



**Contribution of poultry farming to households' welfare: A case of enterprise diversification strategy by livestock farmers in Abuja, Nigeria**

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**ABSTRACT**

The study assessed the contribution of poultry farming to households' welfare in Abuja, Nigeria. Multistage sampling was used in selecting the respondents and data were analysed using both descriptive and inferential statistics. Results revealed that average age, household size, farm size and farm experience were 43.30 years, 6 persons, 869 birds and 8.01 years respectively. Additionally, the study found that poultry farming was profitable based on an average earned income of ₦397,768.36. It was found that the income realized from poultry farming helped in alleviating the poverty status of the farmers. Furthermore, results of the logistic regression revealed that farmers' age, household size, years of farming experience, educational level and income had significant influences on the income earned from poultry farming. Based on the findings of this study, it was recommended that there is need for farmers to be vigilant and at all times be on the watch so that any suspected sick birds should be isolated from the others and that government should intervene to subsidize farm inputs such as feeds and vaccines so that they should not only be affordable but also try to stabilize their prices for the farmers.

**Keywords:** Poultry farming; household; welfare; livestock; Nigeria

**INTRODUCTION**

Poultry refers to domesticated avian species (birds) that are raised for their egg and/or meat values. It includes turkey, duck, geese, pheasant, quail, guinea fowl, pigeons, and chickens. Of them all, chickens are the most abundant and commonly raised poultry (Poultry Farming-Wikipedia). The importance of poultry farming is predicated on its role in providing mankind with the daily protein requirement of about 60 g out of which 35 g is provided by poultry (Salah, 2016). Similarly, Salami *et al.* (2021) noted that poultry is special because it has the highest feed conversion rates and produces the least expensive and best sources of animal protein. On a broader scale, poultry has been credited as the fastest means of solving the problem of protein deficiency in Nigeria (Salami *et al.*, 2021). Therefore, the importance

of poultry cannot be over emphasized as it was said to provide man with meat, eggs, research and medicine avenues, production of organic fertilizer and feathers used for aesthetic values and traditional titles (Okwuokenye & Okoedo-Okojie, 2018). These immense benefits of poultry and its wide acceptance across religion, tradition, and cultural boundaries in the opinions of Okwuokenye and Okoedo-Okojie (2018) and Salami *et al.* (2021) has encouraged the production rate of poultry to grow in recent years. Unfortunately, this advancement in poultry production has failed to gain significant influence on the country's per capita daily protein intake. This is indicated by available data (Dikko *et al.*, 2020) suggesting that the average animal protein intake per capita per day in Nigeria falls within a grossly inadequate level of between 7.6 and 13.2g as against 65 – 72g recommended intake.

This study was sought to understand how poultry farming by livestock farmers has helped to improve their livelihoods, considering the income generating potential of poultry enterprises. Against this background, the objectives of this study were to assess the socio-demographic characteristics of the poultry farmers in the study area, ascertain the proportion of poultry to other farm animals that were kept by the livestock farmers, examine the effects of poultry farming on households' welfare of the livestock farmers, and identify any constraints militating against poultry farming in the study area.

## METHODOLOGY

### The Study Area

This study was conducted in Abaji and Bwari area councils of the Federal Capital Territory (FCT). The FCT is the Capital seat of Nigeria and was established in 1976 but became operational in 1991. It is located in the savannah region of Nigeria and occupies a land area of 8000 Km<sup>2</sup> (Ishaya *et al.*, 2010), with an estimated population of about 3,652,000 in 2022 (NPC, 2022). The FCT lies between Latitude and Longitude 9.07° N and 7.339° E, respectively. It is underlain mainly by differentiated crystal rocks of the pre-Cambrian to early Paleozoic basement complex and cretaceous sedimentary formation, in addition to the fact that the soil in the area is made up of parent materials that are coarse-sandy loam in the basement complex to silt clay in nature (FCT, Wikipedia 2016).

The temperature range of FCT is between 37°C and 15°C. Average rainfall in the FCT is 1632 mm and it occurs between April – October. The vegetation is guinea in nature and grow common crops like maize, yam, millet, sorghum beans, while the common animals reared include goat, sheep, cockerels, guinea fowls (Ishaya *et al.*, 2010).

### Sampling Procedure

The population of the study comprised of poultry farmers operating in Abaji and Bwari area councils, Abuja. The sampling was carried out in stages. The first stage involved the simple random selection of eight communities from the two (2) area councils out of the six (6) area councils of Abuja, thus making a total of 16 communities that were randomly selected and used for the study. The second stage involved a random selection of eight livestock farmers across each of the communities totaling 128 respondents.

Primary data were used for the study and were sourced from the respondents through the use of questionnaire for the literate farmers and interview schedule for the illiterate farmers. Although 128 respondents were selected, some of the questionnaires were deemed

unfit for analysis thereby limiting the questionnaires to 112 (87.5%) used for analysis in this study.

The evaluation of the instrument was carried out in two phases which included validity and reliability tests. Validity of the instrument involved the content validity where experts in the field of agricultural extension were made to criticize, assess and then suggest ways of improving the instruments (Erie, 2009). The reliability of the instrument was confirmed through the Cronbush Alpha method, and this produced a value of 0.61, thus indicating that the instrument was reliable (Okwuokenye & Onemolease, 2010).

### Analytical Techniques

Data of the study were analysed with the use of descriptive and inferential statistics. Descriptive statistics involved the use of percentage, mean and standard deviation to analyse poultry farmers socio-economic characteristics, proportion of poultry to other animals kept by the livestock farmers and the effects of poultry farming on household welfare of the livestock farmers. The constraints militating against poultry farming were analysed on a 4 – point scale. The scale ranked from major constraints (rank 4), moderate constraints (rank 3), minor constraints (rank 2) and insignificant constraints (rank 1). In the instance where up to 50% of the respondents indicated a factor was a constraint, then such is ranked as a major constraint militating against poultry farming in the area. Where the number of respondents is less than 50%, it is then considered otherwise. The inferential statistics used are the Logistic regression and binomial statistics. Logistic regression was used to establish a relationship between socio-economic characteristics of the poultry farmers and effects of poultry farming. It is expressed as:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 \dots + b_7X_7 + e \dots\dots\dots (1)$$

Where:

Y = Effects of poultry farming (Income, ₦) (High = 1; Low = 0)

a = Constant

bi [1 – n or 7] = Coefficients

X1 – X7 = Independent variables

e = Error term

The variables in the model were specified as:

Y = Effects (₦) (measured in naira as either High =1 or Low = 0)

X1 = Gender (dummy: male = 1; female = 0)

X2 = Age of respondents (years)

X3 = Education (primary educ. =1; secondary educ. = 2 and post sec. educ. = 3)

X4 = Marital status (single = 1, married = 2, divorced = 3, widow(er) = 4)

X5 = Farming experience (years)

X6 = Farm size (number of birds in the farm)

X7 = Household size (number of people living and feeding together)

Binomial test was used to determine the proportion of poultry birds and other livestock being reared by the farmers. The Binomial test is an exact test of the statistical significance of deviation from a theoretically expected distribution or observations into two categories. In this analysis, the two-tailed binomial test was used to determine the significance of difference

in proportion of poultry and the other livestock that were reared by the livestock farmers. The formula for binomial distribution is given as follows:

$$b(x;n,p) = nC_x * p^x * (1-p)^{n-x}$$

Where b = binomial probability

x = total number of successes (proportion of the poultry and other livestock being reared by the farmers)

p = probability of success on an individual trial

n = number of trials

## RESULTS AND DISCUSSION

### Socio-demographic Characteristics of the Respondents

Table 1 shows the socio-demographic characteristics of the respondents. It revealed that poultry farming in the study area was dominated by males (65.18%), most of whom were married (66.07%) and having at least primary school experience (46.43%). The average age of the respondents was 43.30 years with the majority (36.61%) between 40 – 49 years. The dominance of males in the poultry farming may be attributed to the practice of purdah by the women and the fact that men were the household heads and hence, the decision makers in households' economic activities. The result was in line with that of Okwuokenye and Okoedo-Okojie (2018) who revealed the dominance of male in poultry production. Most of respondents were married, which was an indication that they were responsible and had people to cater for in their households. The result of Akinbili *et al.* (2008) corroborates with this finding as they found dominance of married people in poverty reduction programmes that were related to poultry farming in their study. Results on educational level implied that most of the respondents were educated and so can read, write and apply relevant agricultural information that can help improve their farming activities. The result agreed with Okwuokenye *et al.* (2022) who noted that education helps farmers to know how to improve their farming practice, given the available resources. The result on farmers age implied that poultry farmers were young and active in their farming business and could withstand the tedious nature of poultry farming. The result was in agreement with the findings of Kaine *et al.* (2018) who found the majority of farmers to be in their active age groups and having an average of 43 years.

The modal household size of the respondents (58.03%) was 4 – 6 persons with a mean of 6 persons which is an indication that the farmers had people they economically catered for. The result corroborates with that of Okwuokenye and Okoedo-Okojie (2018) who stressed that most farmers have dependents and also reported similar household size.

The farm size range of the farmers revealed an average farm size of 869 birds with most (28.57%) of them having between 600 – 899 birds. Going by the number of birds reared by the farmers, they could be described as small-scale farmers. Uchendu *et al* (2015) described poultry farm size range of between 250 – 1900 as small-scale poultry farm and that the earnings from the farm are likely to be used to support their livelihoods. The average farming experience was 8.01 years and the majority (36.61%) of them had between 5 – 9 years' experience in poultry farming. The result shows a good level of experience of the farmers in poultry farming. Salami *et al.* (2021) agreed with this result.

## Contribution of poultry farming to households' welfare

Table 1: Socio-economic characteristics of the respondents (N = 112)

Characteristics	Category	Frequency	Percent	Mean
Gender	Male	73	65.18	
	Female	39	34.82	
Marital status	Single	18	16.07	
	Married	74	66.07	
	Divorced	12	10.71	
	Widow(er)	8	7.14	
Age (years)	< 30	15	13.39	
	30 – 39	28	25.00	
	40 – 49	41	36.61	
	50 – 59	17	15.18	
	60 & above	11	9.82	43.30
Educational Status	No formal education	19	16.96	
	Primary education	52	46.43	
	Secondary education	28	25.00	
	Post-secondary educ.	13	11.61	
Years of residence	< 5	11	9.82	
	5 - 9	19	16.96	
	10 – 14	28	25.00	
	15 – 19	45	40.18	12.98
	20 & above	9	8.04	
Household size range	1 – 3	18	16.07	
	4 – 6	65	58.03	
	7 – 9	19	16.96	
	10 – 12	10	8.93	5.56 = 6 persons
Farm size range (No. of birds in farm)	< 300	7	12.50	
	300 – 599	19	25.89	
	600 – 899	31	28.57	
	900 – 1,199	35	16.07	
	1,200 – 1,499	14	9.82	
	1500 & above	6	7.14	869 birds
Farming experience (years)	< 5	33	29.46	
	5 – 9	41	36.61	
	10 – 14	27	24.11	
	15 – 19	11	9.82	8.01

### Proportion of Poultry to other Livestock kept by the Farmers

Table 2 analyses the respondents on other types of livestock being reared in addition to poultry birds. A total of 75 (66.96%) of the respondents kept other livestock in addition to poultry birds. On further analysis, the study revealed that most (33.04%) of the respondents reared birds, this was followed by those (29.46%) who reared ducks in a free-range system. Closely following this was 18.75% of them that kept goats. About 15.18% of the respondents kept sheep while 3.57% kept cattle. The result implied that most of the respondents were into

the rearing of other animals along with poultry as a means of livelihood and for supporting the financial welfare of their families.

Overall, the average number of poultry birds kept by the farmers (97,298) was significantly higher than the number of other types of livestock kept (547) in the study area. The result therefore implied that poultry is the common livestock reared by the farmers, hence they can be addressed as poultry farmers. The result supports that of Salami *et al.* (2021) which showed that poultry is the livestock commonly kept by most of the livestock farmers in the same area.

Table 2: Proportion of poultry to other livestock kept by the farmers (n = 112)

Livestock	Proportion of respondents		Proportion of livestock	
	Frequency	Percentage	Frequency	Percentage
Cattle	4	3.57	6	0.006
Sheep	17	15.18	85	0.087
Goats	21	18.75	126	0.128
Duck	33	29.46	330	0.337
Poultry	37	33.04	97,298	99.441
Total	112	100.00	97,845	100.00

### Effects of Poultry Farming on Household Welfare of Livestock Farmers

The amount of income earned from poultry farming is shown in Table 3. The results revealed that the average income exclusively earned from poultry farming by the farmers was ₦397,768.36 and a majority (36.61%) of the poultry farmers fell within this category (₦350,001 – ₦400,000). About 38.39% of the respondents earned less than ₦350,001, while about 25% of them earned income that was over ₦450,000. The result implied that poultry farming was an important means of earning income in the study area and through personal communication, the respondents described the income realized as high and that it has impacted on their household welfare. This study is in line with findings of Ettah *et al.* (2021) which reported that farmers realized a net farm income of ₦284,846.60 and thus described the poultry business as a profitable one.

Table 3: Income earned from poultry farming by livestock farmers

Income range (₦)	Frequency	Percentage	Mean
100,001 - 250,000	17	15.18	
250,001 - 350,000	26	23.21	
350,001 - 450,000	41	36.61	
450,001 - 550,000	18	16.07	
> 550,000	10	8.93	397,768.36

### Constraints Limiting Poultry Production

The constraints limiting poultry farming is shown in Table 4. The constraints were analysed on a four – point scale. From the least rating constraint, the scale was ranked as insignificant constraint (rank 1), minor constraint (rank 2), moderate constraint (rank 3) and major constraint (rank 4). Where up to 50% of the respondents indicated an issue to be a constraint, then such was considered as a major constraint to poultry farming. On the other

## Contribution of poultry farming to households' welfare

hand, if the number of respondents is less than 50%, then the constraint under consideration is considered not to be a major constraint.

**Table 4: Constraints of poultry farming**

Constraints	Insignificant	Minor	Moderate	Major	Rank
Disease outbreak	0 (0.00%)	6 (5.36%)	14 (12.50%)	92 (82.14%)	1 <sup>st</sup>
High cost of vaccines and medication	3 (2.68%)	7 (6.25%)	15 (13.39%)	87 (77.67%)	2 <sup>nd</sup>
High cost of feeds	0 (0.00%)	9 (8.04%)	21 (18.75%)	82 (73.21%)	3 <sup>rd</sup>
Lack of extension services on new farm practices	3 (2.68%)	10 (8.93%)	21 (18.75%)	78 (69.64%)	4 <sup>th</sup>
Unstable prices of inputs	7 (6.25%)	10 (8.93%)	31 (27.68%)	64 (57.14%)	5 <sup>th</sup>
Inadequate capital	6 (5.36%)	12 (10.7%)	31 (27.68%)	63 (56.25%)	6 <sup>th</sup>
Lack of credit facility for expansion	4 (3.57%)	18 (16.1%)	28 (25.00%)	62 (55.36%)	7 <sup>th</sup>
High cost of labour	6 (5.36%)	15 (13.4%)	32 (28.57%)	59 (52.68%)	8 <sup>th</sup>
Local authority interference	0 (0.00%)	16 (14.3%)	38 (33.93%)	58 (51.79%)	9 <sup>th</sup>
Theft	7 (6.25%)	10 (8.93%)	39 (34.82%)	56 (50.00%)	10 <sup>th</sup>
Lack of market	47 (41.96%)	28 (25.0%)	25 (22.32%)	12 (10.71%)	11 <sup>th</sup>
Scarcity of feeds	40 (35.71%)	33 (29.5%)	28 (25.00%)	11 (9.83%)	12 <sup>th</sup>

\*50% and above = major constraint

From the categorization in Table 4, it could be deduced that disease outbreak (82.14%), high cost of vaccines and medication (77.67%), high cost of feeds (73.21%) and lack of extension services on new farm practices (69.64%) were the 1st, 2nd 3rd, and 4th major constraints faced by poultry farmers in their farming operations. Constraints like unstable prices (57.13%), inadequate capital (56.25%), lack of credit facility for expansion (55.36%) and high cost of labour (52.68%) respectively ranked the 5<sup>th</sup>, 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> major constraints of poultry farming. Local government interference (51.79%) and theft (50%) were respectively the 9<sup>th</sup> and 10<sup>th</sup> constraints facing farmers in poultry farming. These findings were similar to some of the constraints identified by Singh (2022) facing poultry farming.

### **Influence of farmers Socio-Economic Characteristics on the Effects of Poultry Farming**

Table 5 shows the logistics regression results of the analysis of the influence of poultry farmers socio-economic characteristics on the effects (measured in naira) of poultry farming. The lead model adopted had the highest number of significant variables, conformity to *a priori* and the coefficient of determination ( $R^2$ ) was 71.8%. Computed Chi – square was 40.52, the goodness of fit chi-square was 52.26 with degree of freedom = 55 at 5% probability level. Four socio-economic variables (age, household size, marital status and farming experience) out of the seven were significant on the effects of poultry farming. The age of the poultry farmers ( $b = -4.628$ , standard error (SE) =  $-2.001$ ) had a negative relationship and significant at the 5% level. The result implies that older farmers will naturally keep smaller farm size and therefore realize lower income from poultry farming. Findings of Okwuokenye and Petu-Ibikunle (2021) agreed with this result. They asserted that older farmers are less willing to take risks on their farms and therefore earn less income from their enterprise than their younger counterparts. The beta coefficient (2.194) and standard error (0.427) of the relationship were positively signed and significant at the 1% level. Impliedly, more educated poultry farmers are very likely to earn more economic effects from poultry farming. This

result is in line with findings of Ettah *et al.* (2021) which documented the relevance of the literacy level of broiler farmers to brilliant economic performance and efficiency.

Table 5: Influence of farmers socio-economic characteristics on the effects of poultry farming

Variables	Coefficient (b)	Standard Error (SE)	t-value	Prob. Level
Constant	10.285	3.001	1.92	0.104
Gender	3.914	2.336	1.37	0.012
Age	-4.628*	-2.001	0.16	0.28
Educational status	2.194**	0.427	1.92	0.007
Household size	3.118*	0.381	0.27	0.172
Farm size	- 6.115	-3.725	0.14	0.256
Farming experience	5.529**	1.904	1.40	0.312
Marital status	4.725*	1.583	1.88	0.615

Chi-square < 40.52; df = 7; p < 0.05; Goodness-of-fit chi-square = 52.26; df = 55; p > 0.05; Pseudo R<sup>2</sup> = 0.716

Poultry farmers household size and its effects of poultry farming revealed a beta coefficient of 3.118 and standard error of 0.381. It revealed a positively signed and significant relationship at the 5% level. By implication, larger household size will result to earning more income from the poultry farming. The reason is adduced to the fact that larger household will make more hands available for poultry farm work and such can perhaps translate results to more effects that will help improve the poultry farmers welfare. Findings of Mohammad *et al.*, (2011) is in agreement with this result as the authors acknowledged that large household size helps to cushion the effect of poverty on them through increased farming activities. Poultry farmers farming experience was positively signed with significant effect at the 5% level. The result presented values of 5.529 and 1.804 as its beta coefficient and standard error respectively. By implication, the more farming experience they have, the more income that can be earned from their poultry farming that could be used to improve on their household's welfare.

Abegunde (2004) who agreed with this finding was of the believe that farmers with more farming experience should have capacity to generate more farm income from their farming activities. The beta coefficient and standard error of the poultry farmers marital status was 4.725 and 1.583 respectively. The relationship was positively signed and significant at the 5% level. The relationship implies that the married farmers have more persons in their households and who can be used to carry out more poultry activities that can yield more income to improve on their welfare. Findings of Ettah *et al.* (2021) corroborate with this result as he asserted that married people are more responsible and that they can use the income earned from poultry farming to sustain their family household.

### **Proportion of Poultry Birds and other Livestock reared by the Livestock Farmers**

Hypothesis two which shows the relationship between the proportion in number of poultry birds and other livestock reared by the farmers was analyzed using Binomial test and the result is presented in Table 6. From the result, a larger proportion (97,298) of the livestock kept by the farmers were poultry birds. On the other hand, the other livestock (cattle, sheep, goats and ducks) kept were 547 in numbers. The result showed a great difference in number between the poultry birds and the other livestock that was kept by the farmers, and this was



## Contribution of poultry farming to households' welfare

in favour of the poultry birds. The result was statistically significant at the 1% level of probability.

Table 6: Proportion of poultry birds and other livestock reared by the livestock farmers

Number of poultry and other livestock reared by farmers	Frequency	Proportions	Prob. Level
Poultry	869	0.61	0.001
Other livestock	547	0.39	
Total	1,416	1.00	

For this reason, the alternative hypothesis was accepted, and it states that there is a significant difference between the proportion in number of poultry birds and other livestock being reared by the farmers. The result thus suggest that poultry farming is the main animals being reared by the livestock farmers while the other livestock reared by the farmers are fewer. The result implies that poultry farming is helping the farmers in meeting up with their economic needs and household welfare of the farmers. Nmadu *et al.* (2014) concurred with this finding as they stated that poultry production is profitable in Abuja even when the farmers resources have not been efficiently used.

## CONCLUSION

Poultry farming in the study area is significantly and positively influenced by the farmers educational level, household size, farming experience and marital status, except for farmers age which had negative influence on the effects of farmers household welfare. The farmer appeared to have practiced and enjoyed keeping of more birds than any other livestock and this they attributed to the average high income (₦397,768.36) that was earned from poultry farming which they use to improve on their household welfare. Poultry farming is constrained by many factors like disease outbreak, high cost of vaccines, Lack of extension services on new farm practices and unstable prices of inputs, amongst others which may have in one way or the other lower the income earned by the farmers.

Based on findings, the study recommended that Farmers need to be vigilant and should ensure to follow all protocols related to poultry keeping. Issues concerning hygiene practices, isolation rules concerning sick birds and visitors' protocols should be strictly enforced so as to prevent or minimize incidences of disease outbreaks.

The rising cost of vaccines, feeds and price instability were reported as major constraints. The best way out, is for the government to help to subsidize these inputs so that they should not only be affordable but also try to stabilize the price for the farmers.

Lack of extension service delivery on update on agricultural information was a challenge. The importance of extension services cannot be overemphasized. The government needs to provide extension agents available to poultry farmers either freely or with charges so can offer services to poultry farmers.

The problem of inadequate capital can be improved by advising the farmers to organize themselves into cooperatives with a good management system where they invest their resources towards accessing loans in order to boost their farming operations.

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