COMPARATIVE ANALYSIS OF TECHNICAL INEFFICIENCY OF BROILER AND EGG PRODUCTION ENTERPRISES IN NIGER STATE, NIGERIA

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ABSTRACT

The study examined the technical efficiency of broiler and layer production enterprises in Niger State, Nigeria during the 2010 production season. Farm level data were collected from 120 broiler and 120 egg farmers in the State using a well structured questionnaire. Multi-stage random sampling technique was used to elicit primary data from 240 respondents. The stochastic frontier production function was used to examine the technical efficiencies of broiler and egg production enterprises. Both broiler and egg farmers are not fully technically efficient. The mean technical efficiencies of broiler and layer enterprises are 0.75 and 0.86 respectively. This implies that there is a wide scope for increasing farm profit by reallocating the existing resources more optimally. Level of education, credit status and membership of cooperative has positive influence on technical efficiency of broiler enterprise in the study area. In layer production enterprise, farming experience and gender of respondents are found to have positive influence on technical efficiency. Therefore the study recommends that credit should be made available at terms and times convenient to farmers to enhance their level of efficiency. Farmers should also form cooperative societies to enable them have access to productive inputs to aid large scale operation. Extension services should be improved and intensified to impact technical knowledge on farmers. This should include creating awareness for the women farmers to know the profit potentials of broiler farming so that they could be encouraged to undertake the enterprises.

Keywords: Broiler production, Egg production, Technical efficiency, Nigeria

INTRODUCTION

Poultry is a collective term for all avian species nutritionally and economically useful to man (Okoli, 2006). The most important poultry species remains the domestic fowl commonly called chickens, not only because of its universal availability but also because it provides important highly relished human foods. The other domestic *avian* species classed under poultry include turkey, duck, guinea fowl, goose and pigeon. According to Redmond (2007), in the poultry market, a fowl commonly means a full grown female bird. Young birds of both sexes, such as broilers and layers are called chickens. On poultry farms however, male chickens are called roosters or cocks; females especially those more than a year old are called hens; females less than a year are called pullets; very young chickens of either sexes are called chicks; and castrated males are called capons. Fowl belongs to the order *Galliformes*. The common domestic fowl or chicken belongs to the family *Phasianidae* and is classified as *Gallus gallus* (Redmond, 2007).

The importance of poultry production to the biological needs, economic and social development of the people in any nation cannot be over emphasized. Poultry production in Nigeria as well as other warm climate countries has high priority rating compared with other livestock. Ojo (2003) opined that poultry keeping has several advantages over other types of livestock: First, the production cost per unit is relatively low and the returns on investment are high, thus farmers need just a small amount of capital to start a poultry farm. Second, poultry meat is tender. Its palatability and acceptability to consumers are very high; third, it has a short production cycle (payback period) through which capital is not tied down over a long period. Fourth, egg, which is one of the major products of poultry production, is one of the most nutritious and complete foods known to man. Chicken egg protein has biological value of 1.0 and so shares with human protein the distinction of being a

perfect protein. Fifth, egg is more easily affordable by the common man than other sources of animal protein. An average boiled egg cost ₦25, hence boiled eggs are being sold (hawked) freely at motor parks, railway station, market places, roadside, and schools in Nigeria.

The internal supply of livestock products is in such insufficient quantities that importations are made officially and unofficially annually (Gona, 2009). In spite of these importations however, the total supply of livestock products still fall short of the overall demand. In some cases, the domestic production and importations are together still not enough to meet more than 60% of the actual demand (Mbanasor and Nwosu, 2000). However, the sub-sector is undergoing massive transformation fueled by high demand for meat, which is likely to double in the near future (Gona, 2009). The major forces behind this, is the combination of population growth, urbanization and income growth, Food and Agricultural Organization (FAO, 2006).

According to Olayide and Heady (1982), the success of poultry business lies on the intensive system of production. This system is resource driven and requires the operator to be in control of the housing, nutritional and health needs of the birds. These resources including labour are organize into a production unit whose ultimate objective would likely include profit maximization, cost minimization, the maximization of satisfaction or a combination of all these. In Nigeria, deep litter and battery cages are the most popular rearing systems in intensive production system. The former being adapted to rearing of broiler and egg production, while the latter is essential as an egg production technique (Okoli, 2006).

Effiong (2004) posits that it is important to emphasize that farm production which is an organization of resources to produce output involves different operations with varying technical and managerial requirements. He further added that, livestock production could be significantly boosted through improving efficiency of farms by utilizing resources as well as introducing improved technology. Efficiency is concerned with relative performance of the processes used in transforming given inputs into outputs (Ohajianya and Onyenweaku, 2001). Production efficiency means attainment of production goal without waste (Ajibefun and Daramola, 2003). In essence, the efficient utilization of resources in the production process implies optimal productivity of resources. Economic theory identifies three types of production efficiency namely, allocative, technical and economic efficiencies.

Farmers in Nigeria need to improve the efficiency in poultry production so that output could be raised to meet the growing demand, (Ojo, 2003). An increase in efficiency would lead to an improvement in the welfare of farmers and consequently, a reduction in their poverty level and food insecurity (Effiong, 2004). Researchers and other stakeholders in the livestock sub-sector concerned about increasing animal protein through efficient resource use and utilization should seek ways or solutions compatible or that will agree with the socio-cultural and economic make up of the people. The poultry industry has become a diverse industry with a variety of business interests such as egg production, broiler production, hatchery and poultry equipment business (Amos, 2006).

The demand and supply gap for animal protein intake was high (Olagunju, 2007). This is shown on Table 1. The Food and Agricultural Organization (FAO) recommends that the minimum intake of protein by an average person should be 65gm per day; out of which 26g, (i.e. 40%) should come from animal sources. Nigeria is presently unable to meet this requirement. The animal protein consumption in Nigeria is less than 8gm per person per day, which is a far cry from the FAO minimum recommendation (Niang, and Jubrin 2001). Poultry meat and egg offer considerable potential for bridging the nutritional gap in view of the fact that high yielding exotic poultry are easily adaptable to our environment and the technology of production is relatively simple with returns on investment appreciably high. Animal scientists, economists and policy makers are of the opinion that the development of the livestock industry is one of the options for bridging the generally known deficiency gap in Nigerians' diets (Mbanasor and Nwosu, 2000).

Table 1. Supply of poultry in Nigeria

Year	Production (metric tons)	Import (metric tons)	Consumption (metric tons)
2001	182,300	NA	183,500
2002	188,969	4,121	194,074
2003	199,862	1,338	202,149.43
2004	210,235	954	211,217.43
2005	218,531	287	218,800.43
2006	231,706	1,142	232,267.86
2007	243,299	151	243,453.29
2008	243,234	607	248,768.34
2009	256,425	2,523	257,178.12

Source: FAO, 2012.

Therefpre, the specific objectives of this study were to examine the technical inefficiency of broiler and egg enterprises and compare the mean technical efficiencies of broiler and egg producing farmers in the study area. In additonl the following hypotheses were formulated for further proof:

Ho_1: Broiler and egg farmers are fully technically inefficient in their production activities.
Ho_2: There is no significant difference in the mean technical inefficiencies of the two groups of farmers.

METHODOLOGY

The study was conducted in Niger state. The state is located between latitudes 8°11'N and 11° 20' N and longitude 4° 30'E and 7° 20'E. It is bordered on the north-east by Kaduna state and on the South-east by the Federal Capital Territory, Abuja. It is also bordered on the North, West, South West and South by Zamfara, Kebbi, Kogi and Kwara States respectively. It shares a foreign border with the Republic of Benin in the North West. The state covers an estimated land mass of 86,000 Square Kilometers (about 10% of Nigeria's total land mass) of which 85% is arable land, (Aiyedun, 1989). The population of the state according to the 2006 National Census was 3,950,249, persons (National Population Commission (NPC), 2006). The state experiences distinct dry and wet seasons, with the annual rainfall varying from 1100mm in the northern parts lasting for about 120 days. In the southern parts, annual rainfall is about 1600mm lasting for about 150 days. The maximum temperature (usually not more than 44°C) is recorded between March and June, while the minimum is between November and January during the dry harmattan season, Niger State Agricultural Development Project (NSADP), (1998). The state possesses fertile land as a cherished asset. The even climate, rich annual rainfall and the availability of wide range of mineral and agricultural resources all attest to the economic potentials of the state.

The study was based on primary data elicited using well structured questionnaire administered to broiler and egg producers. The multistage random sampling technique was used in the selection of respondents. The three agricultural zones of the state which reflect the demarcation structure were covered. in the first stage, two Local Government Areas (LGAs) were purposively selected based on the preponderance of poultry production activities from each of the zones. The second stage involves the choosing 2 poultry producing villages, giving a total of 12 villages. In the third stage, twenty (20) poultry producers (10 broiler and 10 layer producers) were randomly selected from each of the 12 villages. This gave a total of 120 broiler and 120 egg producers respectively. Overall, primary data were elicited from a total of two hundred and forty (240) poultry farmers for a detailed study. Well trained enumerators as well as agricultural extension agents residing in each of the villages

in the study area assisted the researcher in data collection.

Empirical Model for Technical Efficiency in Broiler Enterprise - Following Effiong (2004), the explicit form of the Cobb-Douglas Stochastic Frontier Production Function for Broiler Enterprise is specified as:

$$\ln Y_i = \beta_o+\beta_1 \ln X_{1i}+\beta_2 \ln X_{2i}+\beta_3 \ln X_{3i}+\beta_4 \ln X_{4i}+\beta_5 \ln X_{5i}+\beta_6 \ln X_{6i}+\beta_7 \ln X_{7i}+V_i-U_i \quad \ldots\ldots (1)$$

Where:
ln = logarithm to base e; β_1-β_7 = parameters to be estimated, β_o=constant term; Y = Output of broiler (kg); X_1 = Hired labour input (man-days); X_2 = Family labour input (man-days); X_3 = Expenses on feed and feed supplements (₦/kg); X_4 = Expenses on veterinary services and medication (₦); X_5= Expenses on foundation stock (day old chicks) purchased (₦); X_6 = Expenses on transportation (₦); X_7 = Capital inputs (depreciation on poultry equipment, buildings, interest payment, rent on borrowed capital (₦); V_i = Normal random errors which are assumed to be independent and identically distributed having $N\{0,\delta^2\}$; U_i = Non-negative random variables associated with the technical inefficiency of the entrepreneur.

It is assumed that the technical efficiency effects are independently distributed and arise by truncation at (zero) of the normal distribution with mean U_i and variance δ^2, where U_i (for this and the subsequent models) is specified as:

$$U_i=\delta_o+\delta_1 Z_{1i}+\delta_2 Z_{2i}+\delta_3 Z_{3i}+\delta_4 Z_{4i}+\delta_5 Z_{5i}+\delta_6 Z_{6i}+\delta_7 Z_{7i}+\delta_8 Z_{8i} \quad \ldots\ldots (2)$$

Where:
U_i =Technical inefficiency of the i^{th} farmer; Z_1 = Age of farmer (years); Z_2 = Level of education (No. of years spent in school); Z_3 = Farming experience (years); Z_4 = Household size (No.); Z_5 = Extension contact (No.); Z_6 = Credit status (Dummy variable, 1 for access, zero otherwise); Z_7 = Membership of cooperative (1 for membership, zero otherwise); Z_8 = Sex (binary variable, Male = 1, female = 2).

The above model was incorporated in the frontier model in determining the technical and economic inefficiency of broiler and egg production enterprises. This was done with the belief that the variables have direct influence on the level of efficiency (Battesse *et al.* 1993 and Kalirajan and Shand, 1994).

Empirical Model for Technical Efficiency in Egg Enterprise

$$\ln Y_i=\ln\beta_o+\beta_1 \ln X_{1i}+\beta_2 \ln X_{2i}+\beta_3 \ln X_{3i}+\beta_4 \ln X_{4i}+\beta_5 \ln X_{5i}+\beta_6 \ln X_{6i}+\beta_7 \ln X_{7i}+V_i-U_i \quad \ldots\ldots (3)$$

Where, variables β_o, β_1-β_9; X_{1i} - X_{7i} are as defined in equation (16), U_i is the same as in equation (17), Y_i = number of crates of eggs produced.

Tests of Hypotheses - A generalized likelihood ratio (LR) test was carried out to test the hypothesis that broiler and egg farmers are fully technically efficient. The test statistic is defined as follows:

$$LR\ (\lambda) = -2\ [L\ (H_o)-L\ (H_1)] \quad \ldots\ldots (4)$$

Where $L(H_o)$ is the value of the log-likelihood function of the average function as specified by the null hypothesis and $L(H_1)$ is the value of the log likelihood function of the Frontier function. The test statistic LR (λ) has an X^2 distribution which has a degree of freedom equal to q+1 where q is equal to the number of parameters involved in H_o and H_1 respectively (Dey *et al.* 2000).

The null hypothesis is rejected when the test statistic (λ) is greater than the critical X^2 value at the 5 percent level. The critical values of the full efficiency were obtained from the table cited in Idiong (2005). To compare the technical inefficiency indices between broiler and egg production in the area a Z-test was carried out.

The formula is as statedas:

$$Z_{cal} = \frac{\bar{x}_1-\bar{x}_2}{\sqrt{\frac{\delta_1^2}{n_1}+\frac{\delta_2^2}{n_2}}} \quad \ldots\ldots (5)$$

Where,
$\bar{x}_1$ = the mean technical efficiency indices of broiler production in the study area; $\bar{x}_2$= the mean technical inefficiency indices of layer production in the study area; δ_1^2 = standard deviation of technical efficiency indices of broiler producing farmers; δ_2^2= standard

deviation of technical inefficiency indices of egg producing farmers, n_1 = the number of broiler farmers and n_2 = the number of egg farmers.

RESULTS AND DISCUSSION

Summary Statistics of Production Factors - The summary statistics of input and outputs presented in Table 2 showed that a typical broiler farmer produced an output of 343.59kg. A typical farmer also utilized hired labour of 45.28 mandays; family labour 68.08 mandays, feeds ₦83.57/kg, incurred expenses on veterinary services in the sum of ₦4379.75, cost of foundation stock ₦45582.08, cost of transportation ₦3244.75 and capital input cost of ₦8843.75. For the egg enterprise, a representative farmer produced an average of 2637.17 crates of egg utilizing 89.13 mandays of hired labour, 162.7 Mandays of family labour, 88.23kg of feeds, expended ₦5,208.92 on veterinary service and medication, ₦55,741.67 on purchase of foundation stock, ₦2,995.50 on transportation and ₦11,954.86 on capital inputs. The results showed that for each of the inputs, the average used in production is more in layer enterprise as compared to broiler enterprise. This is due to the long production cycle in layer enterprise.

Table 2: Summary Statistics of Output and Inputs of Broiler and Egg Productions

	Broiler			Egg		
Variable	Mean	Min.	Max.	Mean	Min.	Max.
Output	343.59	42.90	2852.00	2637.17	344.00	14318.00
Hired Lab	45.28	0.00	216.00	89.13	0.00	341.00
Family Lab	68.08	0.00	260.00	162.27	0.00	379.00
Feeds	83.57	40.00	112.00	88.23	72.00	100.00
Vet Serv	4379.75	0.00	31000.00	5208.92	1400.00	27800,00
Birds	45582.08	4800.00	255000.00	55741.67	12500.00	270000.00
Transport	3244.75	0.00	18700.00	2995.50	0.00	16700.00
Capital	8843.75	0.00	62350.00	11954.86	310.00	78450.00

Source: survey data, 2011

Tests of hypotheses - Table 3 indicates the generalized likelihood ratio test suggests the rejection of the hypothesis of full technical inefficiency of broiler and layer producers since the calculated chi-square value is less than the critical value at 0.05 probability level. Therefore, we reject the hypothesis that broiler and layer producers are fully technically efficient and accept the alternative that broiler and layer producers are not fully technically efficient in their use of productive resources.

Table 3 also indicated that the Z-cal value of -3.789 is greater than the Z-critical value of 1.950 at the 0.05 probability level and 118 degrees of freedom. We hereby reject the hypothesis that the mean technical efficiency of broiler and layer farmers is the same and accept the alternative that the mean technical inefficiency of broiler and layer farmers is not the same.

Table 3: Tests of hypotheses

Category of producer	L-R test(λ)	Critical $\chi^2_{0.05}$	Decision
Hypothesis one(H_1)			
Broiler	18.2623	11.91	Reject
Layer	109.9952	11.91	Reject
Hypothesis two(H_2)			
Paired samples category	z_{cal}	Critical $z_{0.05,118df}$	Decision
Technical efficiency	-3.789	1.950	Reject

Critical χ^2 values were obtained from Koolde and Palm (1986) cited in Dey *et al.* (2000). Note: H_2 is computed from field survey data, 201.

Technical Inefficiency in broiler and egg producing enterprises - Table 4 shows the results of the stochastic frontier production function estimate of technical efficiency in broiler and egg production enterprises in the study area. The estimates of sigma-squared (σ^2) for broiler and layer functions are 0.21 and 0.34 respectively. They are significant at 1% and 5% levels respectively indicating that they are significantly different from zero. It assures us of the goodness-of-fit as well as the correctness of the specified distributional assumptions of the composite error term. The value of the gamma (γ) for layer is as high as 0.9866 shows that the unexplained variation in output of layer birds is the major sources of random errors. It also indicates that about 90 percent of the variation in output of layer is caused by inefficiency of the producers. This result confirms the presence of the one-sided error-component in the model and hence makes the use of Ordinary Least Square (OLS) inadequate in estimating the production function.

The values of the parameters, their signs and level of significance shows the relationship between variables and output, it indicates percentage change in the value of output as a results of a percentage change in input variables. In broiler enterprise, the explanatory variables depicted that the coefficients of the variables for feeds (β_3) was 0.2847 and statistically significant at the 0.01 probability level. This implies that a 1% increase in the use of feed and feed supplement will increase the output of broiler by 0.2847 holding other variables constant. In the case of layer enterprise, the MLE estimate is 0.1889 and statistically significant at the 0.05 probability level. This means that a 5% increase in the use of feed and feed supplement in egg production will result in 0.1889 increases in output.

For hired labour (β_1), the MLE estimate of the coefficient of hired labour in broiler is 0.0426 and is statistically insignificant. But in layer the coefficient of 0.0252 is statistically significant at the 10% level. This indicates that a 10% increase in the labour employment will result in 0.025 increase in egg output holding other variables constant.

Table 4: Maximum Likelihood Estimates of parameters of the stochastic frontier production function for the measurement of technical inefficiency

Variable	Parameters	Broiler Coefficients	t-ratio	Egg Coefficients	t-ratio
Constant	β_0	-2.90	-2.35**	-4.82	-4.83***
Hired labour	β_1	0.04	1.14	0.03	1.67*
Family labour	β_2	0.03	0.68	0.08	1.08
cost of feeds	β_3	0.28	3.05***	0.19	2.20**
vet service	β_4	-0.03	-1.03	-0.01	-0.11
Cost of birds	β_5	0.68	8.81***	1.12	1.69*
Transport	β_6	-0.00	-0.5	-0.10	-0.02
Capital	β_7	0.04	1.32	-0.02	-1.04
Diagnostic statistics					
Log-likelihood		-72.83		36.88	
Sigma squared (σ^2)		0.21	8.94***	00.34	1.75*
Gamma (γ)		0.03	3.83***	0.99	1.69*
L-R test		18.26		110.00	

Source: Survey analysts, 2011/ computed from Frontier 4.1 version
Note: ***, **, and * implies statistical significance at the 0.01, 0.05 and 0.10 probability levels respectively.

Determinants of Technical Inefficiency - The result of the analysis of the inefficiency model is shown in Table 4. The coefficient of the variable of level of education (Z_2) was found to be negative in broiler but positive in layer production enterprise. The value of the level of education is -0.0019 and is found to be significant at the 5% level in broiler production

enterprise. This signifies that the higher the level of education of the farmers, the lower the technical inefficiency of the farmer. This result is in agreement with Tijani *et al.* (2006) who found the MLE estimate for level of education to be negative and significant and concluded that it means higher levels of education reduces inefficiency. In other words, a higher level of education increases the technical efficiency of the entrepreneur. For layer producers, (Z_2) is positive and statistically insignificant. This is in agreement with the findings of Adepoju (2008), who reported a positive and insignificant coefficient of the level of education and concluded that it leads to decrease in technical efficiency.

Farming experience (Z_3) is significant in egg production enterprise at the 0.05 probability level. This implies that long years of experience in egg production reduce inefficiency. With increase in years of experience, farmers tend to learn better ways of managing their resources, gather current and relevant information in the management of the farm firm and set realistic targets. This result is different from the findings of Adepoju, (2008) and Tijani *et al.* (2006) whose report indicates positive but statistically insignificant value for this variable. For broiler enterprise however, this variable is found to be negative and statistically insignificant. This also shows slight difference with the findings of Adepoju (2008).

Credit status (Z_5) is negative and significant in broiler production at the 5% probability level. This means that as access to credit increases efficiency in broiler production. This is because funds will be available to purchase inputs; this is in contrast with Tijani *et al.* (2006) who reported negative correlation between access to credit and efficiency. In egg production on the other hand, credit status is positive and statistically insignificant. This result differs with the findings of Tijani *et al.* (2006), who reported a positive and statistically significant coefficient and concluded that farmers who have access to credit exhibit higher level of inefficiency. Membership of cooperative society (Z_6) was found to be negative and statistically significant at the 10% level. This implies that increase in years, as a member of cooperative society tends to increase technical efficiency of farmers. This result agree with Idiong *et al.* (2005), who said membership of cooperative increases technical efficiency as it afford members the opportunity to share information on modern practices. For layer producers, the variable is found to be statistically insignificant. The coefficient of gender (Z_8) was found to be statistically significant in egg production at 5% probability level. This indicates that the enterprise is stereotyped to gender. For broiler producers, gender is positive but statistically insignificant.

Table 4: Determinants of technical inefficiency in broiler and egg production enterprises

Variables	Parameters	Broiler Coefficient	t-ratio	Egg Coefficient	t-ratio
Constant	δ_0	0.61	1.77*	0.01	0.01
Age of farmer	δ_1	0.00	0.03	-0.02	-0.07
Level of education	δ_2	-0.00	-1.92*	0.01	0.01
Farming experience	δ_3	-0.01	-0.36	-0.18	-2.63***
Household size	δ_4	-0.00	-0.11	0.07	0.32
Extension contact	δ_5	0.01	0.18	0.03	0.03
Credit status	δ_6	-0.25	-2.53**	0.06	0.06
Membership of coop	δ_7	-0.81	-4.82***	-0.01	-0.01
Gender	δ_8	0.03	0.13	-0.07	-2.86***

Source: survey analysis, 2011.

Note: ***, **, and * implies statistical significance at the 0.01, 0.05 and 0.10 probability levels respectively.

Distribution of Respondents according to Technical Inefficiency Estimates - The distribution of respondents according to their technical efficiency in production is shown on Table 5. The results indicate that the observed technical efficiency range of broiler farmers is between 0.51-1.00. The table showed the mean technical efficiency of broiler to be at 75%, the

minimum technical efficiency of 0.52 and the maximum value of 0.99. The means for the best 10 and worst 10 broiler farmers are 0.55 and 0.99 respectively. This means for an average farmer in the sample achieve full technical efficiency, he/she would require a 25% cost saving [i.e., 1- (0.75/0.99)*100]. The worst technically inefficient farmer needs a cost saving of 45% [i.e., 1- (0.45/0.99)*100]. This means that broiler farmers can increase efficiency by 25%. If this increase is achieved by these farmers, they will be operating on the production frontiers. The result is similar to the findings of Muhammad-Lawal *et al.* (2009) who studied technical efficiency of youth farmers in Ondo State, Nigeria. He reported the mean technical efficiency of 85.23% and affirmed that if efficiency is increased by 14.77%, the youth will be operating on the production frontier.

The distribution of respondents according to their technical efficiency in production is shown on Table 5. The mean technical efficiency of egg production enterprise is 86%. The technical efficiency of egg farmers ranges from 0.21-1.00. Egg farmers have the minimum technical efficiency of 0.29 and the maximum of 0.97. The means for the best 10 and worst 10 broiler farmers are 0.56 and 0.94 respectively. This means for an average farmer in the sample achieve full technical efficiency, he/she would require a 14% cost saving [i.e., 1- (0.86/0.97)*100]. The worst technically inefficient farmer needs a cost saving of 44% [i.e., 1- (0.56/0.97)*100]. This means that egg producers can increase their efficiency of production by 14% if productive inputs are optimally utilized. If this increase is achieved by these farmers, they will be operating on the production frontiers. Thus, there is still need for improvement on the productivity of farmers and income through increased efficiency in the use of existing resources. However, the findings of Adepoju (2008) were slightly different whereby the farmer had a mean technical efficiency of 0.76 in egg production in Osun State.

Table 5: Frequency Distribution of Respondents according to the Range of Technical Inefficiency

	Broilers		Layers	
Range	Number	Percentage	Number	Percentage
0.21-0.50	0	0.00	4	3.33
0.51-0.60	40	33.33	3	2.50
0.61-0.70	20	16.67	5	4.17
0.71-0.80	20	16.67	11	9.17
0.81-0.90	0	0.00	39	32.50
0.91-1.00	40	33.33	58	48.33
Total	20	100.00	120	100.00
Mean	0.75		0.86	
Minimum	0.52		0.29	
Maximum	0.99		0.97	
Mean of worst 10	0.55		0.56	
Mean of best 10	0.99		0.94	

Source: Survey analysis, 2011

CONLUSION AND RECOMMENDATIONS

This study examined the profitability and efficiency of broiler and egg production enterprises in Nigeria. The stochastic frontier production function approach was used in the estimation of the technical efficiency. The mean technical efficiencies of broiler and egg production enterprises were 75% and 86% respectively. This means that if these measures are increased by 25% and 14% respectively, farmers in the area will be operating in the frontier. The study has shown in the study area that the technical efficiency estimates is greater in layers than in broilers. The determinants of efficiency are level of education, credit status and membership of cooperative in broiler enterprise. In egg production enterprise, the determinants of efficiency are farming experience and gender of respondents.

Poultry farmers are not fully technically efficient in their use of productive resources. The varied technical efficiency of broiler and egg farmer is due to the presence of inefficiency effects. The mean efficiency of layer farmers showed that they are fairly technically efficient, while broiler farmers are less efficient. Level of education, credit status and membership of cooperative has positive influence on technical efficiency of broiler enterprise in the study area. In layer production enterprise, farming experience and gender of respondents are found to have positive influence on technical efficiency.

Based on the findings of this research, it is recommended that efforts geared towards increasing the farm size should be intensified. Low participation of women is an indication of limited access of women to inputs needed in poultry production and/or their lack of awareness on the profit potentials of poultry production. High literacy level among the respondents is an indication that poultry farmers' attitude to the adoption of technologies and skill acquisition will be positive. It was found that level of education had a positive influence on technical efficiency. Therefore, farmers should be encouraged to enhance their levels of education by registering in adult/continuing education centers in the areas.Extension services should be improved and intensified to impact technical and economic knowledge on farmers. This should include creating awareness for the women farmers to know the profit potentials of broiler production so that they could be encouraged to undertake the enterprises.

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