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THE USE OF A TWO-STAGE CLUSTER SAMPLING TECHNIQUE IN IDENTIFYING AND ANALYZING SEVERAL FACTORS AFFECTING POULTRY PRODUCTION IN CROSS RIVER STATE, NIGERIA

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ABSTRACT

This study analyzed the factors affecting poultry production in Cross River State, Nigeria. The objective was to establish how farm input factors like cost of feed, cost of drugs, farm size, credit facility, cost of labour etc, and socio-economic problems of the farmers like farming experience, level of education, age of farmer etc, affects poultry production in the study area. Also, the extent to which technology adaption, and availability of market, influence poultry production in the study area, was assessed. A sampling frame (i.e a record of registered farmers in the state) consisting of 1042 registered farmers was obtained from the Cross River State Ministry of Agriculture, from which samples were drawn using a two-stage cluster sampling technique. The first stage units (the primary sampling units) comprising of four Local Government Areas, were selected using probability proportional to size sampling technique. Also, the second stage sampling units (secondary sampling units) consisting of poultry farmers from each of the selected Local Government Area, were selected using simple random sampling technique. A total of 169 poultry farms were drawn. Multiple regression models and other descriptive statistical tools like percentages, frequency tables, mean etc, were used to reveal that factors such as the cost of feed, cost of drugs, farm size, farming experience and credit facilities were statistically significant factors affecting poultry production in the study area. While the cost of drugs, the farm size and farming experience were positively related to the output, the cost of feed and credit facilities were found to be negatively related factors to the output. It was also revealed that majority of the farmers in the study area were small-scale broiler farmers, who were in their active age of between 25 -40 years, have had more than five years of faming experience and were university graduates.

KEYWORDS: Poultry Production, Input factors, Socio-economic factors, Technology and market factors etc

INTRODUCTION

Nigerian economy, although has been largely dependent significantly on the oil sector, Agriculture remains its mainstay. Agriculture is the largest export earner after crude oil and employing over 70% of rural labour. Thus, the sector ranks as a key contributor to wealth creation and poverty reduction (Nwafor, 2008). This sector comprises of four major sub-sectors: crops, livestock, fisheries and forestry, (Rekwot et al., 2015). Crops contribute about 85% to Agriculture Gross Domestic Product (GDP), livestock production about 10% , fisheries and forestry about 4% and1% respectively in 2006. (Rekwot et al. 2015).

Poultry as an aspect of livestock production outnumbers all other forms of livestock in Nigeria and not surprisingly is found throughout the country (Adeyomo and Onikoyi, 2012).

In Cross River State, poultry farmers operate under various conditions and constraints, which affect production and productivity of the sector. Studies have been conducted suggesting that the inefficiency levels of poultry farms are determined by farm and farmers (socioeconomic and demography) factors (Oji & Chukwuma, 2007, Udo & Etim 2009). Factors influencing poultry production is not only based on physical inputs such as land area,

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quantity of feed used, safety surrounding and availability of water, quantity of labour used, quantity of vaccine used, quantity of energy used in the production process etc., but also socio-economic factors, demographic, institutional and non-physical factors. Socio-economic factors encompasses the age of the farmer, level of education, experience in poultry farming, engagement in other income generating activities other than poultry farming, access to credit etc, Ogolla (2016). These factors impact negatively in poultry production yet the demand for poultry products is increasing whereas supply cannot sustain the growing demand. Ettah et. al. (2021), investigated the profitability of broiler production in Cross River State and revealed that broiler production is a profitable venture in the study area, but it's affected by socio-economic attributes like age, sex, marital status, education, experience, business size and training of the farmers. Osuji M.N. (2019) assessed the factors affecting poultry (broilers) production in Imo State and revealed that farm experience, drug costs and farm size had a positive influence on poultry production while disease occurrence has a negative influence.

Agricultural investigations are based on the application of statistical methods and procedures which are helpful in drawing samples and making predictions or inferences using observed data. Thus, the application of statistical principles and methods is necessary for effective practices in resolving the different problems that arise in the many branches of agricultural activity. Regression is a statistical method that attempts to determine the strength and character of the relationship between one dependent variable and a series of other variables known as independent variables. A two-stage cluster sampling is a technique that selects elements in clusters (groups) and again draws subsamples within each of these clusters from which information are obtained.

A two- stage cluster sampling technique, a multiple regression model and other descriptive statistics like the mean, frequency table, percentages etc are the major statistical tools that have been used in this work to identify and analyze factors affecting poultry production in Cross River State. This study was performed in the optimism that the adoption of our results/recommendations by government and business owners would tremendously improve businesses and generate more revenue (IGR) from poultry production within the state and across the country at large.

METHODOLOGY

Target Population: The study was carried out in Cross River State. Cross River State lies in the south-south geopolitical zone of Nigeria. The state is bounded by the states of Benue to the North, Ebonyi to the west, Akwa-Ibom to the south-west and on the east by the Republic of Cameroon. The state lies between latitude 4^{o}15 North and 7^{o}00 North and longitude 7^{o}15 East and 9^{o} 30 East. The land area is about 7,780 square miles or 20,156 square kilometers (FOS, 2007) and the population is about 2,888,966 people (NPC, 2006). The state is composed of Eighteen Local Government Areas, with four major languages spoken. According to Cross River State Tourism Guide (2011), the mean annual rainfall is between 1300mm to 3,000mm, across the State and the temperature is recorded between February and March and does not exceed 37^{o}C and lowest between May and October and does not go below 15^{o}C across different places. Agriculture is one of the major activities of the State with dominance in livestock production.

Since the aim of the survey was to analyze factors affecting poultry farming in Cross River State, the data for the analysis was obtained from poultry farmers who are registered with the State's Ministry of Agriculture. Approximately 1042 poultry farmers across the eighteen (18) Local Government Areas are registered with the Ministry of Agriculture, as distributed in the table below:

Table 1: Number of Registered Poultry Farms in the various Local Government Areas in Cross River State, Nigeria

S/N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
L G A	Calabar Municipality	Abi	Akamkpa	Babassi	Bekwara	Biase	Boki	Calabar South	Etung	Ikom	Obanliku	Odukpani	Obubra	Ogoja	Yakurr	Yala	Akpabuyo	Obudu
NO OF POULTRIES	**152**	12	49	5	44	8	2	38	5	64	7	10	115	111	19	285	59	57

Source: Cross River State Ministry of Agriculture

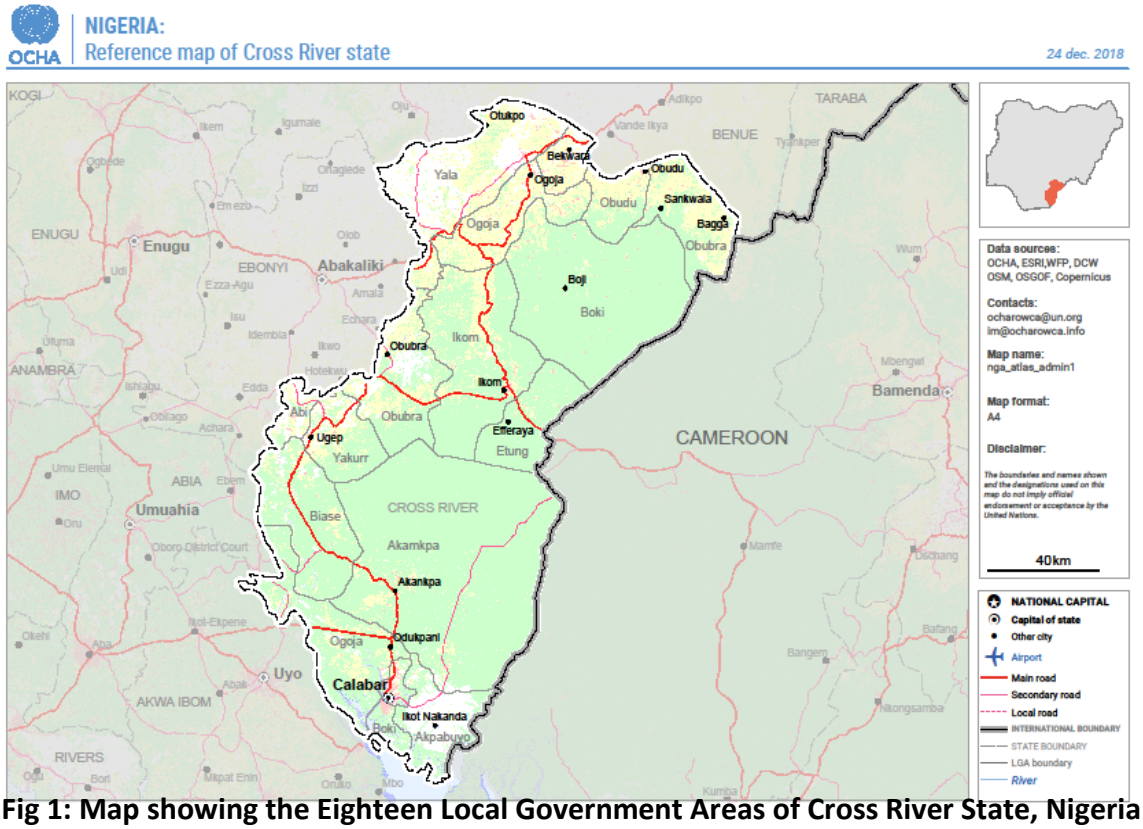

Fig 1: Map showing the Eighteen Local Government Areas of Cross River State, Nigeria

Sample Size and Sampling Techniques

The population of poultry farmers, who were registered with Cross River State Ministry of Agriculture, was 1042 out of which a sample of 289 was drawn. This sample size was determined using the Yamane formula for finding sample sizes given as:

$$n = \frac{N}{1 + N(e)^2} \quad (1)$$

Where:
N= population size = 1042
e= error margin = 5% = 0.05

Thus, $n = \frac{N}{1 + N(e)^2} = \frac{1042}{1 + 1042(0.05)^2} = \frac{1042}{3.605} \approx 289$ (2)

A two-stage cluster sampling technique was used in the selection of 169 poultry farmers as follows: The first stage was the selection of four (4) Local Government Areas (i.e the primary sampling units P.S.U) using the probability proportional to size sampling technique. These Local Government Areas were: Calabar Municipality, Obubra, Yala, and Obudu. The second stage sample units (i.e the secondary sampling units, S.S.U) were poultry farmers selected randomly from each of the initially picked four Local Government areas. The proportion of poultry farmers who were surveyed from each of the selected Local Government Area was determined proportionately according to the number of poultry farmers that were registered there. That is:

$m_i = \frac{M_i}{N} X \quad n$, for i= 1, 2, 3, 4. Where: (3)

M_i = The number of registered poultry farms in the i^{th} selected Local Government Area
m_i = The number of poultry farms surveyed from each of the i^{th} selected Local Government Area
N= Total number of registered poultry farms in Cross River State
n = The total number of poultry farms selected from the total number of registered poultry farms in Cross River State. Thus, we have:
For Calabar municipality, the proportion of poultry farmers who were surveyed was:

$$m_1 = \frac{152}{1042} X\, 289 = 42$$

For Obubra, the proportion of farmers who were surveyed was:

$$m_2 = \frac{115}{1042} X\, 289 = 32$$

For Yala, the proportion of farmers who were surveyed was:

$$m_3 = \frac{285}{1042} X\, 289 = 79$$

For Obudu, the proportion of farmers who were surveyed was:

$$m_4 = \frac{57}{1042} X\, 289 = 16$$

This study made use of primary data which was collected with the help of a well-structured questionnaire (this can be seen in appendix 1), using the direct personal interview and mailed questionnaire methods of data collection. Also, secondary data was gotten from journals and relevant literatures

Table 2: Sampling Procedure Indicating the Selected Local Government Areas, Registered Poultry Farms and Surveyed Poultry Farms

Local Government Area Selected	No of Registered Poultry Farms	No of Poultry farms Surveyed
Calabar Municipality	152	42
Obubra	115	32
Yala	285	79
Obudu	57	16
Total	**609**	**169**

Source: *Researcher's Source*

Data Analysis Procedure:
The data was analyzed using descriptive statistics like mean, frequency distribution tables and percentages. An exponential multiple regression model was used to test the relationship between the dependent variable (output in terms of volume of poultry sold per cycle kept) and the independent variables, i.e, the input and the socio-economic factors. Input factors includes: cost of feed, cost of drugs, cost of day old chick, cost of warming the poultry, farm size, cost of labour, and the socioeconomic factors which includes: Level of education of the farmer, farming experience, engagement in other income generating activities, access to credit, age of the farmer, access to market information, and information on new technology. Thus, we have:

$$\text{Log}Y_i = \beta_0 + \beta_1 Xi_1 + \beta_2 Xi_2 + \beta_3 Xi_3 + \beta_4 X_{i4} + \beta_5 Xi_5 + \beta_6 Xi_6 + \beta_7 Xi_7 + e_i \quad (4)$$

$$\text{Log}Y_i = \alpha_0 + \alpha_1 Zi_1 + \alpha_2 Zi_2 + \alpha_3 Zi_3 + \alpha_4 Zi_4 + \alpha_5 Zi_5 + \alpha_6 Zi_6 + \alpha_7 Zi_7 + e_i \quad (5)$$

These can also be expressed as:

$$Y_i = \beta_0^1 \exp(\beta_1 Xi_1 + \beta_2 Xi_2 + \beta_3 Xi_3 + \beta_4 X_{i4} + \beta_5 Xi_5 + \beta_6 Xi_6 + \beta_7 Xi_7) + e_i \quad (6)$$

$$Y_i = \alpha_o^1 \exp(\alpha_1 Zi_1 + \alpha_2 Zi_2 + \alpha_3 Zi_3 + \alpha_4 Zi_4 + \alpha_5 Zi_5 + \alpha_6 Zi_6 + \alpha_7 Zi_7) + e_i \quad (7)$$

Where:

$\alpha_0^1 = e^{\alpha_o}$, $\beta_0^1 = e^{\beta_o}$, β and α are regression coefficients. i= 1,2,3…169

Y= Dependent variable (volume of poultry sold per cycle kept)

Input Factors:
X_1= Farm Size
X_2= Cost of Feed
X_3= Cost of Chick
X_4= Cost of Drugs
X_5= Cost of Warming
X_6= Cost of Labour

Socio-economic Factors:
Z_1= Educational Level
Z_2= Credit Facilities
Z_3= Age of Farmer
Z_4= Farming Experience
Z_5= Engagement in other Income Generating Activities
Z_6= Market Information
Z_7= Information on new Technology

e_i= Error term, follow a normal distribution with mean zero and variance σ^2 i.e $e_i \rightarrow N(0, \sigma^2)$

RESULTS AND DISCUSSION

Farm Inputs and Poultry Production

To understand how certain farm characteristics, influence production in poultry farming in the study area, it was necessary to carry out a multiple regression analysis of the factors, which were in the model stated in equation (4). The summary of the results of the analysis is presented in tables below:

Results of Farm Inputs and Poultry Production:

Table 3: Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.451[a]	.203	.174	.07536	.203	6.888	6	162	.000

Source: *Field Survey Data, 2024*

Table 4: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.235	6	.039	6.888	.000[b]
	Residual	.920	162	.006		
	Total	1.155	168			

Source: *Field Survey Data, 2024*

Table 5: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1(Constant)	2.145	.834		2.572	.011	.498	3.793
Farm Size	.032	.010	.268	3.073	.002	.012	.053
Cost of Feed	-.039	.014	-.205	-2.828	.005	-.066	-.012
Cost of Chick	-.042	.026	-.114	-1.589	.114	-.094	.010
Cost of Drugs	.020	.009	.184	2.152	.033	.002	.039
Cost of Warming	.002	.010	.016	.169	.866	-.018	.021
Cost of Labour	.006	.010	.053	.678	.499	-.012	.025

Source: *Field Survey Data, 2024*

Table 6: Distribution of the Poultry-Types

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Broilers	134	79.3	79.3	79.3
	Layers	19	11.2	11.2	90.5
	Broilers & Layers	16	9.5	9.5	100.0
	Total	169	100.0	100.0	

Source: *Field Survey Data, 2024*

Table 7: Distribution of the Flock Sizes

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 50	26	15.4	15.4	15.4
	50-200	73	43.2	43.2	58.6
	Above 200	70	41.4	41.4	100.0
	Total	169	100.0	100.0	

Source: *Field Survey Data, 2024*

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Table 8: Distribution of the Quantity of Feed used per Day by Poultry Farmer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 12.5	24	14.2	14.2	14.2
	12.5-25kg	23	13.6	13.6	27.8
	25kg - 50 kg	57	33.7	33.7	61.5
	50kg and above	65	38.5	38.5	100.0
	Total	169	100.0	100.0	

Source: *Field Survey Data, 2024*

Table 9: Descriptive Statistics

	Mean	Std. Deviation	N
(Constant)	1.7453	.08291	169
Farm Size	7.14	.690	169
Cost of Feed	9.86	.672	169
Cost of Chick	16.25	.433	169
Cost of Drugs	23.95	.225	169
Cost of Warming	42.22	.746	169
Cost of Labour	49.34	.780	169

Source: *Field Survey Data, 2024*

Table 3 and 4 shows the over-all performance of the model, signifying that the model is significant at P-Value < 0.05 level of significance with an R^2- value of 0.203, which explains about 20% of the variations in the dependent variable.

From table 5, the farm size, cost of feed and cost of drugs were statistically significant at 5% level of significance. The coefficient of farm size was 0.32. The positive coefficient implies that the larger the farm size, the larger the number of birds reared, which poses a higher chance of productivity. This also means that every1% increase in land use will result to a 0.32 percentage increase in output. This result agrees with the finding of Mwachukwa & Onyenwauku (2009), who argued that fragmentation of land holding had an important bearing on technical efficiency on Agricultural production, because land fragmentation did not give rise to economy of large-scale production. The coefficient of cost of drug was 0.020. This means that expenses on drugs has a positive relationship with the output. This is understandable because poultry management requires significant amount of drugs and medication in terms of routine vaccination to produce high yield. It implies that every1% additional expenditure on drug results to a 0.020 percentage increase in output. The coefficient of cost of feed was -0.39. The negative sign reveals a negative relationship with the output. This is because the higher the additional expenses incurred on feed, the lower the profit at the end of the day. That is, every 1% additional cost incurred on feed, results to a 0.39 percentage reduction in profit.

Table 6 shows the type of poultry kept. It reveals that 134(79.3%) of the farmers reared only broilers, 19(11.2%) reared only layers while 16(9.5%) reared both broilers and layers. This implies that broilers are largely reared by the poultry farmers in the study area. The table on the distribution of flock sizes, i.e table 7, shows that 26(15.4%) kept between 1-50 birds, 73(43.2%) kept between 50- 200 birds and 70(41.4%) kept more than 200 birds. This reveals that more than 50% of the poultry farmers in the area are small scale farmers. Table 8 shows a distribution of the quantity of feed used per day. It reveals that 24(14.2%) of the farmers use less than 12.5kg of feed per day, 23(13.6%) use between 12.5 kg-25kg per day, 57(33.7%) use between 25kg-50kg per day and 65(38.5%) use above 50kg per day. This indicates that more than 65% of the farmers utilize more than a bag (25kg and above) of feed daily. Lastly, table 9 provides the mean and standard deviations of each of these input variables.

Socio-Economic Factors and Poultry Production

Poultry production is not only affected by the physical inputs such as farm size, cost of feed, cost of chicks, cost of vaccine, cost of warming and cost of labour, but also by socio-economic and non physical factors such as age of farmers, level of education, years of experience of farmers, engagement in other income generating activities, credit facilities, information on new technology and information on market. Equation (5) was applied in analyzing the socio-economic influence on poultry farming and the results obtained are shown in the tables below:

Table 10: Model Summary[b]

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.322[a]	.103	.064	.08019	.103	2.654	7	161	.013

Source: Field Survey Data, 2024

Table 11: ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.119	7	.017	2.654	.013[b]
	Residual	1.035	161	.006		
	Total	1.155	168			

Source: *Field Survey Data, 2024*

Table 12: Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1(Constant)	.717	.634		1.131	.260	-.535	1.969
Age of farmer	.004	.011	.031	.355	.723	-.018	.026
Farming Experience	.012	.006	.194	2.013	.046	.000	.023
Educational level	-.003	.005	-.044	-.542	.589	-.014	.008
Engagement in other income generating activities	.013	.015	.068	.835	.405	-.018	.043
Credit facilities	-.048	.015	-.253	-3.194	.002	-.077	-.018
Information on new Technology	-.001	.007	-.012	-.152	.879	-.014	.012
Market Information	.001	.006	.010	.107	.915	-.012	.013

Source: *Field Survey Data, 2024*

Table 13: Age Distribution of Poultry Farmers in the Study Area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 25	27	16.0	16.0	16.0
	25- 40	94	55.6	55.6	71.6
	over 40	48	28.4	28.4	100.0
	Total	169	100.0	100.0	

Source: Field Survey Data, 2024

Table 14: Level of Experience Distribution of Poultry Farmers of the Study Area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1yr	14	8.3	8.3	8.3
	2 yrs	23	13.6	13.6	21.9
	3yrs	19	11.2	11.2	33.1
	4yrs	30	17.8	17.8	50.9
	5 yrs and above	83	49.1	49.1	100.0
	Total	169	100.0	100.0	

Source: Field Survey Data, 2024

Table 15: Distribution of Education Level of Farmers in the Study Area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No formal education	9	5.3	5.3	5.3
	Primary	7	4.1	4.1	9.5
	Secondary	24	14.2	14.2	23.7
	Diploma	29	17.2	17.2	40.8
	Graduate	85	50.3	50.3	91.1
	Postgraduate	15	8.9	8.9	100.0
	Total	169	100.0	100.0	

Source: Field Survey Data, 2024

Table 16: Source of Finance of Farmer in the Study Area

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Others	15	8.88	8.88	8.88
	Bank loan	45	26.63	26.63	35.51
	Government	3	1.78	.1.78	37.29
	Saving	106	62.72	62.72	100.0
	Total	169	100.0	100.0	

Source: Field Survey Data, 2024

Table 17: Farmers Perception of Adoption of Technology and Poultry Production

S/N	Perceived Benefits	SA	A	U	D	SD
		Freq %	Freq %	Freq %	Freq %	Freq %
1	Technology potential of my product is promising	29.0	14.2	5.9	38.5	12.4
2	Searching for new technology for my product is not so difficult	6.5	45.0	13.0	21.9	13.6
3	Technology of my produce is well planned	14.7	18.6	17.0	13	36.7
4	I have information on new technology of my product	17.8	52.7	14.2	13.6	1.8
5	Adoption of technology in poultry farming influence production	34.3	42.0	3.6	5.3	14.8

Source: Field Survey Data, 2024
Note: SD= Strongly Disagree, D= Disagree, U=Undecided, A=Agree, SA= Strongly Agree

Table 18: Descriptive Statistics

	Mean	Std. Deviation	N
Age of farmer	61.12	.656	169
Farm Experience	73.86	1.373	169
Educational Level	4.30	1.252	169
Engagement in other income generating activities	1.25	.433	169
Credit Facility	1.74	.440	169
Information on new Technology	2.29	.972	169
Market Information	2.23	1.160	169

Source: *Field Survey Data, 2024*

Table 10 and 11 gives the model summary with an R^2 value of 0.103 and a P value that is less than 0.05 level of significance. This implies that the overall model is significant and explains about 10% of the variations in the dependent variable. From table 12, the coefficients of farming experience and credit facilities were found to be statistically significant at 5% level of significance. The coefficient of farming experience was positive (0.012) i.e a positive relationship exists between the farmers experience and his output. This means that the experienced farmers have higher farm output than less experienced farmers as they have better understanding of the production techniques that could increase their production. This also means that a 1% increase in a farmer's experience will result to a 0.012 percentage increase in the output. This findings is in congruent with the findings of Nhemachama & Hassan (2007) who also found out that farming experience enhances a farmer's knowledge of information and high skills in farming techniques and management, which improves the efficiency of the farmer. The coefficient of credit facilities was found to be negative (-0.48), i.e a negative relationship exists between the farmer's credit facilities and their output. This can also be clearly seen from table 16. Since majority of the farmers used their personal savings and bank loans, to fund their businesses, there could be a negative impact on the output due to bank loans, collaterals, limited personal funds etc.

The age distribution was revealed in table 13. It shows that 27(16.0%) of the farmers were less than 25 years old, 94(55.6%) were in the age bracket 25 – 40 and 48(28.4%) were above 40 years. This implied that most (55.6%) of the poultry farmers were between the ages 25 -40, while 28.4% were 40 years and above. This also means that poultry farming is common among younger farmers unlike those who are above 40 years which represent just 28.4% of the respondent in the area. The farmers between 25-40 years (71.5%) indicates that majority of the respondents were within the economically active category and this is in line with Yinusa (1999) findings, who observed that the age bracket of 21-40 years comprises of innovative, motivated and adaptable individuals who are actively engaged in economic productive activities.

From table 14, the different years of experience of the farmers was revealed. 14(8.3%) had 1 year of experience, 23(13.6%) had 2 years, 19(11.2%) had 3 years, 30(17.8%) had 4 years and 83(49.1%) had 5 years and above experience. That is, 50.9% had less than 5 years' experience while 49.1% had above 5 years of experience. Little years of experience could be the reason for low production among poultry farmers. The knowledge of management which is the key to profitable poultry production, is gained through years of experience of the poultry farmers (Fetuga,1992).

The distribution of educational level i.e table 15, shows that 15 (8.9%) had postgraduate education, 85(50.3%) were University graduates, 29(17.2%) had Diploma education, 24(14.2%) had secondary education and 7 (4.1%) had primary education while 9(5.3%) had no formal education. This implies that majority of the respondents have some forms of formal education, suggesting that they could cautiously observe challenges of poultry farming in their poultry keeping. Table 16 shows the various financial sources of the poultry farmer. It reveals that 106(62.72%) funded their poultry through personal savings, 45(26.63%) through bank loans, 3(1.78%) through Government funding and 15(8.88%) through other sources. This shows that most of the poultry farmers reared their birds from personal savings.

From table 17 above, 42% of the respondents agreed that the adoption of technology in poultry farming influence production and helps in increasing profit made from the poultry farming. 45% agreed that searching for new technology for their product is not difficult and 52.7% agreed that they have information on new technology of their product. This is because more of the farmers interviewed were between the age brackets of 25-40, who were much familiar with new technology trend required to handle the increase in the poultry business. 38.5% disagree that technology potential of their product is promising to boost their poultry production. Also, 36.7% of the farmers strongly disagreed that the technology of their product is well planned. Table 18 shows the mean and standard deviation of each of these factors considered.

CONCLUSION

In this survey, factors affecting poultry production in Cross River State, Nigeria were identified and analyzed using a two-stage cluster sampling design, a multiple exponential regression model, and some other descriptive statistics like mean, frequency tables, percentages etc. Farm input factors like farm size, cost of feed, cost of drugs, Cost of warming and cost of labour were considered. Also, socio-economic factors like: Educational level of the farmers, credit facilities, age of farmers, farming experience, and engagement in other income generating activities were studied. Among these factors considered, It was revealed that the farm sizes, cost of feed, cost of drugs, credit facility and farm experience were statistically significant. (i.e their effect on the output varied significantly). The farm sizes, cost of drugs and the farm experience had a positive influence on the output while the cost of feed and credit facility had negative influences on the poultry output.

The finding also revealed that majority of the farmers funded their farms from their personal savings, reared only broilers, were medium sized farmers (i.e reared between 50-200 birds), were in their prime (i.e between 25-40 years of age), had little farming experience, were university graduates and made use of more than 50kg (2 bags) of feed daily.

Based on the findings of this survey, the following recommendations are made:

RECOMMENDATION

1. Feed and drugs (vaccine) should be subsidized and made easily available to farmers to cushion the effect of their high cost. This can be achieved by coordinating the activities in the poultry sector so that recurrent cost is reduced and efficiency is increased particularly in the layer/egg industry which has been shown by this study to be declining
2. Since the egg production farmers are declining due to high production costs involved, more farmers are opting for broiler production. Therefore, there is need for government and poultry cooperatives/associations to provide incentives and or subsidies to farmers in the egg/layer industry. This could be in terms of providing appropriate veterinary requisites to small-scale farms at affordable prices, subsidized feed and veterinary supplies, poultry extension officers, providing subsidized (maybe free) foundation stock to kick-start the project.
3. There is need for the government and poultry associations to protect the so-called small poultry farmers from the so-called big poultry farmers from the strategic "pushing out", of the small poultry farmers, by the big poultry farmers, by means of using floor prices that make the whole enterprise too costly and non-profitable. Monitoring the floor prices by poultry and allied associations by coming closer and interacting in a consultative way in order to keep the industry profitable and viable to all is a possible solution to this problem.
5. There is need to develop various supporting industries necessary for commercial poultry production of poultry equipment, pharmaceuticals, packaging material, housing material etc which is practically non-existent (Dludlu, 1993) and needs to be developed alongside the development of commercial poultry production
6. There is need for the poultry associations to regulate the prices of the poultry products than to leave this to a chosen few who do it to fulfill their selfish interest
7 Adequate credit facilities like grants should be provided to poultry farmers in the study area, since most of them fund their business through personal savings and bank loans which could have some limitations on their businesses
8. For the success of the poultry sector in Cross River State, there is need to link the state livestock commercialization programmes and the traditional livestock sector.

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