JFSR

Journal of Family and Society Research 1 (2), December 2022, pp. 150 –158 ISSN 2955 - 1668 (Online)

Socio-demographic Characteristics and Economics of Egg Farming Enterprise among Farming Households in Enugu East Local Government Area, Enugu State

[1*]Okocha, O.I., [1]Uloh, E.V, [1]Ede, A.E., [1]Uwajimgba, A.N., [1]Sombu, T. &[2]Onyegbule, B.A.

[1]Department of Agricultural Education

[2]Department of Home Economics

Federal College of Education, Eha-Amufu, Enugu State.

*Corresponding author: okochaonuoha@gmail.com

Abstract

The study aimed at examining the viability of egg farming enterprise as well as ascertaining the socio-economic characteristics of egg-farming households in Enugu East Local Government Area, Enugu State. Ninety copies of structured questionnaires were administered to egg farmers using random sampling techniques and descriptive statistics, budgetary analysis and multiple regression models were used to analyze the data. The results indicated that were 66.0% male farmers, 42.22% were within the age range of 31-40 years, 73.33% were married, 56.11% had post-secondary education and 48.0% were small scale egg farming households who completely depended on family labour. The identified small scale farmers extensively managed their flock using kitchen waste which was further supplemented with commercial feeds. Cost of feed recorded the highest threat to egg farming within a production cycle of 12 months. The net farm income for the small, medium and large scale farms recorded ₦529,970.00, ₦ 1,503,606.92 and ₦13,035,052.44 respectively. The capital turnover of small-scale (1.67%), medium-scale (1.89%) and large-scale (2.02%) were largely determined by quantity of feed, labour used and flock size. The results of the multiple regression analysis of the determinants of egg production recorded R^2 (0.626) and the adjusted R^2 (0.597) implying that a unit increase in any of number of laying birds, quality of feed consumed in kilogramme and labour used in Man-days, would increase egg production by 62.6%. The study concludes that egg faming is economically profitable especially in large-scale farming. It is recommended that increase in scale of operation to optimize economics of scale which will further improve the socio-economic characteristics of the egg-farming households positively in the study area.

Keywords: Egg Farming, Households, Small, Medium, Large Scale Enterprise

Introduction

The Nigerian poultry industry comprises about 180 million birds. Nigeria has the second largest chicken population in Africa after South Africa (Sahel, 2015 quoted in FAOSTAT (2018). It produces about 650,000 tons of eggs and 300,000 tons of poultry meat in 2013 (FAOSTAT, 2017). About 80 million chickens are raised in extensive system, 60 million in semi-intensive system and the remaining 40 million in intensive system Africa Sustainable Livestock (ASL, 2018). Production of eggs is of a great economic importance in the poultry industry and the success of the enterprise depends among other things on the total number of quality eggs produced (Ojedapo et al. 2009). Egg farming is one of common agricultural enterprises in Africa and most especially in Nigeria; and chicken is the most popular type of poultry reared for eggs and table meat. The major factor affecting performance of laying birds or other livestock is to provide quality feed to meet the requirement for production and maintenance whether it is intensive, semi-intensive or extensive system of management (Owosibo et al., 2007). Though intensive egg production is one of the common forms of livestock farming in Nigeria (Famoyin, 2000); its profitability depends largely on the biological efficiency of feed consumed by the birds. It is a known fact that Nigeria has not been able to provide animal protein in sufficient quantity to meet the animal protein requirement of the populace (World Bank, 2007). It is also evident that animals and man compete for the grain component of feed which continuously escalates its cost and make it to constitute about eighty three per cent of the variable cost of egg production (Ekaete, 2001).

The socio-demographic characteristics of the egg-farming population are also a considerable factor in determining the productivity and efficiency of egg-farming enterprise in any locality. Olorunsanya et al. (2013) reported egg production when majorly carried out by fairly old farmers, had negative implication on the adoption of modern method of production. Nigeria Bureau of Statistics also stated that farming enterprises are dominated by males in Nigeria (NBS, 2006).

The table egg production subsector has continued to be viewed as not being viable due to such factors as high cost of feeding, irregular supply and high cost of day-old chicks, lack of affordable veterinary drugs, periodic egg glut and lack of professional expertise by farmers etc. In Enugu East Local Government Area of Enugu State consisting of urban, peri-urban and rural settings, egg farming enterprise among households is not popular. Egg-farming enterprise provides access to eggs, meat as well as potential for revenue generation through sales of eggs and or live fowl. The high cost of feed is making egg and other animal products unavailable to the ordinary man thus, worsening the protein deficiency and food security problem in the country. According to Awolola and Adedigba, (1999), egg farming could be a means of positively improving the socio-demographic characteristics of farming households. This study therefore aims at evaluating the productivity of egg-farming enterprise as a way of attracting and enlightening more investors and potential investors. This in turn might help to provide solutions to protein deficiency problems in Nigeria.

Objectives of the study

This broad objective of this study is to ascertain the socio-demographic characteristics and the economics of egg-

farming enterprise. Specifically, the study:

1. identified the socio-demographic characteristics of the egg-farming households;
2. identified the egg production characteristics of the respondents, and
3. determine the cost and returns to egg farming enterprise per hen among the respondents in Enugu state.

Methodology

***Study design*:** The research used the descriptive design or method.

***Population for the study*:** The population of the study is all egg-farming households in Enugu East Local Government Area of Enugu State. The population projection according to National Population Commission of Nigeria Enugu East Local Government Area is 374,100 (NPC, 2016).

***Sample selection procedure*:** Ninety egg-farming households were selected from the study area. Snowball sampling technique was used to select the respondents. In this method, one identified egg farming household referred the researchers to another egg farming household.

***Instrument for data collection*:** The instrument for data collection was a set of questionnaire. The questionnaire was made up of three sections. Section A, contained items on the demographic characteristics of the respondents. Section B elicited information of the egg production characteristics of the respondents, and section C obtained data on the economics of egg farming.

***Validation of the instrument*:** The face validation of the instrument was established by three experts from the Department of Agricultural Education, Federal College of Education, Eha-Amufu, Enugu State, Nigeria.

***Reliability of the instrument*:** Reliability of the questionnaire was established using Cronbach alpha method and reliability coefficient of 0.78 was obtained, showing high internal consistency of the test items.

***Method of data collection*:** The respondents were visited in their homes and in their farms to obtain the information. Ninety copies of the questionnaire were administered to the farmers verbally with the help of two trained research assistants. Any member of the household who could give reliable information was used for the study. Their responses were then ticked in the questionnaire accordingly. All the 90 (100%) copies of the questionnaire were correctly filled out and returned.

***Informed consent*:** A verbal consent was obtained from the participants before the study commenced. The purpose of the study, the voluntary nature of participation and confidentiality of data were duly explained to them, after which they gave their consent.

***Data and statistical analysis*:** Descriptive statistics such as frequencies and percentages were used to describe the socio-demographic and egg production characteristics of egg-farming households while production data of egg-farming enterprise used costs/returns and multiple regression model as analytical tools. The multiple regression model used to determine the influence of the independent variables on egg production is shown below:

$$Y = f(X_1, X_2, X_3, X_4, U)$$

Where Y= crates of eggs laid per production cycle

X_1= Number of laying birds

X_2= Quantity of feed consumed in kilograms per production cycle

X_3= Labour employed in Man-days

X_4= Expenditure on other variable inputs including drugs, sprays, transportation cost etc.
U= Depression value of fixed items

The budgetary analysis equation is also shown below:

NFI = TR-TC

Where NF= Net Farm Income
TR= Total Revenue
TC= Total Cost

The total variable cost per production cycle for the study includes cost of feed, water, vaccine, labour, transportation, drugs, additives, antibiotics etc. The fixed cost includes annual depreciation on feeders, drinkers, battery cages, wheel barrow, and other capital equipment. The multiple regression analysis was used to determine the influence of the independent variables on egg production in the study area at 0.05 level of significance, while the hypothesized independent variable in the model were amount of feed consumed by the birds in kilograms, number of laying hens, expenditure on other variable inputs and depreciated values of fixed items.

Results

Table 1 shows the socio-demographic characteristics of the respondents. The results showed that 42.22% of the respondents were between 31-40 years of age, and 33.33% were within the age group of 41-50 years. It also showed that 73.33% of the respondents were married, 35.18% of them had post-secondary education, and 40.56% of them were full time farmers.

Table 1: Descriptive statistics of the demographic characteristics of the respondents

Variables	Frequency (n=90)	Percentage
Age (years)		
20-30	16	17.78
31-40	38	42.22
41-50	30	33.33
51-60	6	6.67
Marital status		
Single	13	14.44
Married	66	73.33
Divorced	6	6.67
Widowed	5	5.56
Sex		
Male	57	66.0
Female	33	34.0
Level of Education		
Informal	10.0	12.01
Primary	22.0	24.13
Secondary	26.0	28.68
Post-secondary	32.0	35.18
Primary occupation		
Farming	37.0	40.56
Civil servants	22.0	24.67
Traders/business	29.0	32.44
Others	2.0	2.33

Table 2 below shows the distribution of respondents based on their production system showing that 58.43% practiced intensive system of management while 36.77% practiced semi-intensive system. The table also showed that 68.08% practiced deep liter management method, 58.0% had small farm size and 35.0% reared Isa Brown species of birds. Based on housing, 67.28% housed their laying chicken permanently indoors, 28.58% housed temporarily while 4.14% provided housing only at night. The farmers mostly (54.66%) fed their birds with kitchen waste supplemented with commercial feed and some (35.56%) made use of commercial feed only. Majority (74.24%) regularly gave medication to their birds and 65.30% of the farmers attested to high cost of feed as a major problem militating against egg farming.

Table 2: Egg production characteristics of the respondents

Variable	Frequency (n=90)	Percentage
Source of labour		
Hired labour	26.0	29.0
Family labour	64.0	71.0
Management method		
Deep litter system	65.0	68.08
Battery cage system	25.0	31.92
Farm size		
Small size	55.0	58.0
Medium size	32.0	38.0
Large size	3.0	4.0
Breed of stock		
Isa Brown	33.0	35.0
Nero Black	18.0	20.0
Harco	22.0	25.0
Noiler	3.0	5.0
Others	14.0	15.0
Problems encountered by egg farmers		
Egg glut	5.0	5.80
High cost of feed	64.0	65.30
Disease outbreak	4.0	5.72
Lack of credit	3.0	4.56
Vaccine failure	1.0	1.28
Pilfering	1.0	1.92
Cannibalism	1.0	2.04
Egg breakage	1.0	1.77
Other problems	10.0	11.61
Management system		
Intensive system	51.0	58.43
Semi-intensive system	35.0	36.77
Extensive system	4.0	4.80
Method of housing		
Permanently	55.0	67.28
Only at night	2.0	4.14
Temporarily	33.0	28.58
Feeding regime		
No feeding	1	1.22
Use of commercial feed	34	35.56
Kitchen waste supplemented with commercial feed	52	54.66
Only kitchen waste	3	7.66
Medication		
Rarely	17.0	25.76
Regularly	73.0	74.24

Table 3 shows the comparative cost analysis of egg-farming enterprise among the respondents. It shows that the cost of feed was highest in small scale egg-farming enterprise (80%) and lowest in large scale egg-farming enterprise. An average smallholder egg-farmer in the study area kept 450 birds per production cycle of 12 months and spent N3,459.77 per hen as variable cost, a medium operator kept an average of 1,000 birds per production cycle of 12 months and spent N3,216.38 per hen as variable cost while the large farms which were in minority (about 4%) kept about 7,500 birds per production cycle of 12 months and spent N3082.82 per hen as variable cost. The profitability analysis for the representative farm categories shows that the three farm categories recorded positive and appreciable net farm income of ₦529,970.00, ₦1,503,606.92 and ₦13,035,052.44 for small, medium and large scale farms respectively.

Table 3: Cost and Returns to Egg Farming Enterprise per Hen among the respondents

Variable	Small farm	Medium farm	Large farm
No. of laying birds	450.00	1,000.00	7,500.00
Cost of feed per hen/cycle in (N)	4,071.57	2,945.71	2,858.16
Cost of feed per hen/cycle in Per cent	80	77	76

Labour cost per hen/cycle in (N)	182.32	200.23	225.05
Cost of day old chicks per hen/cycle (N)	125.00	115.00	110.00
Cost of drugs, water, light per hen/cycle (N)	302.45	302.65	365.97
Total variable cost/hen/cycle	3459.77	3216.38	3082.82
Depreciated cost/hen/cycle (N)	58.87	45.77	32.20
Total cost/hen/cycle (N)	3518.64	3262.15	3115.02
Price per bird of spent layer (N)	1,000.00	1,000.00	1,000.00
Returns on egg/layer (N)	3,850.45	4,340.20	4,620.45
Total return per layer	4,350.45	4,840.20	5,175.45
Net return per layer	1,331.81	2,078.86	2,560.45
Net income (N)	529,970.00	1,503,606.00	13,035,052.44

Table 4 shows the ordinary least square (OLS) estimates of egg production among the respondents. They include the number of laying birds (t = 6.236, p=0.093), the quantity of feed consumed in kilograms (t = 2.167, p=0.034), labour used in Man-days (t = 2.975, p=0.065) and the expenditure on other variable input (t= -0.321, P=0.005). The fixed assets in Naira was 1.905. The regression analysis showed that about 70 per cent of the variation in egg production was explained by the fitted variables with adjusted R^2 of about 70%.

Table 4: Ordinary Level Square Estimates of Egg Production in Enugu East L.G.A. of Enugu State, Nigeria

Explanatory variables	Coefficient	t-value	P values
Number of laying birds	0.818	6.236	0.003*
Quantity of feed consumed in Kilogram	0.691	2.167	0.004*
Labour used in Man-days	0.329	2.975	0.05
Expenditure on other variable input in Naira	-0.344	-0.321	0.05
Fixed assets in Naira	0.765	1.905	
Constant	1.022	2.447	
R^2	0.732		
Adjusted R^2	0.703		
F-value	44.67		

***significant at 5% (critical r=0.254)**

Discussion

The findings of the study showed that the respondents were mostly between 31-50 years of age. This indicated that egg production was carried out by middle-aged farmers in the study area. Many of the egg farmers were married with children, indicating that egg farming is mostly a family business in the study area. A good number of them had secondary and post-secondary education. This implies that the larger population in the study area acquired basic education that enabled them to adopt new agricultural innovation that could lead to greater production. Many of the egg-farming households were full time farmers who might also engage in crop farming and other livestock production enterprises, others were traders and civil servants who might be engaging in egg farming as part time business.

The finding of the study also showed that the respondents mostly practiced intensive system of management while some practiced semi-intensive system. Most of the farmers regularly gave medications to their birds indicating proper management practices. This might help to protect the birds from diseases and death and therefore improve yield. It was further observed that a greater proportion of the respondents housed their laying chicken permanently indoors, others provided temporary housing while a few provided housings only at night but mostly adopted poor management practices. Based on the source of labour involved in egg-farming enterprise, majority of respondents used family labour. Haruna et al., (2007) also reported that household labour is the most important component of labour in small and medium scaled production which is predominantly in use in Nigeria and most parts of Africa. Many of farmers adopted the deep litter method of egg farming system of management adopted by the farmers which was more strenuous in labour. The reason for this finding might be that the farmers were mostly in their active years so they can afford the labour input. However, deep liter method is also cheaper to in terms of infrastructure; therefore, the farmers might opt for it as being more economical. It was also found out that is similar to the findings of Ekaete (2001), high cost of feed was the major problem encountered by egg farmers in this study. The farmers mostly fed their birds with kitchen waste supplemented with commercial feed and some made use of commercial feed only. The reason for supplementing with kitchen waste might be to mitigate the high cost of feed as observed in the study.

The finding on the comparative cost analysis of egg-farming shows that the cost of feed was highest in small scale egg-farming enterprise (80%) and lowest in large-scale egg-farming enterprise. This agrees with the report by Effiong and Umoh (2010) that the cost of feed reduced with the scale of operation. The increase in cost of drugs, water, veterinary services and transportation across the scale of operation is attributed to cost of engaging in veterinary services routinely and engaging the services of registered professional poultry/poultry product drivers. An average smallholder egg-farmer in the study area kept 450 birds per production cycle of 12 months and spent N3,459.77 per hen as variable cost, a medium operator kept an average of 1,000 birds per production cycle of 12 months and spent N3,216.38 per hen as variable cost while the large farms which were in minority (about 4%) kept about 7,500 birds per production cycle of 12 months and spent N3082.82 per hen as variable cost. Evidently, these trends confirm that the large farms enjoyed economics of scale in the study area. The profitability analysis for the representative farm categories showed that the three farm categories recorded positive and appreciable net farm income of ₦529,970.00, ₦1,503,606.92 and ₦13,035,052.44 for small, medium and large-scale farms respectively. Egg farming enterprise was thus profitable in the study area. This corroborates the findings of Yusuf and Malomo (2007) and Haruna et al., (2010) that egg farming enterprise is profitable.

The determinant variables of egg farming included number of laying birds, quantity of feed consumed in kilograms and labour used in Man-days. All these significant variables positively influenced egg production in the study area indicating that a unit increase in any

of these variables would increase egg production by the corresponding estimated coefficients. This is similar to the findings of Haruna et al., (2007) and Effiong and Umoh, (2010), who reported also that the number of laying birds and quantity of feed significantly influence the number of eggs laid in Plateau and Akwa Ibom States of Nigeria respectively. The expenditure on other variable inputs in naira includes items such as cost of medication, cost of providing drinking water, cost of utilities like electricity, use of egg-boosters etc. These costs vary and could affect cost of production. Olorunsanya and Omotesho (2011), reported that changes in variable inputs significantly affect egg production per unit cost.

Conclusion

Egg farming plays a significant role in the socioeconomic life of farming households in the study area. The respondents mostly practiced the intensive system, while some practiced semi-intensive system of bird rearing. Majority of respondents employed the services of family members in managing the farm in order to minimize cost of labour. High feed cost remains the most limiting problem in egg farming enterprise especially in small scale farms. The farmers also regularly provided medications for the birds indicating proper management. Egg farming was generally found to be profitable among the farmers however, large scale farming yielded better economic returns than the medium and small-scale farming. It is therefore recommended that up scaling the size of the enterprise will enable farming households maximize the economics of scale in egg production and improve the socioeconomic characteristics of egg farmers in the study area.

References

Africa Sustainable Livestock (ASL)-2050 (2018). Livestock production systems spotlight Nigeria. FAO, Rome Italy. Retrieved online on 28th March, 2022 at https://www.fao.org/data/Nigeria / Pp.3.

Awolola, M.D., & Adegbija, M.V. (1999). Factors associated with the Adoption of Recommended Practices for Poultry Keeping in Kwara State. *Book of Proceedings NSAP 26th Annual Conference*, 453-456.

Effiong, E.O., & Umoh, G.S. (2010). Cobb Douglas production function with composite error term in egg laying enterprise in AkwaIbom State, Nigeria. *Agro-Science Journal of Tropical Agriculture, Food, Environment and Extension*. 9(1):1-7.

Ekaete, M.N., (2001). An economic evaluation of rabbit enterprise in Abak Municipality of Akwa Ibom State, Nigeria. Unpublished B.Sc. Project, Department of Agricultural Economics, University of Calabar, Calabar, Nigeria. Pp. 9-10.

Famoyin, I., (2000). Poultry farming Project: X-tower Veterinary Konsult, Ibandan, Nigeria

FAOSTAT (2018).Food and Agricultural Organization of the United Nations. Available online at https://www.fao.org/faostat/en/#data/OA

Haruna, U., Jibril, S.A., Kala, D.J.U., & Suleiman, H. (2007). Evaluation of egg production in Jos North Local Government Area, Plateau State, *Nigeria. International Journal of Poultry Science.* 6(8):604-407.

National Bureau of Statistics (NBS), (2006). 2006 Core Welfare Indicator Questionnaire (CWIQ) Survey: National Summary and Enugu State, Federal Republic of Nigeria, Abuja, Nigeria. Pp.36-39

National Population Commission (NPC), (2016) Projected population of Enugu East local government area of Enugu

State, Nigeria.Retrieved from https://www.citypopulation.de on 31st of May, 2022.

Ojedapo, L.O., Adedeji, T.A., Ameen, S.A., Olayeni, T.B., Amao, S.R., Ige, A.O., Rafiu, T.A., Ojediran, T.K., & Akinniran, T.N. (2009). Effect of strain and age on egg quality characteristics of two different strains of layer chicken kept in cages in Derived Savannah Zone of Nigeria. *Proceedings of the 14th Annual Conference of the Animal Science Association of Nigeria,* 14th-17th Sept., LAUTECH, Ogbomosho, Oyo State, Nigeria.Pp.41-43.

Olorunsanya, E.O., Bakare, B.O., & Olanyinka, J.A. (2003). Economics of egg farming enterprise in Kwara State, Nigeria. *Proc. of the 38th Conf. of Nigerian Society of Animal Production,*17-20 March, 2013, Rivers State University of Sci. & Tech., Port Harcourt.

Olorunsanya, E.O., & Omotesho, O.A. (2011). Technical efficiency of poultry egg production in Ogun State: A Data Envelopment Analysis (DEA) Approach. *International Journal of Poultry Science* 6(9):622-629.

Owosibo, A.O., Omole, A.J., Fapohunda, J.B., & Fasanmi, O.G. (2007). Small and medium scale egg production manual (1stedn). *Green Choice Agric. Publications*, Ibadan, Nigeria.Pp.20.

Sahel, J.U. (2015). An assessment of the Nigerian poultry sector: FAOSTAT2018. Food and Agricultural Organization of the United Nations-Livestock and Livelihoods Spotlight: Nigeria Cattle and Poultry Sectors. Available online at https://www.fao.org/faostat/en/#data/OA

World Bank Report (2007). *International assessment of agriculture and technology for development*.World Bank, Washington DC. Pp. 9-10.

Yusuf, S.A., & Malomo, O. (2007). Technical efficiency of poultry egg production in Ogun State: A data envelopment analysis (DEA) approach. *International Journal of Poultry Science.* 6(9):622-629.