International Scholars Journals

African Journal of Poultry Farming ISSN 2375-0863 Vol. 2 (2), pp. 047-052, February, 2014. Available online at www.internationalscholarsjournals.org © International Scholars Journals

Full Length Research Paper

A study of the economics of poultry production in Kwara State, Nigeria

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Accepted 27 January, 2014

This study examined the economics of poultry production in Kwara State, Nigeria using budgetary and profit index analysis. Primary data were collected through a set of structured questionnaire from 80 registered poultry farmers using a systematic random sampling technique. The results of the study showed that 72.5% of the respondents were youth with the mean age of 38.7 years and 63.8% choose poultry farming as main occupation. Analysis of costs and returns revealed that poultry production is profitable in the study area. The gross income and net income for eggs production were found to be ₦4,062,422 and ₦1,255,965, respectively, while the gross and net incomes for broilers production were ₦1,683,209 and ₦499,187, respectively. The regression analysis showed that stock capacity, variable, and fixed costs including labour, feed, and equipment were the significant factors affecting poultry farm business in the study area. These costs increase as the size of the business increases. To achieve optimum output and maximise profit, poultry producers in the study area would have to stem down cost of production. Provision of technical education through extension agents would greatly help in achieving this lofty goal.

Key word: Poultry production, budgetary analysis, benefit cost ratio, regression analysis.

INTRODUCTION

One of the major challenges facing Nigeria is the satisfaction of the ever-increasing demand for protein. Most Nigerian diets are deficient in animal protein. The FAO recommends that the minimum intake of protein by an average person should be 65 g per day; of this, 36 g (that is, 40%) should come from animal sources. The country is presently unable to meet this requirement. The animal protein consumption in Nigeria is 15 g per person per day (Tijjani et al., 2012) which is a far cry from the FAO recommendation. As a result, wide spread hunger, poor, and stunted growth as well as increase in spread of diseases are evident in the country.

Animal protein sources include fish, egg, poultry meat, beef, milk, beacon, pork, and mutton; but they are not affordable. The common sources accessible to most Nigerians are frozen fish, beef, and local chickens. Many

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farmers are involved in poultry production especially in Kwara State Nigeria, but the level of the productivity still remain local and small-scale. Various studies (Tijjani et al., 2012; Nurudeen, 2012; FAO, 2010; Yusuf and Malomo, 2007; Ojo, 2003) reached a consensus that intensification of production of meat and eggs derived from prolific animals like poultry birds is germane to meet animal protein requirements from domestic sources. 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.

Poultry is a sub-sector in the livestock industry constituting a major component of the agricultural economy. The sector provides animal protein to the populace as well as employment for a considerable percentage of the population. According to FAO Report (2010), poultry comes fourth among sources of animal proteins for human consumption in Nigeria and contributes about 27% of the national meat production.

Okoli et al. (2004) revealed that 85% of rural families keep small ruminants and local fowls primarily as an investment and sources of manure or meat at home or for use during festivals. In spite of this, livestock production is not keeping pace with the protein requirements of the rapidly increasing Nigeria population. Demand is more than supply. Since the responsibility of any civilized government is to provide adequate food and assure an atmosphere free from hunger and malnutrition, the Federal Government of Nigeria placed a ban on importation of frozen chicken and turkey parts to encourage massive poultry production locally (Agricultural Transformation Agenda, 2012). This policy has encouraged many investments in poultry production in Nigeria. It has therefore, becomes a full time job for many and is considered to be a commercially viable enterprise.

Considering poultry production as a commercially viable business demands the application of the knowledge of farm management (Olukosi and Ogungbile, 1989) in the area of economic measurement of it profitability, with the utmost aim of guiding the farmers in the appropriate use of resources/combination to maximize profit and encourage potential entrants to increase output and bridge the gap between national demand and supply of animal protein. This study is therefore analysing the economics of poultry production in Kwara State.

The study investigated the cost and returns of poultry production and the factors affecting its productivity in the state. The outcome of the study is to show the profitability level and the branch of the business that is more profitable and remunerative. The result of the study may also point to the fact that poultry business is the quickest and easiest way to reduce poverty level in Nigeria. Another major policy challenge inhibiting the overall development of the country's economy.

MATERIALS AND METHODS

Study area

This study was carried out in Kwara State, Nigeria. Kwara State was one of the seven states created on 27th of May, 1967. It extends from latitude 7° 45`N in its southern end, latitude 2° 45`E to the west and longitude 6° 40`E to south east. It covers an area of 35,705 km^2 and has a total population of 2,371,089 (NPC, 2007) with a population density of 66 people/km^2. The population in the state makes up 1.7% of Nigeria's total population. The state is basically agrarian. 80% of the population resides in the rural areas and 90% of this rural population are farmers. Livestock production, including sheep, goat, and poultry are also popular in the state. Kwara State is divided into 16 Local Government Areas, including Asa, Baruteen, Edu, Ekiti, Ifelodun, Ilorin East, Ilorin South, Ilorin West, Isin, Irepodun, Kaiama, Moro, Offa, Oke-ero, Oyun, and Pategi. Moro is the project area. The main ethnic groups are Yoruba, Hausa, Ibibio, Nupe, and Baruba.

Sampling techniques and sample frame

Proportion sample formula (Bowley's, 1977 quoted from Yusuf, 2011) was employed to determine the sample size for the study. The formula is presented as:

$$n = \frac{N}{1 + N(e)^2} \quad (1)$$

Where n is the sample size sought; N is the research population, e is the level of confidence (taken as 95%).
The sample size (n) for this study was calculated using an assumed mean of 100 as:

$$n = \frac{100}{1 + 100(0.05)^2} = 80$$

Sample size therefore = 80

The primary data were therefore collected from 80 respondents selected from the registered poultry farmers in the state through systematic random sampling technique. Each respondent was selected after the interval of six from the register provided by the KWSADP office on the premise that the selected respondent produces layers and broilers in the same production cycle. The selected sample was served with the structured questionnaires designed in line with the objectives of the study during one of their general meeting early this year.

Information gathered included the value of eggs, layers, and broiler outputs obtained by adding cash receipts from eggs, layers, and broilers produced and the values of each of the outputs consumed by the farmers household and gifts to their friends. Inputs including size of the flocks, feed intake (₦), variable expenses (cost of feeds, labour and other operating expenses) (₦), and depreciation values (durable items). Socio-economic characteristics such as farmers' age (years), education (years), household size, and experience of farmers in poultry production which were considered for their influence on poultry outputs.

Data analysis

Descriptive statistics, budgetary analysis, benefit cost ratio, and

ordinary least squares regression (OLS) were used for the analysis.

Descriptive statistics

This involves the use of means, percentages, and frequency distributions, to show the various findings about the respondents in the study area. The mean and percentage will be derived from the following formula:

$$\text{Mean} = \bar{x} = \frac{\sum_{i=0}^{n} Xif}{\sum_{i=0}^{n} f}$$

X_i = Observed Variable
f = Number of time the variable occurs

$$\text{Percentage} = \frac{X1x100}{\sum_{i=0}^{n} X1}$$

Budgetary technique

According to Olukosi and Sonaiya, (2003), farm budgeting is a detailed physical and financial plan for operating farms for certain period. It enables the estimation of total expenses (costs) as well as various receipts (returns) within a production period. This technique was employed to analyse the net farm income of the poultry business in the study area.
The model for estimating farm budgeting is outlined thus as:

NFI = GI – (TVC+TFC)

Where NFI is the net farm income, GI is the gross income (total revenue), TVC is the total variable cost, and TFC is total fixed cost.

Total variable cost of production (TVC): TVC comprises expenses on water, electricity, hired labour, marketing, vaccinations, and drugs.

Total fixed cost (TFC): Depreciation expenses on land, equipment, generator, houses, and machineries.
To obtain the worth of each of the fixed cost items, the straight line method of depreciation was used and it was assumed that the salvage value of the fixed items used in the business is zero. The formula for depreciation using straight line method is given as:

$$\text{Depreciation} = \frac{\text{Purchase price}}{\text{No of useful years of the asset}}$$

Benefit-cost ratio: The viability of the poultry enterprise was determined using the benefit-cost ratio (BCR), which is the division of total revenue by total cost. The BCR measures the ability of the business to upset its financial obligations and still remain standing.

Regression model: OLS regression analysis was employed to determine the factors influencing the profitability of poultry production.

The double-log function considered is presented as:

$$LnY = Ln\hat{a}_o + \hat{a}_1 LnX_1 + \hat{a}_2 LnX_2 + \hat{a}_3 LnX_3 + \hat{a}_4 LnX_4 + \hat{a}_5 LnX_5 + \hat{a}6\ LnX6 + U_i$$

Where Y = total value of output produced per year (including layers, eggs, and broilers in naira), X_1 = flock size (In number), X_2 = operating expenses (cost of labour, drugs, and transportation in naira), X_3 = cost of feed (in naira), X_4 = depreciation (cost of equipment in naira), X_5 = farmers experience (years), X_6 = level of education (in years), U_i = Error term, and $\hat{a}_o$ = Constant term, $\hat{a}_i$ to $\hat{a}_5$ = regression coefficients to be estimated

RESULTS AND DISCUSSION

Table 1 shows the summary statistics of poultry production in Kwara State. 57% of the total revenue comes from the sales of eggs meaning that this branch of the poultry business is highly lucrative. It was also revealed that the variable cost covered about 70% of the total cost of production with feed and labour contributing close to 80% of the cost. This is in line with the findings of Nurudeen (2012), Yusuf and Malomo (2007) and Ojo (2003). The farm size (stock capacity) was found to be 2036 with standard deviation of 2980. This shows that an average poultry farm in the study area belongs to a medium scale category. This classification is premised on Ojo (2003) classification of poultry farms: small scale category = 1000 birds, medium scale category = 1001 and 4999 birds, while large scale category = more than 5000 birds.

The table also shows that the commercial poultry farmers in Kwara State are highly experienced, well educated and young and showed keen interest in poultry business as revealed by the number choosing poultry production as their main occupation. Yusuf and Malomo (2007) and Ojo (2003) also discovered that majority of the poultry farmers in their areas of studies were young and highly educated. This finding is therefore, a pointer toward a brighter future poultry production in the state in particular and Nigeria as whole.

Profitability analysis of poultry farms in Kwara State

Gross margin and farm income analysis

The study revealed (Table 1) that the mean values of eggs and broilers produced in a poultry farm within a production cycle were ₦4,062,422 and ₦ 2,182,396, respectively, while the total cost incurred in their production were ₦2,806,457 and ₦1,683,290, respectively. This implies that an average poultry farm in the state earns a net revenue of ₦1,255,965 and ₦499187 from eggs and broiler business in a production cycle. In addition, each farm had a gross revenue of ₦839,254 from the sales of old layers. The net revenue per bird stands at ₦862. The analysis showed that poultry business is very profitable and confirmed the findings of various researchers (Nurudeen, 2012; Tijjani, 2012; Ibrahim et al., 2009; Yusuf and Malomo, 2007; Ojo, 2003) in different states of the federation who concluded that poultry business was highly profitable.

Benefit cost ratio

The viability of the business was determined through

Table 1. Summary statistics of the poultry variables.

Items	Mean (₦)	Standard deviation
Sale receipts		
Eggs	4,062,422	10530536
Layers	839,254	1976305
Broilers	2,182,396	10944400
Gross margin	7,084,072	14678347
Total fixed cost (dep)	853,017	1679650
Variable costs		
Labor	231,000	324856
Water	1594	12292
Electricity	26040	21700
Fuel	21927	42185
Feeds (for layers)	1,608,090	1739531
Feeds for broilers)	277,002	-
Vaccination	28,789	24284
Day old chicks (pullets)	360,000	260435
Day old chicks (broilers)	243,840	227650
Total variable cost (layers)	1,953,440	-
Total variable cost (broilers)	830,192	2814729
Total cost (eggs)	2,806,457	3512930
Total cost (broilers)	1,683,209	1589000
Net revenue (eggs)	1,255,965	6145287
Net revenue (broilers)	499187	325670
Net revenue/bird	862	657
BCR	1.6	-
Socio-economic characteristics		
Age	39.4	9.4
Years of education	14.2	2.7
Household size	5.6	1.4
Mean capacity (no)	2,036	2980
Years of experience	8	6.0
Main occupation	-	63%

benefit cost analysis. The ratio of benefit (mean gross revenue) to mean total cost of production was found to be 1.6. This implies that poultry business in Kwara State is viable, capable of offsetting its own cost, and still generate 60 kobo from every one naira invested.

Analysis of the result in Table 2 shows that all the parameters estimated carried positive signs, except household size which was negative. This finding implied that age (X_1), education (X_3), stock capacity (X_4), depreciation value of fixed items (X_5), and operating cost (TVC) (X_6) all have direct relationship with farm output in poultry production. The negative sign carried by households' coefficient showed that farm output reduces with increased number of house hold members probably, because large households consume more. The T-ratios showed that stock capacity (X_4), depreciation value of fixed items (X_5), and operating cost (TVC) (X_6) have significant relationship with output. The high significant level of these variables showed that they increased as the revenue increases. This finding collaborates that of Nurudeen (2012), Yusuf and Malomo (2007), and Ojo (2003), who explained the fact that stock capacity stands for the number of birds in the farm . Farm revenue increases with number of flocks. The variable cost includes cost of feeds, labour, vaccination, and other operating cost; all these increase with the size of the farm and the technical and allocative understanding of the farmer, that is, the ability to use minimum input to produce more output and ability to implore appropriate combination of inputs at least cost to maximize revenue. While, the depreciation cost includes depreciating values of poultry pens, generator, feeding, and watering troughs

Table 2. Regression analysis for input/output relationship in poultry production.

Variable	Estimated parameter	Coefficient	Standard errors	t-values	Significant levels
Constant	X_0	-7254826	5429452	-1.336	0.186
Age (year)	X_1	0.036	7914.74	0.718	0.475
HHSIZE	X_2	-0.011	536227.76	-0.227	0.821
EDU (YEAR)	X_3	0.36	277428.83	0.711	0.479
STOCK CAP	X_4	0.634	473.28	8.732	0.000*
DEP VALUE	X_5	0.521	0.521	3.315	0.001*
VAR. COST	X_6	0.325	0.325	3.539	0.001*

Diagnostics statistic: R^2=0.826; F Value = 57.68; Dependent variable = TR; N=80; *Significant at1%.

and other equipments and all these increase with use and handling.

F-value 57.7 showed that all explanatory variables taken together have a significant effect on the dependent variable (TR). R^2 value of 0.826 implies that 83% of the variation in the dependent variable has been explained by the independent variables, such as stock capacity (X_4), depreciating cost of equipment (X_5), and TVC (X_6) and that the remaining 17% was as a result of random variable.

Conclusion

An attempt to examine the economics of poultry production in Kwara State was the principal focus of this study. The specific objectives were to estimate profitability of poultry production and determine the factors influencing total revenue obtained in poultry production in the study area. Primary data were collected from 80 poultry farmers selected from the registered poultry farmers in the state through systematic random sampling technique using structured questionnaire. Descriptive statistics, farm budgetary technique, benefit cost analysis, and ordinary least square regression analysis were used for the data analysis. Three important findings emerged; first, poultry production in Kwara State was dominated by highly educated youth with the mean age of 38.7 years with keen interest in poultry production. This is a positive sign for future poultry activities. Second, poultry production is highly profitable in Kwara State; however, egg production contributed the highest return. Net farm income from eggs production stood at ₦1,255,965, while that of broilers was ₦ 499,187 in one production cycle, respectively. Third, the costs of variable inputs including: feeds, labour, other operating cost, and depreciating cost of equipment were high and increasing with output thereby depriving the farmers the full benefit of their efforts.

RECOMMENDATIONS

1. To reduce cost of production, farmers should form agricultural cooperative groups which will enable them to benefit from the economy of scale through bulk purchases of farm inputs.

2. Government should encourage the youths involved by providing them technical education in the area of resource management through the extension agents to reduce production cost.

3. The e-wallet program of the federal government to supply subsidized feeds, drugs, and vaccine to poultry farmers is in the right direction and should be intensified to benefit large farmers at the right time to reduce the stress and cost of production in order to improve profitability.

Conflict of Interests

The authors have not declared any conflict of interests.

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