

ANALYSIS OF THE ADOPTION OF RECOMMENDED FEEDS FOR BROILER PRODUCTION IN KOGI STATE, NIGERIA.

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ABSTRACT

This study examined the adoption of recommended feeds for broiler production in Kogi State, Nigeria. Primary data were collected using structured questionnaire and interview schedule from 112 broiler producers. Multistage sampling technique was used to select 30 broiler farmers from four Local Government Areas in the four agricultural zones of Kogi state. Data analysis was carried out using Frequency counts, percentage, linear regression, adoption score and mean score on a 3 point Likert – type rating scale. The result revealed that adoption level of recommended feed, flock size, farming experience, educational status and access to credit facility were positively related to the revenue generated from broiler production with an R^2 of 0.921 and adjusted R^2 of 0.915. Adoption of recommended feed and flock size were both significant at 1% level of significance. The study further revealed that the adoption level of broiler starter and finisher feed kept on increasing each year with low level of adoption of grower feed. Constraints associated with broiler production using recommended feeds include inadequate facility to formulate recommended feeds with a mean score of 2.80, inaccessibility to credit facility (2.54), insufficient storage facility to keep broilers that were slaughtered to cut feed cost of matured broiler (2.54) and inadequate knowledge on feed formulation. Increase in knowledge of farmers on self compounding of feeds is recommended to reduce cost and also ensure the quality of feed being served to the broilers.

Keywords: *Adoption; Recommended Feeds; Constraints to Adoption and Broiler Production.*

INTRODUCTION

The poultry industry has been identified to have a significant effect on the national income of Nigeria. As reported by Okonkwo

and Akubo (2001), about ten (10) percent of Nigerian population are engaged in poultry production, mostly on subsistence and medium scales. Poultry production also contributes to the national Gross Domestic Product (GDP); it provides gainful employment and serves as a source of income for many rural and urban dwellers (Rahman and Yakubu, 2005). This implies that broiler farmers have the advantage of improving their standard of living through income generated from the enterprises.

Broiler refers to that type of chicken kept purposely for meat and is nourished with broiler feeds (pre-starter broiler feed, broiler starter, grower and finisher feeds). Proper nutrition ensures optimum growth of broiler since they are fed with rich protein diets that stimulate growth. Low protein diet leads to poor weight gain (Jane, 2011). Commercial broilers achieve table size at 8-10 weeks depending on the purpose and how fast they gain weight (Amos, 2006).

Several reports have established the relationship between body weight and physical characteristics as indicative of feed efficiency and performance of broiler bird (MC Dowell and ward, 2009). According to Jane (2011), the type of feed given to the birds is determined by its age or stage of growth. With respect to this fact, the following types of feeds are identified as broiler feeds, relative to their age; pre-starter broiler feed, which is fed to chick from day old to ten (10) days of age; broiler starter, given to chick from eleven (11) days of age to twenty-one (21) days of age; broiler grower feed, fed to the birds from day twenty-two (22) to day thirty-five (35); broiler finisher is then fed to the chick after thirty-five (35) days until it is of market size. Other types of feed given to broiler include special broiler feed, super broiler feed, Gromax and broiler concentrate.

Sanni and Ogundipe (2005) reported that feed accounts for as high as 71-86% of the total cost of production in poultry enterprise.

Studies over the years reflect fund inadequacy as one of the major problems affecting broiler farmers which consequently and negatively affect their purchasing power of broiler feed.

Bearing in mind the high cost of feed, Adukwu (1992), Okoli and Esonu, (2009) asserted that it is important that only quality feed be fed to broilers so as to maximise performance of the birds which will consequently translate into profit maximisation for the enterprise. Studies have also emphasised on the need to engage in on-farm feed formulation as some feed manufacturers undermine the effort of poultry farmers by presenting low quality or substandard feed to unsuspecting farmers. There is now the tendency for feed manufacturers to produce substandard feeds, especially as the feed quality control agencies in Nigeria are not very efficient. This presents a situation where farmers, consumers and the public at large are left at the mercy of commercial feed raw material producers or processors, (Uchegbu, *et al*; 2007). An alternative to the adoption of commercial feeds is therefore the adoption of self formulated on-farm feed.

On-farm feed formulation involves the judicious use of available feed ingredient to supply adequate proportion of nutrient required by the animal (Adebayo *et al*; 2002). It is of vital importance to know that before a farmer can be involved in the on-farm feed formulation for the poultry birds he must have adequate knowledge of the nutrient composition of the different ingredients as this will aid adequate feed adoption which at the later end accrues to efficient cost of production. The aim of adopting recommended feeds for broiler production is to maximise the output of broiler. Failure to adopt recommended feed reduces the net return from the poultry business significantly (Aihonson, 1999). Adoption of recommended feed for broiler production by many broiler producers especially in the rural setting is therefore posed with series of challenges such as high cost, poor road network that disrupt free flow of feed supply and doubt of the quality of feed adopted which demand concerted effort from government and other private development agencies to save the industry from total collapse. Failure to do this can lead to a serious reduction in poultry production, income of broiler producer and the protein intake of the people; resulting into poorer status of the producer, malnutrition within the nation and ill-health.

Kogi state located in the north central part of Nigeria is of savannah origin with very

suitable climatic environment for broiler production. Many broiler farmers in the state have explored the short production cycle, relative low cost of broiler production to stay on the enterprise and make their living. Considering the short production cycle, festival periods like Easter, Muslim festival and Christmas are usually periods targeted for attractive market price. These call for adequate feed to increase weight gain for marketing the birds in the period. Adoption of recommended feed will enable farmers meet the market period as earlier identified. Various recommended feeds are expected to be used. Feed such as pre-starter broiler feed which are fed to day old chick until they are ten (10) days of age. Also we have the broiler starter feed, broiler grower feed and broiler finisher feed which usually contain 20%, 19% and 18% protein composition respectively. These broiler feeds are usually fed to the chick to achieve the desired weight gain (Jane, 2011). It was reported by Uchegbu *et al*. (2007) that high demand of commercial feed has led to some feed millers to produce substandard feed. By implication, substandard feed fed to broilers may not lead to good performance of the birds. However, many cannot formulate feeds by themselves, yet the poor available feeds are sold at high cost. Could that be responsible for the unimpressive, under size or weight of 8 – 10 weeks old broiler found in the study area? Do broiler farmers adopt recommended feeds as specified?

What are the socio-economic characteristics of the broiler producers?

Do the socio-economic characteristics of the farmers influence the revenue generated from broiler production?

What is the adoption level of recommended feeds among the broiler farmers?

What are the constraints faced by the farmers who adopt recommended feeds?

The broad objective of the study is to analyse the adoption of recommended feed for broiler production in Kogi State, Nigeria.

Specific objectives are to:

- i. describe the socio-economic characteristics of broiler producers in the study area
- ii. identify the socio-economic factors influencing farmers level of revenue generated from broiler production
- iii. ascertain the level of adoption of recommended feed for broiler production in the study area between 2007 to 2012

- iv. find out the constraints to adoption of recommended feeds by broiler producers in the study area.

METHODOLOGY

Area of Study

The research was carried out in Kogi State of Nigeria. Kogi State which is popularly known as the confluence state was created on the 27th August, 1991 by the Government of General Ibrahim Babaginda from part of Kwara and Benue States. Kogi State lies between Longitudes 5°18'E and 7°49'E and Latitudes 6°31'N and 8°42'N. It is centrally located between the Northern and Southern parts of the country. It shares boundaries with eight (8) states. The state is bordered in the North by Niger, Plateau, Nassarawa states and Federal Capital Territory (FCT); in the south by Enugu and Edo States and in the west by Ekiti and Ondo States.

Kogi has two main rivers – Niger and Benue, running through it and meeting at Lokoja, its capital. Other rivers and wet land

exist in the state due to the hilly nature of some parts such as Ososo hills, which spread from Edo state to the Western part of Kogi State and Oporo hill on the eastern part. Another famous mountain is mount Patti situated in Lokoja and stand at about 750metres above sea level.

The seasons Oscillate between the wet and dry, with a daily temperature of between 24°C - 27°C, while annual mean rainfall is between 1250 – 1700mm spreading over eight (8) months. The wet season spans between middle of March and October while the dry season usually occur between the months of November and March. These conditions make the area favourable and suitable for extensive practice of Agriculture. Crops such as Maize, Rice, Guinea corn, Yam, Millet, Cassava, Sweet Potatoes, Cowpea, Groundnut, Soybean, Beniseed Vegetable and Livestock in the form of cattle rearing, small ruminant and poultry are predominant in the state. The state has a population of 3,278,487 out of which 1,691,737 are males and 1,586,750 are females according to 2006 population (FRN, 2007).

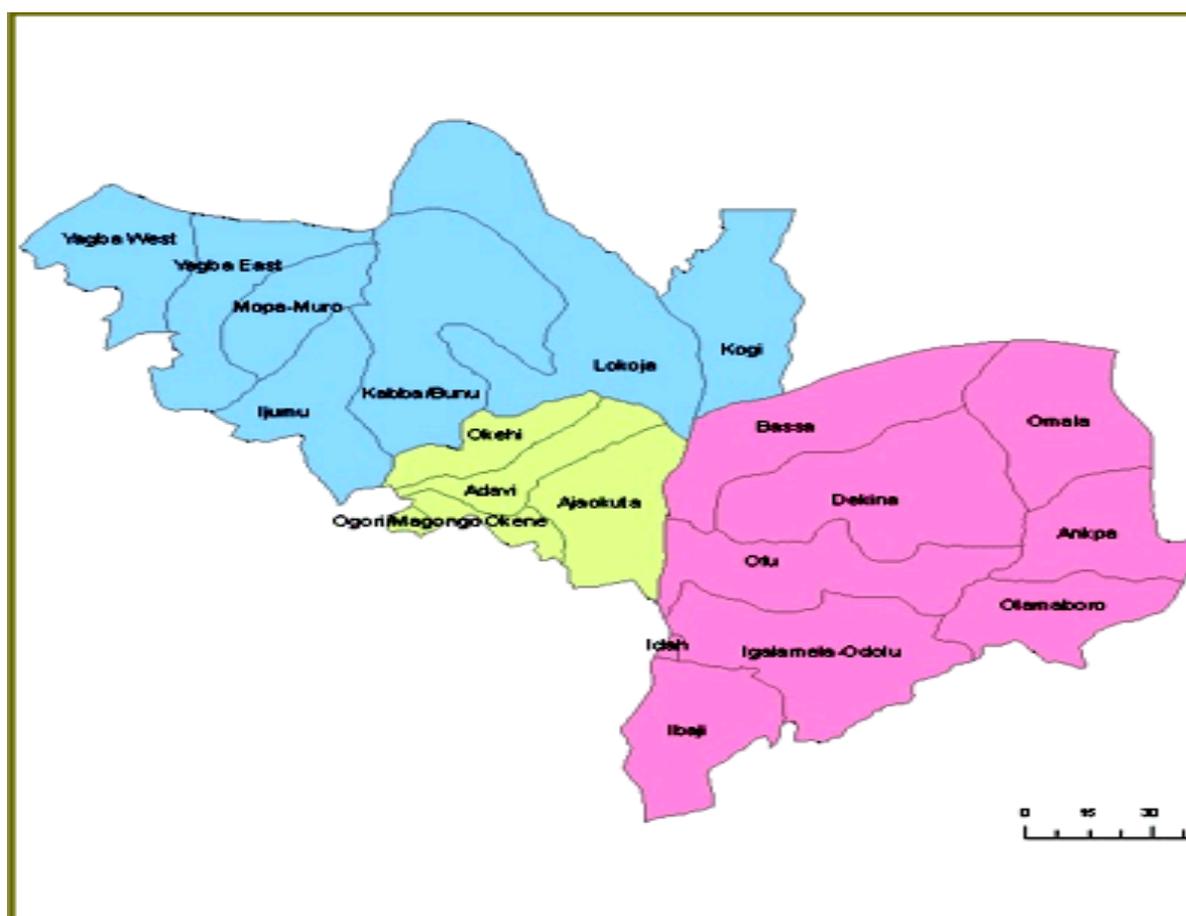


Figure 1: Map of Kogi State

Source: www.speakersoffice.gov.ng/images/map.kogi1.gif

Sampling Technique

Kogi State is recognized to have four (4) Agricultural Zones (Zone A Ayetoro – Gbede, Zone B Anyigba, Zone C Koton-Karfi and Zone D Alloma) according to Agricultural Development Project (ADP) extension structure. A Multistaged random sampling technique was used. The first stage was purposive sampling, designed to pick four Local Government Areas (LGA). These are Kabba/Bunu from zone A, Dekina from zone B, Lokoja from zone C and Idah from zone D). These four Local Government Areas have ready market for broiler because of the semi-Urban Nature of the towns in the area. Villages around the four towns are attracted by the ready market to produce broilers. At the second stage, 10% of the registered livestock extension contact farmers were randomly picked as shown on appendix 1.

The 10% selected contact farmers was based on the premise that about 10% of the Nigerian populace keep poultry at small medium and large scales levels (Okonkwo and Akubo 2001). A total of 129 respondents were interviewed while 112 sets of the questionnaire were retrieved.

Data Collection

Primary data were used for this study. The data were collected with the use of well structured questionnaire. Well trained enumerators resident in each of the selected Local Government Areas assisted in administering the questionnaire. The questionnaire addressed socio-economic issues such as age (measured in years), adoption of recommended feed [measured by the sum of the quantity of types of feed fed, e.g Broiler starter (in kg), Grower (kg), Finisher also (in kg)], farming experience (measured in years), access to credit (measured by volume of loan obtained), family size (measured by using number or people living and feeding together), contact with extension agents (measured by number of visits within the year), among others. Data on adoption level between 2007 and 2012 and constraints to adoption of feeds were also collected.

Analytical Techniques

Objective (i) (description of the socio-economic characteristics of broiler producer in the study area) was analyzed using descriptive statistics such as frequency distribution and percentage. Objective (ii) was analyzed using linear regression analysis to identify those

socio-economic characteristics influencing the revenue generation from broiler production.

Model specification

Model is specified implicitly as follows;

$$Y = F(x_1, x_2, x_3, x_4, x_5, x_6, x_7, e_i) + e \quad (1)$$

The explicit functional form that was used for the data is as shown below.

Linear function

$$Y = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + \dots + b_ix_i \quad (2)$$

Where Y= revenue generated from broiler production

b_0 = Constant term

$b_1 - b_i$ = Regression coefficient to be estimated

x_1 = adoption level of recommended feed (quantity of the various types of recommended feeds, measured in Kg).

x_2 = Education (measured in years)

x_3 = Farming Experience (measured in years)

x_4 = Family size (people living and feeding together)

x_5 = Contact with extension agent (number of visits within 1 year)

x_6 = Flock size (number of broilers kept by a broiler producer)

x_7 = Access to credit (loan for broiler production in Naira)

e_i = error term

Out of the four forms tested (Linear function, cob-Douglas, exponential and semi-log) linear regression was used based on:

Magnitude of R^2 (i.e. coefficient of determination)

Statistical level of significance

Correct signs and magnitude of regression and coefficient as dictated by apriori expectation.

Objective (iii) (to ascertain the level of adoption of recommended feed for broiler production in the study area between 2007–2012) was analyzed using the adoption score as described by Agbamu (2006). In this wise, sigma method of scoring ordinary frequency numbers or percentages of adopters were standardized by mathematical procedures in order to obtain normalized standard scores before using them in parametric statistical analysis. To standardize the adopters score, the percentage of the farmers who adopted recommended feeds was obtained and a value known as sigma distance was read from the statistical table of normal deviates. For example,

if 35% of the farmers adopted broiler starter recommended feeds in 2007, the adoption score should be calculated as $100-35/2 = 82.5$, followed by the statistical table of normal deviates, 82 in the vertical row under column 5, gives 0.935. A constant 2 will be added to this result and multiplied by this same constant in order to increase the magnitude of the value from the table of normal deviates. In other words, the sigma score for adoption of starter feed in 2007 was $(0.935+2) 2 = 5.87$. Since the sigma method of scoring assigns weight in reverse relation on a 10 point scale, the actual starter feed adoption score was $10-5.87 = 4.13$.

Objective (iv) Analysis of the constraints in the adoption of recommended feed for broiler production in the study area was

analysed using mean score, measured on a 3 – point Likert type rating scale as follow:

Very serious = 3

Serious = 2

Not serious = 1

In consideration of the above scores or value attached, only mean score above 2 are counted as significant against feed adoption.

The statistical formula is as stated below according to Osuala (1993).

$$\bar{x} = \frac{\sum F_i(A_i)}{N}$$

Where \bar{x} = mean score

F_i = frequency

A_i = value assigned to each response

N = sample size

\sum = summation

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Broiler Producer

Table 1: Socio-Economic Characteristics of Broiler Producer

Age	Frequency	Percentage (%)	\bar{x}
20-30	40	35.7	
31-40	46	41.1	
41-50	16	14.3	31.8
51-60	8	7.1	
60	2	1.8	
Sub-Total	112	100	
Educational Status			
<6	2	1.8	
7-12	6	5.3	16.8
13-18	70	62.5	
19-24	34	30.40	
Sub-Total	112	100	
Farming Experience			
<5	61	54.5	
6-10	44	39.5	
11-15	6	5.3	6.75
21>	1	0.7	
Sub-Total	112	100	
Number of extension visit(s)			
0	64	57.1	
1	10	8.9	
2	19	17.0	0.97
3	17	15.2	
5	2	1.8	
Sub-Total	112	100	
Flock Size			
<100	10	8.9	
101-500	87	77.7	
501-1000	13	11.6	347.3
1001>	2	1.8	
Sub-Total	112	100	
Household Size			
1-5	81	72.3	

6-10	24	21.4	
11-15	4	3.6	4.9
16-20	1	0.9	
21>	2	1.8	
Sub-Total	112	100	
Sources of capital			
Access to credit	38	33.9	
Personal saving	37	33.0	
Basic salary	27	24.1	
Income from business	7	6.3	
Family assistance	3	2.7	
Sub-Total	112	100	

Source: Field Survey, 2012.

The result presented in table 1 indicates that over 35.70 percent and 41.1 percent of the respondents were aged between 20-30 and 31-40 years respectively. The age range between 20 – 40 is considered as an active productive age in the production process and may likely respond positively to innovation adoption. This finding is in line with previous finding from Ike *et al.* (2011) who reported that, respondents within the age range of 20-40 are generally innovative. It is evident in this result that 14.3 percent of the sample sizes/aged in range between 41-50 are engaged in broiler production. However, the mean age of 31.8 as indicated on the table implies that youths are more involved in broiler production than the elderly ones. The technicalities involved in the rearing of broiler must have scared the elders away from the enterprise.

It was observed from the study as shown in table 4.1 that majority of the respondents (62.5% and 30.4%) spent many years in acquiring formal education ranging between 13-18 and 19-24 years respectively. This result agreed with the findings of Ogunlade *et al.* (2007) who asserted that about 84.6 percent of the respondents who were into poultry production in Ilorin had certificate in post secondary education. The mean of 16.8 also supported the fact that, on the average, the respondents spent as high as about 17 years to acquire formal education. The implication of this is that, most of the respondents received enough education that will enable and ensure rational production decision on adoption of recommended feed for broiler production. It can also be seen that 1.8 percent and 5.4 percent of the respondents had either less than 6years and 7-12 years of educational status respectively. This low level of educational qualification might negatively affect the adoption of recommended feed for broiler production.

The number of years spent on broiler production by the respondents as shown in table 1 reveals that 54.5 percent of the farmers had less than 5years of experience. 39.8 percent of the total sample had farming experience in broiler production ranging between 6-10 years. This implies that majority of the farmers were young in the business. The mean of 6.75 agreed with the fact that many of the respondents had few years of experience in broiler production. In other words, broiler production is being embraced by fresh farmers who could be young graduates, and or some enterprising youths who must have just discovered it as a sustainable way of being self employed. However the more experienced the broiler farmers are the better the likelihood of displaying appropriate management skill as noted by Ogunlade *et al.* (2007) who opined that broiler producer will learn more improved technique if they spend more years in a particular enterprise which can enhance adoption of recommended feed.

Table 1 also indicated that 57.1 percent of the respondents had no access to extension services on recommended feed utilization. The mean of 0.97 revealed that on the average, respondents had extension service at least once in a year. Availability of current extension messages on the use of recommended feed will have a positive impact on the adoption of the technology (recommended feed). The broiler farmers within this study area may not have the opportunity of enjoying the current needed knowledge and technique involved in the utilization of recommended feed. FAO (2005) opined that the poor performance of livestock sector in developing countries to produce the required animal protein have been caused by inadequate research and extension service provision.

The study revealed that majority of the respondents (77.7%) (Table 4.1) had broiler

ranging from 100-500, followed by 11.6 percent with the range of 501-1000 broiler, 8.9 percent with flock size of less than 100 broilers. The mean of 347 broilers by respondents was an indication of high occurrence of small flock size in the study area. This implies that majority of the broiler farmers can still be classified as small scale farmers. This finding agreed with the studies of Laseinde, *et al*; (2005), Amos (2006) and Emaikwu, *et al*; (2011).

Table 1 further showed that 72.3% of the broiler producers had a family size ranging from 1-5 and a mean of 4.9 that is about 5 persons in a family which implies that most of the broiler producers have small family size. They may need to look for labour outside their family because of the small size of their family. This may add to the cost of production as posited by Oladeebo and Ambe-Lamide (2007) that large family size will help to reduce the cost of hired labour.

Access to credit facility to some extent can influence the adoption of recommended feed for broiler production where fund is the limiting factor. Table 4.1 indicates that 33.9% of the broiler farmers in the study area had access to credit facility while 33.0%, 24.1%, 6.2% and 2.7% sourced their capital from personal saving, basic salary, income from business and family assistance respectively which conforms with the findings of Adebayo, *et al*. (2005), that most of

the broiler farmers obtained their capital from other sources aside credit facility which means that access to credit was still not popular among very many broiler farmers in the study area.

4.2 Regression Analysis of the Influence of Socio-Economic Characteristics on Revenue Generated From Broiler Production

Table 4.2 shows the regression result on the influence of socio-economic characteristics on the revenue generated from broiler production. The regression analysis here shows the relationship between dependent and independent variables in broiler production. The dependent variable was the revenue realised from broiler production while the independent variables were: adoption level of recommended feed, educational status, farming experience on broiler production, number of extension contact within the year, flock size, household size and access to credit facility.

The estimated coefficients of the variables and their significance were presented. The lead equation (Linear regression) was chosen on the basis of conformity with the a priori expectation of parameters, the econometric criteria such as the coefficient of multiple determinations (R^2), the level of significance of the coefficient as well as the minimum error term.

Table 2: Result of the Linear Regression on the Influence of Socio-Economic Variable on Broiler Farmers Revenue

Variables	Standard coefficient (beta)	Significance (significant level)
Constant		.018
Adoption level of feed	.728	.000*
Education status	.011	.712
Farming experience	.020	.508
Extension contact	-.013	.660
Flock size	.329	.000*
Household size	-.036	.206
Credit	.021	.502

Source: Field Survey, 2012.

$R^2 = 0.921$

Adjusted $R^2 = 0.915$

*coefficient significant at 1%

Table 3 Co-Efficient of Determination

Model	R	R ²	Std error of the estimate
1	.959a	.921	2.06362

Source: Field survey 2012

The R² for the estimated regression result on broiler production in the study area was 0.921 as indicated in Table 4.2, which implies that about 92.1% of the revenue generated from broiler production was attributed to the socio-economic variables. The regression result also showed that adoption of recommended feed, educational status, farming experience, flock size and access to credit facility had positive influence on the revenue generated from broiler production.

Specifically it was established that the adoption of recommended feed significantly influenced the revenue generated from broiler production by 72.8% at 1% level of significance and also had a positive relationship. This implies that, more revenue was generated from broiler production by those farmers who adopted recommended feed. This result conforms with the apriori expectation and the report from Ike *et al.* (2011) that farmer who adopted recommended feed generated more revenue from broiler production.

Level of formal educational attainment positively influenced the revenue generated from broiler production but not statistically significant at any level of significance. This implies that acquisition of education can influence revenue generated from broiler farming. The study reveals that farming

experience was positively related to farmer's revenue generated but was not statistically significant at any level of significance. Farming experience is expected to improve understanding and management practice that should improve revenue generated from broiler production. In essence the positive influence recorded was expected. This is in conformity with the findings of Ike *et al.* (2011).

Extension contact was negative and not statistically significant. Earlier reports by Adebayo *et al.* (2005) confirmed that extension service does not significantly influence revenue generated from broiler production. This could be due to the poor farmer/extension worker ratio, in-effective service provision by public extension workers who might not be provided with the needed tools to deliver the services on the current techniques of producing broiler.

Flock size was significant at 1% and also positively influenced revenue generation. The implication of this positive sign is that the more the flock size, the more the revenue. Its high significance can also mean that any producer who increases his/her flocks stand less risk of not making profit. This compares favourably with the findings from Oladeebo and Ambe-Lamidi (2007) that economics of scale is often associated with large scale production.

Level of Adoption of Recommended Feeds for Broiler Production in the Study Area from 2007-2012

Table 4: Adoption score for six years on Recommended Feed

Years	Starter Feed	Grower Feed	Finisher Feed
2007	4.45	0	4.45
2008	5.13	2.35	5.13
2009	5.62	1.27	5.62
2010	5.80	1.27	5.80
2011	5.97	1.27	5.97
2012	6	1.55	6

Source: Field survey 2012

In 2007, table 4 indicated 4.45, 0, 4.45 adoption scores for broiler starter, grower and finisher respectively. This implies that grower feed was not adopted at all. This may be as a result of lack of knowledge on the use of grower feed for broiler production or the need to reduce cost of feed. The adoption of only starter and finisher feed was also reported by Ike *et al.*

(2011) in a result carried out in Onitsha North in Anambra State, Nigeria.

Generally, from the result it was observed that starter and finisher feed kept on increasing in the adoption level from 2007 to 2012, while the adoption score for the grower feed indicates the varying and low adoption level. This could mean that only few farmer

adopted grower feed. And this may be attributed to the fact that these farmers were not convinced to use grower feed for their broiler. The increase in the adoption level of starter and finisher feed

could be as a result of increase in the flock size since the more the flock size, the more the feed consumed.

Table 5: Classification of Adopters In Line With Average Quantity of Feed Recommended Per 100 Broilers between Day Old and 8 weeks

S/NO	CLASS	NO OF RESPONDENTS (FREQUENCY)	PERCENTAGE
1	Low Adopters	1	0.9
2	Average Adopters	49	43.8
3	High Adopters	62	55.3

Source: Field survey 2012

Based on the average recommended feed of 17 bags (25kg) per 100 birds as suggested by Aduku (2002), the respondents were divided into three major categories of adopter (low, average and high adopters); as found on Table 5 where those who adopted far below the recommended bags of 17 bags (25kg) per 100 birds were known as Low Adopter and 0.9 percent of the total sampled population falls into this category. Those farmers who adopted just a little less than the recommended feed are known as Average Adopters and constitute 43.8 percent of the respondents. Finally, those respondents who adopted adequately or even above recommended bags of feed of 17 bags per 100 bird are called High Adopter and are about 55.3 percent from the entire sample size. No respondents adopted pre-starter or super-finisher as recommended (Jane, 2011).

CONSTRAINTS TO ADOPTION OF RECOMMENDED FEED FOR BROILER PRODUCTION

The result of the analysis presented in table 6 revealed the constraints to adoption of recommended feed for broiler production in declining order of seriousness as broiler farmers rated inadequate knowledge for formulation of feed by self as the most serious, which has a mean score of 2.8 that is obviously above the average mean score of 2 and representing 93.45% of the respondents. The interpretation of

this result indicates that inadequate knowledge for compounding recommended feed by self is the most critical challenge faced by broiler producers within this study area. This problem may be as a result of inadequate extension contact within this area.

Inaccessibility to credit facility and insufficient storage facility to keep and later sell broiler that are slaughtered to cut feed cost of a mature broiler which has a mean score of 2.54 for each of the constraints. This implies that about 84.8% of the farmers were faced with the problem of lack of capital and insufficient storage facility to keep and later sell slaughtered birds. The constraint of lack of credit here is similar to the findings of Olaniyi *et al.* (2008) in their study in Oyo state that over 65% of the poultry farmers had problem of inaccessibility to credit facility.

However a mean score of 2.34 representing about 77.9% of the sampled broiler farmers were in support of the statement that "inadequate extension contact was a serious problem". This implies that high percentage of the respondents do not have opportunity to interact with extension agents on broiler production. This result conforms to the report of Olaniyi *et al.* (2008) that there was problem of inadequate extension contact by farmers. This could be due to poor government policy on Agricultural extension/activities within the state.

Table 6: Constraints to Adoption of Recommended Feed by Broiler Producers

S/No	Constraint statement	3 (VS)	2(S)	1(NS)	Total No of Respondents (N)	Total Sum of Constraint $\sum F_i A_i$	Mean score	Proportion of respondents in %
1.	Inadequate knowledge for formulation of	86	14	12	112	314	2.80	93.45

feed by self								
2.	Inaccessibility to credit facility	77	19	16	112	285	2.54	84.8
3.	Insufficient storage facility to keep and later sell broiler that are slaughtered to cut feed cost of a matured broiler	73	27	12	112	285	2.54	84.8
4.	Inadequate extension contact	59	32	21	112	262	2.34	77.97
5.	High cost of recommended feed	42	63	7	112	259	2.31	77.08
6.	Unavailability of recommended feed	2	10	100	112	126	1.13	37.50
7.	Inaccessibility to recommended feed	3	8	101	112	126	1.13	37.50
8.	Adulteration of recommended feed	0	8	104	112	120	1.07	35.70

Source: Field survey data, 2012.

CONCLUSION

This study therefore concludes that, adoption of recommended feed positively influenced revenue generation from broiler production. However, poor knowledge of feed formulation and inadequate facility to effectively compound feed may prevent the broiler producers from maximising output and revenue generation from the enterprise. Provision of knowledge on feed formulation and adequate but affordable feed formulation facility by both researchers and extension agents will ensure quality feed adoption and sustainable broiler production in the study area.

RECOMMENDATIONS

A substantial increase in the quality and quantity of broiler production will improve protein supply and needs of the ever increasing population. It will be wise to encourage more farmers to go into poultry production (Broiler especially) using recommended feeds in other to improve upon the current trend. In view if this, the study recommends that:

- i. Credit should be made available to broiler producers by both private and public financial institutions to enhance increase in flock size which will

consequently lead to increase in revenue generation from the enterprise and improve protein supply and intake.

- ii. Government and non-government organizations (NGO's) can increase the number of well trained extension agents on the method of self compounding and formulating feed as this will improve the issue of low level of adoption of recommended feed and the assurance of quality feed utilization.
- iii. Broiler producers cooperative society should be established. Establishment of a broiler producer cooperative can encourage accessibility to loan by cooperative members. The establishment of a cooperative society can also help the members to be involved in the joint purchase of costly facilities such as storage facility (cold room) and Feed mill which an individual cannot purchase on his/her own.

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APPENDIX: I

Distribution of Extension Contact Farmers

Agric Zone	L.G.A	Contact (Livestock)	Farmers	Contact Farmers at 10%
A	Kabba/Bunu	305		31
B	Dekina	352		35
C	Lokoja	305		31
D	Idah	319		32
				Total = 129

Source: Field Survey data, 2008.