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Research Article

Influence of Poultry Farmers Coping Strategies of High Cost of Feed on Food Security Status in South-west Nigeria

John, A. O.[1], Lawrence, B. O.[1], Afolake, A. C.[1,2], Emmanuel, A. O.[1], Oye, A. A.[1], Adenike, S. B.[1], Ayodeji, A. B. T.[1], Chidinma, N. O. L.[1] and Omolade, A. A.[1]

[1]Department of Agriculture and Industrial Technology, School of Science and Technology, Babcock University, Ikenne, Nigeria

[2]Department of Agricultural Economics, College of Agricultural Management and Rural Development, Federal University of Agriculture, Abeokuta, Nigeria

Corresponding e-mail: *afoduo@babcock.edu.ng*

Abstract

Poultry products have served as one of the cheapest protein source in the Nigeria today making it one of the food ingredients to fight protein malnutrition in the Nigeria economy. The poultry industry also provides a means of living for the Nigerian populace. Recently the poultry industry is facing a serious decline due to the high cost of feed which consist about 75% of total cost of production. This research was conducted to determine the influence of poultry farmers coping strategies of high cost of feed on their food security status in South-West Nigeria. The study population consist of registered poultry farmers with the Poultry Association of Nigeria (PAN) in the study area. This study adopted a multi-stage sampling technique to select 575 poultry farmers; though only 515 questionnaires were fitted for the study. Descriptive and inferential statistics were used for data analysis. The food security status was captured with the use of Household Food Insecurity Access Scale, while Logit regression was used to analyse the effect of coping strategies of high cost of price of feed on food security status among the poultry farmers. Majority (56.9%) of the poultry farmers were male. Majority of the poultry farmers were found to be young and active with about 81% of them were between the age range of 20 -50 years. A large number of them (45.4%) were found to be severe food insecure. The coping strategies adopted include zero response, use of compounded feed, use of integrated farming, reduce flock size and exiting the poultry business. Access to credit and number of coping strategies adopted were the major variables influencing the food security status of the poultry farmers during the period of high cost of feed.

Keywords: *Coping strategies, Egg price, Feed cost, Food security, Logit regression, Poultry farmers*

Introduction

There is a significant increase in the demand of eggs and other poultry products due to the increase in African population, World Health Organization (2010). The USAID (2022) estimated that this trend is very likely to continue over the next few years. According to Obi (2003), the consumption of eggs and other poultry products will increase by 200% between 2010 and 2020 for at least some countries in sub-Saharan Africa. This trend is obvious in Nigeria as one of the countries in Africa. Poultry egg has served as one of the cheapest protein source in the Nigeria today making it one of the food ingredients to fight protein malnutrition in the Nigeria economy. According to USDA (2014), the demand for egg is expected to increase by more than 100%, this demand can only be met if the supply can be increased.

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Grains and other ingredients used in the production of poultry feeds are also been consumed by man, therefore, increasing the demand for these materials. According to Sani (2015), a change in output of maize and its price shows immediate change in poultry feed price and prices of poultry products and consequently its profitability. The recent performance of poultry industry in Nigeria has fallen below expectation due to high cost of feed arising from fluctuations in feed supplies, rising prices of ingredients, poor feed ingredients and inefficiency in production (Olatunji and Ifeanyi-Obi, 2011). The cost of production may be too high, hence the enterprises are not profitable (Adene, 2009). According to the study of Heinke (2015), the poultry sector in Nigeria have the potential of meeting the envisaged growth in demand as well as to reduce the poverty level and increase the food security of the farmers. It is in view of this aforementioned problem that this study was conducted to address the determinants of poultry farmers' response to rising feed cost and their implications on their food security status.

Materials and Methods

The study was carried out in Southwestern Nigeria, located between longitude 30° and 7°E and latitude 4° and 9°N (Oni and Odekunle, 2016). The zone is made up of six states which are; Ekiti, Ondo, Osun, Ogun, Oyo and Lagos. National Population Commission (2007) reported that 27 511 892 people lived in Southwestern Nigeria. It has two distinct seasons which are: rainy season (April-October) and dry season (November-March). The temperature zone ranges between 21 and 28 degree centigrade with high humidity of 77 percent. Hence, crops and livestock production are done with little problems in the area. The major occupation of the people is agriculture. The other occupations include trading, driving, carpentry, etc. The official language is English, while the major informal language for communication in this region is Yoruba, which has different dialects.

Sources and types of data

The study made use of primary data collected from registered poultry farmers. The data collected include: socio-economic characteristics such as age, educational level, marital status, sex, household size, farm size (number of birds); type of birds, poultry farmers response to as well as data on food security viz the types of food, the quantity and quality of food items consumed in the previous seven days to the time of the interview, access to credit. And also data on the various coping strategies such as zero response, use of compounded feed, use of integrated farming, reduce flock size and exiting the poultry business.

Study population

The study population consist of registered poultry farmers with the Poultry Association of Nigeria (PAN) in Ogun, Osun and Oyo State. The population of the registered farmers for the three states are three hundred and sixty three (363), three hundred and twenty one (321), and four hundred and thirty (430) respectively.

Sampling technique

This study adopted a multi-stage sampling technique to select the poultry farmers. At the first stage, three (3) states were purposively selected from the six (6) states in South-West Nigeria. These states were selected due to the high concentration of poultry farmers. Purposive selection was also adopted in the second stage for the selection of poultry association from each state. Lastly, 575 poultry farmers were randomly selected; though only 515 questionnaires were fit for the study.

Method of data analysis

Descriptive and inferential statistics were used to analyse the data of this study. Household Food Insecurity Access Scale (HFIAS) was adopted to measure the food security status of the farmers.

Food security status of poultry farming household

This study adopted the Household Food Insecurity Access Scale because it has been used previously in other developing countries and yielded substantial results. HFIAS incorporates three fundamental components: uncertainty and anxiety over food, perceptions that food is of insufficient quantity and quality, and reported

reduction of food intake due to lack of resources (Gathiaka and Kinyanjui, 2013). HFIA questions were culturally adapted to include local examples. Results of HFIAS were substantively used in the context of resource poor developing countries like Uganda, Burkina Faso, Bangladesh, Kenya, Zimbabwe, Mali and South Africa (Walton, 2012; Coates *et al*., 2003; Kirkland *et al.,* 2013). As a result, questions involved can be added to a standard baseline and final household survey and adapted to the purpose of the study Deitchler *et al.* (2010).

Analysis of the effect of coping strategies on food security status among poultry farmers

The effect of coping strategies on food security status among the poultry farmers was captured with the of Logit regression model.
The model is specified as

$$Y_i = \alpha_0 + \sum \alpha_j x_j + \varepsilon_j \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots 1$$

$$Y_i = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \alpha_3 x_3 + \alpha_4 x_4 + \alpha_5 x_5 + \alpha_6 x_6 + \alpha_7 x_7 + \alpha_8 x_8 + \alpha_9 x_9 + \alpha_{10} x_{10} + \alpha_{11} x_{11} + \alpha_{12} x_{12} + \varepsilon_i$$

Where:

Y_i = Food Security Status [Secure = 1, Non-Secure = 0]
X_1 = Age of the Poultry Farmers [in years]
X_2 = Sex [Male = 1, Female = 0]
X_3 = Marital status [Married = 1, single = 0]
X_4 = Educational Status [in years]
X_5 = Household Size [Number]
X_6 = farm size [hectare]
X_7 = farming experience [in years]
X_8 = Cooperative Membership [yes = 1, no = 0]
X_9 = Access to credit [Access to credit = 1, no access to credit = 0]
X_{10} = Strategies adopted [number of coping strategies adopted]
X_{11} = Egg Price [₦/Crate]
X_{12} = Price of Feed [₦/25kg bag]
ε_i = Random term

Results and Discussion

Socio economic characteristics of respondents

Table 1 shows the Socio-economic characteristics of the respondents. Male poultry farmers were observed to be more (56.9%) than their female counterpart (43.1%). This fining could be due to the high labour demand of the the venture. The finding is in tandem with the findings of Afodu *et al.* (2021) who stated agricultural venture is dominated by the male due to the nature of the work.

Majority of the poultry farmer in the study area were found to be in their active age with about 81% of them within the age range of 20 -50, while only 19% of them were found to be above the ages of 50. The average age of the farmers was 39 years, which means that the poultry farmers in the study area are young and vibrant. The marital status of the respondents shows that 51.8% were married, 22.7% of them were single and 11.1% of them were widow while 8.2% of them were divorced.

The educational level of the respondents shows that 16.9% of the respondents had no primary education, 11.5 % of them had primary education and 15.9% had secondary education. Majority (55.7%) of them were found to have tertiary education. This means that the majority of the respondents are well educated and this could go a long way to help the respondents in adopting the best coping strategies that will positively influence their food security status.

The household size of the respondents shows the number of people in their family. Most of the respondents (63.4%) had 4 - 6 people living together, 16.9% of them had about 1-3 persons in the household while 19.8% of them had more than 7 persons in their households. The farm size of the poultry farmers were also captured in Table 1. The table shows that 14.2% of them had less than a thousand bird, majority (30.9%) of them had number of birds which ranges from 1100 - 2000, 4.9% of them had between 2100 and 3000 birds, 24.5% of the poultry farmers number of birds were within the range of 3100 and 6000, only 4.1% of the farmers had a flock of birds within the range of 10100 and 20000, 2.1% of them had birds within the ranges of 20100 and 30000, while 5.2% of the poultry farmers had more than 30000 birds.

Categories of food security status of the poultry farmers

Table 2 shows the various categories of food

security of the respondents. It was observed that 25.8% of the poultry farmers were food secure, 1.6% of them were mild food insecure, 27.2% were moderately food insecure, while a large number of them (45.4%) were found to be severely food insecured.

Strategies adopted by poultry farmers in response to high cost of feed

Table 3 shows the coping strategies of the poultry farmers to high price of feed. The table shows that only 5.2% of the poultry farmers did not adopt any response to high price of feed. About 24.7% of the poultry farmers made feeds themselves to reduce the high price by sourcing their materials in other to further reduce the cost of production. Some of the respondents (20.8%) adopted integrated farming system to reduce their high cost of feed. Reduction of flock size was another strategy adopted by 16.1% poultry farmers to reduce the high price of feed. As part of the strategies, 6.2% of the respondents prefer to exit the poultry business once they can't cope with the high price of feed.

Effect of coping strategies and other determinants on food security among poultry farmers amidst high price of feed

Table 4 shows the effect of coping strategies and other determinants of food security among poultry farmers amidst the high price of feed. The result of the logistic regression analysis with pseudo R^2 value of 0.59 implies that about 59% of the variations in the determinant of food security status of the poultry farmers can be explained by the specific explanatory variables in the model.

From the regression Table it was observed that the age of the farmers was significant with a negative coefficient. This implies that as the farmers grows older, there is every possibility that the farmers may be food insecure. This is an apriori expectation. This finding is in-line with the findings of Afodu *et al.* (2019) who opined that younger farmers tend to diversify their livelihood in other to be food secured. Also, Guancheng *et al.* (2015) finds out in China that the ageing population has a negative impact on agricultural output. Age can be seen as an important variable in agricultural output. The younger farmers are more likely to adopt the best strategies just to reduce the effect of high price of feeds, and improving their food security status.

The regression also shows that the educational level of the farmers was found to be significant with a positive coefficient which implies that the more educated the farmers are the likely that the farmers will be food secured. This is because the educated farmers will have the knowledge of the best strategy to adopt to reduce the effect of high price of feed on egg price. This finding is in-line with the Apriori expectation. The findings is in accordance with the findings of John *et al.* (2020) who observed that increase in educational level of the farmers have a positive impact on their productivity vis-a-vis food security. World Bank (2007) opined that education is central to its strategies for helping countries to reduce poverty and improves their living standard through sustainable growth and investment in people. Feyisa *et al.* (2022) view educational status as a variable which has direct impact on productivity, growth and which is essential to improve human capital.

Farm size which depicts the number of birds owned by the farmers was found to be significant with a positive coefficient which implies that there is direct relationship between the sizes of the farm as a coping strategy to reduce the effect of the high cost feed and consequently improves their food security status. This finding is in line with the Apriori expectation, and this is in accordance with the findings of Osuji *et al*. (2017) who observed that farm size was highly significant in reducing food insecurity among farming household in Imo State. They opined that the larger the farm size, the higher the probability of the households being food secure. This could imply that the large the farm size, the higher the stock density and the higher the output. This is also in-line with the findings of Henri-Ukoha *et al*. (2013) and Godwin (2016).

Farming experience was found to be highly significant at 1% and with a positive coefficient, implying that the longer the farmers had been in the poultry farming industry the more the

knowledge of coping with the high cost of feed, and this could translate for them being food secured. The result of this study is consistent with the findings of Osuji *et al*. (2017), Henri-Ukoha *et al*. (2013) and Afodu *et al*. (2020).

The determinants of food security Table also shows that members of farmers belonging cooperative society were found to be food secured. This could be due to the sensitization of members on the best strategy to cope with the high price of feed. This finding is in line with the findings of Kehinde (2020) who found that there is a positive relationship between cooperative membership and food security.

Tale 4 also shows the importance of access to credit on the food security of the poultry farmers. Access to credit was found to be significant with a positive coefficient, showing that as the farmers get credit facilities, the more likely they may adopt the best coping strategy to ameliorate the effect of high price of the feed, this may increase the farmers income and thereby making the farmers more food secured. This finding is in line with the findings of Kehinde (2020) who carried a research on the impact of access to credit and cooperative membership on food security of rural households in south-west Nigeria and found that there is a positive relationship between food security and the rural households.

The number of strategies adopted was also found to be significant with a positive coefficient showing that the more the strategies adopted the more food secured the farmers are likely to be. This is in line with John *et al*. (2020), who looked into the impact of livelihood diversification on food security among rice farmers in Ogun state. They noticed that as farmers that diversify were more food secured than their counterpart who never did. The price of egg was found to be highly significant with a positive coefficient showing that as the price of egg increases, the income of the farmers also increases thereby enabling the farmers to afford basic necessities.

Conclusion and Recommendations

Food insecurity is a big challenge for both individual and the nation at large, combating the issues calls for various institutions to synergies. Access to credit facilities can serve as a booster to the poultry farmers to adopt the best strategies that will increase their productivity and thereby making them more food secured. The price of feed had inverse relationship with food security, as the price of feed increases there is every tendency of the farmers income from the poultry farmer to decline because the rate at which feed price increases is far above the rate at which the price of egg increases. Poultry farmers should be encouraged to adopt more one coping strategies to combat this high cost of production.

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Table 1: Socio-economic Characteristics of the Respondents

Variable	Frequency	Percent
Male	293	56.9
Female	222	43.1
Total	515	100.0
Age		
Less than 20	45	8.7
21-30	91	17.7
31-40	150	29.1
41-50	132	25.6
51-60	85	16.5
61-70	13	2.5
Total	515	100.0
Mean= 39.26		
Marital Status		
Married	299	58.1
Single	177	22.7
Widow	57	11.1
Divorced	42	8.2
Total	515	100.0
Education		
No formal education	87	16.9
Primary school education	59	11.5
Secondary school Education	82	15.9
Tertiary Education	287	55.7
Total	515	100.0
Family Size		
1-3	87	16.9
4-6	326	63.4
➢ 7	102	19.8
Total	515	100.0

Farm Size		
< 1000	73	14.2
1100 - 2000	159	30.9
2100 - 3000	25	4.9
3100 - 6000	126	24.5
6100 - 10000	72	14.0
10100 - 20000	21	4.1
20100 -30000	11	2.1
> 30000	27	5.2
Total	515	100.0
Mean = 7060.29		
Farming Experience		
> 5 years	170	33.0
6 -10 years	293	56.9
10 years above	52	10.1
Total	515	100.0
Mean = 6.01		

Field Survey, 2022

Table 2: Categories of Food Security

	Frequency	Percent
Food Secure	133	25.8
Mild Food Insecure	8	1.6
Moderately Food Insecure	140	27.2
Severe Food Insecure	234	45.4
Total	515	100.0

Field Survey, 2022

Table 3: Strategies Adopted to High Price of Feed (n=376)

	Frequency	Percent
Zero response	27.00	5.20
Use of compounded feed	127.00	24.70
Use of integrated farming	107.00	20.80
Reduction of flock size	83.00	16.10
Exiting the poultry business	32.00	6.20
Total	376	73.0

Field Survey 2022

Table 4: Determinant of Food Security Among Poultry farmers in Ogun State.

Variable	Coefficient	Standard Error	Marginal Effect	t-value
Constant	2.403526**	.8770369		2.74
Age	-.0237223**	.0106137	-.0039645	-2.24
Sex	.267247	.2156596	.0446626	1.24
Marital Status	.0676627	.0879087	.0113041	0.77
Educational Status	,1227313	.0784228	.020511	1.56
Household Size	.005593	.0696154	.0009347	.08
Farm Size (Number of Birds)	.0000192*	9.60e-06	3.20e-06	2.0
Farming Experience	.1438131***	.0326922	.0240342	4.40
Cooperative Membership	.7056128***	.2321546	.1179228	3.04
accesstocredit	.4182906*	.2184702	.0699052	1.91
Strategies Adopted	.4553205***	.1442635	.0761936	3.16
Price of Egg	.8825022**	.3680034	.1188300	2.40
Price of Feed	-.5279110***	.1148801	-.0965336	-4.60
Pseudo R^2 = 0.5931				
Log likelihood = -259.07111				

Field Survey 2022