

PROFITABILITY AND MARKET APPEAL AGE AMONG SMALL HOLDER BROILER FARMERS IN ENUGU STATE NIGERIA

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ABSTRACT

The study analysed profitability and market appeal age among small holder broiler farmers in Enugu State, Nigeria. The market appeal ages studied were 8, 10, and 12 weeks. Primary data was obtained from the field survey through well-structured questionnaires, administered to Sixty (60) broiler farmers randomly selected from the three agricultural zones of the State. The data was analysed using gross margin which determined the cost and returns of the broiler farmers. Regression analysis was used to estimate the determinants of profitability of the enterprise. The results revealed a positive relationship existed between the revenue collected and the market age. Thus the profitability to rear and sell broiler in Enugu State is best between 8 and 10 weeks of age. The study showed that farm size and production cost influenced profitability. The study thus recommends among other things that government should provide credits subsidies most especially on feed and medication as they contribute immensely to high production cost and also introduce fast growing and hardy breeds to farmers in the enterprise.

Keywords: profit, gross margin, age, production, determinants.

INTRODUCTION

Small-holder farmers are the main actors in agricultural development as they account for about 90% of food production in Nigeria (Okpukpara, 2009). This trend will continue for many years to come. However, despite its prominence, Nigeria's agricultural

situation has been characterized with decline in food import bill during the past decade (Mark, 2000). In addition, small holder farmers have marginal impact on food production for the teeming population (Kadurumba, *et al.*, 2009). Many factors have been reported to be responsible for

decline in smallholders' productivity. The problem of low profitability and lack of improvement in livestock production is due to predominance of primitive farming system, misplaced government priorities, inadequate supply of credit or capital to the sector and inadequate incentives as well as poor infrastructural facilities or the combination of these factors (Jappelli, *et al.*, 2000).

Animal protein is essential in human nutrition as it contains most of the essential amino acids in the right proportion and in the right form readily useful to the needs of the human body (Ajibefun and Daramola, 1999). It has been postulated that the poultry is strategic in addressing animal protein intake shortage in human nutrition (Oluyemi and Roberts, 2000; Isika et al., 2007). The broiler sub-sector has been observed to be the fastest way of bridging the protein deficiency gap in Nigeria (Akinwumi and Olayide, 1997). Broilers have the advantage of being good converter of feed into useable protein, producers of meat which is palatable and acceptable and low production cost per unit relative to other livestock. In spite of the numerous advantages and the positive market outlook, broiler sub-sector specifically faces increasing challenges (Adene and Oguntade, 2006). One of these challenges is the increasing cost of broiler production (Okere et al., 2018). Ubosi and Sekuna (2000) had stated that the cost of

feed among others is the largest single variable cost in broiler production. It represents about 60 to 70 percent of the total cost.

Currently, broilers are offered for sale in different ages and sizes depending on circumstances and purposes. Oluyemi and Roberts (2000) had noted that exact time for marketing broilers depended on relative cost of chicks, feed and market preferences. Broiler farmers operate at various scales and use various techniques to achieve their production goals. They also sell their products at different sizes and at different prices. Generally, broilers are known to attain slaughter weight at about 7 – 8 weeks of age (Ojewola *et al.*, 2006). Despite being slaughtered at these ages, growth has not reached maximum, but efficiency of feed conversion starts falling due to higher proportion of fats being deposited (Agwu, 1996). However what is clear is how profitable it is for farmers who rear at 8 weeks and above. In order to maximize profit and efficiency to be maintained in resource use, in the face of increasing cost of production inputs, this necessitated the study to examine the cost and profit implication of the various market appeal ages. Thus this study seeks to determine and compare the cost and returns of broilers marketed at various ages as well as analyse the determinants of profitability of broiler farmers in the study area.

MATERIALS AND METHODS

The study was conducted in Enugu state located in southeastern Nigeria and lies within latitude $06^{\circ} 30'N$ and longitude $07^{\circ} 30'E$ of the Greenwich Meridian. Enugu is bounded in the North by Kogi state, in the South by Abia State, in the West by Anambra State and Benue and Ebonyi State on the East. The state falls within the tropical rainforest zone and annual rainfall ranges from 1300mm – 1350mm. The atmospheric temperature is $28^{\circ} - 30^{\circ}C$ and relative humidity is at 73% to minimum of 70%. It has an area of 7,161km² and a population of 5,590,513 people (NPC, 2006). Agriculture is the mainstay of the vast majority of people which livestock production forms a significant proportion. A multistage sampling technique was used. Enugu state was stratified into three zones according to the agricultural zones of the State. In the second stage, two blocks were selected from each zone by simple random sampling (SRS) procedure. In the third stage, the circles in each chosen block were delineated and the list constitutes the sampling frame from which a circle was chosen per block by SRS procedure. In all, a total of 6 circles were chosen. With the assistance of the village heads and the extension agents of the Enugu State Agricultural Development Programme in charge of the chosen circles the listing of broiler farmers in the chosen circle was

done. A total of 60 broiler farmers, consisting of 10 farmers per circle were chosen. Data generated were analysed with gross margin analysis and regression analytical technique.

Specification of model

Gross margin analysis model is specified as follows

$$GM = \sum P_i Q_i - \sum P_j X_j \text{ where}$$

P_i = unit price of i^{th} output

Q_i = quantity of i^{th} output

P_j = unit price of j^{th} input

Q_j = quantity of j^{th} input

Alternatively $NR = GM - TFC$

Where NR = profit

GM = Gross margin

TFC = total fixed cost

The implicit regression model for determinants of broiler production is specified thus

$$Y = F(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, x_{10}, x_{11})e$$

Where Y = Profitability (₦)

x_1 = rent

x_2 = transportation

x_3 = cost of feed

x_4 = cost of medication

x_5 = cost of energy (electricity diesel/petrol /kerosene)

x_6 = cost of water

x_7 = cost of labour

x_8 = depreciation

x_9 = cost of purchase of day old chicks

x_{10} = cost of poultry equipment

x_{11} = farm size (No of birds)

e = stochastic error term

This model was tried in four functional forms viz: linear, semi-log, double log and exponential. A lead equation was chosen based on the number of significant variables, R^2 values and the F- ratio value.

RESULTS AND DISCUSSION

Cost and return analysis of broiler enterprise in Enugu State

The cost and return analysis of broiler enterprise in Enugu State is shown in Table 1. The result shows that the cost of feed, day old chick and medication were significant variables. The cost of production and

market age showed a positive relationship. The implication is that as age increases, cost of production also increases. This is shown in the percentage increase from 6.45% at 10 weeks to 19.74% at 12 weeks of age. There exist a positive relationship between the revenue collected and the market age. The net profit for 8, 10 and 12 weeks respectively were 3784100, 5244600 and 6653500. The overall result showed a decrease from 38.60% at 10 weeks to 26.86% at 12 weeks of age. This result shows that it is not economically efficient to produce beyond 10 weeks of age.

Table 1 Cost and return analysis of broiler enterprise in Enugu State.

Variables	8 weeks	10weeks	12 weeks
Total revenue	8,120,00	9,860,000	12,180,000
Variable cost			
Feed	2,700, 200	2,900,300	3,692,000
DOC	1,215,000	1,215,000	1,215,000
Medications	151,000	154,000	173,000
Rent	30,300	50,000	72, 000
Transportation	29,700	43,000	51,000
Electricity	20,000	22,000	30,000
Water	31,300	42,000	51,000
Litter	2,900	5,300	9,300
Tax	1500	1500	1500
Labour	60,000	70,000	91,600
TVC	4,241,900	4,503,100	5,384,900
Fixed cost			
Fixed asset	93, 000	102,000	130,000

Depreciation on assets	1,000	10,300	11,600
TFC	94,000	112,300	141,600
Total cost	4,335,900	4,615,400	5,526,500
Total farm size at market age	5,800	5,800	5,800
Selling price/bird	1,400	1,700	2,100
Net profit	3,784,100	5,244,600	6,652,500
Cost of production/bird	747.57	795.76	952.84
% increase in cost of production	-	6.45	19.74
Profit/bird	652.43	904.24	1147.16
% increase in profit	-	38.60	26.86

Source: Computation from field survey, 2018.

Determinants of profitability among broiler farmers in Enugu state

The double log form was chosen as the lead equation based on the high R^2 value, number of significant variables and agreement with priori expectation. The R^2 value of 0.942 implying 94.2% of variability in the dependent variable were explained by the independent variables. The F- value of 9.874 was highly significant at 1% level of probability indicating regression of best fit. The result shows that price of feed/feed supplement, appeared to be an important variable input that determines profit levels in broiler enterprise in the study area. It was rightly signed and statistically significant ($p < 0.050$) with a coefficient of 0.152. This showed the indispensable nature of feed in broiler production but however implied that a 10% increase in price of feeds would depress profit level of the enterprise by

1.52%. This means that the price is negatively related to profitability. The coefficient for price of drugs and medication was -0.614 though carried right sign a-priori. This coefficient which was inelastic in nature appeared not to be a major determinant of profit level of broiler enterprise in the study area. The high cost of veterinary drugs might have cut off most farmers. Effiong (2005) stressed that the cost of drugs had gradually assumed a significant proportion of the total variable cost in the industry. The coefficient cost of water used was positive (0.611) which agrees with a priori expectation. Water cost was highly significant at 95.0% confidence level. This implies that a unit increase in the cost of water would increase total cost and decrease profitability by 0.611. The coefficient of number of birds raised was 0.619 and highly significant at 1%

probability level. The coefficient is positive and less than unity implying that increasing the number of birds by one would increase the revenue accruable by 61 kobo. In other words, the allocation and utilization of this factor is in stage II of the production surface and thus it is efficiently allocated and utilized. The cost of day old chicks(DOC) was significant and had a negative coefficient (-0.542) meaning that the cost is negatively related to probability. By implication, as these cost increase, profitability decreases. Labour unit has a coefficient of -1.169 and has high t-value (-9.766). Its implication is such that an increase in labour input reduces

profitability. Given a production elasticity of -1.169, the broiler farmers in the study are either misallocating or over utilizing labour. This finding contradicts Ezech (2006) that showed farm operations in Nigeria to be labour intensive. The coefficient for capital input was 0.843 and although it carried positive sign, was statistically not significant($p < 0.050$). The coefficient was highly inelastic and did not play a major role in profit level of the enterprise. The coefficient of depreciation is negative and not significant. Depreciation is not a major determinant in profit level of broiler production in the study area.

Table 2: Determinants of profitability among broiler farmers in Enugu State.

Variables	Linear	Semi log	Double log	Exponential
Constant	15813.4 (1.743)	-101.151 (-2.611)***	6.112 (2.104)**	10.241 (11.813)***
Price of feed	-0.114 (-3.124)***	22113.130 (0.572)	-0.152 (-2.081)*	1.73E – 0.008
Rent	15.321 (-0.742)	-17443.3 (-0.463)	0.824 (0.732)	-7.61E- 0.05 (-1.241)
Transportation cost	8.423 (0.613)	9285.031 (3.645)**	0.124 (0.213)	0.003 (2.214)**
Price of drug/medication	4.321 (2.843)**	-278412.2 (-2.947)**	-0.614 (-0.144)	3.35E- 0.05
Water	3.024 (0.461)	135721.14 (1.323)	0.611 (2.814)**	3.72E – 0.05 (0.584)
Stock size	0.149 (0.314)	0.639 (1.114)	0.619 (11.128)***	0.529 (0.584)

Cost of DOC	7.312 (5.243)***	110184.21 (1.200)	-0.542 (-4.329)	2.10E – 0.05 (0.572)
Cost of labour input	-6.149 (-2.104)	-74123.304 (-0.342)	-1.169 (-9.766)***	9.74E – 0.06
Capital input	-6.042 (-2.632)**	-124840.3 (-1.187)	0.843 (0.782)**	7.64E -0.03 (0.035)
Depreciation cost	3.413 (0.113)	-132041.6 (-1.321)	-0.342 (-0.856)	-5.43E – 0.05 (-0.421)
R2	0.874	0.901	0.942	0.877
f-ratio	10.332***	8.374***	9.874	10.442

Source: Computation from field survey, 2018.

Note: figures in parenthesis are the t-values *, **, *** are 10%, 5% and 1% levels of significant respectively.

CONCLUSION

The result of this study showed that the profitability to rear and sell broiler in Enugu State is best between 8 and 10 weeks of age. More so, high cost of production significantly affects profitability of the enterprise negatively. Therefore, it is recommended that policies aimed at increasing broiler farmers scale of operation through improved access and subsidies to production inputs like feed, drugs and capital as well as targeting relevant policies at experienced broiler farmers will be necessary for increasing profitability. Furthermore, it is suggested that government should introduce new packages of technologies that promote productivity, efficiency and profitability to the boiler farmers.

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