

## ASSESSING THE PROFITABILITY AND CHOICE OF FEED-TYPE DETERMINANTS IN EGG PRODUCTION: EVIDENCE FROM ONDO STATE, NIGERIA

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Received: 22 December 2024, Revised and Accepted: 06 February 2025

### ABSTRACT

**Objective:** This study investigates the determinants of profitability and the choice of feed type used for egg production in Ondo State, Nigeria.

**Methods:** Primary data were collected using a well-structured questionnaire. The analysis employed descriptive statistics, budgetary techniques, multiple regression, and multinomial logit (MNL) models to evaluate the factors influencing profitability and feed choice among poultry farmers.

**Results:** Findings indicate that 74% of respondents were male, 85.8% were married, and the average household size was four persons. A significant proportion (88.3%) of the farmers had access to loans, and most owned between 200–250 birds. Feed-related challenges were prevalent, with 82.5% citing poor feed quality as a major issue. The Return on Investment (ROI) for egg production was calculated at 3.85. Key factors influencing profitability included education level, age, access to loans, number of birds, feed choice, labour, and output quantity ( $p < 0.05$ ). The MNL model results revealed that marital status, age, number of birds, and profit significantly predicted feed choice ( $p < 0.05$ ). Specifically, being married, older, having a higher number of birds, and achieving higher profits increased the likelihood of using non-self-formulated feeds. These factors also positively influenced the likelihood of using both self-formulated and non-self-formulated feeds.

**Conclusion:** Egg production is profitable in the area. Enhancing access to loans and investing in better feed quality are recommended to improve productivity and reduce unemployment.

**Keywords:** Choice, Profitability, Egg production, Types of feed, Return on investment, Nigeria.

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### INTRODUCTION

Poultry has a significant effect on the national economy (Olutumise *et al.*, 2023). According to Agbato (2019), about 10% of the Nigerian population is engaged in poultry production, mostly on subsistence and small or medium-sized farms. Recently, the industry has been adversely affected by stringent government economic measures. The measure has been very pronounced in poultry production due to the high level of sensitivity of the industry to management factors and the resultant effect on the life and productivity of the birds (Akpan and Udo, 2021; Olutumise, 2023). Egg production in both the rural and urban areas of these countries makes a substantial impact on family diets and household budgets through their efforts in agricultural production (Musa *et al.*, 2021). Since farming is the cornerstone of the economy of most developing countries, there is a need to strengthen egg production efforts to make improvements in several aspects of rural life such as food production and animal husbandry. Modern intensive systems are mainly seen in urban and peri-urban areas and these are characterized by high investment costs (Fasasi, 2019). The increase in the need for protein has posed a greater pressure and challenge to our egg producers. On the other hand, the profitability of egg producers is affected by the lack of constant feeding of fowls. The poor feeding of fowls affects the rate at which fowls lay eggs for their owners. This is one of the major constraints that affect the growth of poultry birds and egg productivity. This poor feeding of poultry birds affects the profitability of poultry farmers.

Most egg producers do not feed their poultry birds with vitamins, which affect their growth and constant laying of eggs. Poultry birds that lack the right vitamins in their meal would be low in egg production, which would

affect the profitability of egg producers. In Nigeria, the lack of nutritious poultry feed is a problem facing egg producers (Ogunlade and Adebayo, 2021), and most feed producers cannot compound feed as recommended. Furthermore, in the past years, many small-scale operators in the poultry industry have been forced out of business due to problems ranging from shortage and high cost of feed, high cost, and inadequate veterinary services and drugs, poor quality of equipment and other inputs, as most egg producers could not afford quality feed for their poultry birds to enhance their growth. Thus, this study investigated determinants of profitability of egg production in Ondo State. The findings in the study would be of help to poultry farmers who deal with different breeds of birds, such as chicken, turkey, and duck, to make use of nutritious feed to nourish their poultry birds to enhance their level of egg production. The study's findings will benefit poultry feed producers by encouraging the use of standard materials in feed formulation, thereby enhancing poultry production. The specific objectives of the study were to describe the socioeconomic characteristics of poultry egg farmers in the area, analyze the factors affecting the profitability of egg production in the study area, estimate the cost and returns of egg production in the study area, examine the effect of poultry farmers choice of a particular type of feed on the profitability of egg production in the study area; and identify the challenges militating against egg production in the study area.

### METHODS

The study was carried out in Akure South and Ifedore Local Government Areas (LGAs) of Ondo State. In Ondo State, the rainy season lasts from April to October, with rainfall of about 1524 mm per year. Temperatures vary from 28°C to 31°C with a mean annual relative humidity of about

80%. The people of Akure speak the Akure dialect of the Yoruba language. Akure dialect is considered by most Yoruba linguistic research to be a subdialect of the Ekiti Yoruba dialect. Agriculture is an important economic activity in the area. The people specialized in livestock, goats, and fowl (chicken). Akure is the trading avenue for a farming region where cocoa, yam, cassava, maize, and tobacco are grown. Cotton is also grown and used to weave cloth. Grains such as rice, beans, and millet are very common as they are the major sources of carbohydrates. It has a vibrant agricultural community that organizes an annual trade fair under the shield of the Ondo State Agricultural Commodities Association.

Primary data were used for this study. The data for this study were obtained using a well-structured questionnaire containing relevant questions on each of the objectives for eliciting information from the respondents. A multi-stage sampling technique was used to randomly select 120 poultry egg farmers in the study area. In the first stage, four communities were selected from Akure South LGA Ondo State and four communities in Ifedore LGA Ondo State, which are Oke-Igan, Oke-Aro, Aponmu, Gbogi, and Ilara-Mokin.

The second stage involved a random selection of 24 poultry egg farmers from each of the selected five communities using the snowball sampling technique, thus giving a sample size of 120 respondents for the study.

The analytical techniques that were used in this study were descriptive statistics, budgetary technique, multiple regression, and multinomial logit (MNL) regression.

The descriptive statistics used in this study include mean, frequency distribution, and simple tabular form. Descriptive tools were used to describe the socioeconomic characteristics of poultry egg farmers in Akure South and Ifedore LGA Ondo State.

This budgetary technique was used to analyze the cost and returns to egg production in the study area. The technique includes Return on Investment (ROI).

Return on Investment (ROI) = Total Revenue/Total Cost

ROI = TR/TC

NFI = TR – TC (1)

TC = TVC + TFC (2)

Where:

NFI = Net Farm Income (N)

TR = Total Revenue (N)

TC = Total Cost (N)

TVC = Total Variable Cost (N)

TFC = Total Fixed Cost (N)

This multiple regression model was used to examine the factors affecting the profitability of egg production. Due to the combination of metrics and nominal variables, a double-log functional was adopted. The double-log regression model is explicitly stated below:

$$\ln Y = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + \beta_6 \ln X_6 + \beta_7 \ln X_7 + \beta_8 \ln X_8 + \beta_9 \ln X_9 + \beta_{10} \ln X_{10} + \beta_{11} \ln X_{11} + U_1 \quad (3)$$

Where Y = Net income of egg poultry farmers in Naira

$\beta_1 \dots \beta_8$  = estimated parameters

$X_1 \dots X_8$  = set of independent variables

$X_1$  = Gender (male = 1 and 0, otherwise)

$X_2$  = Marital status (married = 1 and 0, otherwise)

$X_3$  = Household size (numbers)

$X_4$  = Level of education (educated = 1 and 0, otherwise)

$X_5$  = Age (years)

$X_6$  = Assess to loan (yes = 1 and 0, otherwise)

$X_7$  = Number of birds (numbers)

$X_8$  = Cost of medication (Naira)

$X_9$  = Access to veterinary services (yes = 1 and 0, otherwise)

$X_{10}$  = Cost of labor (Naira)

$X_{11}$  = Quantity of eggs produced (numbers)

$U_1$  = error term.

The study also employed a MNL regression technique to examine the effect of poultry farmers' choice of a particular type of poultry feed in achieving profitability in egg production. The MNL is a generalization of the logistic regression model to the case where we have more than two outcomes and where the outcomes are not ordered. The MNL is a widely used model in econometrics to explain the choice of an alternative among a set of exclusive alternatives (Fatuase and Ajibefun, 2014; Olutumise *et al.*, 2021; Olutumise, 2020). This study employed the standard Multinomial Model, the probability function, which was defined by (Maddala, 1983). Let  $Y_i$  be a random variable representing the types of feed categories or options, which are: 0 = Self-formulated feed (based category); 1 = Non-self-formulated feed; and 2 = Both (non-self-formulated and self-formulated feed). The question is how *ceteris paribus* changes in the elements of  $X$  affect the response probabilities  $P(Y = j/X)$ ,  $j = 1, 2, \dots, J$  since the probabilities must sum to unity,  $P(Y = j/X)$  is determined once we know the probabilities for  $j = 2, \dots, J$ . Let  $X$  be a  $1 \times K$  vector with first element unity. The MNL model has response probabilities:

$$P(Y = j/X) = \exp(X\beta_j) / [1 + \sum_{h=1}^J \exp(X\beta_h)], j=1, \dots, J \quad (4)$$

Where  $\beta_j$  is  $K \times 1$ ,  $j = 1 \dots J$ .

The model is explicitly expressed as;

$$Y^* = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + U_1$$

Where  $Y^*$  = Dependent variable (poultry farmers' choice of a particular type of poultry feed)

Where;

$\beta_0$  = Constant

$X_1$  = Gender (1 = male and 0, otherwise)

$X_2$  = Age (years)

$X_3$  = Marital status (1 = married and 0, otherwise)

$X_4$  = Level of education (years of schooling)

$X_5$  = Household size (numbers)

$X_6$  = Access to loan (1 = yes and 0, otherwise)

$X_7$  = Number of birds (numbers)

$X_8$  = Poultry Size ( $m^2$ )

$X_9$  = profit (Naira)

$U$  = error term.

## RESULTS AND DISCUSSION

### Socioeconomic characteristics of the respondents

Table 1 revealed that 61.7% of the respondents were male, whereas 38.3% were female. This result showed that egg production in the study area was being dominated by males because of the energy-demanding nature of the poultry enterprise. This result aligns with the findings of Johnson *et al.* (2020), who reported that the majority of the poultry farmers in their study area were male-headed households. It was revealed that 5% of the respondents were <30 years old, 28.3% were within the age bracket of 31–40 years, 48.3% were within the age bracket of 41–50 years, 14.2% were within the age bracket of 51–60, and 4.2% were above 60 years. The mean age of the respondents was estimated to be 49.3, which suggests that egg producers in the study area were economically active. This result correlated with the findings of Wongnaa *et al.* (2023), who reported that poultry farmers in their study area were young and economically active. Findings further showed that almost all (85.8%) of the respondents were married whereas 14.2% were widows/widowers. This result is supported by the findings of Inyang

**Table 1: Socioeconomic characteristics of the respondents**

Variable	Frequency	Percentage	Mean
Gender			
Male	74	61.7	
Female	46	38.3	
Marital Status			
Single	-	-	
Married	103	85.8	
Widowed	17	14.2	
Age			
<30	6	5.0	
30–40	34	28.3	
41–50	58	48.3	49.3
51–60	17	14.2	
>60	5	4.2	
Household Size			
1–2	16	13.3	
3–4	75	62.5	5.2
5–6	29	24.2	
Educational Level			
No formal	44	36.7	
Primary education	36	30.0	
Secondary education	40	33.3	
Higher institution	-	-	
Total	120	100.0	

Source: Computed from Field Survey, 2024

*et al.* (2023), who revealed that the majority of the poultry egg farmers were married. These researchers further reported that it was expected since the average age of the respondents in the study was 41 years, which, under African culture, they are expected to be married and have families of their own. About 13.3% of the respondents had a household size of 1–2 persons, 62.5% had a household size of 3–4 persons, and 24.2% had a household size of 5–6 persons. Thus, the majority of the respondents had a household size of 3–4 persons. The mean household size of the respondents was approximately four members. This result suggests that the respondents may have children or family members who can be used as labor in egg production, thereby reducing the cost of labor and enhancing production. However, as reported by Akinde and Adekunle (2024), large household sizes may not guarantee increased efficiency since family labor may comprise mostly children of school age. This result correlates with the findings of Inyang *et al.* (2023), who reported that the mean household size of poultry farmers was four persons per household. Furthermore, the results indicated that 36.7% of the respondents had no formal education, 30% had primary education, and 33.3% had secondary education. These results showed that respondents in the study area had formal education ranging from primary to secondary education, which may have a positive influence on production efficiency. This result aligns with the findings of Oladoyin *et al.* (2024), who reported that educational attainment is directly related to the efficiency level of farmers. Similarly, Inyang *et al.* (2023) reported that the poultry egg producers in the study area had one form of education or the other, which significantly contributed to an increase in poultry egg production in the study area.

#### Problems faced as a result of choice of feed

Table 2 shows the results of the problems they faced as a result of the choice of feed. The majority (82.5) of the respondents reported poor quality of feed, 15.8% reported high price, and 1.7% reported scarcity when most needed. Therefore, the majority of the respondents are faced with poor-quality feed. This correlates with the findings of Kandpal and Kumar (2023), who concluded that the poultry owners faced constraints during rearing are high chick cost, high feed cost, low-quality chick, and low-quality feed.

#### Costs and returns of egg production in the study area

Table 3 shows the analysis of cost and return of egg production in the study area. The depreciation value of the total fixed cost was estimated to be 61,611.44. The cost percentage of variables under the fixed cost includes watering can (19.2%), feeding can (12.6%), hand gloves (9.2%),

**Table 2: Problems faced as a result of choice of feed**

The problem of choice of feed	Frequency	Percentage
High price	19	15.8
Scarce when most needed	2	1.7
Poor quality	99	82.5
Total	120	100.0

Source: Computed from Field Survey, 2024

nose cover (10.6%), knapsack (11.4%), and wheelbarrow (37%). The variable cost was estimated to be N161,332.51. The items under the variable cost include the purchase of chicks which accounted for 58.8% of the total variable cost, cost of feed accounted for 16.2%, medication accounted for 7.8%, veterinary services accounted for 3.3%, transport accounted for 9.8% whereas labor accounted for 4.1% of the total variable cost. The total cost of production (TC) which is the addition of total fixed cost and total variable cost (TF + TVC) was estimated to be N222,943.95, whereas the total revenue (TR) stood at N881,353.08. The profit (TR-TC) was estimated to be N658,409.13. However, the ROI stood at 3.85. This result suggests that egg producers in the study area will get a return of N3:85k in every N1 they invested in egg production. Thus, one may say that egg production is a profitable business in the study area. This result is in line with the findings of Odimegwe *et al.* (2015) and Inyang *et al.* (2023), who revealed that egg production is a profitable enterprise. Inyang *et al.* (2023) reported that for every ₦1 invested in the business, it yielded ₦2.00 in return whereas Odimegwe *et al.* (2015) reported that for every ₦1 invested in the enterprise, a farmer earns N 0.45 gross margin and N0.43 net income which is higher than the commercial interest rate of 21%.

#### Factors affecting the profitability of egg production in the study area

Table 4 shows the multiple regression model of the factors affecting the profitability of egg production in the study area. Findings from the Table showed that the R-square of the model was 0.983. The value of the R-square suggests that the independent variables (sex, marital status, household size, education, access to loans, and number of birds) can explain 98.3% of the factors affecting the profitability of egg production in the study area. The result of the factors affecting the profitability of egg production in the study area showed that the coefficient of the level of education, age, access to loans, number of birds, source of feeds, labor, and quantity produced was statistically significant ( $p < 0.05$ ).

The result in Table 4 further showed that the coefficient of level of education was positively significant. The coefficient of level of education was estimated to be 0.015. This result suggests that an increase in the level of education significantly increases the profitability of egg production by 1.5%. This result contradicts the findings of Johnson *et al.* (2020), who revealed that the coefficient of years of schooling was negatively signed but statistically significant across all quantiles at the 1% level. This researcher suggested that this negative coefficient could probably mean that farmers can acquire the needed skills in poultry egg farming through extension services, seminars, and workshops.

The age of the egg producers was found to be positively significant. The coefficient value of age stood at 0.012. This result suggests that an increase in the age of the respondents will significantly increase the profitability of egg production by 1.2%. This could be because as farmer grows older, they may have better access to resources and may have acquired more skills in egg production, which may have eventually improved their farm output, thereby leading to an increase in profitability of egg production. This result correlated with the findings of Johnson *et al.* (2020), who reported in their finding that a year increase in the age of respondents, leads to an increase in farm income.

The coefficient of access to loan was positively significant and the coefficient values stood at 0.032. This result suggests that a 1% increase in loan accessibility increases the profitability of egg

Table 3: Analysis of cost and return of egg production in the study area

Item	Value in (n)	Percentage	Expected life span	Depreciation value
<b>Fixed cost</b>				
Storage tank	N46,212.12		8	5776.52
Watering can	N13,620.83		3	4540.28
Feeding can	N8,982.33		3	2982.11
Hand gloves	N6,533.33		2	3266.67
Nose cover	N7,530.83		1	7530.33
Knapsack	N8,112.50		3	2704.17
Wheelbarrow	N26,266.67		4	6566.67
Poultry pen	N254,233.22		10	25,432.32
Egg store	N8,437.11		3	2,812.37
TFC	N 379,928.94			61,611.44
<b>Variable cost</b>				
Purchase of chicks	N94916.67	58.8		
Cost of feed	N26100.00	16.2		
Medication	N12,578.33	7.8		
Veterinary services	N5,375.00	3.3		
Transport	N15,858.34	9.8		
Labor	N6504.17	4.1		
TVC	N161,332.51	100.0		
<b>Revenue</b>				
Quantity produce (crates)	147.2			
Price of creation of quantity	N2373.33			
Total revenue	N881,353.08			
Total cost (Depreciation value+TVC)	N222,943.95			
PROFIT=TR-TC	N658,409.13			
ROI=TR/TC	3.85			
BCR=ROI*100	385			

Source: Computed from Field Survey, 2024

Table 4: Results of multiple regression using double-log functional form

Variable	Coefficient	Standard Error	p-value
(Constant)	-1.423	1.667	0.731
Sex	0.071	0.042	0.093
Marital status	-0.038	0.048	0.431
Household size	0.008	0.015	0.621
Level of education	0.015*	0.008	0.044
Age	0.012*	0.006	0.045
Access to loan	0.032*	0.012	0.014
Number of birds	0.053*	0.024	0.024
Medication	-2.892E-5	0.001	0.180
Veterinary services	0.010*	0.001	0.000
Labor	0.022*	0.009	0.020
Quantity of eggs produced	0.135*	0.013	0.000

Dependent Variable: Net income (Naira); R<sup>2</sup>=0.983; F-value=112.564\*; \* Significant at 5% probability level

Source: Computed from Field Survey, 2024

production by 3.2%. This result correlated with the findings of Shittu *et al.* (2023), who found a positive relationship between the gross income realized from the production of backyard poultry and access to credit.

Furthermore, findings from the table showed that the number of birds was positively and statistically significant. The coefficient value was estimated to be 0.053; this value indicates that a unit increase in the number of birds will significantly increase the profitability of egg production by 5.3%. This result aligns with the findings of Johnson *et al.* (2020), and Akinbola and Aturamu (2021) revealed that the number of birds had a positive relationship with farm income at a 1% probability level, thereby suggesting that a unit increase in the number of birds, holding other variables constant, farm income will increase across all chosen quantiles by 0.02%, 0.04%, and 0.06%, respectively.

The result from Table 4 also showed that the cost of labor had a positive effect on the profitability of egg production. The coefficient value was 0.022 and this suggests that a unit increase in the cost of labor significantly increases the profitability of egg production by 2.2%. This is because higher labor input may indicate a large farm size or a higher number of birds. This result contradicted the findings of Johnson *et al.* (2020), Akinbola and Aturamu (2021), and Olutumise (2022) reported that with a 1% increase in labor wage per hour, all things being equal, farm income will reduce by 0.01%, 0.05%, and 0.06%, respectively, across the quantiles. Similarly, Oladunni and Fatuase (2014) and Olutumise (2022) reported that the cost of labor is inversely proportional to the total revenue derived from backyard poultry farming in Akoko North West LGA of Ondo State, Nigeria. Findings from the table also showed that the coefficient of quantity produced was positively significant. The coefficient value was estimated to be 0.135. This result suggests that a 1% increase in the quantity produced significantly leads to a 13.5% increase in the profitability of egg production. This result is in line with the findings of Johnson *et al.* (2020), who revealed a positive association between farm income and the price of eggs. These researchers reported that if a unit increases in the price of egg, the influence on farm net income will be as high.

#### Effect of choice of type of poultry feed on profitability of egg production

The MNL result of the effects of socioeconomic characteristics on the choice of poultry feed is presented in Table 5. The model fitting information showed a likelihood ratio test of 91.947 with 18 degrees of freedom (df), while the p=0.000. The calculated likelihood ratio test is greater than the tabulated at a 5% significant level. Hence, at a 5% significant level, the coefficients of the respective variables are jointly significant in explaining variation in the choice of poultry feed in the study area. Findings from the result showed that among all the explanatory variables, marital status, age, number of birds and profit were statistically significant (p<0.05) with the probability of feeding non-self-formulated feed to birds, whereas marital status, number of



birds, and profit, were the statistically significant variables ( $p < 0.05$ ) with the probability of feeding both non-self-formulated and self-formulated feed to their birds.

#### Marital status

The marital status of the respondents had a positive and significant relation with the likelihood of feeding non-self-formulated feed and both non-self-formulated and self-formulated feed to their birds. The coefficient values of non-self-formulated feed and both non-self-formulated and self-formulated feed were 0.127 and 0.060, respectively. This coefficient suggests that being married increases the probability of choice of feeding non-self-formulated feed and increases the probability of the choice of feeding both non-self-formulated and self-formulated feed to birds by 6%. This result contradicts the findings of Wongnaa *et al.* (2023), who reported that the marital status of the farmers has a negative influence on poultry farmers' choice of feed.

#### Age

Findings from the study showed that the coefficient values of age of the respondents' positive relation with the probability of feeding non-self-formulated feed to birds. The coefficient was estimated to be 0.226. This result suggests that a 1% increase in the age of the egg producers increases the probability of choice of feeding non-self-formulated feed to formulated feeds to chicks by 22.6%. This result aligns with the findings of Johnson *et al.* (2020) and Wongnaa *et al.* (2023), who reported that as the farmer's age increases, he/she tends to use more commercial feed. Similarly, Hansen (2022) reported that an increase in the farmers' age increases the probability of farm exit or reduction of their farming activities since the farmer is unable to undertake certain activities he/she used to do.

#### Number of birds

The number of birds was also found to be positively significant for non-self-formulated feed and both non-self-formulated and self-formulated feed. The coefficient values of both types of feeds stood at 0.029 and 0.106, respectively. These coefficient values suggest that a unit increase in the number of birds decreases the likelihood of choice of feeding birds non-self-formulated feed to self-formulated feed and increases the likelihood of choice of both non-self-formulated and self-formulated feed to self-formulated feed. The results of non-self-formulated feed supported the findings of Olutumise (2022) and Wongnaa *et al.* (2023), who reported a negative significant relationship between production capacity and the use of commercial feed. However, the result on the use of both non-self-formulated and self-formulated feed is consistent with the findings of Wongnaa *et al.* (2023), who reported that production capacity is the only factor that proved to be significant for the use of each type of feed, namely, farmers' own prepared feed and commercially prepared feed.

#### Profit

The results from Table 5 further showed that profit has a significant relationship with the likelihood of choice of feeding non-self-formulated feed to self-formulated and both non-self-formulated and self-formulated feed birds. The coefficient values of profit were 0.410 and 0.093 for non-self-formulated feed and both non-self-formulated and self-formulated feed respectively. This result suggests that a unit increase in profit increases the probability of choice of feeding birds both non-self-formulated feed to self-formulated feed by 41% and increases the probability of choice of feeding both non-self-formulated and self-formulated feed by 9.3%. This result aligns with the opinion of Adamu and Hussaini (2015), who stated that each feed type has its cost implications and how it contributes to profitability.

Table 5: Effect of choice of type of poultry feeds on profitability of egg production

Variable	Non-self-formulation			Both		
	Coefficient	Standard error	Sig.	Coefficient	Standard error	Sig.
Intercept	237.14	312.63	0.940	218.12	378.2	0.954
Sex	70.983	114.55	0.951	69.060	115.5	0.967
Marital Status	0.127*	0.081	0.000	0.060*	0.036	0.023
Household size	-2.664	495.39	0.998	-4.450	4.954	0.199
Level of education	-1.173	6.063	0.998	-0.086	6.063	0.800
Age	0.226*	0.113	0.046	0.215	0.414	0.159
Access to loan	1.510	13.261	0.999	18.841	16.96	0.991
Number of Birds	0.029*	0.015	0.049	0.106*	0.049	0.011
Breed of birds	28.086	21.058	0.981	25.77	121.8	0.983
Profit	0.410*	0.014	0.000	0.093*	0.023	0.001

Reference category=Self-formulated; No of observation=120, LR Chi-square (12)=91.947, Prob >Chi-square=0.000, Pseudo R<sup>2</sup>=0.615

Source: Computed from Field Survey, 2024

Table 6: Challenges militating against egg production in the study area

Challenges	Very Serious	Serious	Mild Serious	Not Serious	Mean	Ranked
Inadequacy of capital						
F	97	15	8	-	3.74	1 <sup>st</sup>
%	80.8	12.5	6.7	-		
Price fluctuation of egg products						
F	38	80	-	2	3.28	2 <sup>nd</sup>
%	31.7	66.7	-	1.7		
Increase the price of feed						
F	29	82	9	-	3.17	3 <sup>rd</sup>
%	24.2	68.3	7.5	-		
Poor handling and loading of eggs for marketing						
F	10	39	46	25	2.28	4 <sup>th</sup>
%	8.3	32.5	38.3	20.8		
Spoilage of eggs						
F	2	27	74	17	2.12	5 <sup>th</sup>
%	1.7	22.5	61.7	14.2		

Mean  $\geq 2.50$ =Major Challenges

Source: Computed from Field Survey, 2024

### Challenges militating against egg production in the study area

Descriptive statistics, i.e., the Likert scale was used to identify challenges militating against egg production. Table 6 shows the challenges militating against egg production in the study area. Findings from the table showed that inadequacy of capital (3.74), price fluctuation of egg product (3.28), and increase in price of feed (3.17) were the major challenges militating against egg production in the study area. However, poor handling and loading of eggs for marketing (2.28) and spoilage of eggs (2.12) were not major challenges militating against egg production. This result correlates with the findings of Kandpal and Kumar (2023), who reported that the major problems facing egg producers were low market prices, high cost of feed, veterinary services, transportation, and lack of access to credit and extension services.

### CONCLUSION

The study concludes that egg production in the area is a profitable venture, as evidenced by a ROI of 3.85. Key factors affecting profitability include education level, age, access to loans, number of birds, feed choice, labor, and quantity of eggs produced. The MNL model results indicate that marital status, age, number of birds, and profit significantly influence the choice of feed type, with older farmers, those with higher profits, and larger flock sizes more likely to use non-self-formulated or a combination of feed types. This highlights the critical role of feed quality and type in determining egg production profitability. Challenges identified, such as inadequate capital, price fluctuations in eggs, and rising feed costs, underscore the need for targeted interventions to support egg producers. Addressing these challenges through increased access to loans, better feed quality control, and price stabilization measures can enhance productivity and profitability. The study recommends encouraging more investment in the egg production sector, particularly through financial support and training programs that emphasize the importance of feed quality. Policymakers and stakeholders should focus on providing poultry farmers with better access to credit facilities, extension services, and quality feed to optimize egg production. By addressing the challenges faced by farmers and supporting the adoption of efficient feed management practices, egg production can significantly contribute to improving household incomes, reducing unemployment, and ensuring food security in the region.

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