



Econometrics of Socio-economic Characteristics on Poultry-egg Production in Wukari Local Government Area, Taraba State, Nigeria

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ABSTRACT

This study was on the econometrics of socio-economic characteristics of farmers on poultry-egg production in Wukari LGA of Taraba State. The study specifically, identified the socio-economic characteristics of the farmers, determined the socio-economic factors that affected poultry-egg output and identified the constraints associated with poultry-egg farming in the study area. Primary data were collected from 150 poultry-egg producers in the study area. The data collected were subjected to descriptive statistics and multiple regression analysis. The findings indicated that most of the respondents (71.33%) were males between 41-60 years of age with an average of 8 years' experience in the poultry-egg business. The multiple regression indicates high F-Value (25.158), significant at 1% and R^2 was 0.604 (60.4%). The multiple regression parameters showed that education level, household size, experience, extension visit, farm location and cooperative membership were positive and significant, while household head was found to be negative and significant. The study identified poor feed quality and poor day old chick as the most serious constraints to the poultry-egg business in the area. It is recommended in the study that extension service should be encouraged and credit and inputs should be made available and affordable to poultry farm owners.

Keywords: Econometrics, Socio-economics, Poultry-egg, Production

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INTRODUCTION

Poultry refers to all birds of economic value to man as source of meat, egg and fibre. Egg production involves the use of good layer birds for the purpose of table egg production (Ogunlade and Adebayo, 2007). Eggs are major sources of animal protein in human diet, according to Oji and Chukwuma (2007) the poultry goes a long way in providing animal protein for the populace because it yields quick returns and provides for meat and eggs in a very short time. Esingner (1991) added that poultry eggs nearly approach a perfect balance of all food nutrients. Food and Agricultural Organization of the United Nations (FAO, 1990; FAO, 2013)

found that eggs rank second to cow milk in terms of nutritive value and the most economically produced animal protein.

The need for quantity and quality of protein supply in Nigeria is a challenge that is beyond dependence on plant protein alone. According to Fasasi (2006), Nigeria has to explore quality protein of animal origin of which poultry egg is of prime importance.

Globally, egg production is growing rapidly (39% over 10 years) with Asian countries in particular having the high rates of increase; China and India with increase of 42% and 67% respectively (Scanes, 2007). Nigeria's poultry population is estimated at 140–160 million comprising of 72.4 million chicken, 11.8 million ducks, 4.7million guinea fowl, 15.2 million pigeon and 0.2 million turkeys (FAO, 2006: FAO, 2013). This figure accounts for 71.38% of the total livestock kept in the country and supplies 17% of animal protein need of the population (Oji and Chukwuma, 2007).

Eduvie (2002) stated that Nigerian poultry industry is dominated by small-holder farmers. Farming in general, has to use available inputs as efficiently as possible to achieve optimum production (Udoh and Akintola, 2001; Etim *et al.*, 2005). Hunger and malnutrition remain among the most devastating problems facing the world poor. The supply of agricultural products from any nation to satisfy human wants and resources used in their production are very vital, due to their limited supply and stiff competition for them by many enterprises (Fasasi, 2006).

Oji and Chukwuma (2007) stated that the major problems associated with rearing of layers commercially are their susceptibility to diseases and sensitivity to feeding and deviation in the following environmental factors; ventilation, temperature, humidity, light and sound. Anosike *et al.* (2018) identify high rate of disease and pest attack, lack of loan and credit procurement, lack of technical knowledge, high rate of mortality, high cost of poultry feed, supply of poor quality chicks, inadequate poultry extension services, and inadequate access to and high cost of veterinary services as common challenges of poultry production.

A number of factors influencing technical efficiency have been identified by different researchers. Education, family size, access to credit, extension service and health status were identified as the factors affecting technical efficiency of tobacco farmers in Uganda (Obwona, 2000). Similarly, Coelli and Battese (1996) highlighted the number of years of schooling, farm size and age of farmer as the factors that are positively related to technical efficiency. Farming experience and education were both significant variables for

improving technical efficiency. In addition, credit was found to be a very important variable that should be taken into account in trying to measure the level of technical efficiency (Kebede, 2001). In their study, Ajibefun and Daramola (2003) found that the age of farmer, level of education and level of investment are the most significant determinants of technical efficiency. It was also discovered that the more experienced a farmer is, the more technically efficient he is in livestock development project, poultry inclusive (Karki, 2004).

High cost of feeds, poor quality of day-old chick, inadequate extension and training facilities are viewed as the bane to industrial poultry production in Nigeria (Alabi and Aruna, 2006). Closely linked to these are inadequate information, inadequate input supply, marketing of products and access to capital as the constraints to poultry egg production (Olaniyi *et al.*, 2008). In another opinion by Dama *et al.* (2002) apart from high cost of production inputs and poor extension services, other problems facing poultry egg producers in Nigeria include inadequate or difficulty in sourcing loans from commercial banks, price fluctuations and lack of storage facilities. Other researchers who have attributed the downward trend in poultry egg production in the country to increasing cost of feeds, poor quality feeds, inefficiencies in production and distribution of drugs/vaccines (Olanloye, 1998; Adepoju, 1999; Hassan, 2002; Polycarp *et al.*, 2004).

The aforementioned reasons made it very difficult to ensure the attainment of FAO recommendation of thirty-five grams (35gm) per caput of animal protein per day (Ojo, 2003). The current level of food insecurity calls for well-defined approaches in meeting the desired objectives. One of the generally adopted approaches is through increased production and productivity of the poultry sub-sector. Increasing productivity and efficiency within the agricultural sector particularly among small-scale poultry egg producers require a good knowledge of the current efficiency or inefficiency inherent in the subsector as well as factors responsible for this level of efficiency or inefficiency. This is because despite the growth in the egg production industry since year 2000 in Nigeria (Tijjani *et al.*, 2006), local demand has not been matched by local supply. It is against this background that the study was to determine effects of socio-economic characteristics on poultry-egg production in Wukari Local Government Area of Taraba State. In view of the above, this study attempted to describe the socio-economic characteristics of the respondents, determine the effect of socio-economic characteristics on poultry egg output in the study area and identify the constraints associated poultry in the study area.

METHODOLOGY

Study Area

This study was carried out in Wukari Local Government Area (LGA). Wukari is located in the Guinea Savannah of the middle belt region of Nigeria. It is located between latitudes 7.5°N and 9.5°N of the Equator and longitudes 10°E and 12°E of Greenwich Meridian. It is bounded to the north by Ibi and Gassol LGA to the North East; to the South by Kastina-Ala (Benue State) and Takum LGA, to the East by Donga LGA and to the west by Nasarawa (Nasarawa State).

The LGA has good climatic conditions and rich agricultural soil (Zekeriya, 2007). The study area has a land mass of about 4,308km² with a population of 241,546 (NPC, 2006) projected to be over 350, 731 people in 2018 at a growth rate of 2.5% per annum. The dry and rainy season common to tropical regions are the dominant climatic features. The rainy season starts in April and ends in October, while the dry season begins in November and ends in March. The dry season reaches its peak in January and February when the dusty north east trade winds blows across the study area.

Wukari people are predominantly farmers, hunters and partly fishermen, while some are civil servants in recent time (Danjuma, 2005). The Local Government is situated on a rich agricultural land, suitable for the cultivation of the following crops and animals; yam, rice, sorghum, maize, fruit trees, sesame, vegetables, cattle, sheep, goats and birds. The major tribes found in the LGA are Jukun, Hausa, Chamba, Tiv and Fulani among many others.

Sample and Sampling Technique

For this study, ten wards (10) were selected using purposive sampling techniques based on the concentration of poultry egg producers in the areas. From the selected wards 150 respondents were selected using snowball sampling technique, so as to identify the farmers in their respective locations. This study made use of strictly primary data. The primary data was collected by interview method using structured questionnaire.

Analytical Techniques

The tools used in analyzing collected data include; Descriptive statistics and Multiple Regression analysis. Simple descriptive statistics like means, percentages, ranking, and frequency distribution was used. Multiple regression analysis was used to determine the socio-economic factors that affected poultry-egg output as presented below:

The explicit form of exponential model selected as the best fit is expressed as;

$$\text{Ln}Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + u_i \dots \dots \dots (1)$$

Where:

Y = Output (Number of eggs per day)

X_1 = Age of respondents in years

X_2 = Gender (male=1, Female=0)

X_3 = Educational qualification in years

X_4 = House hold Size in Number

X_5 = Experience in years

X_6 = Extension Service (Number of Contact)

X_7 = Training (Yes = 1 No = 0)

X_8 = House hold head (head =1, not head = 0)

X_9 = Farm location (within = 1, outside = 0)

X_{10} = Cooperative Membership (Member =1, Non-member = 0)

u_i = error term

RESULTS AND DISCUSSION

Socio-economic Characteristics of farmers

The results of the analysis of socio-economic characteristics of the poultry-egg farm owners in the study area are presented as follows:

Table 1: Socio-Economic Characteristics of Poultry-Egg Farmers

Items	Frequency	Percentage	Mean
Age			
20-40	64	42.67	43.7
41-60	79	52.66	
61-80	7	4.67	
Level of Education			
Primary Education	2	1.33	4.1
Secondary Education	23	15.33	
Tertiary Education	124	82.67	
Years of Experience			
1-10	125	83.33	4.1
11-20	23	15.34	
21-30	2	1.33	
Sex			
Male	107	71.33	8.0
Female	43	28.67	
Household Size			
1-5	57	38	8.0
6-10	89	59.33	
11-15	4	2.67	
Marital Status			
Married	120	80	8.0
Single	30	20	
Member of Cooperative			
Member	66	44	8.0
Non Member	84	56	
Access to Credit			
No Access	117	78	8.0
Access	33	22	
Total	150	100	

Source: Field Survey, 2019

Age

As indicated on Table 1, the results of the study revealed that, the average age of the decision makers of poultry egg enterprise was 43.7 years. Majority of the respondents were 60

years and below represented by 95% this suggests high level of vitality for agricultural activities. This implies that poultry egg production in the area was embarked upon by men and women who were physically strong and mentally alert to face challenges which poultry farming in the developing countries like Nigeria requires.

Educational status

Table 1 showed the level of education of the respondents in the study area. All the respondents attended at least primary school. It can be deduced that majority of (83%) them had tertiary education, while those who had only secondary and primary education were 15% and 2% respectively. This indicated that all farms owners were literates. Educational level of farms owners is very important in the management of poultry and it is known to affect their farming activities. The high literacy level of the respondents would afford them the opportunity to understand and adopt modern farm practices thereby enhancing productivity and profitability. This agrees with the findings of Ikheola and Inedia (2005) which indicated a high literacy level of about 85% among poultry farms owners in Edo State

Farming experience of the respondents

According to the result presented on Table 1, up to 83% of the respondents had only 10 years or less experience in poultry-egg enterprise and 17% had above 10 years' experience, the mean years of experience was 4.1 years. This suggests that majority of the poultry-egg farms owners in the area were fairly new entrants into the business. It is generally expected that productivity increases with years of experience. Farmers master the techniques of production and avoid previous mistakes. Experience poultry-egg farm owners are likely to make better decisions to enhance productivity and income, because it is expected that experience in poultry-egg production usually determines the effectiveness of farmers' decision with respect to input combinations or resource allocation.

Sex

The results on Table 1 revealed that 71% of the respondents were males while 29% were females. This indicates that poultry egg production is basically male dominated. This is expected given the drudgery nature, physical and energy demand as well capital intensive nature of investment required to establish poultry-egg farm enterprise.

Household Size

Table 1 showed that poultry-egg farms owners in the study showed that 97% had 10 or fewer members in their household, only 3% had more than 10 members in their household, the mean household size was about 8 persons. This result was in conflict with opinion of Nwaru

(2004) who reported that large household sizes enhance family labour availability, since it reduces labour constraints in poultry-egg production.

Marital Status of the Respondents

The results in table 1 show that about 80% of the respondents were married in one way or the other, while only 20% were single. The finding is almost in consonance with that of Ajala *et al.* (2007) who reported 86% married and 14% single. The implication of this finding is that majority of the respondents can be considered to be responsible in taking rational decision that can improve their productivity and subsequently increase their income.

Membership of Cooperative

Table 1 showed that majority of the respondents (56%) did not belong to any cooperative society, while the remaining (44%) belong to one or more cooperative societies. Membership of cooperative societies is believed to enhance the sharing of information on improved technologies through interactions in addition to the ease of inputs acquisition and utilization constraints faced by decision makers (Effiong, 2005; Kebede, 2001). The outcome of this research evidently showed that sizable percentage of the respondents were co-operatives member of society which means that they stand some benefit from collective actions of co-operative groupings.

Access to Credit

Adequate funding is required by poultry farmers to finance all production activities. However, a large number of respondent face serious shortage of funds to finance their poultry activities, they obtained their funds through formal and informal sources as presented in table 1. The results indicated that the majority 78% of the respondents had no access to credit to finance their production activities while about 22% had access to credits. This low access to credit could be attributed to the fact that government seldom grants financial credit many farmers. Ekong (2003) asserts that credit is a very strong factor that is needed to acquire or develop any enterprise; its availability could determine the extent of production capacity. This agrees with the findings of Bassey *et al.*, (2013), who found that most of the rice marketers have their finance through personal savings and did not borrow from any commercial bank.

Table 2: Socio-economic Factors Affecting Poultry-egg Output

Variables	Coefficient	Standard Error	t-Value
Constant	5.044	0.269	18.776***
Age	0.000	0.001	0.764
Sex	0.043	0.086	-0.505
Education Level	0.163	0.840	1.945*
House Hold Size	0.060	0.015	4.088***
Experience	0.067	0.009	7.252***
Extension Visit	0.417	0.107	3.899***
Training	-0.014	0.105	-1.130
House Hold Head	-0.259	0.142	-1.831*
Farm Location	0.283	0.129	2.202**
Cooperative	0.297	0.132	2.257**
F-Value			25.158***
R ²			0.604

Source: Computed from Field Survey, 2019

***Significant at 1%, **Significant at 5% and *Significant at 10%

The Socioeconomic Factors Affecting Poultry-Egg Production

The estimates of the multiple regression yield the results presented on Table 2, the exponential functional form was adopted as the best fit for this particular analysis. The results had a model summary of $R^2 = 0.604$, which implied that 60.4% of the variation in socio-economic factors affecting output among poultry-egg farmers in the study area were explained by the independent variables. The F-Value was high (25.158) and significant at 1% level indicating best of the model adopted for this study.

The results of the regression analysis showed that household size, experience and extension visit were positive and significant at 1% level, while, farm location and cooperative membership were positive and significant at 5% level, education level was positive and significant at 10% level. Meanwhile, household head was negative and significant 10% level. However, age, sex and training were insignificant at conventional level.

Education was positive and significant at 10% level with coefficient of 0.163. This implied that an education level will increase the output by 0.163, meaning the more education poultry-egg farmers attain, the more egg they realize. This depicts that education influence

number eggs realized by farmer positively. Household size was positive and significant at 1% level with coefficient of 0.060. This implied that an additional household member will increase number of egg realized by 0.060, meaning the larger the household size, the more labour realized from the larger household members on their farms. This asserts that larger members of households will provide manpower for regular labour on farm which is time consuming and more of monitoring. Experience was positive and significant at 1% level with coefficient of 0.067. This implied that an additional year of experience will increase output increase egg output by 0.067, meaning the more experience gained by individual on poultry egg production, the more egg will be realized. This depicts that experience is paramount characteristics that makes farmers increase their efficiency and effectiveness in production management. Extension visit to poultry egg farmers was positive and significant at 1% with coefficient of 0.417. This indicates that an additional visit by extension worker will increase egg output by 0.417, suggesting that the more the extension contact, the more the egg realized by poultry farmer. This could be as a result of more access to new innovations and modern technology provided by extension workers, which subsequently increase output of the farmer.

Being a household head was negative and significant at 10% with coefficient of - 0.259. This assert that those that are head of their household will reduction in their egg output by 0.259, this is because such an individual can easily be distracted by other activities that can threaten egg production as a results of dependents in the household. This opined that non head of house will have more attention to such business as it need more time and attention which heads of household could not provide that easily. Farm location was positive and significant at 5% with coefficient of 0.283. This revealed that farmers that have their farms in their dwelling areas are having increase in egg output by 0.283; it is so because having poultry farms closer to dwelling area will give the owner more opportunity to monitor and supervise the farm and also gives more security to the farm. This shows that farmers that are close to their farms have comparative advantage on those that have their own farm located elsewhere. However, those having their farms in their dwelling area are more susceptible to diseases from the birds. Membership of cooperative was positive and significant at 5% with coefficient of 0.297. This means poultry farmer that are engaged in cooperative activities are having increase in egg output by 0.297 because engaging in cooperative activities enhances efficiency and effectiveness of poultry farming as a results of having interaction among themselves, ease access to inputs, better means of accessing fund among others. This suggests that more membership of cooperative is an important factor in yielding egg from poultry-egg farms.

Table 3: Constraints to Poultry Egg Production in the Study Area

Constraints	Frequency	Percentage	Ranking
Poor quality feed	30	20.0	1 st
Poor quality day old chicks	23	15.3	2 nd
Disease Infestation	18	12.0	3 rd
High cost of inputs	16	10.6	4 th
Limited finance	15	10.0	5 th
Inadequate storage facilities	14	9.3	6 th
Poor Management Skills	13	8.67	7 th
Poor Marketing	11	7.34	8 th
Lack of Extension	10	6.67	9 th
Total	150	100	

Source Field survey 2019

Constraints to Poultry-Egg Production in the Study Area

The result of the analysis presented on Table 3 revealed the constraints to poultry egg production in declining order of importance in terms of severity of the challenges

Poor quality feed

Generally, when flocks are fed with feed of high nutritive value, they will produce good eggs of good quality. Quality of feed intake is one of the factors affecting eggs production in laying birds. Making available to your birds feed of high quality and not just quantity is important. There are some essential elements that must be present in the feed, if they are absent you will not achieve the maximum result from the laying birds. In addition, the provision of adequate dietary minerals and vitamins is essential for good eggshell quality.

Poor quality day old chicks

This is the second most important constraint in poultry egg production. Stocking of poor breeds of poultry is tantamount to waste of effort because such breeds are positioned to

get infected with diseases than good breeds. Poor quality day old chicks make the farms' investment less profitable if not a complete loss. This confirms the findings of Saleque (2000) who identified inappropriate breeds as one of the major constraints affecting poultry industry

Disease Infestation

This is the third important constraint affecting poultry egg production in the study area. Diseases in chickens can be a devastating factor not only on egg production, but to the health of the whole flock. Some common diseases found in egg layers are fowl pox, coccidiosis, and infectious bronchitis. Fowl pox is a viral infection that causes chickens to decrease body growth and production of eggs. It causes sores and scabs on the skin and can be transmitted either by mosquito or by an infected chicken. It is very important to implement disease prevention programs for commercial poultry farms to keep hens healthy, and to keep egg production levels high. Keeping egg layers in a clean environment will prevent decreases in egg production.

High cost of inputs

This was the fourth most important constraints identified by the respondents. High cost of inputs makes it very difficult for existing firms to expand their scale of operation making a large number of them to stagnate in the small scale class, while new ones are reluctant to go into the business.

Limited finance

Respondents rated limited finance as the fifth most important problem. This could be the reason why farmers could not acquire the necessary inputs especially fixed inputs for large scale production which attracts higher profit and efficiency. Supporting this assertion, Liu (2006), in his work found that Technical Efficiency was highly influenced by financial constraints. This is because in addition to the quantity of inputs used, the timing of input usage also affects farm output.

Inadequate storage facilities

The respondents in the study area pointed inadequate storage facilities as sixth most important problem to their business. The decision makers found it very difficult to purchase enough inputs especially feed which at harvest periods usually considerably cheap and available. The eggs can only be stored for few days in which case must be disposed even when the price is not favourable in order to avoid complete loss.

Poor Management Skills

Management issues is pointed as the seventh most important constraint affecting eggs production in layers. Management of the poultry compound is very important and contributes greatly to eggs production in the farm. If the compound or the entire place is dirty, this will surely welcome some agent that will have negatively influenced on the birds. These agents include reptiles, outbreak of diseases among others. This will occur in to high mortality of bird and result in to low quality and quantity of egg production in the farm.

CONCLUSION AND RECOMMENDATIONS

Based on the findings from the study, years of experience, access to credit, cooperative membership, education level, house hold size, farm location and extension contact were socio-economic factors found to have significant influence on poultry-egg production. Also, poor quality feeds, poor quality chick, disease infestation, high cost on inputs and limited finances were the major constraints associated with poultry-egg farming.

In line with the findings of the study, the following recommendations are put forward:

- i. Research should focus on developing feeds using local contents available in the country so as to make quality feeds available and affordable to poultry farmers.
- ii. Stakeholders in the sector should encourage extension agents through the provision of incentives such as in-services training, scholarship and better welfare to enhance efficiency of the extension service and subsequently better profit margin for poultry-egg farmers.
- iii. Policies that will make credits available, accessible and affordable with minimal interest rate should be encouraged by policy makers' that are responsible for poultry-egg farmers.
- iv. Supply of quality feeds and day old chicks should be controlled from their respective production to the poultry-egg farmers; this could be done by regulatory bodies such as standard organization of Nigeria, consumer protection agency among others.
- v. Farmers are advised to engage into cooperative to enhance their activities for better output.

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