

PROFITABILITY ANALYSIS AND MANAGEMENT PRACTICES AMONG POULTRY FARMERS IN YOLA METROPOLIS OF ADAMAWA STATE, NIGERIA

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ABSTRACT

This study analysis the profitability and management practices among poultry farmers in Yola metropolis of Adamawa State, Nigeria. The objectives of the Study were to: identify and describe the socio-economic characteristics of Poultry farmers in Yola metropolis, determine the costs of inputs and output returns, determine the resource use efficiency and to identify the major constraints of poultry farmers in the study area. Data were obtained from 75 purposively selected poultry farmers. The result of the study shows that majority of poultry farmers are within the age group of 31-50 years; 69% had no formal training in poultry and about 52% were female farmers. The gross margin per farmers shows ₦1719.43, and net farm income of ₦1713.43k, which gives the gross margin per Naira invested of ₦2.14 and net farm income per Naira invested of ₦2.12. This shows poultry production is profitable. The study recommends the formation of poultry farmers association, so as to source more funds from financial institutions, government agencies at lower interest rate, adequate, reliable, affordable and constant feed, water, stable market and electricity supply to its members. The major constraints includes: high input costs, unstable market, power supply, diseases, loans, government assistance and to lack of poultry management techniques in the study area.

KEY WORD: Profitability analysis, management practices, poultry farmers.

INTRODUCTION

Poultry are birds that are kept on farms for supplying eggs and meat (Dellas, *et al* 1995). Poultry production in Nigeria has grown from an aggregate backyard production into a thriving industry since after independence in 1960. It is today one of the major livestock industry which has been contributing both eggs and meat addition to immense potentials towards alleviating the protein shortages in the diet of most Nigerian (Likita, 1999). According to Ketchoch (1984) and Youdeowei (1986) the poultry species that render economic service to man and produce freely include chickens, turkeys, ducks, grease and guinea fowls are among others that are useful to the Nigerian farming situations.

Inadequate protein intake by most Nigerian is a recognized problem. The average Nigerian diet contains about 15gm/caput/day of animal protein as against the recommended intake of 35gm/ caput/day for normal health (Oyenuga, 1987; Likita, 1999). The potential of the poultry industry in reversing this situation has also been recognized in Nigerian agricultural policy objectives. In comparison to other livestock enterprises, poultry (layers and broilers) have the advantage of fast growth rate, high feed conversion efficiency and therefore can be relied upon in the short run for ameliorating the deficit of protein supply in Adamawa State, Nigeria (Oji, 2006).

In Adamawa State poultry are kept as scavengers in almost all the households. There are about 8.3 million poultry, 4.0 million ,cattle, 3.0 million ,sheeps, 3.3 million, goats, 1.04 million, pigs respectively, mostly of which are the local breeds (ADSEEDS, 2004).The Local breeds are better adapted to local conditions than the exotic breeds. However, local breeds are less productive for example local chicken lays about 50 eggs per year, hybrid and exotic breeds lay 250-270 eggs per year (Ekesen, *et al*, 1990; Aliyara and Yakubu,2005).

The importance of poultry production to human beings has brought about the high demand of poultry product in Adamawa State; and in particular Yola metropolis. Poultry business is a source of livelihood as well as a way of achieving a certain level of economic independence (FMANR, 1980). Researchers agreed that the poultry industry is one of the major causes of finding the protein deficiency among Nigerian (FAO, 1965, Ikpi *et, al* 1979, Akinwumi, 1979; Oji, 2006).

Nwobu (1990) reported that there is a deficit in the supply of poultry product in Nigeria, and this has become a serious problem in Adamawa State, which often experiences sudden shortages in poultry product supply. Presently there is only one poultry production unit (PPU) of the State Government in Yola and now handed over to Adamawa State University, Mubi for research, teaching of students and commercial units,

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cannot meet the demand of the people in Yola metropolis. The then PPU (1980-1990s) of the upper Benue Basin Development Authority is no longer functional. Poultry production is now mostly in the hands of individual dealers who order their stocks from Jos, Lagos, Ogun (Ota farms), NAPRI, Shika-Zaria and Delta States. It is against this background that this study is set to find out answers to the following questions on: socio-economic characteristics, costs of inputs used and output values, management systems used, is poultry production profitable, are the resources efficiently used, and constraints of poultry farmers in the study area.

The broad objective of the study is to examine the profitability analysis and management practices among poultry farmers in Yola metropolis of Adamawa State, Nigeria. The specific objectives are to: -Identify and describe the socio-economic characteristics of poultry farmers; determine the costs and returns associated with poultry farmers, identify the various management systems used by poultry farmers, determine the resource use efficiency of poultry farmers, and identify the major constraints of poultry farmers in Yola Metropolis

METHODOLOGY

This study was carried out in Yola metropolis of Yola south Local Government area of Adamawa State. The area lies between Latitudes $9^{\circ}00'N$ and $9^{\circ}29'N$ and between longitude $12^{\circ}12'E$ and $12^{\circ}37'E$. It lies within the Benue valley and has an altitude of 185m above sea level. Yola falls within the tropical climate with distinct wet and dry seasons. Dry season lasts for six months (November to April). While wet season start from May to October and mean annual rainfall is 900mm (Jongur and Obidi, 2007).

Both primary and secondary sources were used. Structural questionnaire and oral interview were used to obtain information from randomly selected 75 poultry farmers. This shows about 68.18 percent of respondents from the sampling frame of 110 poultry farmers. The survey was carried out between August 2005 to June 2006.

Both descriptive and inferential statistics were employed in analyzing the data. These were the means, frequencies and percentages to describe the socio-economic characteristics of poultry farmers. While multiple regression and farm budgets were used to determine the influence of input used on the output values of the poultry farmers.

Analytical Technique

Descriptive statistics were computed from the administered questionnaire to describe the socio-economic characteristics of the poultry farmers in Yola metropolis. Costs and returns of poultry were also computed from the input – output of on farm data. The production function analysis was done on poultry output with others physical quantities (X_1, X_2, \dots, X_7). In the regression model 1 four functional forms were used as follows:

Linear function:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + E$$

Exponential function:

$$\ln Y = b_0 + b_1X_1 + b_2X_2 + \dots + b_7X_7 + E$$

Semi-log function:

$$Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_7 \ln X_7 + E$$

Double log function:

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_7 \ln X_7 + E$$

$$Y = a \times X_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} X_5^{b_5} X_6^{b_6} X_7^{b_7} E \dots \dots \text{model 1}$$

Where:

Y = Poultry output (Kg)

X_1 = Quantity of feed used (kg)

X_2 = Poultry size (No. of birds)

X_3 = Vaccine used (ml)

X_4 = Quantity of litter material (kg)

X_5 = Poultry experience (years)

X_6 = Labour (man – hours)

X_7 = Curling circle (weeks)

a = Constant

b = Coefficient

E = Error term

This was transformed into a double log form and estimated as an ordinary least square multiple regressions (Nwagbo and Onwuchekwa, 1988; Jongur, 2008). The poultry farmers use similar technology in Yola metropolis and there is no problem in using Cobb – Douglas, since the coefficient (b) are direct elasticities of production (Jongur, 2008).

RESULTS AND DISCUSSION

Socio-economic characteristics of poultry farmers

The research shows that the majority of poultry farmers are within the age groups of 31-50 years (64 percent) and 52 farmers (69 percent) had no formal education in poultry production. Also about 39 farmers (52 percent) were female poultry farmers. This shows that there are more women in small scale poultry farming than male farmers, and most of them are within the middle aged brackets (Table 1). The inference revealed that majority of the farmers are willing to adopt the new skills/technology in the poultry business so as to attain a profitable and efficient production in Yola metropolis.

Poultry experience, source of stocks and type of houses

Experiences in modern poultry production are less than 5 years by the majority i.e. 46 farmers (61.3 percent) and about 20 farmers (26.7 percent) had 6-10 years. The inference drawn is that most of the poultry farmers are civil servants supplementing the income and preparing skills for retirements (26.7 percent) had 6-10 years (Table 1). The major source of poultry stock in Yola metropolis is usually from Jos, and its environment in Plateau state. However, other poultry dealers often travelled to Ibadan Lagos and Abeokuta (Ota farms) respectively for their stocks and feeds (Table 1).

Generally the type of poultry houses in Yola are the zinc house, block and zinc with Zana mat, and some are timber/wood battery cages, The major source for drugs and vaccines are from the Kofare (old Adamawa province ministry of Agriculture Headquarters) vaccination unit of the National veterinary research institute (NVRI) Vom office in Yola (Table 1).

Profitability Analysis

The cost and returns analysis of poultry production in Yola metropolis was carried out (Table 3). The cost components are the variable and fixed resources such as the cost of poultry birds, feeds, power supply, sawdust, hired labour, veterinary services, transportation, water charges and marketing were among the variable cost, While the fixed cost includes the poultry houses, cages, water trough or drinkers and feeders. The depreciation on fixed cost items were calculated using the declining balance method (Jongur, et al, 1999; and Jongur, 2008). The average lifespan of those implements was 2 years.

The net farm (poultry) income was used to determine the profitability of poultry production in Yola metropolis (Olukosi and Erahbor, 1989; Jongur, 1993; Jongur and Obidi, 2007) that is:

i. Net Farm Income (NFI) = Gross Margin (GM) – Depreciation of fixed inputs.

ii. Gross Margin is the differences between the gross farm income and the total variable cost (TVC).

$$GM = GI - TVC$$

Multiple Regression Analysis

Four functional forms were tried (i.e linear, double log, exponential and semi-log) and the semi-log based on the magnitude of the coefficient of determination (R²), the apriori expectation and the statistical significance of the estimated regression coefficient (Table7).

The result of the semi – log function---model II

$$Y = -6597.661 + 0.0308X_1 - 0.417X_2 + 0.041X_3 + t - values = (-4.753)^{***} (2.861)^{***} (-2.583)^{**} (0.425) 0.546X_4 + 0.78X_5 + 0.451X_6 + 0.29X_7 (4.077)^{***} (0.928) (4.816)^{***} (0.352).$$

R² = 58 percent, F – Value = 13. 35

Standard error = 1517.32

Where: *** = Significance at 1 percent level of probability

** = Significance at 5 percent level of probability

The regression analysis reveals that the semi-long functional forms has R² of 52% which implies that 58 percent of the variation in the poultry production output is accounted for by the independent variables included in the regression model II. These coefficients suggest that a unit increase in poultry size (No. of birds) when others variables are held constant will result in 0.11kg an increase in output of poultry (Table 4). The inference drawn is in consonance with the apriori expectations that the more input is utilized the more will be the output expected with good management (Olukosi and Ogungbile, 1989; Olayemi, 1998; and Jongur, 2008).

Resource Use Efficiency for Poultry Farming

The net return to scale for the response of poultry farming output was obtained through the sum of their coefficients. Since the coefficient from the Cobb-Douglas is a direct elasticity measurement for each variable input (Table 4). Feed (0.11), poultry size (31.14), vaccines (5.03), litter materials (8.09); and labour (6.62). This implies that all the input required for poultry productions were increased by 1%, the output will increase by 1.89 (Table 5). The inference drawn from the study is that the productivities of the variable specified in the model for poultry is efficient in Yola metropolis.

The marginal value of productivity of feed was compared with its respective marginal unit cost. The result showed a value of 0.004, which is less than 1 (Table 4). This implies that feed, litter materials (0.54) and labour (0.83) were over utilized, but the number of birds (10.38) and vaccines (5.03) were more than 1, indicating under utilization of resources. This is in consonance the work of Onyenwacku and Ukaeghu, 1981; Sophia, 2006; and Jongur, 2008.

Constraints of Poultry Production

Poultry production in the study area is faced with a number of constraints ranging from high cost of input used in feed preparations/formulations (15.16%), lack of credit facilities by government and commercial/financial institutions (14.74%), unstable market for curled birds and eggs (14.11%), adequate power supply from PHCN and high cost of diesel for private generator’s owners (9.68%) to lack of constant and inadequate water supply by state water board (3.79) Table 6 show. These have led to low returns and hence the decline in poultry meat and egg production in Yola metropolis.

SUMMARY AND CONCLUSION

Poultry birds (egg and meat) constitute a major source of protein in the diet and income for a large proportion of Poultry farmers in Yola metropolis. This study examined the profitability analysis and management practices among poultry farmers in Yola metropolis of Adamawa State of Nigeria. Data were obtained from 75 selected poultry farmers (among the 110 earlier identified). The result shows that majority of poultry farmers are within the age group of 31 – 50years, and about 69 percent had no formal training for poultry farmers. The result of the analysis shows a gross margin of ₦1,719.43 and net farm income of ₦1,713.43. Also a gross margin and net farm income per naira invested of ₦2.14 and ₦2.12 were obtained respectively. This shows poultry production is profitable in Yola metropolis of Adamawa State of Nigeria.

The result of the marginal analysis of input utilization and cost of output shows that feed, labour and litter materials were over utilized, while farm (poultry) size and vaccine usage were underutilised. However, the result reveals an increasing return to scale among the poultry farmers in Yola metropolis.

Table 1: Socio-Economic Characteristics of Poultry Farmers in Yola Metropolis.

Variables	Frequency	Percentage (%)
Age (years):		
Lessthan -20	3	4
21-30	11	14.7
31-40	21	28
41-50	27	36
51 and above	13	17.3
Gender :		
Male	36	48
Female	39	52
Marital Status:		
Single	14	18.67
Married	56	74.67
Widowed	5	6.66
Education:		
Primary	5	6.67
Secondary	29	38.66
Tertiary	41	54.67
Training Poultry:		
Non-formal	52	69.3
Formal	23	30.7
Poultry farming experience(yrs):		
Lessthan 5	46	61.3
6-10	20	26.7
11-15	5	6.7
16 and above	4	5.3
Source of Poultry:		
Yola	34	45.33
Jos	30	40
Lagos	6	8
Ibadan	5	6.67
Management systems:		
Intensive	40	52
Semi-Intensive	27	36
Battery cage	9	12
Source of feeds:		
Market	47	62.67
Feed mills	11	14.67
Self compounded	14	18.66
Feed mill/self compounded	3	4
Poultry house:		
Block Zinc house	44	58.67
Zinc Shade	16	21.33
Mud/zana mat	8	10.67
Battery cage/wooden	7	9.33
Vaccination Schedule (weeks):		
1-2	8	11
3-4	25	33
5-6	18	24
None	24	32
Poultry waste (faeces) uses:		
Crop Production	22	29.33
Thrown away	47	62.67
Sold	6	8
Causes of mortality:		
Climatic changes	12	16
Outbreak of diseases (bird flu)	9	12
Lack of proper care and others	54	74
Source of Capital:		
Personal savings	67	89.33
Money lenders	5	6.67
Government Assistants	3	4
Occupations:		

Civil servant	33	44
Traders	16	21.33
Full-time poultry farmers	18	24
Crop and Poultry Farming	8	10.67
Poultry respondents:		
Adamawa indigene	53	70.67
Non-indigene farmers	22	29.33
Total	75	100

Source: Survey Data, 2006.

Table 2 Total cost structure of poultry production in Yola metropolis

Variables	Cost (₦)	Percentage(%)
Stock	4,259,500	16.2
Feed	18,906,883	67.6
Veterinary Services	842,545	3
Litter materials	63,650	0.2
Hired Labour	3,152,403	11.3
Equipment (Depreciation)	172,128	0.6
Electricity	188,150	0.7
Transport	164,990	0.6
Miscellaneous	223,860	0.8
Total	27,974.106	100

Source: Survey Data, 2006.

Table 3 Average estimated costs and returns of production

Variable Cost	₦/Bird farm
Cost of feed (kg)	546.2
Cost of stocks	123.05
Cost of electricity (Unit/N)	5.44
Litter materials	1.84
Transportation	4.77
Veterinary services	24.34
Hired labour	91.07
Other costs	6.47
Total variable Cost	83.18
Returns	2522.53
Gross Margin	1719.43
Gross Margin per Naira invested	2.14
Total Fixed Cost) depreciation on tools)	4.97
Net farm income	1713.43
Net farm income per naira invested	2.12

Source: Survey Data, 2006.

Table 4 Marginal Analysis of Input utilization of poultry production

Resources	MVP	MFC	Ratio $\frac{MVP}{MFC}$
X ₁ Quantity of Feed (kg)	0.11	25	0.004
X ₂ Poultry size (No of birds)	31.14	3	10.38
X ₃ Vaccine (Mills)	5.03	1	5.03
X ₄ Poultry Litter Materials (kg)	8.09	8	0.54
X ₅ Labour (Man-hours)	6.62	15	0.83

Source: Survey Data, 2006.

Table 5: Elasticity of production of inputs in poultry rearing

Variables	Elasticity
Quantity of feed (kg)	0.235
Poultry size (No. of birds)	0.346
Vaccines (mil)	0.064
Litter materials (kg)	0.641
Labour (men-hour)	0.601.
Return to scale	
Total	1.887

Sources: Survey Data, 2006.

Table 6: Constraints of Poultry Production.

Variables	Frequency	Percentage (%)
High cost of inputs	72	15.16
Lack of credit facilities	70	14.74
Unstable market	67	14.11
Lack of government assistance	65	13.68
Weather Hazards	50	10.53
Power (PHCN) failures	46	9.68
Lack of extension staff	49	10.31
Outbreak of diseases	38	8.0
Lack of constant water supply	18	3.79
Total	475	100

Source: Survey Data, 2006.

Table 7: Result of Regression Analysis Poultry Production

Expanatory Variables	Equation			
	Double Log	Exponential	Semi Log	Linear
Constant term	-2374.02 (-081)***	2.360 (23.568)***	-6597.661 (-4753)***	-95.217 (-0.443)
X ₁ Cost of feeds (Kg/N)	0.367 (4.015)***	0.261 (2.265)**	0.308 (2.861)***	0.99 (1.605)
X ₂ Farm Size (No. of birds)	0.380 (2.771)***	0.553 (4.792)***	-0.417 (-2.583)**	0.210 (3.395)***
X ₃ Cost of Stock (N)	-0.068 (-822)	0.089 (0.298)	0.041 (0.425)	0.350 (2.194)**
X ₄ Cost of Labour (Manday)	0.164 (1.444)	0.158 (0.539)	0.546 (4.077)***	0.410 (2.615)***
X ₅ Experience (years)	0.076 (-1.063)	0.002 (-0.024)	0.078 (0.928)	0.005 (0.121)
X ₆ Cost of fixed Assets (N)	0.125 (1.575)	-0.178 (-0.518)	0.451 (4.816)***	0.022 (0.352)
X ₇ Veterinary Services (N)	0.081 (1.154)	0.018 (0.208)	0.29 (0.352)	0.30 (0.669)
R ²	70%	55%	58%	87%
F-Value	22.328***	11.910***	13.351***	65.305***
Standard Error	0.32063	0.39072	1517.32059	839.53508

*** Represents values that are significant at 1% level

** Represents values that are significant at 5% level

* Represents values that are significant at 10% level

+ Represents lead equation

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