quantity of feeds exerted statistically significant influence on broiler production with an R^2 of 0.79 and an F-ratio of 39.1. A single broiler nurtured to maturity had a total cost of ₦ 942.14 made up of ₦ 30.40 fixed cost and ₦ 911.74 variable cost. With gross revenue per bird at ₦ 1334.00, net revenue of ₦ 391.86 per bird was calculated and this gave a net margin-to-cost ratio of 0.42 which implies that a ₦ 1.00 investment in broiler production all things being equal would yield ₦ 0.42 in return. It is the recommendation of this study that state and local governments should improve their credit delivery to farmers as this will go a long way in improving output.

Key words: Broiler production, profitability, feed cost, veterinary cost, gross margin

INTRODUCTION

The poultry industry in Nigeria has undergone a significant transformation since the early fifties, from a backyard, peasant and primitive household-oriented husbandry to modern and large-scale poultry which can be found in the countryside and urban centers today. Though the value of livestock resources have grown in absolute terms in recent years, its overall contribution to agricultural output remains dismally low (CBN, 2006).

In Nigeria, animal protein, especially meat is expensive, in short supply and is out of reach to the majority of the population. The effect of inadequate animal intake is felt more by a large proportion of the population especially in rural areas, whose inhabitants constitute over 70% of the Nigeria population and who constitute over 85% of the extreme poor in the country (Chukwuji et al., 2006). Due to this reason and because there will be increase in population and demand for animal protein, different sources, one of which is poultry production (broiler in particular) are exploited towards meeting these needs. Studies have shown that animal protein, apart from its profitability in terms of income to the farmers, is essential for normal physical and mental development of man (Ugwu, 1990).

The growth of the poultry industry in Nigeria was very impressive from the 1960's to the 1980's. In 1986 Nigeria had the largest poultry population in black Africa. Poultry keeping provides a method by which rapid transformation in animal protein consumption can be achieved and this accounts for the expansion of small-scale poultry enterprises in Nigeria in general and in Onitsha North local government area of Anambra state in particular.

Prohibitive increases in the cost of inputs especially that of feeds and drugs are among the constraints in commercial broiler production. Feed and medication cost rose above the reach of most farmers. This drastically reduced the profit margin of poultry farmers. Given the above, poultry farmers would be faced with the problem of deciding which of broiler or layer enterprises to embark on. The farmers' concerns in this regard are the cost implications and returns from their choice of enterprise.

Researchers in the study area have not adequately addressed the economics of broiler enterprise with the aim of determining its profitability and benefit. Also, because of the increasing need for animal protein consumption in the state, the threat of broiler keepers leaving the business will be addressed by this investigation to enable the farmers make more informed decisions towards production. The specific objectives of this study are therefore to determine the effects of socioeconomic characteristics of broiler farmers on output and to estimate the returns in small scale broiler enterprise in the study area.

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MATERIALS AND METHODS

The study area: The study area is Onitsha north local government area. The local government is among the areas covered by the popular Onitsha market which is the largest single market in the West African sub region. The area lies approximately between longitude 5° 00' and 6°30' N. It covers an area of approximately 2,046.00 sq.km and has an estimated population of about 280,000 with nine local administrative quarters (Communities). The study area has a tropical climate characterized by both dry and wet seasons. It has an average rainfall range of about 2500-3500 mm with an average temperature of 80°F. The local government area, due to the presence of the Onitsha main market and all other large markets in the environment has potential market for poultry products. The major occupation of the people is trading, fishing and livestock production.

Sampling technique: The nine quarters (communities) in Onitsha North LGA form the sample frame. All the broiler farmers in the study area form the population from where sample was drawn. Fifteen broiler farmers were randomly selected from each of the 9 communities that make up the LGA. These include: Isikwe, Odakpu, Woliwo, Omagba, GRA, Waterside, Awada, Upper Iweka and Trans-Nkisi. This sampling procedure gave rise to 135 respondents for the study.

Data collection/analysis: Data for the study were collected from primary sources through the use of questionnaire administered on the respondents of the study. The period of data collection was between Octobers to December 2008. The birds were sold off during the Christmas celebration. Descriptive statistical techniques such as means, percentages and enterprise budget as well as regression analysis were used to analyze the data collected for this study.

Analytical framework

Multiple regression analysis: Multiple regression analysis was used to ascertain the socioeconomic characteristics (independent variables) of the poultry broiler farmers that significantly contributed to output. These independent variables included gender of the broiler producers, age, farming experience, educational attainment, family size, farming status and access to credit. These variables are farmer related factors which varies as output changes in the short run.

The multiple regression analysis involved the use of production function model, which stipulates the technical relationship between inputs and outputs in any production process. This relationship shows that total output depends on the quality and quantity of inputs used in the production process. The multiple regression model is implicitly specified as:

$$OUT = F(AGE, FXP, FMS, LAB, EDU, GND, CRD, FAS, NDO, QTF, \varepsilon)$$

where OUT = Broiler output (Kg)

AGE = Age of farmers in years, FXP = Farming experience, FMS = Family size, LAB = Labour (Man days), EDU = Educational attainment measured in the number of years spent in formal education, GND = Gender (Dummy variable: female = 1, male = 0), CRD = Access to credit (Dummy variable: 1 if credit was accessed, 0 if otherwise), FAS = Farming status (Dummy variable: 1 if full time farmer, 0 if otherwise, NDO = Number of Day-old chicks, QTF = Quantity of feeds (Kg), ε = Stochastic random term.

The production function was fitted in three functional forms of linear, semi logarithm and double logarithm. The lead equation was chosen on the basis of conformity with *a priori* expectations of parameters, statistical as well as econometric criteria such as the magnitude of R^2 and the t-values of the estimates and the number of significant variables in each estimated equation.

Enterprise budget: Enterprise budget is the listing of revenue from the sales of broiler birds and cost incurred in production. These costs are variable costs and include the costs of labour, Day-old chicks, veterinary services, transportation, poultry items and rent charges on land used. Enterprise budget involves the determination of gross margin and net farm income. In the same vein, profitability analysis was done through establishing a net margin-to-cost ratio.

RESULTS AND DISCUSSION

Socioeconomic characteristics of the broiler producers: The various socioeconomic variables of poultry farmers which could be relevant in influencing output were examined. These include gender of respondents, age, farming experience, level of education, family size and farming status. The result is presented in Table 1.

The result indicates a male dominance (74%) in broiler enterprise production in the study area. Also, over 85% of the respondents are aged between 26 and 55 years. This age range is considered as an active productive age in the production process. Most of the respondents (74%) however did not go beyond primary education. This has a serious implication with regards to technology adoption.

Influence of farmers socioeconomic characteristics on broiler output: On the basis of an expected relationship between broiler output and the socioeconomic variables of the poultry farmers, a multiple regression analysis was used to ascertain the influence of these variables on broiler output in the study area.

Table 1: Socioeconomic characteristics of the broiler producers

Gender	Number of respondents	Percentage
Male	100	74
Female	35	26
Total	135	100
Age		
25years and less	8	5.92
26-35 years	20	14.82
36-45 years	35	25.92
46-55 years	60	44.44
56-65 years	12	8.88
65 years and above	-	-
Farming experience		
1-5	15	11.11
6-10	25	18.52
11-15	40	29.63
Above 15	55	40.74
Level of education		
No formal education	35	25.92
Primary school completed	65	48.15
Secondary school completed	25	18.52
Higher institution completed	10	7.41
Type of profession		
Full-time farmers	40	29.63
Civil servants	14	10.37
Business Men	16	11.85
Craft Men	65	48.15

The regression model was tried under the three basic functional forms and the semi logarithmic function was chosen as the lead equation. This is based on the value of the coefficient of multiple determination (R^2) and the number of significant variables in conformity with *a priori* expectations and the lowness of the mean square error. The econometric estimate is presented in Table 2.

The regression estimates indicate that six variables viz: experience in poultry (broiler production), farming status, access to credit, labour, number of day old chicks and quantity of feeds were statistically significant on their influence on broiler output. The coefficient of multiple determination (R^2) of 0.79 indicates that about 79% of the changes in output of broiler were explained by the explanatory variables and the F-ratio of 39.1 is significant at 5% level.

Examining the coefficient of individual characteristics reveal that experience in poultry production is statistically significant at 1% level of significance. This implies that poultry output will increase as the farmers experience in poultry production increases. This is in line with the a priori expectation as it is well known in economic theory that efficiency increases with an increase in production experience. The size of the household of the farmer, though positive is not significant on its effect on output. This may be as a result of the fact that most of the family members are engaged in other forms of enterprises rather than serving as a source of labour to the poultry business. In the same vein, level of formal educational attainment is not significant. This could be that experience acquired on the job training may prove to be more relevant in affecting broiler output than acquisition of mere formal education. Though, relevant as formal education is, it can not substitute experience in a particular enterprise.

The farming status of the broiler producers has positive influence on output and it is statistically significant at 5 % level. This implies that the more a farmer is devoted to poultry production on full time basis, the more the possibility of improving output. This is in line with *a priori* expectation as a full time poultry farmer is expected to specialize and get more experience than the part time farmers who have their time to share with other activities. The coefficient of access to farming credit is also positive and significant at 1% level. This implies that the more the broiler farmers accessed credit, the more their output would be as more Day-old chicks will be bought and more labour can be employed. This finding is also in line with those of various authors that credit is a veritable tool that can lead to increased output if properly applied (Ike and Chidebelu, 2003; Saito, 1994). In the same vein, labour as a critical input in production is positive and significant at 1 % level. With adequate hands, output will increase relative to the size of the farm.

The coefficient of number of Day-old chicks is negative but significant at 5% level. Though this is against the a priori expectation, the implication could be that as more day old chicks are bought, mortality rate could become high particularly with poor management. Likewise, the quantity of feed is negative and significant at 5% level. This could imply that farmers are using low feeds of low quality for their broiler production. The quality of feeds has very high effect on output.

Estimating profitability of the broiler enterprise: Fixed costs incurred by respondents with respect to broiler production are, cost depreciation on building and equipment.

Table 2: Lead Equation of Regression Estimate (Semi-log) Results

Variables	Coefficients	t-values
Constant	0.895	(8.84)**
Age	701.3	(0.744)
Experience	2.99	(5.94)**
Family size	2.27E-02	(0.79)
Education	4.21E-02	(0.83)
Farming status	0.11	(2.39)*
Gender	-0.21	(-1.23)
Access to credit	6.72E-06	(3.95)**
Labour (mandays)	9.14E-07	(4.29)**
Number of day old chicks	-0.08	(-2.24)*
Quantity of feeds	-0.09	(-2.56)*
R^2	0.79	
F- ratio	39.1	

Figures in parenthesis are t-values, *Significant at 5% level, **Significant at 1% level.

Table 3: Enterprise budget per Annum for the average broiler producer

Items	Quantity	Cost/Unit	Amount
Gross income	475	1300,00	650,000.00
Broiler sales (stock balance)	475	-	-
General stock	500	-	-
Empty bags (feeds)	250	20	5,000.00
Manure (bags)	120 bags	100	12,000.00
Total Revenue			667,000.00
Variable cost			
Opening stock	500	160	80000.00
Feeds (Starter)	63	1550	97,650.00
Feeds (Finisher)	187	1400	261,800.00
Medication/Veterinary Services			10,220.00
Miscellaneous (water, wood shavings, electricity)			2,350.00
Labour			3,850.00
Total variable cost			455,870.00
Gross margin			211,130.00
Fixed cost			
Depreciation on shelter/housing			5,680.00
Depreciation on equipment			3,100.00
Depreciation on repairs and maintenance of heat and light			4,420.00
Transportation			2,000.00
Total fixed cost			15,200.00
Net farm income			195,930.00

The straight line method of depreciation was used to determine the annual cost of building and equipment. The average fixed cost incurred by the farmers in the study area amounted to the sum of ₦ 15,200.00 on 500 unit broiler production enterprise.

Findings indicate that feeds cost accounted for about 78.84% which is the greatest variable cost. This is followed by purchase of day old chicks and medication that accounted for 17.54% and 2.24% respectively.

From the enterprise budget analysis for the broiler shown in the Table 3 it could be observed that broiler production is a profitable venture in the study area.

The result of the survey shows a Gross Margin on Variable cost ratio of 0.46 and a return to Capital of 0.41. Further more, a break-even analysis was done to determine the break-even quantities. The results show that a large margin of safety was exhibited (that is the amount of output by which the scale of operation exceeds the break-even point).

For a scale of operation of 500 birds, a margin of safety of 0.05 or 5% and the break-even quantity of 475 (broilers) was calculated. The general results show that the broiler production enterprise is highly profitable and economically viable in the study area.

Also, Table 3 reveals that the average gross income for a 500 unit of broilers of sampled farms were ₦ 667,000.00 and average net returns was calculated to be ₦ 195,930.00. It could therefore be summarized that the average total cost for producing a broiler to maturity in the study area is ₦ 911.74, while average total fixed cost per bird is ₦ 30.40. Thus, the total cost of producing a mature broiler is ₦ 942.14, while the gross revenue per bird is ₦ 1334.00. The calculated net revenue per broiler for a typical farmer in the area is ₦ 391.86.

A net margin-to-cost ratio of 0.4159 indicates that ₦ 1.00 investment in input would yield additional ₦ 0.42 k in broiler production. This might be the reason behind more farmers' engagement in broiler production in the study area.

Conclusion: From the above results of the analysis, there is an indication that broiler enterprise could be a profitable or viable venture if properly managed in the study area. This is drawn from the fact that since good profit (net returns) could be achieved by farmers in the study area, it could also be wise if the farmers are encouraged to go to poultry production (Broiler especially). Apart from making good profit, increase in poultry production would guarantee protein needs of the ever increasing population.

In order to successfully exploit the high profit potential of the broiler industry in the study area, the following recommendations are made. The provision of capital or credit is one of the most commonly utilized methods of directly influencing small-scale industries. The overwhelming use of self-financing in poultry production reflects the underlying capital shortage and a corresponding need for improved access to credit through the formal financial system.

Secondly, technical training programmes organized in the form of seminars for small scale business operators including broiler farmers at local government or community levels is advocated. This is because as evidenced in this study, improved managerial skills with respect to record keeping, savings, reinvestment of accumulated profit and business planning would enhance the economic viability of these enterprises.

Non-governmental organizations (NGOs) in addition to their active role in provision of financial credit to small businesses in Anambra state should also engage in establishing poultry farms at community levels to reduce the problems encountered by broiler farmers in some communities.

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