WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

PROFITABILITY AT RISK: A SENSITIVITY ASSESSMENT OF BROILER PRODUCTION IN THE FEDERAL CAPITAL TERRITORY, NIGERIA

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ABSTRACT :

This study assessed the profitability and sensitivity of broiler production in the Federal Capital Territory (FCT), Nigeria, amidst fluctuating input and output prices. Poultry farming, particularly broiler production, remains a significant source of animal protein and income generation in Nigeria. However, profitability in broiler production is often threatened by rising input costs, volatile market prices, disease outbreaks, and limited technical expertise. This study employed a quantitative research design, utilizing primary data collected from 120 randomly selected broiler farmers in Bwari, Gwagwalada, and Kuje Area Councils of FCT. Data were analyzed using profitability metrics such as gross margin, net farm income, return on investment (ROI), and benefit-cost ratio (BCR). Sensitivity analysis explored the impact of ±5% to ±50% changes in costs and revenues, showing profitability remains viable up to a 20% cost increase or revenue decrease, but marginal beyond 25%, with losses occurring at higher variations. The Garrett Ranking method identified high feed costs (85.3 average score), high day-old chick costs (82.9), and inadequate capital (82.3) as the top constraints. Socio-economic analysis revealed a male-dominated (65%), educated (38.3% tertiary), and experienced (mean 8 years) farmer base, though limited by poor credit access (31.7%) and extension services (mean 2 visits/year). The study recommends strategic interventions to reduce feed costs, stabilize input prices, and enhance credit access to boost profitability and sustainability in broiler production.

Keywords*: Profitability, sensitivity analysis, broiler production, Federal Capital Territory (FCT), poultry farming, production constraints.*

INTRODUCTION

Poultry farming, particularly broiler production, plays a significant role in meeting the protein needs of the growing population in Nigeria. Broilers, which are fast-growing poultry birds reared mainly for meat, are essential for providing affordable and high-quality animal protein. As one of the fastest-growing agricultural subsectors, poultry farming, particularly broiler production, has gained prominence due to its short production cycle, high feed conversion efficiency, and potential for profitability (Adeyonu, Okunola & Alao, 2021). According to the Food and Agriculture Organization (FAO, 2019), poultry meat accounts for a substantial proportion of animal protein consumed in many developing countries, including Nigeria. Consequently, broiler production has become an attractive agribusiness venture, offering employment opportunities and contributing to household income and food security (Adebayo & Adeola, 2020; Olagunju, Adesiyan & Ojo, 2020).

In the Federal Capital Territory (FCT) of Nigeria, broiler production is increasingly becoming popular among farmers due to its relatively short production cycle, high feed conversion efficiency, and potential for quick returns on investment (Okoli, Ebere & Opara, 2018). Despite its profitability, the broiler production sector in FCT is faced with several challenges that affect profitability and sustainability. These challenges include fluctuating input prices, unstable output prices, disease outbreaks, and inadequate technical know-how (Ezeh, Anyiro & Chukwu, 2017; Ojo, Adejumo & Oyediran, 2017; Ojo & Ogunwale, 2020). Therefore, understanding the profitability and its risks which lies mainly in the sensitivity of broiler production to changes in input and output prices is vital for developing strategies to enhance the viability and sustainability of the business.

Profitability analysis is essential in agribusiness to assess the viability of investments and determine the net gains derived from production activities (Ogunniyi & Omotesho, 2016; Etim, Udoh & Awoyemi, 2019). The profitability of broiler production depends on several factors, including the cost of inputs such as feed, day-old chicks, vaccines, labour, and utilities. Output prices, mainly determined by market forces, also significantly affect profitability. Studies have shown that broiler farming can be profitable when production costs are managed effectively and market conditions are favourable (Adeyonu et al., 2021). Also, previous studies indicated that feed costs alone constitute approximately 60-70% of the total cost of broiler production (Ekunwe & Soniregun, 2019; Ibrahim & Abubakar, 2023). As such, any fluctuation in feed prices could substantially impact profitability. Sensitivity analysis is a vital tool that helps in examining how changes in critical variables, such as input and output prices, influence the overall profitability of broiler farming (Yusuf, Ajayi & Mohammed, 2018).

Sensitivity analysis in broiler production is crucial for risk management and decision-making. Sensitivity analysis explores how variations in costs (e.g., feed, labour, and medication) and revenues (e.g., broiler meat prices) impact profit outcomes, offering a lens through which to evaluate risk exposure (Ogunniyi, Omotayo & Olagunju, 2022). In Nigeria, broiler farmers face significant price volatility due to reliance on imported feed ingredients, unstable foreign exchange rates, and inadequate market regulation (Umar et al., 2021). Thus, it assists farmers and stakeholders in identifying the most critical variables that could significantly influence profitability, thereby guiding them in making informed decisions under varying economic conditions (Olagunju & Babatunde, 2020). Given the volatility in feed and chick prices in Nigeria, understanding how these changes impact profitability is crucial for sustainable broiler farming and the resilience of the enterprise in the face of economic uncertainties.

Furthermore, broiler farmers in FCT face several production constraints that hinder optimal profitability and productivity. These constraints include high feed costs, inadequate veterinary services, poor access to credit facilities, and challenges related to marketing and price fluctuations (Adeoye, Adegbite & Oyekunle, 2017; Ibrahim & Abubakar, 2023). Identifying and ranking these constraints using appropriate methods, such as the Garrette Ranking method, is essential for formulating strategies to mitigate their impact and improve the profitability of broiler production (Alabi & Aruna, 2018; Etim et al., 2019).

Although numerous studies have examined the profitability of broiler production in various parts of Nigeria, limited attention has been given to the sensitivity analysis of profitability in FCT, particularly in relation to changes in input and output prices. Moreover, there is a paucity of research on identifying and ranking the specific challenges faced by broiler farmers using a systematic approach. Hence, this study aims to fill this gap by analyzing the profitability of broiler production in FCT, evaluating the sensitivity of profitability to changes in input and output prices, and identifying the critical constraints hindering profitability using the Garrette Ranking method. The research aims to provide actionable insights for farmers, investors, and policymakers, also, the study aligns with broader national objectives of achieving food security and economic diversification, as outlined in Nigeria's Agricultural Promotion Policy, by highlighting opportunities to strengthen a vital subsector of the agricultural economy.

Definition of Terms

To ensure clarity and consistency throughout this study, the following key terms are defined based on their relevance to broiler production and economic analysis:

Broiler Production: The rearing of chickens (*Gallus gallus domesticus*) specifically bred for meat production, typically harvested at 6–8 weeks of age (FAO, 2018; Oladejo & Owo, 2019). In this study, it refers to the commercial or small-scale farming of broilers in the Federal Capital Territory (FCT), Nigeria.

Profitability: The financial gain derived from broiler production, measured as the difference between total revenue (TR) and total cost (TC), expressed as net profit, gross margin, or return on investment (ROI) (Olanrewaju, Kristófersson, Tómasson & Kristjánsson, 2021). It indicates the economic viability of the enterprise.

Sensitivity Analysis: A quantitative method used to assess how changes in key input variables (e.g., feed costs, market prices, or flock size) affect the profitability of broiler production (Chibanda, Wieck & Sall, 2024). It evaluates the robustness of profitability under varying conditions. In this context,

it evaluates how changes in costs and revenue components affect broiler production profitability.

Federal Capital Territory (FCT): The administrative capital of Nigeria, encompassing Abuja and its surrounding area councils, serving as the geographical focus of this study.

Constraints: Factors that limit the efficiency, productivity, or profitability of broiler production, such as high feed costs, disease outbreaks, or inadequate infrastructure (Otu, Juliana & Victor 2021).

Garrett Ranking Method: A statistical technique used to rank constraints based on their perceived severity, converting ordinal ranks into scores for analysis (Garrett & Woodworth, 2015). In this study, it identifies and prioritizes challenges faced by broiler farmers.

Methodology

This study adopts a quantitative research design to investigate the profitability, sensitivity, and constraints of broiler production in the FCT, Nigeria. The methodology integrates economic analysis, sensitivity modelling, and constraint ranking to achieve the stated objectives. Primary data were collected from broiler farmers through structured questionnaires, supplemented by secondary data from agricultural reports and market surveys. The approach involves assessing profitability using budgetary techniques, conducting sensitivity analysis to evaluate the impact of variable changes, and employing the Garrett Ranking method to identify and prioritize constraints. This multi-faceted methodology ensures a comprehensive evaluation of broiler production dynamics in the study area, drawing on established frameworks on agricultural economics studies (Olanrewaju et al., 2021; Chibanda et al., 2024).

Study Area

The study was conducted in the Federal Capital Territory (FCT), Nigeria, located in the North-Central geopolitical zone of the country. The FCT covers an area of approximately 7,315 square kilometers and is geographically positioned between latitude 8°25′ and 9°20′ North and longitude 6°45′ and 7°39′ East. It comprises six area councils: Abuja Municipal, Abaji, Bwari, Gwagwalada, Kuje, and Kwali. The FCT has a population of about 3.5 million people (National Bureau of Statistics, 2020) and experiences a tropical climate with distinct wet (April–October) and dry (November–March) seasons, which influences agricultural activities. Poultry farming, including broiler production, is a significant economic activity in the FCT due to its proximity to urban markets in Abuja and increasing demand for poultry meat. The area's diverse farming systems, ranging from smallholder to commercial operations, make it an ideal location for studying broiler production profitability and its sensitivity to economic variables (Otu et al., 2021).

Sampling Technique and Data Collection

A multi-stage sampling technique was employed to select respondents for this study. In the first stage, three area councils (Bwari, Gwagwalada, and Kuje) were purposively selected based on their high concentration of broiler farming activities, as identified through preliminary consultations with the FCT Agricultural Development Programme (ADP). In the second stage, five farming communities were randomly selected from each of the three area councils, resulting in a total of 15 communities. In the third stage, eight broiler farmers were randomly sampled from each community, yielding a total sample size of 120 respondents. This sample size aligns with similar studies on poultry production in Nigeria (Omolayo, 2018; Otu et al., 2021) and ensures statistical reliability.

Primary data were collected using a structured questionnaire administered to the selected farmers between December, 2024 and February, 2025. The questionnaire captured data on production costs (e.g., feed, labour, day-old chicks), revenue (e.g., sales of broilers), flock size, and perceived constraints. Trained enumerators facilitated data collection to ensure accuracy and consistency. Secondary data, including market prices and input costs, were obtained from FCT ADP reports and local poultry associations/markets. The data collection process was designed to provide robust inputs for profitability analysis, sensitivity modelling, and constraint ranking.

Data Analysis

Data analysis was conducted in three phases to address the study's objectives:

Profitability Analysis: Descriptive statistics (means, frequencies, and percentages) were used to summarize the socio-economic characteristics of the respondents and budgetary techniques along with descriptive statistics were used to determine the profitability of broiler production. Key indicators included total revenue (TR), total cost (TC), gross margin (GM = TR – Total Variable Cost), and Net Farm Income (NFI = TR – TC). Return on investment (ROI = NP/TC × 100) and Benefit-Cost Ratio (BCR) = TR / TC

were also calculated to assess economic viability, following methods outlined by Olanrewaju et al. (2021).

Sensitivity Analysis: A deterministic sensitivity analysis was performed to evaluate how changes overall cost of production and output prices affect profitability. Scenarios were modelled by varying each parameter by ±5%, ±10%, ±20%, and ±30%, while holding others constant. The resulting changes in net profit and ROI were analyzed to assess the robustness of broiler production profitability, adapting techniques from Chibanda et al. (2024). Results

were presented in tables and graphs for clarity.

Constraint Analysis: The Garrett Ranking method was applied to identify and rank constraints faced by broiler farmers. Respondents ranked constraints (e.g., high feed cost, disease outbreaks, inadequate finance) on an ordinal scale. These ranks were converted to scores using Garrett's formula:

Percent position = $\frac{100(Rij-0.5)}{Nj}$

Where

Rij = Rank given for the i^{th} constraint by j^{th} respondent

Nj = Number of constraints ranked by j^{th} respondents

Scores were averaged across respondents, and constraints were ranked based on mean scores, with higher scores indicating greater severity (Garrett & Woodworth, 2015).

Ethical Considerations

This study adhered to ethical standards to protect participants and ensure the integrity of the research process. Informed consent was obtained from all respondents prior to data collection, with participants briefed on the study's purpose, their voluntary participation, and the confidentiality of their responses. No personally identifiable information (e.g., names or addresses) was recorded, and data were anonymized using unique codes. Enumerators were trained to conduct interviews respectfully, avoiding coercion or undue influence.

Results and Discussion

Socio-economic characteristics

Table 1: Socio-economic characteristics of respondents in the study area

Class	Category	Frequency	Percentage (%)	Mean
Gender	Male	78	65	
	Female	42	35	
	Total	120	100	
Age (years)	<25	16	13	38 years
	25-45	67	56	
	>45	37	31	
	Total	120	100	
Marital status	Married	88	73	
	Unmarried	32	27	
	Total	120	100	
Household size	1-3	38	31.7	5 members
	4-6	55	45.8	
	>6	27	22.5	
	Total	120	100	
Level of education	No formal education	9	7.5	
	Primary	23	19.2	
	Secondary	42	35	
	Tertiary	46	38.3	
	Total	120	100	
Broiler farming experience (years)	<5	44	36.7	8 years
	5 – 10	48	40	
	11 – 20	19	15.8	
	>20	9	7.5	
	Total	120	100	
Membership of cooperative group	Yes	49	40.8	
	No	71	59.2	

	Total	120	100	
Number of visits by	None	46	38.3	2 visits
extension agent per year	1 – 3	44	36.7	
	4 – 6	22	18.3	
	>6	8	6.7	
	Total	120	100	
Access to Credit	Yes	38	31.7	
facilities	No	82	68.3	
	Total	120	100	
Stock size	<50	34	28.3	220 birds
	50-200	43	35.8	
	201-500	26	21.7	
	>500	17	14.2	
	Total	120		
Mortality rate (%)	<5	69	57.5	7%
	5-10	27	22.5	
	11-20	18	15	
	>20	6	5	
	Total	120	100	

Source: Field survey 2025

The gender distribution shows that males dominate the enterprise, accounting for 65% of respondents, while females make up 35%. This disparity may be attributed to the physically demanding nature of broiler farming, which men may find less challenging. Similar findings have been reported in other studies, where men predominantly engage in livestock farming due to the labour intensity involved (Ogunniyi & Omoteso, 2016). Ogunniyi, Olagunju & Adebayo, (2017) noted that poultry farming is often male-driven due to control over resources. The average age of broiler farmers was found to be 38 years, indicating that the farmers are in their productive and economically active years. Studies have shown that younger farmers are generally more innovative and open to adopting improved technologies (Afolabi, Akinbode & Bamire, 2014). Ajah, Nmadu & Aliyu, (2018) also found this age group more adaptable to modern poultry practices. Moreover, 73% of the farmers were married, reflecting the importance of family labour in poultry farming, consistent with findings by Adebayo and Adeola (2020). Also, Enete and Amusa (2015) reported that married farmers are more committed to income-generating activities like broiler production to sustain households.

The household size averaged five members, suggesting that family labour might play a significant role in broiler management. Larger household sizes often correlate with higher labour availability, which is crucial in poultry farming (Ojo, 2014; Ojo, Ibrahim & Mohammed, 2020). Furthermore, 38.3% of respondents had tertiary education, while 35% had secondary education, indicating a relatively high literacy level among the farmers. Higher educational attainment has been linked to better managerial skills and the adoption of improved agricultural practices (Oladele, 2015), Adebayo, Ogunniyi, & Olagunju, (2016) linked higher education to better poultry management.

The majority (40%) of the farmers had 5–10 years of broiler farming experience, reflecting moderate experience levels. Experience is crucial for effective management practices and risk mitigation (Onunkwo & Okoye, 2019; Oluwatusin (2017). Unfortunately, only 40.8% of farmers belonged to cooperative groups, which limits their access to financial and technical support. Cooperative membership significantly enhances farmers' ability to access inputs and credit facilities (Akinbode & Bamire, 2015). A mean of 2 extension visits per year, with 38.3% receiving none, indicates limited support. Ogunleye, Oladeji & Ogunniyi, (2018) noted that inadequate extension services hinder productivity in Nigerian poultry farming.

Only 31.7% of respondents had access to credit, a major constraint in scaling up production. Credit access has been identified as a key factor affecting productivity and profitability in broiler farming in Nigeria (Ekunwe & Soniregun, 2019; Akinbode, Ojo & Adebayo, 2021). Additionally, the average mortality rate of 7% suggests some level of inefficiency in disease management, aligning with previous findings that inadequate veterinary services lead to higher mortality rates (Nwosu & Onyeneke, 2018), however, Ojo et al. (2020) noted mortality rates below 10% indicate good management practices. The mean stock size is 220 birds, with 35.8% raising 50–200 birds, typical of small to medium-scale operations (Mgbenka, Mbah & Ezeano 2016). Only 14.2% exceed 500 birds, reflecting capital and land limitations.

Table 2: Average Cost and Return of Broiler Farming in the Study Area per 100 Birds

S/N	Item	Amount (₦)	Percentage of variable cost/fixed cost (%)	Percentage of total cost (%)
A	**Total Revenue (TR)**	**1,490,000**		
B	**Variable Inputs**			
1	Day-old chicks	120,000	15.5	11.7
2	Feeds	402,000	52.0	39.3
3	Vaccines and drugs	20,800	2.7	2.0
4	Transportation	35,000	4.5	3.4
6	Labour	120,000	15.5	11.7
7	Heating	8,000	1.0	0.8
8	Litter material	12,000	1.6	1.2
9	Miscellaneous	55,000	7.1	5.4
	Total Variable Cost (TVC)	**772,800**		
C	**Fixed inputs**			
2	Rent	138,000	55.0	13.5
3	Depreciation on equipment	87,000	34.7	8.5
4	Interest on loans	26,000	10.4	2.5
	Total Fixed Cost (TFC)	**251,000**		
D	**Total Cost (TC)**	**1,023,800**		
	GM (TR - TVC)	**717,200**		
	NFI (GM - TFC)	**466,200**		
	ROI	**45.54%**		
	BCR	**1.46**		

Source: Field survey 2025

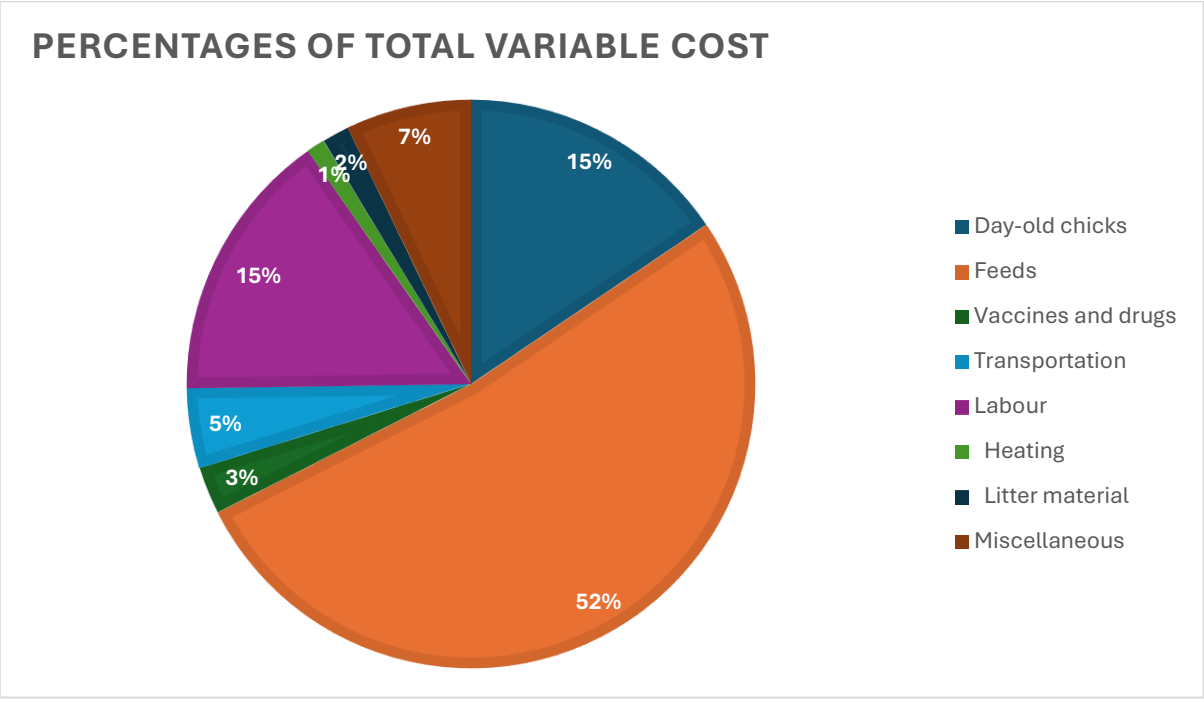

Fig 1: Percentages of Total Variable Cost from Table 2

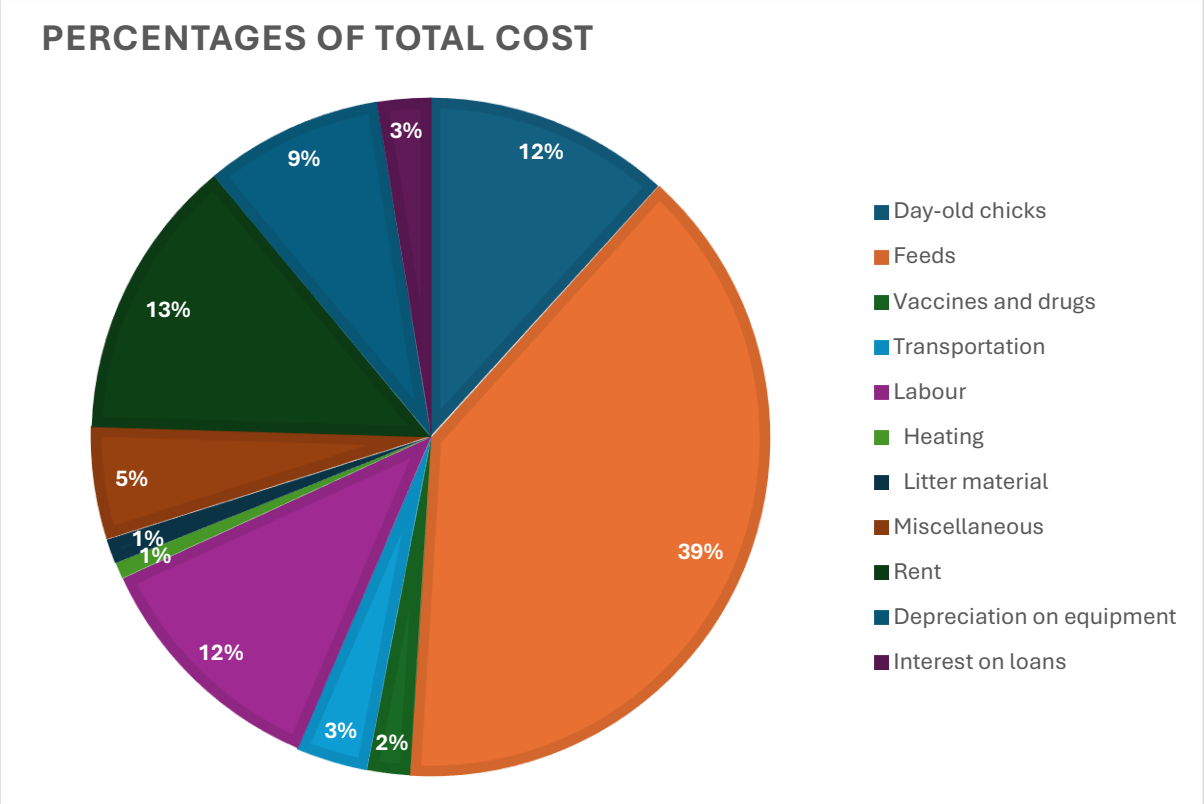

Fig: 2 Percentages of Total Cost from Table 2

The cost and return analysis revealed that feed cost accounted for 39.3% of the total cost, making it the most significant expense. This aligns with Ojo (2014), who reported that feed constitutes a major cost component in poultry production. Day-old chicks (15.5% of TVC) and labour (15.5% of TVC) are significant, reflecting input and operational expenses (Ogunniyi et al., 2017). Transportation (4.5% of TVC) and miscellaneous (7.1% of TVC) indicate logistical challenges. The total revenue of ₦1,490,000 and total cost of ₦1,023,800 resulted in a net farm income (NFI) of ₦466,200, indicating that broiler production is profitable despite extant challenges.

The gross margin (GM) of ₦717,200 and the return on investment (ROI) of 45.54% signify that every ₦1 invested yields a profit of approximately ₦0.46, which corroborates findings by Adepoju and Oyewole (2017) that poultry farming can be highly lucrative if efficiently managed, it also surpasses Oluwatusin (2017)'s 35% ROI in southwest Nigeria, possibly due to FCT's urban market proximity. The benefit-cost ratio (BCR) of 1.46 further indicates profitability, as a value above 1 reflects a viable investment. This finding is consistent with similar profitability assessments in Nigeria (Ojo, 2014).

Sensitivity Analysis on NFI and ROI of Broiler Production in the Study Area

Table 3: Increasing Cost

S/N	Increase in cost (%)	TR (₦)	TC (₦)	NFI (₦)	ROI (%)	Remark
1	0	**1,490,000**	**1,023,800**	**466,200**	**45.53624**	Viable
2	5	**1,490,000**	1074990	**415,010**	**38.60594**	Viable
3	10	**1,490,000**	1126180	**363,820**	**32.30567**	Viable
4	15	**1,490,000**	1177370	**312,630**	**26.55325**	Viable
5	20	**1,490,000**	1228560	**261,440**	**21.2802**	Viable
6	25	**1,490,000**	1279750	**210,250**	**16.42899**	Marginal Return
7	30	**1,490,000**	1330940	**159,060**	**11.95095**	Marginal Return
8	35	**1,490,000**	1382130	**107,870**	**7.80462**	Marginal Return
9	40	**1,490,000**	1433320	**56,680**	**3.954455**	Marginal Return

10	45	**1,490,000**	1484510	**5,490**	**0.369819**	Marginal Return
11	50	**1,490,000**	1535700	**-45,700**	**-2.97584**	Not Advisable

Source: *Field survey, 2025*

Table 4: Decreasing Revenue

S/N	Fall in Revenue (%)	TR (₦)	TC (₦)	NFI (₦)	ROI (%)	Remark
1	0	**1,490,000**	**1,023,800**	**466,200**	**45.53624**	Viable
2	5	1415500	**1,023,800**	**391,700**	**38.25943**	Viable
3	10	1341000	**1,023,800**	**317,200**	**30.98261**	Viable
4	15	1266500	**1,023,800**	**242,700**	**23.7058**	Viable
5	20	1192000	**1,023,800**	**168,200**	**16.42899**	Marginal Return
6	25	1117500	**1,023,800**	**93,700**	**9.152178**	Marginal Return
7	30	1043000	**1,023,800**	**19,200**	**1.875366**	Marginal Return
8	35	968500	**1,023,800**	**-55,300**	**-5.40145**	Not Advisable
9	40	894000	**1,023,800**	**-129,800**	**-12.6783**	Not Advisable
10	45	819500	**1,023,800**	**-204,300**	**-19.9551**	Not Advisable
11	50	745000	**1,023,800**	**-278,800**	**-27.2319**	Not Advisable

Source: Field survey, 2025

Sensitivity analysis was conducted to assess the impact of variations in cost and revenue on profitability. An increase in cost by up to 50% results in a negative NFI, making the venture unadvisable. However, up to a 20% increase in cost still maintains viability, with a marginal return at 25%. This indicates that broiler production is relatively resilient to moderate cost increases, consistent with findings from Nwosu and Onyeneke (2018). This result also reflects vulnerability to input price increases, especially feed, as noted by Mgbenka et al. (2016).

Revenue reduction analysis shows that a 20% decrease still results in positive NFI, but a 25% fall results in marginal returns. Further reduction beyond 30% results in negative profitability, indicating that revenue stabilization is crucial for sustained profitability. This shows market price volatility risks as noted by Akinbode, Ojo & Adebayo (2021). These results are also comparable to those obtained by Adepoju and Oyewole (2017), who found that broiler farming profitability is significantly affected by fluctuations in revenue.

Constraints to broiler production in FCT, Nigeria

Table 4. Constraints to broiler production in FCT, Nigeria

S/N	Constraints	Scores							
		1st	2nd	3rd	4th	5th	Total	Average	Rank
1	High cost of feed	9,546	693	0	0	0	10,239	85.3	1st
2	High cost of day-old chicks	7,654	1,386	568	335	0	9,943	82.9	2nd
3	Inadequate capital	6,708	2,618	355	67	126	9,874	82.3	3rd
4	Poor access to credit facilities and high interest rates	5,848	2,156	1349	335	0	9,688	80.7	4th
5	High cost of transportation	4,558	3,003	1562	402	0	9,525	79.4	5th
6	Lack of processing and storage facilities	4,730	2,387	781	0	1449	9,347	77.9	6th
7	Theft and Predators	2,494	1,386	2840	1407	756	8,883	74.0	7th

8	Problem of Diseases	3,182	847	142	2747	1827	8,745	72.9	8th
9	Harsh weather condition	1,978	2,387	1065	1340	1953	8,723	72.7	9th
10	Scarcity of land	2,752	924	994	2211	1827	8,708	72.6	10th
11	Poor market access	1,978	1,848	923	2613	1323	8,685	72.4	11th
12	Poor extension service	688	2,387	3195	1742	630	8,642	72.0	12th
13	Inadequate veterinary services	1,806	924	2343	2278	1260	8,611	71.8	13th
14	Lack of technical expertise	1,290	1,617	1846	2747	1071	8,571	71.4	14th
15	Lack of electricity	1,720	1,309	568	2680	2205	8,482	70.7	15th
16	High mortality rate	860	1,309	1633	2278	2268	8,348	69.6	16th
17	High cost of drugs/medication	946	693	852	3417	2331	8,239	68.7	17th
18	High cost of labour	774	154	1491	2948	2772	8,139	67.8	18th

Source: *Field survey, 2025*

Constraints to Broiler Production

The most critical constraint identified was the high cost of feed, followed by the high cost of day-old chicks and inadequate capital. This aligns with previous studies that have highlighted feed costs as a major challenge in poultry farming in Nigerian (Ogunniyi & Omoteso, 2016; Adebayo & Olagunju, 2015). Poor access to credit and high interest rates also ranked high among the constraints, highlighting the need for more affordable credit facilities (Akinbode & Bamire, 2015).

Other significant challenges include high transportation costs, lack of processing and storage facilities, and theft/predators. The presence of these constraints significantly undermines profitability and efficiency (Nwosu & Onyeneke, 2018). Addressing these issues through government interventions and cooperative support systems could enhance broiler production outcomes.

Summary

The research titled "Profitability at Risk: A Sensitivity Assessment of Broiler Production in FCT, Nigeria" investigates the economic viability, risk exposure, and challenges of broiler farming in the Federal Capital Territory (FCT). Conducted between December 2024 and February 2025, the study employed a multi-stage sampling technique to survey 120 farmers across Bwari, Gwagwalada, and Kuje area councils, using structured questionnaires and secondary data from agricultural reports. Profitability analysis, based on budgetary techniques, showed a total revenue of ₦1,490,000 and total cost of ₦1,023,800 per 100 birds, yielding a gross margin of ₦717,200, net farm income of ₦466,200, an ROI of 45.54%, and a BCR of 1.46, confirming the enterprise's profitability. Feed costs dominated expenses at 39.3% of total costs, underscoring their critical role. Sensitivity analysis tested cost increases and revenue decreases from ±5% to ±50%, finding profitability resilient up to 20% changes but marginal at 25% and unviable beyond 30%, reflecting risks from price volatility. The Garrett Ranking method ranked high feed costs (85.3), high day-old chick costs (82.9), and inadequate capital (82.3) as the most severe constraints, followed by poor credit access and transportation issues. Socio-economic data revealed a male-dominated (65%), educated (38.3% tertiary), and moderately experienced (mean 8 years) farmer profile, with an average stock size of 220 birds and a 7% mortality rate, though limited by low credit access (31.7%) and extension support (mean 2 visits/year). The study highlights broiler production's economic potential in FCT, its sensitivity to market dynamics, and the urgent need to address key constraints to ensure sustainability and support Nigeria's food security objectives.

Conclusion

The findings from this study underscore that broiler production in the Federal Capital Territory (FCT), Nigeria, is profitable, yielding a net farm income of ₦466,200 and a return on investment of 45.54%. However, the sector remains highly vulnerable to fluctuations in input costs and output prices, as evidenced by the sensitivity analysis. A 30% increase in production costs or a 30% decrease in revenue would significantly erode profitability, while a 50% change in either parameter would result in substantial losses. These findings highlight the inherent risks in broiler farming, emphasizing the need

for effective cost management and revenue stabilization. Furthermore, the study revealed that the high cost of feed, high cost of day-old chicks, and inadequate access to capital are the primary constraints undermining profitability. Addressing these challenges requires concerted efforts from stakeholders, including government intervention to regulate feed prices, promote local feed production, and improve access to affordable credit facilities. Moreover, enhancing extension services and technical support would help farmers adopt best management practices to mitigate risks and optimize productivity. Overall, the study contributes to the body of knowledge by demonstrating the profitability potential of broiler farming in FCT while emphasizing the critical areas where improvements are needed for sustained growth and resilience.

Recommendations

Based on the findings, the following recommendations are proposed to enhance the profitability and sustainability of broiler production in FCT, Nigeria:

1. Government and stakeholders should implement subsidies or price stabilization mechanisms for critical inputs like feed and day-old chicks, which account for significant production costs, to reduce financial strain on farmers and buffer against price volatility.
2. Financial institutions and policymakers should design low-interest loan schemes tailored for small and medium-scale broiler farmers, while encouraging cooperative membership (only 40.8% currently participate) to facilitate collective access to funds and resources.
3. Agricultural agencies, such as the FCT Agricultural Development Programme, should increase the frequency and quality of extension visits (currently averaging 2 per year) to provide farmers with technical expertise, disease management strategies, and modern farming practices.
4. Investments in local feed manufacturing using affordable indigenous ingredients should be made, as this could reduce reliance on expensive (and sometimes) imported inputs, thereby lowering the 39.3% cost share of feed and improving profitability resilience.
5. Policymakers should improve transportation networks and establish regulated poultry markets in FCT to minimize transportation costs (4.5% of variable costs) and stabilize output prices, addressing revenue fluctuations identified in the sensitivity analysis.
6. Public-private partnerships should focus on developing affordable processing and storage facilities to reduce post-harvest losses and enhance value addition, tackling the sixth-ranked constraint (score 77.9).
7. there should be investments in accessible veterinary care and farmer training programs which are essential to reduce the 7% mortality rate and mitigate disease-related risks (ranked eighth, score 72.9), improving overall productivity.
8. Extension services and NGOs should promote the formation of farmer cooperatives to enhance bargaining power, access to inputs, and technical support, addressing the low participation rate (40.8%) and its impact on capital and credit access.

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