Sapientia Global Journal of Arts, Humanities and Development Studies (SGOJAHDS), Vol.3 No.4 December, 2020; p.g. 187 – 198; ISSN: 2695-2319 (Print); ISSN: 2695-2327 (Online)

ECONOMIC ANALYSIS OF CHICKEN BROILER PRODUCTION IN AKKO LOCAL GOVERNMENT AREA OF GOMBE STATE, NIGERIA

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ABSTRACT

The study analyzed the economic production of broilers in Akkko Local Government of Gombe State, Nigeria. A total of 51 farmers were selected from one hundred and two (102) poultry farmers (enterprises scattered all over the Local Government Area and a structured questionnaires were administered to the broilers farmers. The results revealed that most of the respondents (farmers) were male with 68.63% and have 6-10 years experience in the entrepreneurship with 31.37%. The results for the costs and return analysis indicated that the enterprise is profitable. Gross margin and net farm income were found to be ₦27,440,750 and ₦26,804,079.6 respectively. The regression analysis results revealed that the variables X2 (flock size) and x9 (drugs) have positive relationship with the output and are significant at 1% level of probability. Variables X6 (water) and X8 (litter material) have positive relationship with the output and are significant at 5% level of probability. X10 (chicken cost) have an inverse relationship with the output and are significant at 5% level of probability. On the other hand X2 (feed), X3 (growth circle), and X4 (farming experience) are not significant but have positive relationship with the output X5 (household size) and X7 (labour) are not significant but have an inverse relationship with the output (weight gram). The respondents identified lack of finance and disease outbreak as their major problem in broiler production in the study area. It is therefore recommended that government should provide assistance in giving loans to the farmers and also farmers should adhere to the vaccination programmes of the expert for the birds (broilers) and ensure personal hygiene to avert disease outbreak. Also government policies in terms of agricultural development should always be favourable to the poultry farmers.

Keywords: Chicken Broiler, Economic analysis, Production, Challenges, Gombe State.

Introduction

Poultry production is unique in that it offers the highest turnover rate and the quickest ◦◦returns to investment outlay in the livestock enterprises (Sanni and Ogundipe, 2005). Funds invested in poultry production are recovered faster than any other livestock enterprise. The

rate of growth in production of Poultry is the highest when compared with ruminants and other monogastric animals (Breankaerl *et al*., 2002:21) and the cheapest, commonest and the best source of animal protein (Ojo, 2002:53). Ogundipe and Sanni (2002:16) affirmed that returns to investment can be improved by turning out batches in a year depending on the length of the production cycle.

The contribution of Poultry production to total livestock output increased from 26% in 1995 to 27% in 1999, while increase in the production of table eggs accounted for about 13% during the same period (CBN, 1999: 14). The federal government in bid to encourage the poultry industry in Nigeria, in 2000 banned the importation of Poultry and products, therefore one way of bridging demand and supply in the diet of average Nigerian is through the intensive rearing of Poultry and any other domestic avian.

Profitable poultry farming depends upon good parent stock, quality chicks and feed (Islam *et al*., 2002:27) Nigeria`s poultry industry depend entirely on the importation of parent stock from foreign countries (NAPRI,1998:11). However, the major constraint in poultry production in Nigeria is the high and rising cost of inputs, particularly feed which accounts for more than 85% of the total cost of production day old chicks, and medicinal (Ume and Udo, 2002:78). Analysis of cost-return structure in Poultry production would facilitate appropriate knowledge of cost implications in order to obtain optimum economic benefits from investment into the industry (Sanni and Ogundipe, 2005:52).

Broiler industry is one of the profitable agro industries which can effectively tackle the problems of unemployment and underemployment in the rural areas, particularly of small and marginal farmers. Broiler industry can be adopted under a wide range of climate conditions and can generally be combined conveniently with other farm enterprises. The land and capital requirements for this enterprises being not large, it ensure regular flow of income through the marketing of poultry products. In spite of a spectacular growth in the poultry sector during the past two decades, a huge gap exists between availability and requirement of poultry products. And increase in per capita consumption by one egg and 50 grams of poultry meat can create employment for about 26,000 persons per year (Kazi, 2003:41).

Efficiency of feed and labour utilization is very important means of increasing profit in any poultry enterprises. Nworguand, Egbunike (2000:52) reveal that profit margins in any poultry production depended mainly on feed utilization, cost of day old chicks efficient management of resources. These authors further stated that the economy of new technologies should be assessed to determined how much productivity needs to be increased or what risk needs to be reduced and that diet formulated should be directed towards profit maximization, which is accomplished by relating inputs to economic measures of broiler performance. Poultry production is regarded as means of sustainable livelihood and a way of achieving a certain level of economic independence .Oluyemi (1984:27) and Kekeoka (1985:12) noted that feed cost was over 70% of production, while Nwargu *et al.* (1999:5) reported that feed utilization accounted 60-70% of total cost of broiler However, some major problems facing poultry production in Nigeria are low market price, high cost of feed, veterinary service, transportation, lack of access to credit and extension services production. The present study was therefore focused on the economic analysis of broiler production in Akko local government area of Gombe State, Nigeria.

Statement of the Problems

Poultry production has been one of the most popular enterprises adopted by small and medium scale farmers in both rural and urban areas (Idowu & Alabi, 2005:45).

As Jongur (2009:42) in his study on the analysis of the profitability and management practice among Poultry famers observed that unavailability of good quality vaccines to prevent disease outbreaks and high cost of drugs to control the disease where an outbreak had occurred, others are lack of skill labour and management in the industry; it is highly costly when available and hence causes over-reliance on family labour which is unskilled and inadequate.

According to Ja`afar (2010:66). On his study identifying major factors of poultry production as sustainable enterprise among farmers using improved methods in rural areas that the broilers industry relies on some set of captive technology embodied in the housing, nutritional drugs and processing materials which have to be imported.

The aforementioned facts indicate that Nigeria is a Country in need of a quick protein source in order to meet up with the needs of its ever increasing population, with poultry production been identified as one of the quickest source to meet of the demand. Against this background problem this study aimed at analyzing the performance of the broiler enterprise of the poultry production industry with regards to the financial management, in order to see how the goals of the producer and the consumer can be met simultaneously.

The research provides answers to the following research questions:

i. What are the socio-economic characteristics of broiler producers in the study area?
ii. What is the resource use efficiency in the broiler production in the study area?
iii. Are there any cost and returns in broiler production enterprises?
iv. What are the various problems associated with broiler production in the study area?

Objectives of the Study

The objectives are: identify the socio economic characteristics of broiler producer in the study area, determine cost and returns in broiler production enterprises, analyze the resource use efficiency in broiler production in the study area, and identify the problems associated with broiler production in the study area.

Literature R**eview**

There are three kinds of poultry farming enterprises in Nigeria. They include breeding and hatchery operations, commercial egg production and broiler production (Dafwang, 1986:12).This enterprise include the rearing of parent stock hens and cocks in the correct ratio to provide fertile egg which are then sold out to poultry producers who are engaged in the production of table egg or commercial broilers. The primary product of these enterprises is the day old chicks. Egg that is not good for hatching. The old hens and cocks are secondary products. Breeder flocks may be egg tapes or broilers.

For table egg production, pullet chicks are purchased from a hatchery and these are ten brooded and reared to the egg of about five months before they begin laying eggs. The chicks as purchased must have been divided (sexed) in to male and female prior to sale. The table

egg producer only purchased the female chicks. The primary products of this enterprise are eggs which are sold for consumption. The hens at the end of their laying cycle which usually is about one year.

Broiler production commercial day old broiler are purchased from the hatchery and reared to markets weight; with good feeding and management broiler should be ready for markets at between eight and nine weeks when they should be weighing between 1.7 to 2.0 kg each. The broilers may be sold alive or processed and sold fresh or frozen.

In poultry farms focused on meat production, broiler breeders are raised mainly in environmentally controlled poultry house. Fertile eggs are collected and transported to the hatchery, where they are placed in hatchery for 18 days and then transferred to incubators in the last 3 days (Beutler, 2007). After hatching, broiler chicks are distributed to producers who grow out the birds, and send them for slaughtering and processing after 42 days. These broilers are chickens that are raised for the purpose of meat production and have a larger body frame and weight than layers (Beutler, 2007:43).

For the establishment of broiler production enterprises there are certain resources that are necessary for its existence and successful continuity. The following sections discuss extensively the fundamental resources, as they related to the successful establishment and development in broiler production. The availability of good source of day old chicks with desirable characteristics of high disease resistance, high feed conversion efficiency etc. is vital to the success of a broiler production scheme. The effect of biological strain of birds for rearing is one of the greatest of all factors influencing gross output (yield) and profitability of broiler production.

Methodology

The study was carried out in Akko Local Government Area of Gombe State, Nigeria. Its headquarters are in the city of Kumo on the high way south of the state capital Gombe (about 40km approx). kumo (headquarters) is a cosmopolitan community of more than 30 different tribes, ranging from renown Fulani and Hausa, to remote Jukun and Tulaa. Kumo also serves as the second largest commercial center beside Gombe the town of Akko from which the LGA is named is west of Gombe at$10^0$17′00″N $10^0$58′00″E /10.28333^{0}N 10.96667^{0}E. Coordinates: $10^0$03′00″N $11^0$13′00″E / 10.05000^{0}N 11.21667^{0}E (NIPOST, 2009).

The LGA has an area of 2,627 km^2 (1,014 sq mi) and a population of 337,853 at the 2006 census. And several of agricultural activities are practice in the study area, which include maize, sorghum, millet, groundnut, cotton, gum Arabic and tomatoes. It is divided into three (3) districts; Kumo Pindiga and Gona districts. It has eleven (11) wards (NPC, 2006,:29).

The sample for this study was 51 farms in Akko local government area of Gombe State which was selected randomly to avoid bias, this form the sample size for the research.

The sources of data that used for the study are primary and secondary data. The primary data was generated through structured questionnaires and was administered randomly to the respondents. The secondary sources of information include textbooks, articles, journals, newspapers, magazines, annual report and other relevant publications. Some of the data that

was collected include; price of the day old chicks, cost of feed, medication/vaccines and production equipments. Questionnaire and interview was use to collect the data. The questionnaire was distributed to the large and small farm holders, relevant questions pertaining poultry production particularly (broilers), this include information from inventories such as receipt, farm record, ledgers, production chart , types of source of inputs and production cost as well as returns.

Data Analysis

a) Descriptive statistics such as frequency distribution, percentage, tables and rank was used to achieve the following objectives socio-economic characteristic of the poultry farms owners, the problems faced by the poultry (broiler production) farms owners in the study area.

b) Gross Margin analysis: the gross margin (GM) analysis (Budgetary technique) was used to determine the cost and returns of production in the study area (Olukosi and Erhabor, 1988:33). The net farm income (net revenue) is the specific budgetary method that was used. The net revenue is the differences between the gross income and the total cost of production. The value of output was obtained by adding all cash income from sales of broiler and poultry manure, the value of part of broiler output consumed by the farmers and the giving out as gifts. For effective valuation, labour was determined by taking the opportunity labour where such labour was use. The fixed cost to be consider include depreciation on poultry rearing tools, the model to be used for the estimation of net revenue is stated mathematically, Thus

GM=TR-TVC - - - - - - - (1)

NR=GM-TFC - - - - - - - (2)

Where:

GM = Gross Margin from broiler production (₦)

GI = Gross Income from broiler production (₦)

TVC = Total variable Cost from broiler production (₦)

NI = Net Income (or income from broiler production) (₦)

TFC = Total fixed cost of broiler production (₦)

c) Regression Analysis

Regression (R): A statistical tool that allows you to examine how multiple independent variables are related to a dependent variable. Once you have identify how these multiple variables related to your variable, you can take information about all of the independent variable and use it to make more powerful and accurate predictions about why things are the way they are:

Regression Formula

Y = Weight of broiler at point of sale, (kg.) The explicit form of the model that was use is presented as:

$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + b_8 X_8 + b_9 X_9 + b_{10} X_{10} + U$ - - - - - - - (3)

$b_1 – b_{12}$ = Regression Coefficient for X_1- X_{10}

X_1 = Feed (kg)

X_2 = Flock size (Number of Birds)

X_3= Age or cycle of broiler at point of sale

X_4 = Farming Experience
X_5 = House Hold Size
X_6= Water
X_7 = Labour (Man-day)
X_8 = Litter material in (Bags)
X_9 = Vaccines / Medications (N/L)
X_{10} = Cost of Chicks
U = Error Term
b_0 = Constant Term

d) Marginal efficiency of input utilization

Regression coefficient (b1, b2….bn) was used to estimate the marginal value product (MVP) for each input used.
MPP = b1 (coefficient of beta) is the estimates regression coefficient of input
R= MVP / MFC
Where: MPP = Marginal physical product
R = is the efficiency parameters and if R = 1, resources is efficiently used, R < 1, resources is over used, R > 1, resources is under used
MFC = is the prevailing market price of each input used

Results and Discussion

The socio-economic characteristics of broiler farmers in the study area include gender age, marital status, family size, and level of education, nature of broiler production, occupation, years of experience, flock size, source of labour, source of capital, system of management and so on.

The age distribution of the respondents shows that 35.29% of the respondents were between the ages of 20 to 29 years, 33.33% are between 30 to 39 years, 27.45% are between 40 to 49 years while only 3.93% of the respondents are between the ages of 50 to 59 years. This result shows that majority (about 69%) of the broiler farmers in the study area are young/youths of 20 to 39years who are capable of handling and managing broiler chicken production which requires much labour and much time consuming through proper management. The sex distribution of the respondents (broiler producers) in the study area shows that the results, 68.63% of the respondents are male while 31.37% are female. The result shows that majority of the broiler chicken producers in the study area are male. This could be that they (men) are the heads of the family and hence, they are into the business to supplement their income and financial needs of their families.

The distribution of marital status of the respondents from the result, 37.25% of the respondents are single, 47.05% are married, and 5.90% are divorced while 9.80% of the respondents are widowed. From the result, most (47.05%) of the respondents in the study are married. This could be that they have responsibilities such as feeding, school fees, house rent and other contingencies which make them to venture into broiler chicken production in the study area.

The family size distribution of the respondents shows that the result, 80.39% of the respondents had 1 to 5 people in their household while 19.61% had 6 to 10 people in their household. This result shows that majority (80.39%) of the broiler farmers have a household

of 1 to 5. This could be that majority of the broiler farmers or the respondents in the study area have nuclear Family or have on wives which result to less (1 to 5) family size.

The distribution of level of education of the broiler farmers in the study area shows that the result, 3.92% of the respondents have no formal education, 1.96% attended primary school, and 27.45% attended secondary school while 66.67% of them attended or had tertiary education. This result shows that majority of the broiler farmers are educated since 94% of them had at least secondary education. This equips the farmers with skills, techniques and knowledge required for improved agriculture, thereby ensuring efficient utilization of resources and improved management practices on the farm (broiler chicken production).

The result indicate that 54.90% of the farmers have between 1 to 5 years of experience, 31.37% are between 6 to 10 years of experience and 13.73% had between 11 to 15 years of experience respectively. This indicates that majority of the broiler farmers in the study area had between 1 to 5 years of experience in broiler chicken production. The years of experience in broiler production provides the farmers with skills and techniques in overcoming most of the problems associated with broiler chicken production such as disease outbreak, high mortality rate and proper management of resources.

The occupational distribution of the broiler farmers in the study area shows that the result, 39.22% ware full time broiler farmers, 2 1.57% are civil servants, 13.73% are students, 3.92% are business people, 15.68% are traders, and 3.92% are housewives while only 1.96% is a tiler. The result shows that majority of the respondents in the study area are full time broiler farmers. This is due to the fact that broiler chicken production could be a very profitable venture in the study area which can satisfy their needs.

The result from Appendices 1 indicates that the total variable cost for all respondents N4, 374,460 while the total fixed cost N636, 670.40. This result implies that the variable cost constitute 87.29% of the total cost in the enterprise while fixed cost constitute 12.71% of the total cost. This depicts low investment in fixed asset in Agricultural practice.

The table also indicates that total gross margin of the enterprise N27, 440,750.00. This implies the profitability of the enterprise in the study area.

Four functional forms of production function where used to determine the resource use efficiency out of which the double log function was the best fit and was selected. This is because of the value of r^2 (0.72) and f-statistics (9.103874) which is significant at 1% level of profitability.

The result in Appendices II shows that the variables X_2 (flock size) and X_9 (drugs) have positive relationship with the output and are significant at 1% level of probability. Variable X_6 (water) and X_8 (litter material) have positive relationship with the output and are significant at 5% level of probability. X_{10} (chick cost) have an inverse relationship with the output and are significant at 5% level of probability. On the other hand X_1 (feed), X_3 (growth circle) and X_4 (farming experience) are non-significant but have positive relationship with the output. X_5 (household size) and X_7 (labour) are non-significant but have an inverse relationship with the output (weight gain).

The result depict that resources X_2 (flock size), X_9 (drugs), X_6 (water) and X_8 (litter material) where efficiently utilized in the enterprise. While resources X_1 (feed), X_3 (growth circle) and X_4 (farming experience) were not efficiently utilized. X_{10} (chick cost), X_5 (household size) and X_7 (labour) are under utilized in the enterprise.

Appendices III shows that feed, labour and litter material were over utilized owing to their ratio of marginal value product to marginal factor is less than 1. On the other hand drug and water had Marginal Value Product to Marginal Factor Cost ratio of greater than 1. This shows that they are below economic optimal level. It is therefore recommended that the use of feed, labour and litter material should be reduced while the use of drugs and water should be increased to enable farmers` maximize profit.

Appendix IV shows that all the problems encountered by the respondents lack of finance has the highest ranking order (31.37%) these result shows that the farmers are small scale farmers owing to the fact that they are lacking finance to expand their farm enterprise or take advantage economic of scale, disease outbreak account for 25.49%, harsh weather is 23.52%, inadequate drugs and vaccines 7.84% respectively, and other problems include; lack of extension service which accounted of 7.84%, and high cost of feed is constituted 3.92%.

Conclusion and Recommendations

The result revealed the broiler production is profitable and has a potential of addressing the problem of unemployment, self-reliance and source of income.

The financial constraints of the enterprise in the study area shows the reason why broiler producers are small holder farmers, operating at inefficient resource utilization level.

Based on the findings of study, the following recommendations are deemed necessary in order to improve the resource use efficiency of the enterprise.

It is recommended that the farmers should adhere by the vaccination programmes of the birds and ensure personnel hygiene to avert disease outbreaks.

It is recommended that farmers should stock pen at the right time or season where disease prevalence is less.

Inadequate vaccines, given through institutions should ensure the availability of drugs and' vaccines at affordable price to farmers.

Inadequate extension service, government should ensure the availability of extension agents to guild farmers on modern techniques of production.

Farmers should form and join co-operatives in order to access the bulk purchase of feed at low prices and sharing of information to enhance efficiency in production.

Lack of finance, government should provide assistance in giving loans to the farmers to improve the production of broiler chickens in the study area, examples bank of agriculture.

It is recommended that producers should increase their flock size, the use of drugs, water and litter material as they are significant in the weight gain of broiler chicken

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APPENDICES 1

Table 4.1.8 Cost and returns in broiler production enterprise

Items	Total Amount(₦)	Amount/ Respondent(₦)		Amount/ % Total Cost (₦) Poultry(₦)
(A) Variable cost				
1. Cost of purchasing chicks	712,000	15,148.94	59.68	14.21
2. Cost of feeds	333,100	7,087.23	27.92	6.64
3. Cost of drugs	162,400	3,455.32	13.61	3.24
4. Cost of water	147,300	3,134.04	12.35	2.94
5. Cost of litter materials	147,300	3134.04	12.35	2.94
6. Labour cost	246,000	5,234.04	20.62	4.91
7. Transportation cost	2,626,360	55,880	220.15	52.41
Total variable cost (TVC)	**4,374,460**	**93,073.61**	**366.68**	**87.29**
(B) Fixed cost (depreciation)				
Housing	465,600	9,906.38	39.03	9.29
Feeders	114,060	2,426.8	9.56	2.28
Drinkers	31040	660,43	2.60	0.62
Broom	14,430.4	307.02	1.21	0.29
Spade	6,220	132.34	0.52	0.12
Rake	5,320	113.19	0.45	0.11
Total fixed cost (TFC)	**636,670.40**	**13,546.17**	**53.37**	**12.71**
(C) Revenue	31,815,210	676,919.36	2,666.8	
GM =₦27,440,750				
NFI=₦26,804,079.6				

Source of Data; Field source, 2018

Appendices II

Double log regression result of input variables and weight gain of broiler production in the study area

Variable	Coefficient	Standard error	T-statistics	r^2	F-statistics
Feed	-0.013634	0.014353	0.949960	0.72	9.103874***
Flock size	0.215611	0.043841	4.918014***	72%	
Growth cycle	0.001430	0.006105	0.234259		
Farming experience	0.003401	0.013342	0.259401		
Household size	-0.013547	0.008074	-1.677811		
Water	0.324960	0.040958	7.933987**		
Labour	-0.029954	0.021682	-1.381552		
Litter materials	0.035700	0.0187667	1.902268**		
Drugs	0.422670	0.067472	6.264334***		
Chick cost	-0.009190	0.003887	2.364170**		
C	0.149707	0.050895	2.941493		

Source of data Computed from; Field Survey, 2018

Key

** = Significant at 5% level of probability

*** = Significant at 1% level of probability

All parentheses are at T-statistics

Appendices III

Resource use Efficiency

Resources	**MPP**	**MVP**	**MFC**	$r = \frac{\text{MVP}}{\text{MFC}}$
Feed	1.28	76.39	1366.87	0.056
Drugs	15	895.20	102.15	8.76
Labour	0.6	35.81	52.34	0.68
Water	1.2	71, 62	0.98	73.08
Litter material	100	5,968	6,314	0.95

Source of Data; Field source, 2018

Appendices IV

Distribution of respondents according to major problems

Major problems	**Frequency**	**Percentage (%)**
Lack of finance	16	31.37
Disease outbreak	13	25.49
Harsh weather	12	23.52
Inadequate drugs and vaccines	4	7.84
Lack of extension service	4	7.84
High cost of feed	2	3.92
Total	**51**	**100**

Source of Data; Field source, 2018