Broilers Production among Small Scale Producers in Imo State, Nigeria: A Profit Function Analysis

Ibekwe U. C, Chikezie C, Ibeagwa O. B, Onyeoziri M. N

Department of Agricultural Economics, Federal University of Technology, Owerri, Nigeria

Abstract: *The Study was on profit function analysis of small scale broiler producers in Imo state Nigeria. Both primary and secondary data were sourced. Multi stage sampling technique was used to select a total number of 60 broiler producers. Descriptive Statistics and Ordinary Least Square Regression model were the major tools of analysis. The finding shows that the broiler farmers had a mean household size of 4 and over 90% were learned.. The result also shows a mean age of 44 and a male dominance (74%) in broiler enterprise production in the study area. The mean net farm income was N31, 282.04 and a benefit cost ratio of 1.08. linear function was the lead equation on the basis of highest R^2, F-value and number of significant variables and in conformity with the a priori expectations. The Coefficient of Multiple Determination (R^2) was 0.848 and F value was 28.67. Age, educational level, farm experience, farm size and cooperative membership were significant whereas household size, gender and marital status were not. The major constraints are lack of production facilities and inadequate capital.*

Keywords: *Broiler production, profit function, production constraints*

1. INTRODUCTION

Before independence and during the early years after independence, Nigeria was a thriving agrarian economy. Agriculture contributed reasonably in share of Gross Domestic Product of the nation to the tone of 65%. The proceeds of agricultural production were able to feed the teeming population {1}. These laudable contributions began to dwindle at the discovery of oil in 1970's. In the quest to boast agriculture and to restore its past glory, successive governments in Nigeria launched different agricultural programmes ranging from Operation Feed the Nation (O.F.N) in 1976, National Accelerated food production (NAFP) in 1972, Agricultural Development Programmes (ADP) in 1974, among others {2}. However, the performances of these programmes are yet to register remarkable results and according to {3}, this has a serious implication for continued food insecurity in the country.

Protein is required for growth and repair of lost tissues. This can be gotten from both animal and plant sources {4}. Animal protein especially poultry meat is scarce, costly and not within the reach of majority of the people. This low consumption and its effects are felt more by a larger proportion of the population who reside in the rural areas. This group of individuals makes up over 70% of the Nigerian population and they constitute approximately 85% of the extreme poor in the country {5}. According to {6}, broiler production is in short supply and demand on the other hand is growing by nearly 3.5% per annum {7}. With the growing population in Nigeria, the increased demand for poultry meat is inevitable, hence the need for an expanded production {8}.

Broilers are birds which are reared especially for meat and the enterprise has short production cycles. According to {9}, most commercial broiler reaches slaughter weight at between 5 – 7 weeks of age, although some growing strains reach slaughter weight at approximately 14 weeks of age. Large numbers of farmers who engage in this business do so for income generation purposes {9}. However, they are constrained by rising cost of inputs, particularly feed and medication {10}. Therefore, analysis of profit function on poultry production in the study area would facilitate appropriate knowledge for enhanced economic benefit in poultry business. The objectives of the study are to:

- Describe the socio-economic characteristics of broiler farmers in the study area;
- Analyze the factors influencing the net farm income of the respondent in the study area;

- Examine the constraints in profitability of broiler production in the study area;

2. MATERIALS AND METHODS

The study was conducted in Imo state. The state has three agricultural zones and 27 Local Government Areas. It has a population of 3,934,899 million people {11}. The people in the state are mainly farmers who engage in food and livestock production and marketing. Animals reared at both subsistence and commercial levels are poultry (broilers, layers), goats, sheep, pigs and fishes.

Multistage sampling technique was adopted for the study. In the first stage, 5 Local Government Areas (LGAs) were randomly selected, followed by a purposive sampling of two (2) communities from each LGA due to a high number of broiler farmers in the area. From each community, two (2) villages were randomly selected to give a total of twenty (20) villages. Lastly, three (3) broiler farmers were selected from the sampling frame in each village, giving a sample size of sixty (60) respondents.

Both primary and secondary data were used for the study. Primary data was collected with structured questionnaire. Secondary data were collected from journals, newsletters, past projects, internets, textbook amongst others.

Both descriptive statistics and ordinary least square regression model were used to achieve the stated objectives. The regression model is implicitly stated as follows.

$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e) \tag{1}$$

Where Y = Net farm income.

X_1 = Farmers age (years)

X_2 = Amount invested (Naira)

X_3 = Educational level (years)

X_4 = Farming experience (years)

X_5 = Stock density (Number)

X_6 = Member of cooperative society (1 for member, 0 if otherwise).

X_7 = Sex (Dummy 1 = male, 0 = female)

X_8 = Marital status (Dummy, 1 for married. 0 if otherwise)

e = Error term

It is expected a priori that $X_1 < 0$, and $X_2, X_3, X_4, X_5, X_6, X_7, X_8, > 0$. $\tag{2}$

The different functional forms were tested and the lead equation was chosen based on the value of the coefficient of determination (R^2), F statistics, Signs and size of estimated parameters as well as the significance of the parameters.

3. RESULTS AND DISCUSSION

3.1. Socio-Economic Characteristics of Broiler Farmers

Table 1 shows that 53.33% of the respondents are within the age bracket of 41 -50 years, indicating that majority of the respondents were middle aged farmers who are still active and vibrant. By implication they are more likely to adopt innovations faster than others in the other age brackets. This supported by {1}.The broiler farmers had a mean household size of 4. This is quite different from what is common among farmers since more household size mean more work forces. This may be as a result of the fact that the respondents are educated hence appreciates the idea of moderate family size.

The table shows that 45%, 36.66% and16.66% of the respondents attained secondary, primary and tertiary education respectively whereas 1.67% is illiterates. High educational attainment is very essential; since modern agriculture requires some level of literacy and technical knowledge level of education influences the rate of adoption of new technology. The mean farming experience of broiler farmers in the study area is 9 years. This number is reasonable enough for any significant achievement by the respondents in the study. The result also shows a male dominance (74%) in broiler enterprise production in the study area. This is consistent with the findings of {12} and {13}.

Table1. *Socio-Economic Characteristics of Respondents*

Categories	Frequency	Percentage (%)
Age (years)		
20-30	6	8.33
31-40	7	11.66
41-50	32	53.33
51-60	14	23.33
61-70	1	1.67
>70	1	1.67
Household size		
0-5	29	48.33
6-10	30	50
11-15	1	1.67
Educational level		
0	1	1.67
1-6	22	36.66
7-12	27	45
>12	10	16.66
Farm experience		
0-10	33	55
11-20	25	41.67
31-30	2	3.33
Sex		
Male	44	73.33
Female	16	26.67
Total	**60**	**100**

Source: *Field survey data, 2014*

3.2. Factors Influencing the Net Farm Income of the Respondents

From table 2 linear functional form was chosen as the lead equation on the basis of highest R^2, F-value and number of significant variables and in conformity with the a priori expectations. The value of coefficient of Multiple Determination (R^2) was 0.848 which implied that 85% of the variations in the net income of broiler producers were explained by the combined effect of independent variables included in the model. F-ratio of 28.67 is significant at 1% level.

Table2. *Estimate of Multiple Regression Result*

Explanatory Variable	LinearFunction	Semi log Function	Exponential Function	Double log Function
X_1 (Age)	282. 9303 (2.21307)*	–40640.9 (–0.48798)	–0.00323 (–0.17269)	–0.19737 (–0.25462)
X_2(Amount invested)	5281.164 (0.8982)	11187.34 (0.359925)	0.011189 (0.135138)	–0.2939 (–1.0159)
X_3 (Education)	1355.365 (6.385892)**	–626.559 (–0.02162)	0.018149 (0.366927)	–0.06634 (–0.2459)
X_4(Farm experience)	559.4534 2.4135)*	3521.613 (0.123385)	0.023837 (0.730239)	–0.03301 (–0.12428)
X_5 (Farm size)	935.9283 (8.118233)**	159022.7 (5.713156)**	0.00456 (2.808891)**	1.490394 (5.752966)**
X_6 (Cooperative)	73146.98 (2.670582)**	153489.9 (3.112955)**	0.416529 (0.675523)	0.240305 (0.523637)
X_7 (Gender)	–35677 (–1.45856)	–38653.9 (–1.21413)	–0.01793 (–0.05206)	–0.43994 (–1.4847)
X_8(Marital Status)	48863.15 (1.311753)	63729.64 (1.327059)	0.607588 (1.158252	0.861359 (1.927111)*
Constant	–85997.2	–524570	9.637313	5.025697
R^2	0.848	0.768	0.47787	0.651175
F–value	28.67	16.973	4.69064	9.567164

* = Significant at 5%; ** = Significant at 1% ; t-ratios are the values in bracket

Source: *Field survey data, 2014.*

Age (X_1) was significant at 5% level of significance and positively related to the net farm income of broiler producers in the study area. This is contrary to a priori expectation. Education (X_3) was significant at 1% level of significance and positively related to net farm income in the study area, this implied that net income increased as respondents become more educated. This result agrees with a priori expectation, though contrary to findings of {14}, {15}

Also, coefficient of farm experience (X_4) was significant at 5% level of significance and positively related to the profitability of broiler production in the study area. This implied that adequate experience in broiler production reduced mortality rate and brought about an enhanced income. This is consistent with the findings of {6}. Farm size (X_5) was significant and positively related to net farm income in the study area. This implied that as more birds were stocked, profit increases. This agrees with the finding of {13} that shows a positive effect of stock size on broiler output and by extension net income.

Finally, cooperative membership (X_6) was significant at 1% level of significance and positively related to net farm income. Conversely, coefficient of age (X_1), household size (X_2), gender (X_3) and marital status (X_8) were not significant at both 5% and 1% level of significance.

3.3. Perceived Problems

Figure 1 shows the frequency distribution of farmers according to their perceived problems i.e. the constraints. From the chart 26% of broiler farmers have problem of distance from buyers, (22%) of them lack production facilities whereas 20% of the them does not have enough capital for the production. 20% have limited, little or no buyer to buy the product and 12% of broiler have other problems in their farms like disease outbreak. By Implication, all these problems could slow down production process and by extension reduce profit levels in the study area.
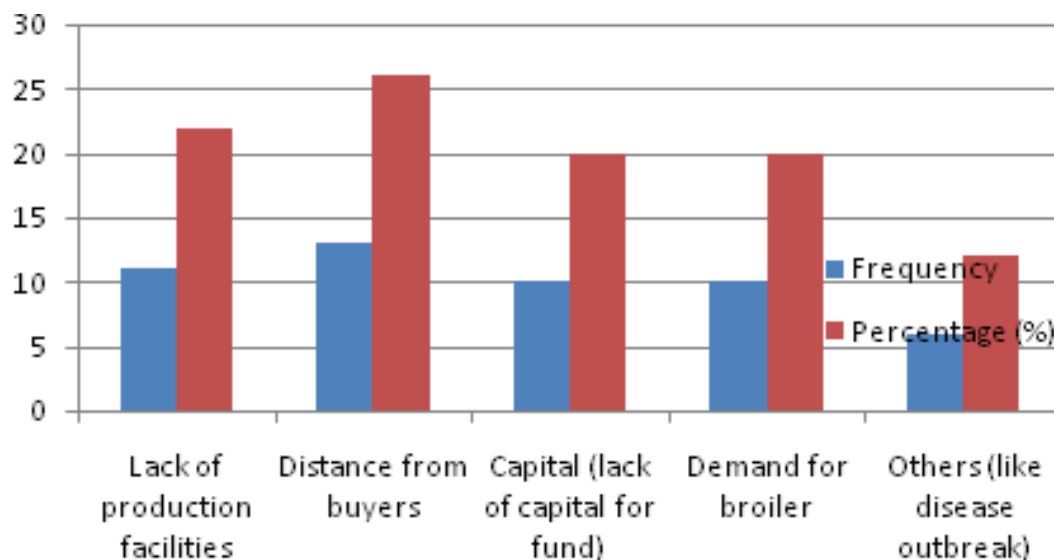

Fig1. *Distribution of respondents according to perceived problems (constraints)*

4. CONCLUSION/ RECOMMENDATIONS

Variables such as age (X_1), educational level(X_3), farm experience (X_4), farm size(X_5) and cooperative membership (X_6) were significant at 5% and 1% level of significance whereas household size (X_2), gender (X_7) and marital status (X_8) were not. Greater number of the respondents (26%) identified distance from buyers as their major problem in broiler production whereas 20% of them identified lack of adequate fund as their limiting factor. Based on these findings, it is recommended that training, seminar, workshop should be organized by relevant agencies to educate both members of cooperative and non-member of cooperative farmers on modern agriculture, using better quality breeds of broiler and improved production technologies. Also, soft loans at low interest be made available for the farmers in the study area

REFERENCES

[1]. Otitolaiye, J.O., Ajayi, O.J.,.and Emesioluwa, A.M.,. 2009, Analysis Of Credit Utilization Behavior of Small Scale Business Farmers in Bosso Local Government Area Of Niger State, Nigeria Continental J. Agricultural Science ,: 58 - 64,

[2]. Obetta, K. C., and Okide C.C., 2013, Rural Development in Nigeria; problems and Prospects. Society for research and Academic Excellence

[3]. Oyatoye, E.T., 1981, "Financing Small Farmers: A Change of Strategy", proceeding of a Seminar Organized By Central Bank of Nigeria Lagos pp 8 – 14.

[4]. C. Alais and G Lindel,. Food Biochemistry, Aspen Publishers Inc, Gaithersburg, Maryland. 1990.

[5]. Chukwuji C. O., Inoni O. E., Osuagwu C. N.,2002, Family size, purchasing power and strategies for increasing rural household protein intake in Delta State, Nigeria. In: V. A., Aletor. and G. E., Onibi (eds) Proceedings of the 27th Annual Conference of the Nigerian Society of Animal Production. Akure, Nigeria, pp 380-382.

[6]. IKE P.C., and. Ugwumba C.O.A., 2011, Profitability of Small Scale Broiler Production in Onitsha North Local Government Area of Anambra State, Nigeria International Journal of Poultry Science 10 (2). 106-109, 2011 ISSN 1682-8356

[7]. FAO (2013). - Corporate Document Reposting Agriculture and Consumer Protection 2013. Guide to Animal Feeding Operation (6. Page fact sheet). Jefferson City.

[8]. Chukwuji C.O., Inoni O.E., Ogisi O.D., Oyaide W.J., 2006, A Quantitative Determination of Allocative Efficiency in Broiler Production in Delta State, Nigeria. Agriculturae Conspectus Scientificus, 71 (1), 21–26.

[9]. Nwajiuba, C., and. Nwoke, E., 2000,. Inflation and Poultry in Nigeria: Implication for Profitability Re-inventing Animal Production in the 21st Century In: U.I. Ojo and O.C. Mgbere (Eds). Proceeding.of the 5th annual conference of the Animal Science Society of Nigeria, Port Harcourt, Nigeria, pp 206-208

[10]. Umeh, G. N., and Odo, B. I., 2002, Profitability of Poultry Production among School Leavers in Anambra State, Nigeria. Nigerian Journal of Animal Production, 29(1), 76 – 80.

[11]. National Population Commision, 2006

[12]. Achoja, F.O., Ike P.C., and. Akporhuarcho, P.O., 2008, Economics of Veterinary Services Delivery among Commercial Poultry Farmers in a Market-Driven Economy: Evidence from Delta State, Nigeria. Int. J. Poult. Sci., 9: 1117-1121

[13]. Ukwuaba S.I., and. Inoni O.E 2012, Resource-Use Efficiency in Small-Holder Broiler Production in Oshimili North Local Government Area, Delta State International Journal of Poultry Science 11 (11), 700-705, 2012 ISSN 1682-8356

[14]. Amos T.T., 2006, Analysis of Backyard Poultry Production in Ondo State, Nigeria International Journal of Poultry Science 5 (3), 247-250, 2006 ISSN 1682-8356 © Asian Network for Scientific Information, , p. 247

[15]. Emenyonu, C.A., Odii, M.A.C.A., . Obih, U.,and. Anaeto, C.F., 2005 Determinants of Sustainable Broiler Meat Production in Imo State. In Onibi,G.E., Agele, S.O. and Adekunle, V.A.J. (eds). 2005. Proceedings of the 1st Annual Conference on Developments in Agriculture and Biological Sciences. 27th April, 2005. School of Agriculture and Agricultural Technology, Federal University of Technology, Akure, Nigeria, pp:300.

AUTHORS' BIOGRAPHY

Dr. Ibekwe U. C was born in Akokwa, Imo state Nigeria on July 24, 1958. He obtained his Bachelor of Agriculture (B. Agric) in Agricultural Economics from the University of Ibadan, Oyo State, Nigeria (1983) and a Master of Science (M.Sc) in Agricultural Economics from University of Nigeria Nsukka Enugu State, Nigeria in 1994. Dr. Ibekwe obtained his Doctoral Degree in Agricultural Economics from University of Nigeria Nsukka, Nigeria in 2001.His research interest is in Farm management and Production Economics. He works in the Department of Agricultural Economics, Federal University of Technology, Owerri Imo State Nigeria as a Senior Lecturer and he has several publications. Dr. Ibekwe is a member of several learned associations including Nigerian Association of Agricultural Economists (NAAE) and Agricultural Economics Society U.K.

Mrs. ChikezieComfort was born in Aba, Abia State of Nigeria on July 4, 1971. She obtained her Bachelor of Agriculture from the University of Calabar, Cross River State, Nigeria and a Master of Science (M.Sc) from Federal University of Technology, Owerri Imo State. Nigeria. Mrs Chikezie is currently studying as a Ph.D student at Federal University of Technology, Owerri Imo State, Nigeria. She has Research interests in Resource Use, Climate Change and Environment. She works in the Department of Agricultural Economics, Federal University of Technology, Owerri Nigeria as an Assistant Lecturer and she has several researches Papers. Mrs Chikezie is a member of several associations including Agricultural Economics Society U .K, the Agriculture Society of Nigeria and the Farm Management Association of Nigeria.

Mr. Ibeagwa Okwudili Bismarck was born in Buchanan, Liberia on December 19, 1976. He obtained the Bachelor of Agriculture (B. Agric) from the University of Ilorin, Ilorin Kwara State, Nigeria in 2003 and a Master of Science (M.Sc) from Michael Okpara University of Agriculture, Umudike, Abia State Nigeria in 2012. Mr. Ibeagwa is currently studying as a Doctorate student at Michael Okpara University of Agriculture, Umudike Nigeria. He has Research interests in Sustainability of Agricultural Projects in Rural Farming Communities. He is currently working in the Department of Agricultural Economics, Federal University of Technology, Owerri Nigeria as an Assistant Lecturer and He has co-authored several research articles. Mr. Ibeagwa is a member of several learned associations including the Agriculture Society of Nigeria and the Farm Management Association of Nigeria.

Ms. Onyeziri N. was born in Imo State on May 28, 1987. She completed her elementary education at community school, Umuhu, Imo State Nigeria (1993) and her Secondary School at Lily International School Rivers State, Nigeria (2005). She earned her Bachelor degree with honors in Agricultural Technology (B. Agric. Tech.) in Agricultural Economics in 2014.