

## Economic Analysis of Pig Production in Ibadan Metropolis, Oyo State, Nigeria

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### Abstract

Pig production is an important enterprise as source of protein for its consumers. In this study, economic assessment of pig production was assessed using primary data gathered using well-structured questionnaire. Multistage sampling techniques were used. Data were analysed using descriptive statistics and ordinary least square regression. The descriptive statistics revealed that there was more (87.7%) male than female pig farmers with average age, household size, experience and herd size of 39 years, 5 members, 7 years and 45 pigs respectively. 79.2% of pig farmers had secondary education, dominating the group's educational profile. Majority (63.2%) had access to pig training while a significant majority (74.5%) of pig farmers lacked access to credit facilities. The majority (77.4%) of pig farmers had a spouse. The major constraint pig farmers were faced with was inadequate fund followed by high cost of transportation and pig feed. The study found that experience, household size, credit access, mortality and herd size were significant predictors of profitability among pig farmers, collectively explaining 64% of the variation. Ramsey RESET, Breusch-pagan and normality tests were conducted to ensure that the OLS assumptions were met. Stakeholders should invest in health management training and facilitate access to affordable veterinary care. Finally, the role of credit access in enhancing profitability calls for financial inclusion strategies, such as tailored loan schemes and microfinance support.

**Keywords:** pig production; net farm income; fuel subsidy removal; agricultural policy.

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### Analyse économique de la production porcine dans la métropole d'Ibadan, État d'Oyo, Nigéria



### Résumé

La production porcine est une activité importante comme source de protéines pour ses consommateurs. Dans cette étude, l'évaluation économique de la production porcine a été évaluée à l'aide de données primaires recueillies à l'aide d'un questionnaire bien structuré. Des techniques d'échantillonnage à plusieurs degrés ont été utilisées. Les données ont été analysées à l'aide de statistiques descriptives et de la régression des moindres carrés ordinaires. Les statistiques descriptives ont révélé qu'il y avait plus (87,7 %) d'éleveurs de porcs masculins que féminins avec un âge moyen, une taille de ménage, une expérience et un troupeau moyen de 39 ans, 5 membres, 7 ans et 45 porcs respectivement. 79,2 % des éleveurs de porcs avaient une éducation secondaire, dominant le profil éducatif du groupe. La majorité (63,2 %) avait accès à une formation porcine tandis qu'une majorité significative (74,5 %) des éleveurs de porcs n'avait pas accès aux crédits. La majorité (77,4 %) des éleveurs de porcs avait un conjoint. La principale contrainte à laquelle les éleveurs de porcs étaient confrontés était le manque de fonds, suivi par le coût élevé du transport et des aliments pour porcs. L'étude a révélé que l'expérience, la taille du ménage, l'accès au crédit, la mortalité et la taille du troupeau étaient des prédicteurs significatifs de la rentabilité parmi les éleveurs de porcs, expliquant collectivement 64 % de la variation. Les tests de Ramsey RESET, de Breusch-Pagan et de normalité ont été réalisés pour s'assurer que les hypothèses des MCO étaient respectées. Les parties prenantes devraient investir dans

*la formation en gestion sanitaire et faciliter l'accès à des soins vétérinaires abordables. Enfin, le rôle de l'accès au crédit dans l'amélioration de la rentabilité appelle à des stratégies d'inclusion financière, telles que des régimes de prêts sur mesure et un soutien de la microfinance.*

**Mots-clés** : production porcine; revenu agricole net; suppression des subventions au carburant; politique agricole.

## Introduction

Agriculture can be regarded as a backbone of the Nigerian economy as it results in a contribution of more than 20 percent of the GDP and provides employment to more than 70 percent of the population in rural areas (FAO, 2020). In this sector, livestock production is an important activity that improves food security, income and decreases poverty. Pig production has become relatively prominent among various livestock enterprises owing to their high reproduction potential, short gestation period, and rapid growth rate, which makes pigs very economical to keep as compared to other livestock enterprises (Adebayo & Adeola, 2019). Pig farming in Nigeria is of special interest given its capacity to turn feed to meat more economically than other livestock species and the growing consumption of pork in both urban and peri-urban centers (Nwachukwu & Udegbonam, 2020; Enimu et al., 2024; Esheya & Anagah, 2025). Economic analysis of pig production has therefore become imperative in understanding the profitability of pig production, its cost structure, and its sustainability particularly with the changing dynamics of the market and with the changes occurring in policies.

In the past, government subsidies on pigs and other agricultural inputs like feed, veterinary drugs and energy sources were very vital in helping pig farmers increase their profitability (Ojo & Oladimeji, 2021). In the recent times however, economic reforms have made the pig farming less profitable by relieving the government of subsidizing production cost, and thus the future of pig farming as a cash-generating venture is now questionable. Medium and small-scale pig farmers are the ones who have been most impacted by the withdrawal of subsidies as they tend to work with restricted resources and can be extremely

vulnerable to changes in input prices (Akinola et al., 2022).

Despite the strategic importance of pig production in Nigeria's agricultural landscape, there remains a significant gap in empirical research assessing its economic viability in the post-subsidy era. Previous reports, like that of Adetunji (2012) and Ogunniyi & Omotoso (2011) offer useful information on profitability and technical efficiency, but only when it pertains to subsidy supported conditions no longer applicable in the current economic situation of the producers. Rescinding of agricultural subsidies-especially subsidies applying to feed and veterinary inputs- have created a new set of financial pressures that jeopardize the financial sustainability of smallholder pig farming. However, few recent analyses are available that explore whether pig production is still a valid livelihood strategy in the new environment.

There have been recent studies on pig farming in other parts of Nigeria which can serve as a benchmark. In another study on Niger Delta profitability, Enimu et al. (2024) established that more than 85 percent of the total variable costs were feed costs, and the benefit-cost ratio was 1.5 suggesting profitability. In Enugu State, according to a study by Onyekuru et al. (2020), the main factors that determine profitability in pig farming were found to be the level of education, cost of feed, and labor cost with an awaited profitability of 84% of investment. The studies of Omodele et al. (2019) analysed the pig production using GIS technology and identified that farms were especially concentrated in the South of Nigeria with small to medium-sized farms. Nonetheless, none of them aimed at paying attention to Ibadan Metropolis, a large urban area with peculiarities of production processes and market demands. Since value of inputs has increased and no

specific research to support this since the removal of subsidy, the business has a strategic need to assess the current cost of production structure as well as its profitability and socio-economic implications involved in pig farming within this context. This study seeks to fill that critical gap by providing a localized economic analysis of pig production in Ibadan Metropolis, thereby informing policy decisions and guiding stakeholders toward more sustainable and profitable practices.

## **Materials and methods**

### ***Study area***

The study was conducted in Ibadan metropolis, Oyo state. The capital of the Oyo state, Ibadan Metropolis is one of the largest and most economically diversified urban centers in Nigeria. The geostrategic position, population and demographic structure and its changing agricultural landscape all render it an important node in livestock research- specifically pig production. Increasing demand and changing eating habits has encouraged the expansion of pig farms in the peri-urban areas of the city to serve the local and regional market. Recent researches have emphasized on the prominent role Ibadan plays in swine production. To point an example, Omotosho et al. (2015) highlighted the fact that there has been major investment in pig farming and high labour involvement in pig farming activities in the metropolis whereas Fasiku et al. (2023) highlighted the fact that there has been an increased trend in rearing livestock in urban areas and the public health consequences of swine farming in Ibadan. These facts indicate that the Ibadan is a centre of agricultural change and inventions.

### ***Sampling technique***

Well-structured questionnaire and interview guide were employed for data collection. The list of registered pig farmers from PFAN (Pig Farmers Association of Nigeria), Ibadan chapter was collected from the association. Simple random technique was used to select 110 respondents out of the 130 respondents in the association. Of the 110 that were randomly selected, 106 of those that responded to the

questionnaire were found useable due to attrition.

### ***Analytical technique***

#### ***Descriptive statistics***

The descriptive statistics employed the use of simple percentage, frequency, mean, standard error and or deviation to profile the socioeconomic characteristics of individual pig farmers as well as the constraints militating against the farmers in the study area.

#### ***Budgetary analysis***

This was used to estimate average cost and returns of pig production. Theoretically, Net Revenue (NR) is the total revenue (TR) less the total cost (TC);

$$NR = TR - TC \dots\dots\dots (1)$$

Total cost is the addition of the entire variable cost (VC) and fixed cost (FC) items;

$$TC = TVC + TFC \dots\dots\dots (2)$$

Total revenue is the total amount of money that a farmer received from the sale of stock;

$$TR = \sum P_x Q_x \dots\dots\dots (3)$$

$$\text{Gross margin (GM)} = TR - TVC \dots\dots\dots (4)$$

$$\text{Net farm income (NFI)} = GM - TFC \dots\dots\dots (5)$$

The rate of return is a performance measure used to measure the amount of return on an investment relative to the investment cost. It is given by:

$$\text{Rate of Returns (ROR)} = NR/TC \dots\dots\dots (8)$$

$$\text{Gross Ratio (GR)} = TC/TR \dots\dots\dots (9)$$

$$\text{Benefit Cost Ratio (BCR)} = TR/TC \dots\dots\dots (10)$$

P = price per pig, Q = quantity of pig sold

Pig production is profitable if its  $BCR \geq 1$ . The higher the BCR, the more profitable the pig production business is. Depreciation was calculated using the straight-line method.

#### ***Multiple regression***

An econometric method of ordinary least square (OLS) regression model was employed to identify the factors influencing profit level of pig farmers in the study area.

#### ***Model specifications***

In the choice of the suitable econometric specification in this research, we used the linear functional form of the OLS regression model. The informed selection was influenced by the empirical test and theoretical fit with the research. The linear model was found to have

consistently many statistically significant explanatory variables, a high adjusted R-square and the estimated coefficients under the linear form had the expected results on the expected signs and as such offered a better interpretation and more robust empirical findings.

Given these advantages, the linear OLS model was deemed most appropriate for isolating the key determinants of profitability in pig farming within the study area. The ordinary least square (OLS) regression model was specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \mu \dots\dots (11)$$

Where,

Y = Profitability

X<sub>1</sub> = Sex (Female 0, otherwise 1)

X<sub>2</sub> = Marital status (Married 0, otherwise 1)

X<sub>3</sub> = Household size (Number of persons)

X<sub>4</sub> = Level of education attainment (Years)

X<sub>5</sub> = Experience (Years)

X<sub>6</sub> = Mortality (Number of dead pig)

X<sub>7</sub> = Credit access (No = 0, Yes = 1)

X<sub>8</sub> = Extension service (No = 0, Yes = 1)

X<sub>9</sub> = Herd size (Number of pigs)

μ is error term, and β is coefficient of explanatory variables.

## Results and Discussion

### *Socio-economic and production characteristics of pig farmers*

Table 1 indicated that most (87.7) of the pig farmers were male. This means that pig production may be a physically demanding and labor-intensive endeavor, where, sometimes, animals, feed, and equipment have to be handled manually. This can discourage women to be involved in pig production. The finding is consistent with the one by Yakubu (2020) and Sasa et al. (2022). It also showed that 77.4%, 15.1 and 7.5 percent of the pig farmers were married, single and widowed respectively. Seeing that majority were married, it is a foretelling that married pig farmers have access to more labour, shared duties and financial provisions. This is congruent with the result of Omoregie and Osabuohien (2021). The outcome showed that the greatest number of the pig farmers were between 31 and 40 years. Pig

farmers had an average age of thirty-nine (39) years. It implies that the industry was dominated by people who were in the middle age that could easily invest in their farms and withstand economic changes. This result is consistent with that of Enimu et al. (2024). It revealed that the years of experience of 88.7 percent of the pig farmers ranged between 1 and 10 years, 10.4 percent between 11 and 20 years, and 0.9 percent between 21 and 30 years. The average experience of pig farmers was seven (7) years. This implies that majority of pig farmers were just new entrants in the pig farming industry and that they would be more willing to embrace new technologies and practices. The finding is in line with the conclusion of Nwachukwu and Udegbonam (2020a) and Omoregie and Osabuohien (2021). The outcome according to the level of education that the pig farmers had indicated that 6.6 percent of them had primary education, 79.2 percent had secondary education, and 14.2 percent had tertiary education. Every pig farmer was learned. This implies that they are able to receive and use extension services, training and resources. Majority of the pig farmers (74.5%) did not access credit as 25.5 percent of them had access to credit. One of the most significant limitations that face the farming businesses in Nigeria is inadequate capital (Williams et al., 2025). Inability to access credit, however, disables the purchase of raw materials and other inputs of enterprises. It means that they can be dependent on personal savings. Farmers with no access to credit at all may not be able to react to the market opportunities or shocks. In the meantime, access to credit is considered to be one of the significant factors in increasing the productivity of agriculture (Galiwei & Erhijakpor, 2025). Three-fifths (63.2) of the pig farmers were available to training with 36.8 percent of the pig farmers lacking access to training. This implies that they will be in a good position to enhance their productivity and profitability, since they will possess the required knowledge and skills. Herds averaged 45. The pig farms are medium-sized in the scale classification of Nwachukwu and Udegbonam

(2020b) in terms of herd size. The findings indicated that 17 percent of the respondent had between 1-3 members in their households, 69.8 percent had household size of 4-6, 10.4 percent had household size of 7-9, and 2.8 percent had 10-12 members in their households. The mean family size was 5 persons. The pig farmers may use the family labour in the farming processes.

The average mortality was 3 pigs (mortality rate - 6.67%). The mortality rate at the pig farm is relatively low and this is a positive indication that there is good animal health and welfare. This is in line with the results of Eleazar et al. (2022) who found that better care of neonates and management of farrowing considerably alleviates neonatal pig mortality.

**Table 1: Distribution of pig farmers by socioeconomic and production characteristics**

Variable	Frequency	Percentage	Mean
Sex			
Male	93	87.7	
Female	13	12.3	
Marital status			
Single	16	15.1	
Married	82	77.4	
Widowed	8	7.5	
Age			
21-30	11	10.4	39
31-40	56	52.8	
41-50	32	30.2	
51-60	5	4.7	
≥61	2	1.9	
Educational level			
Primary	7	6.6	
Secondary	84	79.2	
Tertiary	15	14.2	
Credit access			
Yes	27	25.5	
No	79	74.5	
Training			
Yes	67	63.2	
No	39	36.8	
Herd size			
12-37	42	39.6	45
38-63	50	47.2	
64-89	14	13.2	
Experience			
1-10	94	88.7	7
11-20	11	10.4	
21-30	1	0.9	
Mortality recorded			
1-3	87	82.1	3
4-6	11	10.4	
7-9	8	7.5	

Household size			
1-3	18	17	5
4-6	74	69.8	
7-9	11	10.4	
10-12	3	2.8	

Field survey, 2024

**Estimate of cost and return of pig production**

Table 2 presents the results of pig production by average size using the standard enterprise budget format. The estimated average total cost of production was ₦1,763,202.02(\$1327) and total return was ₦2,437,075.47(\$1834). This revenue figure aligns with recent findings by Oladepo (2025), who observed that small-to-medium pig farms in southwestern Nigeria typically generate between ₦2.2 million and ₦3 million per production cycle, depending on breed quality and market access. The variable inputs were breeding stock, feed, medications, labour and transport cost. Feed constituted the

highest percentage (35.2 %) of the total cost. This is consistent with Businesstoks (2025), which emphasized that feed remains the most significant cost driver in pig farming. This was followed by breeding stock (25.1%) and transportation cost (4.5%). Cost and returns analysis showed that the interviewed farmers made ₦673,874 ≈ \$507 average profit in the previous year of pig production. This show that pig production is a profitable venture. The rate of return on investment in the study area was 38%. This means that for every ₦1 invested, 38Kobo or for every \$1 invested, 38 cent is gained in the business.

**Table 2: Cost and returns structure (average values) of pig production**

Item	Amount	Percentage
Total Revenue (₦)		
Adult pig sold	2,437,075.47(\$1834)	
Variable cost (₦)		
Piglets	441,839.62(\$333)	25.1
Feed	621,439.15(\$468)	35.2%
Transportation	78,891.51(\$59)	4.5
Water	3,643.40(\$3)	0.2
Medication	11,454.72(\$9)	0.7
Labour	53,111.42(\$40)	3
Total variable cost	1,210,379.82(\$911)	68.6%
Fixed cost (₦)		
Rent	132,016.5(\$100)	7.5
Borehole	95,000(\$72)	5.4
Salary	320,000(\$241)	18.1
Wheel barrow	2,250(\$2)	0.1
Weighing scale	1,350.7(\$1.02)	0.1
Pig catcher	2,205(\$2)	0.1
Total fixed cost	552,822.2(\$416)	31.4%
Total cost (₦)	1,763,202.02(\$1327)	
Gross margin (₦)	1,226,695.65(\$923)	
Net Farm income (₦)	673,873.47(\$507)	
Return on Investment (ROI)	0.38	

Field survey, 2024

Note: ₦1329.29 ≈ 1USD as at March, 2024 when the data were collected.

***Factors influencing profitability of pig farmers in the study area***

To determine the variables influencing the profitability of pig farmers in the research area, an econometric technique using an ordinary least square (OLS) regression model was utilised. By performing the Breusch Pagan, Ramsey RESET, and normalcy tests, the assumptions for adopting the ordinary least square were satisfied. The outcome demonstrated the appropriate model specification, the expected existence of homoscedasticity, and the normal distribution of the error term. Table 3 lists the variables that were found to have an effect on pig farmers' profitability in the research area. Up to 64% of the changes in farmers' profitability were explained by the explanatory factors, according to the adjusted R-squared value of 0.64. Therefore, other factors that the model could not account for could be the cause of the remaining 36%. The regression analysis reveals five (5) variables out of nine (9) variables that significantly influence the profitability of pig farmers in Ibadan Metropolis: household size, farming experience, pig mortality, and access to credit.

The household size shows positive and significant relationship with profitability. Each additional household member results in a profitability of pig farming by about 0.107 units. This implies that greater households will provide more labor to pig farming activities thus avoiding the hiring of labor and the cost of production. The result corresponds with that of Adebayo et al. (2022) who found that the household labor was a key factor in determining profitability of smallholder poultry enterprises in Ogun State. In urban agricultural settings where the cost of human labor is increasing, the access to family labor is an added competitive advantage. Farming experience has a positive relationship with profitability, implying that experienced farmers are better placed to handle farming risks, optimize on the use of inputs and respond to market forces. The one more year of farming experience will add 0.144 units to

profitability. This finding supports that of Eze and Nwachukwu (2023), who established that experience had a significant effect on profitability among pig farmers in Enugu State. Skilled farmers are more knowledgeable in breeding, disease prevention, and feed efficiency which are all factors that lead to financial success. Pig mortality also has a negative and significant impact on profitability. Each one-unit change in pig mortality implies a change in profitability of -0.201 units. Such a result is not surprising, since high mortality rates automatically decrease the number of marketable pigs and raise the cost of production per unit. Ogunleye et al. (2021) also determined the issue of mortality as a central cause of financial losses in pig farms in Southwest Nigeria, especially during the outbreak of certain diseases like African swine fever. It is thus necessary to reduce mortality by enhancing veterinary care and by implementing biosecurity measures to ensure profitability is sustained. The availability of credit has a positive effect on profitability, which is why financial liquidity is so essential in agricultural businesses. Profitability enhances by a margin of 0.122 units when there is access to credit. Credit helps farmers to invest in quality input, grow their operations and use modern technologies. As revealed by Adepoju and Salau (2022), the profitability of the livestock farmers in Oyo State, especially pig and goat farmers, was impacted positively by access to microcredit. The size of herd is positively linked to profitability, meaning that farmers with larger herds are in a better position to enjoy economies of scale, market power and more effective use of resources. An increment in the herd size by one unit translates to a profitability increment of about 0.188 units. This indicates that since pig farmers can grow their farms, they can amortize fixed costs including housing, labor, and equipment over more animals, which consequently makes per-unit cost of production drop and overall returns rise. This finding confirms the findings of Nwachukwu and Udegbonam (2020), who found out that the size of herd was a major

determinant of profitability among pig farmers in Southeastern Nigeria.

**Table 3: Factors influencing profitability of pig farmers**

Variable	Coefficient	p-value
Intercept	1.046	0.051
Sex	-0.083	0.375
Marital status	0.054	0.728
Household size	0.107	0.063*
Education	0.048	0.605
Experience	0.144	0.059*
Mortality	-0.201	0.045**
Credit access	0.122	0.070*
Extension service	-0.131	0.158
Herd size	0.188	0.004***
P-value(F)	3.715	0.001
R-squared	0.73	
Adjusted R-squared	0.64	
Breusch-Pagan test		0.065
Test for normality of residual		0.412
Ramsey RESET test		0.062

Field survey, 2024

\*\*\* 1% level of significance, \*\* 5% level of significance and \* 10% level of significance

**Constraints militating against pig farmers**

In the research region, farmers faced numerous challenges. After analysis and ranking, twelve (12) of these issues were found (Table 4). Among them are the high expense of feed, the lack of sufficient funding, the sensitivity of the animals to environmental elements and susceptibility to diseases, lack of government support, the loss of pigs due to theft, illness outbreaks, injuries, and weather. Muhanguzi *et al.* (2012) in Uganda, Petrus *et al.* (2011) in Namibia, Kagira *et al.* (2010) in western Kenya, and Baruwa (2019) in Nigeria all observed similar production problems. With a mean value of 3.00, inadequate fund was ranked 1st. This is consistent with the prior research by Oladoyin (2023), who identified

insufficient funding as one of the main issues facing pig operations. Second place went to high transportation costs, with a mean value of 2.95. This outcome is a result of the elimination of fuel subsidies, which is one of the main causes of the increase in transport expenses (Orjime, 2024). Third place went to high cost of feed, with a mean score of 2.94. This is due to the expectation that other agricultural commodities' prices will rise as a result of the multiplier impact of rising transportation costs. This is further corroborated by Premium Times (2023), which claims that feed suppliers are forced to pass these extra expenses on to farmers and livestock owners, which drives up the cost of animal feed generally.

**Table 4: Constraints militating against pig farmers**

Variable	Yes	No	Mean	Rank
Inadequate fund	106(100)	-	3	1 <sup>st</sup>
High cost of transportation	101(95.3)	5(4.7)	2.95	2 <sup>nd</sup>
High cost of feed	100(94.3)	6(5.7)	2.94	3 <sup>rd</sup>
High cost of farm input	105(99.1)	1(0.9)	2.93	4 <sup>th</sup>
Poor quality of breeding stock	68(63.2)	38(36.8)	1.68	5 <sup>th</sup>

Injuries	67(64.2)	39(35.8)	1.64	6 <sup>th</sup>
Weather condition	48(45.3)	58(54.7)	1.45	7 <sup>th</sup>
Loss of swine to theft	46(43.4)	60(56.6)	1.43	8 <sup>th</sup>
Lack of government support	45(42.5)	61(57.5)	1.42	9 <sup>th</sup>
Low demand for pork	41(38.7)	65(61.3)	1.39	10 <sup>th</sup>
High mortality	30(28.3)	76(71.7)	1.28	11 <sup>th</sup>
Offensive odour	12(11.3)	94(88.7)	1.11	12 <sup>th</sup>

Field survey, 2024

Figures in parentheses are in percentage

### Conclusion

The findings of this study confirm that pig farming in Ibadan Metropolis remains a profitable enterprise despite notable challenges such as limited access to funding, high feed costs, and transportation expenses. Profitability was significantly influenced by household size, marital status, herd size, farming experience, credit access, and pig mortality. These variables underscore the importance of both socio-economic and production-related factors in shaping financial outcomes for pig farmers. Stakeholders should invest in health management training and facilitate access to affordable veterinary care. Finally, the role of credit access in enhancing profitability calls for financial inclusion strategies, such as tailored loan schemes and microfinance support, to enable farmers to invest in productivity-enhancing inputs.

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