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ASSESSMENT OF RISKS AND ITS ATTITUDES IN POULTRY EGG PRODUCTION AMONG POULTRY FARMERS IN KUJE AREA COUNCIL, FEDERAL CAPITAL TERRITORY, NIGERIA

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ABSTRACT

This research assessed the risks and attitudes of poultry producers associated with poultry farmers in the Kuje area council, the federal capital territory of Nigeria. A multistage sampling technique was employed and a total of 109 farmers involved in poultry farming were randomly selected across five wards from a sample frame of 150 poultry farmers. Descriptive and inferential statistics, like Kendall's Coefficient of Concordance, were employed to find out the risk management practices adopted by the poultry egg producers in the study area. It was evident from the result that there was a moderate level of agreement (W=0.340) among the egg producers in the rankings of the risk management practices. The result of the poultry farmers' attitude towards risk using the safety-first behavioral model approach, showed that the poultry producers in the study area were risk neutral. The major types of risk that were severe and faced by the poultry producers in the study area were weather fluctuation, price of birds and infectious parasites. The study, therefore, recommends that poultry farmers should be encouraged to adopt more management practices like proper sanitation, proper disposal of dead birds and debeaking that can reduce risk generally.

Keywords: Risks, Assessment, Attitude, Poultry farming, Egg production, Management

INTRODUCTION

Poultry farming is defined as the domestication of birds to be maintained for their meat, feathers, or eggs (Adeyonu *et al*., 2017). These varied collections of animals have been integrated into the agricultural systems for the benefit of both people and the animals. In developing countries like Nigeria, the poultry farming industry has sprung up significantly amongst the agricultural subsector, and it has shown to be essential for nutrition as a source of protein, and food security, as well as providing employment opportunities and improving welfare (Adeyonu *et al*., 2021).

Poultry egg production can be categorized as a subset of poultry farming and like other enterprises; the performance of the production process thrives on the quality of resources used, technical know-how, and environmental factors (Olugbenga *et al.*, 2021). Another factor to consider is the efficient management of the resources used to maximize output and guarantee sustainability. This approach must be deliberate, ensuring that all stakeholders mitigate the threat that comes with raising chickens, which might ultimately cause the sector to collapse. Risk results from the high degree of uncertainty in production outcomes; due to weather, pests, diseases, and other natural disasters, also farmers are unable to accurately forecast how much output their enterprise will produce (Abimbola *et al*. 2013). Risk in the production of poultry eggs includes uncertainties that may have a detrimental impact on output, profits, and farm operations as a whole. Some of these risks are broadly classified into human, technological, market, financial, and production risks. The main source of production hazards, for example, are disease outbreaks like Newcastle and Gumboro, which are common in Nigeria and can result in high flock fatality rates. In a similar vein, farmers encounter increased financial strains due to inflation, high feed prices, and limited financing availability which impairs the farmers' income stability, making it more difficult to market concerns including price volatility and restricted market access. Also, the absence of contemporary agricultural methods and equipment poses technological hazards since it reduces farm operations' efficiency, especially for small-scale farmers. Human hazards, such as a lack of workers, poor training, and health problems among farmers, also play a role in ineffective poultry management (Obike *et al*., 2017) All of these hazards put the sustainability of poultry farming in jeopardy, hence suitable risk management techniques must be implemented.

Employing strategic management techniques is vital for keeping poultry businesses sustainable despite these impediments. These involve defining precise goals, taking a strategic stance, carrying out in-depth strategic planning, creating successful marketing plans, and facilitating innovation to adjust to changing business circumstances. To reduce potential losses and promote sustainability, poultry operators may find these features useful in setting clear strategic goals, making strategic plans, and operating with a strong strategic orientation Kahan (2013).

Risks, farmer attitudes, and strategic management approaches in poultry farming are thoroughly examined in this research, which advances risk management, and policy development. Therefore, researchers, farmers, and policymakers looking to improve the sustainability and resilience of Nigerian poultry production will find great value in its conclusions. Production of poultry eggs is essential for enhancing nutrition, food security, and revenue creation, especially in developing nations like Nigeria (Olugbenga *et al*., 2021).

However, the enterprise is naturally vulnerable to a number of hazards that could seriously impair its sustainability and productivity, such as disease outbreaks, price swings, input scarcity, and climate variability (Falculan, 2023; Adeyonu *et al*., 2021). Having said that, studies have been conducted about the risks encountered in poultry production but a little has been done regarding the risk attitudes of poultry farmers and how they see and react to such hazards hence the grounds for this study. The broad-ranging objective of this study was to assess the risks in poultry egg farming amidst poultry farmers in Kuje Area Council, while the definite objectives were to; (i) describe the socio-economic characteristics of the poultry egg producers in the study area; (ii) describe the types of risks encountered in poultry farming in the study area; (iii)

describe the risk management practices adopted by poultry egg producers in the study area and; (iv) describe the poultry egg farmer's attitude towards risk in the study area.

MATERIALS AND METHODS

This study was conducted in Kuje Area Council, the Federal Capital Territory of Nigeria, which is located between longitudes 60 45 and 70 39 east of the Greenwich Meridian and latitudes 80 25' and 90 20' north of the equator. The Federal Capital Territory (FCT) has six Area Councils, including the Kuje Area Council (Aluko, Sennuga, & Ezinne, 2021). Kuje Area Council is ideally situated close to the FCT's heartland and a few more are among the settlements like Kuje town, Kutunku, Dobi, TungaGayan, Gudun, Dukwa, Dagiri and Paso, Ibwo, Wumi, Zuba, TungaMaje, Giyabiri, Kwaita, Gurfata, Ashara, Kabi, Giri, Kaida, and Gaube (Aluko et al., 2021). The average annual temperature in the region is between 300 and 370 degrees Celsius, with March seeing the maximum temperature. The average annual rainfall is roughly 1,650mm and approximately 60% of the yearly precipitation occurs between July and September. The entire region lies inside the Guinea Savannah's northern border and because of the favorable climate and soil properties; agriculture is one of the main economic activities in the Kuje Area Council. Among the crops grown are rice, maize, sorghum, and soybeans. Also, majority of indigenous people work as fish farmers, loggers, livestock farmers, and peasant farmers Abomeh, Nkiruka, and Ozioma, 2017.

For this study, a multi-stage sampling procedure was employed to choose the respondents. The Kuje Area Council was specifically selected in the first round due to the high number of farming households in the area. Five of the ten wards in the Area Council were chosen at random for the second stage. The wards that were chosen were Gudun, Kabi, Gaube, Kuje, and Kutunku. Ultimately, 109 agricultural households were chosen at random from a sample frame of 150, using the Yamane (1967) technique to determine the study's sample size.

It is specified as follows:

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

Where;

n = Sample size of poultry egg farmers (Unit)

N = Sample Frame of poultry egg farmers (Unit)

e = Level of Precision (5%)

This study used primary sources for its data. Using interviews and a carefully designed questionnaire, the researcher and skilled enumerators gathered the data.

Model Specification

Descriptive and inferential statistics were used to achieve the objectives of the study. Descriptive statistics was used to achieve objectives (i) and (ii). To deduce the risk management practices adopted by poultry egg farmers in the study area, Kendall's Coefficient of Concordance was employed. Kendall's Coefficient of Concordance (W), measures the agreement between several judges who have rank-ordered a set of entities. Kendall's statistic represents the ratio of the observed variance of the total ranks of the ranked entities to the maximum possible variance of the total ranks.

To accomplish the study's objectives, descriptive and inferential statistics were employed. In order to accomplish objectives (i) and (ii), descriptive statistics were used. The Kendall's Coefficient of Concordance was used to infer the risk management strategies used by poultry egg producers in the research areas. The agreement between many judges who have ranked a group of things is measured by Kendall's Coefficient of Concordance (W). The ratio of the observed variation of the ranking entities' total ranks to the maximum variance of the total ranks is known as Kendall's statistic.

$$W = \frac{12S}{m^2\,(n^3-n)}$$

S is computed as specified

$$\mathrm{S} = \sum_{i=1}^{n}(R_{\mathrm{i}} - \bar{\mathrm{R}})^2$$

$\bar{\mathrm{R}}$ is computed as specified

$$\bar{\mathrm{R}} = \frac{1}{n}\sum_{i=1}^{n}\mathrm{R_i}$$

$\mathrm{R_i}$ is computed as specified

$$\bar{\mathrm{R}} = \sum_{i=1}^{n}\mathrm{r_{ij}}$$

Where;

W = Kendall's coefficient of concordance,

S = Sum of squared deviations,

m = Number of respondents,

n = Number of objects (consumers' constraints) considered,

$\bar{\mathrm{R}}$ = Mean value of the total ranks

$\mathrm{R_i}$ = Total rank is given to the ith object (consumers' constraints) considered,

$\mathrm{r_{ij}}$= Rank given to the $\mathrm{i^{th}}$ object (consumers' constraints) considered,

i = $\mathrm{i^{th}}$ (consumers' constraints) considered, and

j = $\mathrm{j^{th}}$ respondents

The Safety-First Behavioural Model (SFM)

The safety-first behavioural model describes the poultry egg farmer's attitude towards risk in the study area.

$$K(s) = \frac{1}{\mathrm{ɵ}}\left[1 - \frac{PiXi}{Pfi\mu y}\right]$$

Where;

K (s) = Risk Parameter

ɵ = Coefficient of Variation

Pi = Factor Price

Xi = Input Level of Interest

μy = Mean yield

Fi = Elasticity of Production of the Input Choice

P = Price

RESULTS AND DISCUSSION

Socio-economic Characteristics of the Poultry Egg Farmers in the Study Area

The socio-economic features of the poultry egg farmers include their age, gender, marital status, household size, educational level, farming experience, major occupation, membership of farmers association, extension visits, source of capital and poultry rentage. In the Kuje area council Federal Capital Territory, the socioeconomic characteristics of the poultry egg farmers are summarized in Table 1.

According to the result in Table 3.1, the average age of the poultry farmers in the study area was 37 years while (74%) were male and (26%) were female. The labor-intensive nature of poultry egg farming, which is assumed to be a male-dominated occupation, may be the reason for the notable discrepancy between male and female poultry egg producers in the area. This result aligns with the observations made by Ibrahim *et al*, (2014), who noted that in Kwara State, Nigeria, the poultry egg production sector is predominantly male which can be linked to the demanding tasks involved in poultry egg farming. According to the age distribution, only 2% of the farmers who produced poultry eggs were between the ages of 51 and 60, while the bulk (48%) were between the ages of 31 and 40. It would appear from this that these poultry farmers were still living active lives.

This result is consistent with Iheke and Igbelina's (2016) study, which found that the majority of responders were still young. Additionally, the results showed that roughly 73% of poultry egg growers were married, 49% of respondents had a

college degree, and 9% had no formal schooling. The average household size was eight people, with most households (58%) having six to ten people. Only 34% of the poultry egg producers were members of cooperative associations in the research area, but the majority (65%) had 1–5 years of experience in the field.

Cooperatives contribute significantly to the economic activities of their members through the provision of input support, periodic training, and advisory services. They also pool resources together to enjoy economies of scale thereby converting supposed liable individual risks to mutual or shared risk since poultry production is such a highly risky enterprise (Popoola, and David, 2015). Additionally, the results indicated that roughly 22% of respondents had access to extension services. Table 3.1 shows that 61% of respondents in the study area were farmers, and 93% of respondents obtained their land through other means other than renting.

Table 1: Socioeconomic Characteristics of Poultry Egg Producers in the Study Area

Variable	Frequency	Percentage	Mean
Sex			
Male	81	74.3	
Female	28	25.3	
Age(years)			
20-30	21	19.3	
31-40	52	47.7	36.91
41-50	34	31.2	
51-60	2	1.8	
Marital Status			
Single	21	19.3	
Married	79	72.5	
Divorced	5	4.6	
Widowed	4	3.7	
Household size			
1-5	30	27.5	
6-10	63	57.8	7.47
11-15	15	13.8	
16-20	1	0.9	
Level of Education			
Non Formal Education	10	9.2	
Primary education	6	5.5	
Secondary Education	33	30.3	
Tertiary Education	53	48.6	
Quranic Education	4	3.7	
Adult Education	3	2.8	
Years of Experience			
1-5	71	65.1	
6-10	38	34.9	4.63
Membership of farmers Association			
Yes	37	33.9	
No	72	66.1	
Major Occupation			
Civil servant	11	10.1	
Farming	67	61.5	
Trading	28	25.7	
Carpentry	3	2.8	
Major Source of Capital			
Commercial Banks	27	24.8	
Cooperative Society	38	34.9	
Friends and Relatives	13	11.9	
Money Lenders	13	10.1	
Personal savings	20	18.3	
Poultry Farm Rentage			
Yes	8	7.3	
No	101	92.7	

Source: Computed from field data, 2024

Types of Risks Encountered by the poultry farmers

Table 3.2 presents the various types of risks the poultry egg farmers confronts. The result indicated that (39%) of poultry egg farmers were not severely to a shortage of feed, while (21%) of poultry egg farmers were very severely to a shortage of feed. For shortage of water supply, (49%) of the poultry farmers were not severe, (31%) were severe, while (20%) were very severe.

Also, (29%) of the poultry farmers experienced mild effects from weather fluctuation, (51%) faced severe impacts, and (19%) were affected very severely by weather fluctuations. The spread of consequences from weather changes among farmers reveals a notable difficulty, as more than half face serious impacts. The findings on dung accumulation among poultry egg producers reveal a concerning scenario. While a slight majority (45%) reports no significant issues, nearly half (49%) faced considerable challenges regarding dung management, and a small yet important group (8%) experienced extremely severe difficulties. Concerning disease outbreaks in the research area, the result revealed that (50%) of poultry egg producers were not severe to disease outbreak, (45%) of poultry egg producers experienced a severe disease outbreak, while (6%) were a very severe disease outbreak.

The findings also showed that (54%) faced severe challenges of Infectious Parasite issues, (42%) experienced no severe Infectious Parasite issues, and (4%) of the poultry egg farmers dealt with very severe Infectious Parasite problems. Furthermore, 15% of respondents said they were extremely impacted by the lack of veterinary services, 38% said they had a serious lack of veterinary services, and 48% of farmers said they had no severe lack of veterinary services.

As seen in Table 2, the poultry farmers in the research areas also faced the hazards of theft, low parent stocks, and bird death. The findings of this study are therefore consistent with those of Falculan's (2023) research, in which the majority of participants concurred that there are several hazards associated with managing poultry, including those related to the environment, production, health, market, and finances. Disease outbreaks, veterinary care, poultry facilities, water and electricity supplies, a lack of understanding about poultry rearing, and high feed costs are some of the determinants.

Table 2: Types of Risk encountered by the Poultry Egg Production in the Study Area

Variables	Not Severe Frequency (%)		Severe Frequency (%)	Very Severe Frequency (%)		Mean	Ranking
Shortage of Feed	43(39.4)		43(39.4)	23(21.1)		1.50	7
Shortage of Water Supply	53(48.6)		34(31.2)	22(20.2)		1.39	16
Weather Fluctuation	32(29.4)	29.4	56(51.4)	21(19.3)	19.3	1.63	1
Accumulation of Faeces	49(45.0)	45.0	51(46.8)	9(8.3)	8.3	1.51	5
Disease Outbreak	54(49.5)	49.5	49(45.0)	6(5.5)	5.5	1.48	10
Infectious Parasite	46(42.2)	42.2	59(56.2)	4(3.7)	3.7	1.56	3
Lack of Veterinary Services	52(47.7)	47.7	41(37.6)	16(14.7)	14.7	1.44	14
Pen Injury	51(46.8)	46.8	48(44.0)	10(9.2)	9.2	1.47	12
Vaccine Failure	47(43.1)	43.1	50(45.9)	12(11.0)	11.0	1.50	7
Price Fluctuation of Birds	30(27.5)	27.5	44940.4)	35(32.1)	32.1	1.59	2
Price Fluctuation of Materials and Tools	29(26.6)	26.6	30(27.5)	50(45.9)	45.9	1.51	5
Transportation Problem	46(42.2)	42.2	36(33.0)	27(24.8)	24.8	1.44	14
Rotting of Eggs at Storage	54(49.5)	49.5	46(42.2)	9(8.3)	8.3	1.46	13
Death of Birds	51(46.8)	46.8	50(45.9)	8(7.3)	7.3	1.48	10
Theft	52(47.7)	47.7	52(47.7)	5(4.6)	4.6	1.49	9
Poor Parent Stock	46(42.2)	42.2	53(48.6)	10(9.2)	9.2	1.52	4

*Percentage in parenthesis

Source: Computed from field data, 2024

Risk Management Practices Adopted by poultry Egg Producers in the Study Area

Table 3a, highlights the mean scores for the different risk management practices used by egg producers in the study area along with their ranking. It also documents the perception of the risk management practice used by the poultry egg farmers as determined by Kendall's Coefficient of Concordance.

With a mean score of 7.24, consistent feeding and good sanitation were ranked first. This implies that the poultry egg producers in the research area strongly value and implement these techniques. With a mean score of 3.83, drug administration gets the lowest ranking (11th), suggesting that egg producers may be careful about administering pharmaceuticals unless absolutely essential or may be less likely to give drugs as a risk management strategy. Relatively high mean scores also indicate that practices like debeaking, properly disposing of dead birds, and maintaining a steady supply of water are often used risk management techniques in the production of poultry eggs. This finding is consistent with Ibrahim *et al* (2014) who reported that constant feeding was a widely used practice to maintain bird health. Less commonly, some farmers engaged in caponizing, dubbing, and using windbreakers. Many also practised debeaking to prevent pecking and cannibalism, and a significant number implemented vaccination and deworming.

Table 3b shows Kendall's W test which is a statistical indicator of the agreement among rankings. It indicates how consistent or synchronized the rankings are across the risk management practices. The W was 0.340; this value shows a moderate level of agreement among the egg producers in the rankings of risk management practices. It also implies that there is 34% agreement among the egg producers in the rankings of risk management practices.

The Chi-Square was 71.436; this test statistic measures whether the rankings are consistent across the practices. This result was also statistically significant ($p < 0.001$).

Table 3a: Risk Management Practices Adopted by the Egg Producers in the Study Area

Risk management practice	Mean score	Ranking
Vaccination	6.45	6th
Use of foot dips at the entrance	5.40	8th
Drug administration	3.83	11th
Proper disposal of dead birds	6.98	3rd
Debeaking	6.98	3rd
Constant feeding	7.24	1st
Constant water supply	6.98	3rd
Spraying disinfectant	4.62	9th
Deworming	6.19	7th
Proper Sanitation	7.24	1st
Wing-breaker	4.10	10th

Source: Computed from field data, 2024

Table 3b: Kendall's Coefficient of concordance

Number (N)	21
Kendall's W[a]test	0.340
Chi-Square	71.436
Degree of freedom	10
Asymp. Sig.	0.000

Source: Computed from field data, 2024

The Poultry Egg Farmer's Attitude towards Risk in the Study Area

The findings in table 4 shows the risk attitude of the poultry egg producers in the study area using the safety-first behavioral model approach. The result indicated that majority (95%) of the respondents were risk neutral. This could mean that if the risks are considered with the likely benefits, they might be receptive to adopting new technologies. The findings also indicated that about (5%) of poultry egg farmers were risk takers who are willing to take risks in their decision-making, possibly adopting new technologies despite uncertainties. This result is consistenet with the findings of Faleye *et al*., (2017) that risk-taking farmers typically lean towards maximizing potential gains, rather than minimizing losses while remaining attentive to the potential returns on their investments. Also, none of the poultry egg farmers were risk averse.

Table 4: Poultry Farmer's Attitude towards Risk in the Study Area

Decision	Frequency	Percentage
Risk Takers	5	4.59
Risk Neutral	104	95.41
Risk Averse	0	0

Source: Computed from field data, 2024

CONCLUSION

Following the study's findings, it was concluded that the majority of the poultry egg farmers in the study area were risk-neutral. Also, the most pronounced risks faced by these poultry farmers in the study area were environmental and biological risks (such as weather changes and infectious diseases). Therefore, encouraging poultry egg farmers to adopt risk management practices is pivotal.

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