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Access to Credit and its Effect on Poultry Farmers' Productivity: A Case Study of Layer Chicken Farmers in Ikorodu Local Government Area of Lagos State, Nigeria

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Abstract

Despite the relevance of the poultry sub-sector to the economy of Nigeria and the capital-intensive nature of poultry production, many poultry farmers are unable to access adequate credit which affects their productivity. This study was therefore conducted to understand the effect access to credit has on farmers' productivity, with emphasis on layer producers in Ikorodu Local Government Area of Lagos State, Nigeria. A multistage sampling technique was used to select 114 layer producers. The data collected were analyzed using descriptive statistics, Total Factor Productivity, and Tobit regression model. The result of this study showed that though most of the layer producers had access to credit (87.6%), not all of them obtained credit (67.0%) from the sources where credit can be accessed. It also revealed that layer farmers with access to credit (4.88 ± 1.99) were marginally more productive than layer producers without access to credit (4.22 ± 2.22). The study finally revealed that while socio-economic variables such as sex of layer farmers, marital status of layer farmers, household size of layer farmers, and membership of cooperative association significantly influenced productivity of layer farmers, access to credit also significantly influenced the productivity of layer farmers. The study recommended that the government should enforce policies relating to ease of accessing credit from financial institutions.

Keywords: Credit, Layer, Productivity, Institutions, Production

1.0 Introduction

The poultry sub-sector, one of the sub-sectors of the Nigerian agricultural sector, not only contributes about 25% to the total agricultural Gross Domestic Product (GDP) (Netherlands Enterprise Agency (NEA) 2020), but it also serves variety of functions economically, ranging from source of income to farmers, as well as contributing protein to the diets of humans (Antia-Obong *et al.*, 2021). Its by-products (feathers, droppings) are also used in making different household items and for organic manure (Ogunyemi and Orowole, 2020). The poultry industry in

Nigeria has in recent years been expanding rapidly and also remains one of the most commercialized sub-sectors of Nigerian agriculture (Adene and Oguntade, 2006).

While the worldwide production of birds is 103 million metric tonnes (Statista, 2024), Nigeria – the second largest producer of birds in Africa produces 180 million birds annually (NEA, 2020). In addition, since the production of birds according to USDA (2018) is divided into two categories – egg and meat production, Nigeria produces over 400,000 tonnes of meat and more than 14 billion eggs annually (NEA, 2020). This stems from its popularity in the country owing to its many advantages over other livestock on one hand, while on the other hand is because poultry birds are good converters of feed into useable protein in meat and eggs. Furthermore, poultry meat is very tender, hence demand and acceptability by consumers is very high, regardless of their religious beliefs. Also, the production cycle is quite short, hence capital is not tied up over a long period. In addition, eggs are quite affordable for the common person than other sources of animal protein (Erdaw and Beyene, 2022).

The term “poultry” used in agriculture generally refers to all domesticated birds kept for eggs or meat production. These include chickens (domesticated fowl), turkeys, ducks, geese, pigeons, guinea fowls, quails, swans and so on. The most common of these is the domestic fowl (Igbokwe, 2010) which includes Noilers, Broilers and Layers; with layers mostly being raised for its egg and also for its meat. Omodele and Okere (2014) further opined that layer production attracts more poultry farmers than other birds because of its meat and eggs which provide high economic values. Furthermore, the production of layers, according to Amos (2006) is adjudged to be more profitable when compared to the production of other birds, including broiler production.

Despite the fact that layer production is highly profitable, the industry is faced with myriads of challenges. These challenges ranges from feed price fluctuations, fluctuations in the prices of production equipment, inadequate operating or working capital, cost of vaccine, disease outbreak and high prevention cost, etc. (Akanbi, *et al.*, 2020). Osinowo and Tolorunju (2019) further submitted that layer producers are faced with management challenges of inadequate funds and capital as well as high cost of feed. These challenges have slowed down the rate of production thus preventing farmers from achieving efficient production (Anosike, Rekwot, Owoshagba, Ahmed and Atiku, 2018), therefore causing a reduction in the efficient conversion of inputs used in production into outputs, and consequently, limiting layer farmers’ productivity.

Furthermore, the cost of feed in Nigeria account for about 70% of the cost of poultry production (Adejoro, 2004). This is due to the high cost of some critical feed ingredients (e.g. maize and soybean) which are needed in poultry ration. Several researchers also considered high cost of medicine and vaccine, non-remuneration price for eggs, cost and type of fuel/energy as major constraints to the poultry enterprise (Rajendran and Mohanty 2003; Ekunwe and Soniregun, 2007; Sefeepari, *et al.*, 2013). In addition, as a result of the capital-intensive nature of layer production, a lot of funds are therefore required for an efficient production. However, Silong and Gadanakis (2020), submitted that farmers do not have the means to obtain adequate credit from financial institutions, which affects or hamper an efficient production and consequently, the productivity of the enterprise.

The constraints faced by farmers in accessing credit, according to Odum and Chukwuji (2022) had been adduced to lack of collateral, high interest rate, bureaucratic issues, lack of awareness on where to get the necessary funds, rejection of application by funding institutions, etc.

Similarly, Akintunde, *et al.* (2020) also submitted that education and stock size can reduce the chances of accessing credit. Consequently, the lack or limited access to credit has affected farmers' ability to procure agricultural inputs like feed, drugs, feeding troughs, etc. This therefore has a negative impact on production and consequently productivity (Akwaa-Sekyi, 2013). This is because low level of access to credit is termed to be very hazardous as it limits the potential productivity of the farm (Ololade and Olagunju, 2013).

Subsequently, due to the high rate of poultry mortality, frequent low productivity and infrequent loan repayment, the majority of financial institutions view the production of poultry as a high-risk investment. Financiers are now warier when evaluating funding requests for the production of poultry as a result of the above stated predicaments. Due to a weak financial position and high business risk which lowers the degree of accruable profit, a significant number of small-scale poultry operators in South-Western Nigeria lives in poverty (Oludimu, *et al.* 2004). Nimoh, *et al.* (2013) stressed that the delay in making loans available at the time they are needed for production prevents farmers from accessing credit which hampers their productivity. This further reiterates the submission of Kusi, *et al.* (2015) that lack or limited access to credit has been noticed to be the single most important challenge facing the poultry industry.

Therefore, if layer producers will enjoy increased layer productivity which will result to a better standard of living for them and ensure that the country is not only better represented among the comity of nations producing eggs and meat, but that the country also enjoys increased foreign exchange earnings from layer production, then there is a need to understand how productive layer farmers are with respect to their use of credit or access to credit. This is necessary for policymakers to make holistic policies that will further push the enterprise to the forefront of the poultry sub-sector. It is therefore against this backdrop that this study examined the level of credit access among layer producers, estimated the productivity of layer producers, and determined the influence of credit access on productivity of layer farmers.

2.0 Materials and Methods

2.1 Study Area

This study was carried out in Ikorodu Local Government Area (LGA) of Lagos State, Nigeria. Ikorodu is located in the north-east of Lagos between latitude 6°37' and 6°45' N and longitude 3°3' and 3°5'E (Elelu, 2017; Olugbemi, *et al.* 2020). The city which lies along the Lagos Lagoon and shares a boundary with Ogun State, is a rapidly expanding city with more than 1 million inhabitants and it currently ranks 12th among the most populous cities in the country (Yahaya, *et al.* 2023). Ikorodu is in the tropical rainforest region and has an average temperature of between 28°C and 33°C. Moreover, the city has a long wet and short dry season, with wet seasons peaking in May to September and a dry season in December and January. Ikorodu gets an average of 132.03 millimeters of rain each year, and it rains 193.66 days per year, or 53.06% of the time (Weather and Climate, 2022). Ikorodu is noted for its substantial farming activities and majority of the rural people are farmers. Crop production and livestock farming such as fish farming, and poultry production is prominent in Ikorodu LGA (Ologbon, *et al.* 2017). In addition, one of the largest concentrations of poultry farms in Lagos State is found in Ikorodu LGA and this is evidenced by the presence of poultry estates in the region (Elelu, 2017).

2.2 Data Collection

A multistage sampling technique was used for this study. In the first stage, three farm estates were purposively selected on the basis of predominance of poultry production. The second stage involved a stratification of the estates into different stratum, namely pig production stratum, broiler production stratum, fish production stratum, and layer production stratum. In the third stage, 60% of layer farmers were randomly selected from each layer production stratum to arrive at a sample size of 114 layer farmers. Although 114 copies of questionnaires were distributed and collected, only 97 copies of questionnaires were found useful for data analysis. Primary data were collected with the use of a well-structured questionnaire. Data were collected on farmers' socio-economic and farm characteristics (such as age, sex, education, lot size, and years of experience), inputs used and output obtained from layer farming in the study area.

2.3 Analytical Techniques

2.3.1 Total Factor Productivity (TFP)

The productivity of layer farmers was estimated using Total Factor Productivity (TFP). This measures productivity as a ratio of gross output to total input (equation 1). The TFP was used unlike the partial factor productivity because it takes into account all outputs and inputs used in production, making it a better indicator of productivity than other productivity measures. The output in this study was measured as an aggregate index of layers' production, including the birds and eggs, while inputs were measured as an aggregate index of capital, labour used, and other services. Since outputs and inputs are often measured in different units, there may be challenges with the results that will be obtained, hence, an index formula known as the Fisher Index method was used to measure TFP. This formula which according to Kuosmanen and Sipiläinen (2004) enables researchers to tailor productivity index, is also a useful alternative when compared to some other indices and is not influenced by arbitrary technological assumptions. The Fisher Index uses the quantity and price of each output and input to create the TFP index. In this case, the quantity of each item were weighted by its price before being aggregated. It should be noted that TFP is not a measure of profit or profitability because prices are used as weights in developing the index. TFP is not a profit measure but a measure of quantity or volume of the relationship between output and input quantities. The Fisher Index method is appropriate because it satisfies more axiomatic or mathematical properties than most other index formulas. It also embodies an extensive variation of farming technologies and accords some key economic axioms and behaviours, like cost minimisation, perfect competition, and constant returns to scale.

$$\text{Total Factor Productivity} = \frac{\text{total outputs}}{\text{total inputs}} \quad (1)$$

2.3.2 Tobit Regression Model

The Tobit regression model was used to determine the effect access to credit and other socio-economic characteristics has on the productivity of layer producers. The Tobit regression model by Tobin (1958) can be used either with a right-censored (censored at a high threshold) or left-censored (censored at a low threshold) dependent variable. For this study, the productivity of layer producers was right-censored because there were no zero productivity estimates. In this study, the dependent variable is productivity of layer producers while the independent variables include the socio-economic characteristic and credit variables of the layer producers. The Tobit regression model is expressed in equation (2) as:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon_i \quad (2)$$

Where:

Y_i is Productivity of layer farmer i (index)

The independent variables are defined as follows:

X_1 : Age of layer farmer (years);

X_2 : Sex of layer farmer (0= female, 1= male);

X_3 : Marital status of layer farmer (0= unmarried, 1= married);

X_4 : Household size (actual number);

X_5 : Number of years of formal education (years);

X_6 : Membership of association (0= non-member, 1= member);

X_7 : Access to credit (1= yes, 0= no);

X_8 : Obtain credit (1= yes, 0= no);

ε_i : Random error term

3.0 Results and Discussion

3.1 Socio-economic Characteristics of Layer Producers

The result of the socio-economic characteristics of layer farmers in the study area as presented on Table 3.1 showed that the mean age of layer producers was approximately 46 ± 7 years, suggesting that layer producers are active, agile and are expected to be able to withstand the tedious activities involved in layer production. The result also revealed that majority (66.0%) of the producers are males and are mostly married (94.8%), thus indicating that producers have dependents and are expected to have more responsibilities which can spur a committed attitude towards layer production. In addition, the result revealed that layer producers have an average household size of approximately 5 ± 2 members, indicating on one hand, the availability of family labour should the layer producer wish to use labour, and on the other hand, a reduction in the cost that would have otherwise be incurred by the producer in employing labour. The result also showed that all (100.0%) the producers are educated and have spent an average of 16 ± 2 years in attaining formal education. This suggests that layer producers are literate who should be able to keep abreast with information on the procedures to access and obtain credit from different institutions. The result further showed that layer producers are mostly (71.1%) small-scale producers, that is, they have between 250 birds and less than 2000 birds according to the classification of Uchendu, *et al.* (2015). Also, the result showed that layer farmers have an average of approximately 7 ± 5 years of experience in layer production, implying that they should be familiar with the production requirements and should also be able to navigate the hurdles of layer production. The result further showed that almost all (99.0%) the layer producers belong to an association, which should afford them enough opportunity of having information on

Table 3.1: Socio-economic characteristics of layer farmers

Characteristics of farmer	Frequency	Percentages	Mean (Standard Deviation)
Age of layer farmer			
30 – 39	19	19.6	45.67 (7.369)
40 – 49	48	49.5	
50 – 59	26	26.8	
60 – 69	4	4.1	
Minimum	32		
Maximum	65		
Sex of layer farmer			
Female	33	34.0	66.0
Male	64	66.0	
Marital status of layer farmer			
Single	5	5.2	94.8
Married	92	94.8	
Household size of layer farmer			
1 – 5	66	68.0	4.72 (1.694)
6 – 10	31	32.0	
Minimum	1		
Maximum	10		
Highest level of education of layer farmer			
Secondary Education	14	14.4	85.6
Tertiary Education	83	85.6	
Years of formal education of layer farmer			
10 – 19	90	92.8	16.31 (2.210)
20 – 29	7	7.2	
Minimum	11		
Maximum	20		
Scale of operation			
Backyard	4	4.1	71.1
Small	69	71.1	
Medium	23	23.7	
Large	1	1.0	
Years of experience in layer production			
1 – 10	82	84.5	7.00 (4.635)
11 – 20	14	14.4	
21 – 30	1	1.0	
Minimum	1		
Maximum	25		
Membership of association			
No	1	1.0	99.0
Yes	96	99.0	
Access to credit			
Access to credit	85	87.6	67.0
Obtain credit	65	67.0	

Source: Field Survey, 2023

production techniques, as well as procedures of accessing and obtaining credit. The result finally revealed that though majority (87.6%) of the layer producers had access to credit, not all of them obtained credit (67.0%).

3.2 Productivity Estimate of Layer Producers

The result of the productivity of layer farmers in the study area as presented on Table 3.2 showed that the average productivity index for all the layer producers was approximately 5 ± 2 . This shows that the output – input ratio is 5:1, that is, for every input used in naira value, there is a corresponding output that is five times in naira value the input used in layer production. The result further revealed that the mean productivity index of layer producers who did not have access to credit was approximately 4 ± 2 , implying that the ratio of output to input is 4:1. This shows that for every input used in naira value, there is a corresponding output that is four times in naira value the input used in layer production. Also, the result revealed that the average productivity index of layer producers with access to credit was approximately 5 ± 2 , and this shows that the ratio of output to input is 5:1. This thus shows that for every input used in naira value in layer production, there is a corresponding output that is five times in naira value the input used in production. Furthermore, the result of the t-test showed that there is no significant difference between the productivity of producers with access to credit and those without access to credit, that is, the productivity of these producers are quite similar. Though, the result showed that the productivity of the layer producers without access to credit was quite similar with the productivity of the layer producers with access to credit, it however showed that the layer producers with access to credit were marginally more productive when compared with those without access to credit. The similarities observed between the productivity of those with access to credit and those without access to credit could be ascribed to the fact that not all those who had access to credit obtained credit, which could affect productivity through limited funds.

Table 3.2: Productivity of Layer Farmers

Productivity index	Pooled	No access to credit	Access to credit	t
	Frequency (%)	Frequency (%)	Frequency (%)	
0.00 – 0.99	4 (4.1)	1 (8.3)	3 (3.5)	-0.846
1.00 – 5.99	68 (70.1)	9 (75.0)	59 (69.4)	
6.00 – 10.99	25 (25.8)	2 (16.7)	23 (27.1)	
Minimum	0.25	0.74	0.25	
Maximum	10.32	8.75	10.32	
Mean (Standard Deviation)	4.73 (2.02)	4.22 (2.22)	4.80 (1.99)	

Source: Data Analysis, 2024

3.3 Influence of Access to Credit on Productivity of Layer Producers

The estimated Tobit regression model as presented on Table 3.3 showed that the log likelihood function was -196.05936, pseudo R-squared was 0.3384 and that the entire model was significant at the 1% level of significance. The result showed that of the eight independent variables considered, only five variables, that is, sex of layer farmers, marital status of layer farmers, household size of layer farmers, membership of association, and access to credit significantly influenced the productivity of layer farmers.

The result on Table 3.3 showed that the coefficient of sex was negative and statistically significant at 10% level of significance. This implies that a change in the sex of respondents from males to females will increase their likelihood of being productive, that is, female layer producers were more efficient in converting the inputs used in layer production into more output than their male counterparts. Though this is somehow odd because it had earlier been established that layer production is a physically demanding enterprise, Henry *et al.* (2018) however submitted that females in poultry management could have the potential to foster a more accurate and careful husbandry. This result corresponds to that of Henry *et al.* (2018), who reported a negative relationship between sex and technical efficiency of poultry farmers.

The result also showed that the coefficient of marital status was positively significant at 5%. This implies that a change in the status of respondents from unmarried to married will increase their likelihood of being more productive. This further suggests that married layer farmers were more efficient in converting the inputs used in layer production into more output. This may be due to the fact that married layer producers have more responsibilities and as such are more committed to the job than their unmarried counterparts. This can also be because married farmers are expected to have more household members which can translate to more family labour, and consequently cause an increase in the productivity of layer producers. This result agrees with the work of Gibson *et al.* (2017), who reported a positive relationship between marital status and productivity of poultry farmers.

The result on Table 3.3 revealed that the coefficient of household size was negatively significant at 1% level of significance. This implies that an increase in the household size of respondents will less likely cause them to be productive, that is, the larger the household, the less productive layer producers will be and vice-versa. This implies that layer producers with larger members may have their households exerting more pressure on the output of the farm, thereby consuming that part of the output that could have hitherto been sold when compared with their counterparts with smaller household size. This result thus agrees with the works of Saliu *et al.* (2015) and Obike *et al.* (2017) who reported that household size had a negative influence on productivity of poultry farmers.

The result on Table 3.3 further revealed that the coefficient of membership of cooperative association was positive and statistically significant at 1% level of significance. The implication is that layer farmers who are members of a cooperative association will likely be more productive than those who were not members of a cooperative association. This could be due to the fact that farmers who belong to cooperatives are not only able to pool resources together, but have information on adequate and cheaper sources of funds. This result corresponds to the result gotten by Henry *et al.* (2018), who reported a positive relationship between membership of an association and efficiency of poultry farmers.

Finally, the result on Table 3.3 revealed that the coefficient of access to credit was positive and statistically significant at 10% level of significance. This implies that layer farmers who have access to credit will more likely be more productive than their counterparts who did not have access to credit. This could be because access to credit will provide a farmer with enough capital to purchase inputs, thus leading to increase in production and hence, farmers' productivity. This result is similar to the work of Yusuf *et al.* (2018) who reported that farmers with higher access to credit facilities have higher returns on their production.

Table 3.3: Factors influencing productivity of layer farmers

Variable	Coefficient	t	P> t
Age of layer farmers	-0.004	-0.15	0.884
Sex of layer farmers	-0.775*	-1.93	0.056
Marital status of layer farmers	1.712**	2.22	0.029
Household size of layer farmers	-0.408***	-3.16	0.002
Years of education of layer farmers	-0.027	-0.34	0.735
Membership of cooperative association	4.697***	3.08	0.003
Access to credit	1.180*	1.73	0.087
Obtain loan	-0.668	-1.31	0.194
Pseudo R-squared	0.3384		
Prob. > F	0.0000		
F-value	83.71***		
Log Likelihood	-196.05936		

Source: Data Analysis, 2024

Note: *, **, *** signifies 10%, 5% and 1% level of significance respectively

4.0 Conclusion and Recommendations

This study was conducted to analyze the effect of access to credit on farmers' productivity with focus on layer producers, particularly in Ikorodu Local Government Area of Lagos State, Nigeria. The study concluded that though most of the layer producers had access to credit, not all of them obtained credit from the sources where credit can be accessed. It also concluded that layer farmers with access to credit were marginally more productive than layer producers without access to credit. The study finally concluded that while socio-economic variables such as sex of layer farmers, marital status of layer farmers, household size of layer farmers, membership of cooperative association significantly influenced productivity of layer farmers, access to credit also significantly influenced the productivity of layer farmers.

The study therefore recommended that male layer producers should be provided with incentives that will encourage them to go into layer production. This can be done through the use of grants and start-up packages. Also, male layer producers should be given specialised training through use of workshops and seminars on improved production techniques. The study also recommended that unmarried layer producers should be encouraged and motivated into going into layer production. In addition, the study recommended that farm owners should be sensitized on the dangers having large household size can have on their productivity. Also, layer producers with large household size should receive specialized education on how to either separate or reduce the consumption of the family from the farm. Layer farmers should also be encouraged to participate in family planning in order to have a smaller household size. This study further recommended that layer producers should be encouraged to be part of or form a cooperative association. This can be done by orientating farmers on the benefits of joining cooperative associations such as getting credit at lower interest rates, control of market, bulk purchase of inputs, etc. Finally, this study recommended that the government should enforce policies relating to ease of accessing credit from both formal and informal institutions. This in practical terms will involve the government enforcing the giving of agricultural loans by commercial banks at a

reduced interest rate. It will also involve reducing the stringency of the guarantor requirement and reducing the collateral demanded by formal institutions.

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