

ISSN 1682-8356
ansinet.org/ijps



INTERNATIONAL JOURNAL OF
POULTRY SCIENCE

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Evaluation of Egg Production in Jos North Local Government Area, Plateau State, Nigeria

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Abstract: The study was conducted to evaluate small-scale egg production in Jos North Local Government Area of Plateau State. Thirty five (35) poultry farms were purposively selected from the local government area. Structured questionnaire were used to collect data and analyzed using descriptive statistics, farm budgeting model and regression analysis. The results showed that 77.40% of the egg producers were females and 71.43% attended tertiary institutions. The returns per naira invested was found to be 1.35 and the operating ratio was 0.6 indicating the venture was profitable. Regression analysis revealed that the significant variables influencing egg production were feeds ($P<0.01$) and flock size ($P<0.001$). Avian diseases constituted the most predominant constraint (91.4%), followed by feed problems (68.6%). Farmers should be encouraged on modern poultry management systems with emphasis on disease prevention and feed formulation in order to improve the production of the enterprise.

Key words: Evaluation, egg, cost, returns, constraints

Introduction

Poultry production is a very important enterprise of the livestock industry in Nigeria. Despite the large population of livestock in the country, the protein intake is below the requirement of 20% for adults (Shaib *et al.*, 1997). Animal products are generally better balanced in amino acids than proteins from plant origin. They contain minerals and vitamins that are vital for human growth and development (Adegbola, 1998).

The production of eggs has been the factor of the greatest economic importance in poultry production (Morley, 1985). Poultry egg is composed largely of protein and lipids (fatty substances), two of the most important dietary essentials. The egg is a poor source of carbohydrates, which, however are in abundant supply in fruits, cereals and vegetables. The egg contains various minerals and nearly all the known vitamins, with A, D, thiamine and riboflavin being present in important amount (Oluyemi and Roberts, 1988).

Egg producers usually make rational decisions for future investment in their enterprises based on previous or current production performance. Cost and returns are important considerations, as they are used to evaluate the efficiency or performance of the business. Sanni and Ogundipe (2003) suggested that egg-producing farmers should pay particular attention to major cost components by seeking a way of maximizing effectiveness, quality, method and utilization of materials. Thus, Haruna *et al.* (2002) concluded that profitability in egg production is not only a function of increase in the scale of production, but also how efficiently the resources are being utilized. This study

therefore, evaluates the profitability of egg production in Jos-north local government area, of Plateau State, Nigeria. The study has the following specific objectives:

- To identify the socio-economic characteristics of the poultry farmers in the study area
- To determine the cost, returns and profitability of egg production in the area, and
- To identify the constraints that affect egg production in the area.

Materials and Methods

The study was conducted in Jos North local government area (LGA) of Plateau State. It is situated at the extreme north of Plateau State and located between latitude 80°22' North and longitude 100°24' East. The LGA was bordered on the north by Toro local government area of Bauchi State, on the east by Jos East local government area of Plateau State and on the west by Bassa local government area of Plateau State. The area (Jos North) has a near temperate climate though located in the tropics, with an average temperature of 18-27°C, an altitude of 1,500 meters above mean sea level and an annual rainfall of 1317.5 to 1500mm range per annum. A total of thirty five (35) poultry farms were purposively selected within the local government area. Data were collected through the use of structured questionnaires administered to the egg producers in the study area. The data were analyzed using descriptive statistics, farm budgeting and regression models.

Specifications of the models used

The farm budgeting technique: The farm budgeting

technique was employed to analyze the cost and return structure of the egg production enterprise. This was aimed at evaluating the probability of the business. The model for estimating the profitability, using the farm budgeting technique, is the net farm income (NFI). It is mathematically expressed as:

$$NFI = \sum_{i=1}^n P_{yi} Y_i - \sum_{j=1}^m P_{xi} X_j - \sum_{k=1}^n F_{xi} \quad \dots \quad (1)$$

Where:

- NFI = Net farm income
- Y_i = Quantity of the product
- P_{yi} = Unit price of the product
- X_j = Quantity of the variable inputs
- P_{xi} = Price per unit of variable input
- F_{xi} = Cost of fixed inputs
- Σ = Summation sign

Also, return to cash invested was used to explain the extent to which a naira invested in to the egg production contributes to the net farm income, while the operating ratio indicates the proportion of the gross income that represent the variable cost component of the total cost.

Regression analysis: Regression analysis was used to investigate the relationship between inputs and outputs in the enterprise.

It is specified as:

$$Q = f(X_1, X_2, X_3, X_4, X_5)$$

The explicit form of the model used is presented as:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + U$$

Where:

- Y = total number of eggs
- b₀ = constraint term
- b₁-b₅ = regression coefficient for X₁ – X₅
- X₁ = feed
- X₂ = flock size
- X₃ = length of laying period
- X₄ = farming experience
- X₅ = household size
- U = error term

Results and Discussion

Socio-economic characteristics of poultry farmers:

The socio-economic characteristics of the respondents include sex, household size, educational status and experience in egg production.

The sex of the respondents is presented in Table 1. It shows that majority of the respondents (77.14%) were female while 22.86% were male. Also, 40% of the respondents had household size of less than 5 persons while 60% of the respondents had household size of more than 5 persons. This implies that household size is important in egg production, as members will help in most of the work on the farm.

The level of education of the respondents is also shown in Table 1. It can be deduced that majority (71.43%) of

Table 1: Socio-economic characteristics of poultry farmers

Class	Frequency	Percentage
Sex		
Male	8	22.86
Female	27	77.14
Total	35	100
Household size		
Less than 5	14	40.00
5 – 8	17	48.57
9 and above	4	100
Total	35	100
Educational level		
Secondary school	10	28.37
Tertiary institution	25	71.43
Total	35	100
Farming experience (years)		
1 – 5	28	80.00
6 and above	7	20.00
Total	35	100

Table 2: Distribution of respondents (poultry farmers) according to flock sizes

Flock size	Frequency	Percentage
1 – 200	19	54.29
201 – 400	7	20.00
401 – 600	2	5.71
601 – 800	1	2.86
801 – 100	3	8.57
1001 and above	3	8.57
Total	35	100

Table 3: Average cost and returns of egg production in Jos North local government area per produce per farm

No.	Cost/Revenue	Value(N)	Percentage of total
1	Costs		
(i)	Variable cost		
a.	Clucks	14,363	10.59
b.	Feeds	261,433	37.23
c.	Water	10,267	1.46
d.	Medication	10,304	1.47
e.	Bedding material	34,800	4.96
f.	Labour	306,800	43.67
	Labour variable cost	697,767	99.38
(ii)	Fixed cost (depreciated values)		
a.	Feeders	937	0.13
b.	Drinker	587	0.08
c.	Laying boxes	2847	0.41
	Total fixed cost	4371	0.62
	Total cost	702,138	100
2.	Returns		
a.	Total returns	946,400	
b.	Net returns	244,262	
c.	Gross margin	248,633	
d.	Returns/naira invested	1.35	
3.	Operating ratio	0.60	

the respondents had access to tertiary institution while the remaining 28.37% had secondary education. Education is important amongst the poultry farmers because it enables them adopt improved agricultural practices and innovation for improved productivity as stressed by Haruna *et al.* (2002).

Table 4: Regression analysis for the determinants of egg production in Jos north local government area

Independent Variable	Regression Coefficient	Standard Deviation	T-ratio	Probability
Feed (X_1)	-0.7026	1985	-3.24	0.003**
Flock (X_2)	4.9111	1996	5.89	0.0008***
Experience (X_3)	38.5	1870	1.64	0.111
Education (X_4)	-2311.4	8307	-0.52	0.601
Housing (X_5)	209.1	2411	-0.77	0.450

R squared, $R^2 = 0.721$. Adjusted R squared = 0.672. ** Significant at 1% level. *** Significant at 0.1% level. Constant value = -5190

$$Y = 5190 - 6423X_1 + 11578X_2 + 3074X_3 + 4325X_4 - 1846X_5$$

Table 5: Distribution of respondents according to constraints in egg production

Nature of constraint	*Frequency	*Percentage
Pilfering	1	2.9
Transportation	8	22.9
High cost of feeds	24	68.6
Storage problems	8	22.9
Diseases	32	91.4
Day old chicks procurement	11	31.4
Financial problem	13	37.1
Marketing problem	12	34.3

* Multiple responses were recorded

Table 1 further shows that majority of the respondents (80%) had between 1-5 years of farming experience, while only 20% had more than 5 years of farming experience. This indicates that most of the poultry farmers in the study area had few years of experience in the business.

Size of the flock: Table 2 shows the distribution of respondents according to their flock sizes. The result shows that majority (54.29%) of the respondents had between 1 – 200 stock of birds, while only 2.86% had a flock size within the range of 601 – 800 birds. This implies that majority of the respondents are small scale poultry farmers (egg producers).

Farm budget analysis: Table 3 shows the average cost and returns of production in the study area per production module per farm. Variable costs comprised of cost of acquisition of chicks, feeds, water, medication, bedding materials and labour. Fixed cost components were cost based on depreciated values of feeders, drinkers and laying boxes.

Labour and feed with 43.67% and 37.23% respectively, constituted the bulk of the total cost of production, while the cost of day old chicks constituted 10.59% of the total cost of production. This is in agreement with the findings of Nwajiuba *et al.* (2002) who asserted that the cost of feed and labour constitutes more than half of the total cost of egg production enterprises.

The total returns (TR) from egg production was N946, 400 while the net farm income (NFI) was computed to be N244, 262, and the returns per naira invested was 1.35. This implies that egg production is a profitable venture

in the study area. Also an operating ratio (OR) of 0.60 was found implying that 60% of the gross income represents the total incurred variable cost on egg production.

Regression analysis: The results of the regression analysis is shown in Table 4. The semi-log production model gives an R^2 value of 0.721 implying that 72.1% of the behaviour of the endogenous variable is accounted for by the exogenous variables stipulated.

Feeds and flock size were found to be significant at ($P < 0.01$) and ($P < 0.001$) respectively, as they influence the level of egg production. However, the farmers experience in egg production, their educational status and poultry housing were not significant in influencing the level of egg production in the area.

Constraints to egg production in the study area: Table 5 shows the distribution of respondents according to factors militating against egg production in the study area. Majority of the respondents (91.4%) complained about diseases as a constraint to egg production followed by the cost of feed (68.6%). Vocke, (1991) stated that the increasing dependence on imported feed stuffs by developing countries to supply their expanding livestock industries is a big disadvantage to poultry production. Only 2.9% of the respondents identified pilfering as a constraint to egg production. These and many other constraints identified constituted great hindrance to increased egg production in the study area.

Conclusion: Egg production in Jos North local government area of Plateau State is a profitable venture based on the findings of this study. There is a possibility for further increase in production and profit, if factors militating against egg production in the area were alleviated. Thus, any policy meant to increase egg production should be geared towards improving the accessibility of the farmers on improved breeds of the day old chicks as well as the afford ability of well formulated poultry feeds in the area.

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