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Determinants of Adoption of Improved Swine Production and Management Practices among Swine Farmers in Jos South Local Government Area of Plateau State, Nigeria

Owa, G.T[1*]., Ponjul, T.D[2]., Wuyep G.K[1]., Agada, S.A[1] and Matawal, O.M[3]
[1]Department of Agricultural Extension & Management, Federal College of Forestry, Jos Plateau State, Nigeria; [2] Department of Crop Production, Federal College of Forestry, Jos Plateau State, Nigeria
[3]Department of Agricultural Extension & Management, Plateau State College of Agriculture, Garkawa, Plateau State, Nigeria; **Corresponding Author:** owatijesu1@gmail.com;

Abstract: *Improving swine productivity is essential for meeting the growing demand for animal protein and enhancing farmers' livelihoods in Nigeria. This study examined the determinants of adoption of improved swine production and management practices among farmers in Jos South Local Government Area of Plateau State, Nigeria. Specifically, the study described farmers' socio-economic characteristics, assessed their awareness and level of adoption of improved practices, identified factors influencing adoption, and examined constraints faced by farmers. A multistage sampling technique was used to select 90 swine farmers. Primary data were collected through structured questionnaires and analyzed using descriptive statistics and logit regression. The results showed that the mean age of farmers was 42 years, with 68% male, 74% married, and 47% having tertiary education. The average farming experience and herd size were 9 years and 21 pigs, respectively. Awareness of improved practices was generally high, particularly in water supply (94.4%), disease prevention (91.1%), and feeding (88.9%). Adoption was highest for water supply (mean = 3.7), feeding (3.2), vaccination (3.2), and sanitation (3.1), while record keeping (2.5) had lower adoption. Logit regression results indicated that education, farming experience, farm size, household size, awareness, and income significantly influenced adoption. Major constraints included high input costs (80%), limited access to credit (72%), inadequate extension services (64%), and poor technical knowledge (60%). The study concludes that despite high awareness, adoption remains constrained. The study therefore recommended that strengthening extension services and improving access to credit and training are essential to enhance adoption and productivity.*
Keywords: *Adoption, improved management practices, Swine farmers, Plateau State.*

Introduction: Livestock production constitutes a vital component of agricultural development in Nigeria, contributing significantly to food security, employment generation, and rural income (Food and Agriculture Organization [FAO], 2023; Federal Ministry of Agriculture and Food Security [FMAFS], 2026). Among livestock enterprises, swine production continues to attract considerable attention due to its capacity for rapid growth, efficient feed conversion, and short production cycle, which enables quick turnover and profitability. Recent studies have shown that pigs possess strong biological and economic advantages, including efficient feed utilization and high productivity when properly managed, making them suitable for both smallholder and commercial operations (Ogunsipe, Akinbani, Ibidapo, & Akingbade, 2024; Adie, 2025). In Nigeria, pig farming is increasingly recognized as a viable agribusiness capable of enhancing household income, improving food security, and meeting the growing demand for animal protein (Akinbobola, Kumuyi, Olusoji, et al., 2025; Nwankwo, Jimoh, & Shittu, 2025). Despite these potentials, productivity in swine enterprises remains below optimal levels. Several studies have identified major limitations, including high cost of feed, inadequate access to quality breeding stock, poor housing conditions, and limited veterinary services, all of which negatively affect growth performance and profitability (Makanjuola, Boladuro, Adesehinwa, Dunmade, Adeogun, & Adesehinwa, 2025; Nwankwo et al., 2025). Many farmers also rely on traditional management practices, such as ethnoveterinary treatments and poor biosecurity measures, which compromise animal health and reduce productivity (Akinbobola et al., 2025). These constraints highlight the need for improved management practices, access to modern inputs, and strengthened extension support to enhance the performance of swine production systems in Nigeria.

Adoption of improved swine production and management practices is essential for increasing productivity, reducing mortality, and improving profitability. Modern management practices include proper housing, balanced nutrition, adequate water supply, improved breeding techniques, regular vaccination, disease prevention and veterinary care, biosecurity measures, proper stocking density, waste

management, record keeping, and the use of modern feeding equipment (Akinbobola et al., 2025; Ogunsipe et al., 2024). Adoption refers to the willingness and capacity of farmers to integrate these techniques into daily operations to improve animal health, productivity, and overall farm profitability (Fidelugwuowo & Omekwu, 2023; Adesida, Nkomoki, Bavorova, & Madaki, 2021). The extent of adoption is influenced by socio-economic, institutional, and technical factors. Socio-economic variables, including education, age, household size, gender, farming experience, farm income, and access to credit, significantly affect farmers' adoption decisions (Fidelugwuowo & Omekwu, 2023; Shaibu & Shaibu, 2025). Awareness, access to information, and participation in training programs further determine the likelihood of adopting modern practices (Osikabor, Emeghara, Umunna, & Audu, 2025; Adesida et al., 2021). Despite these benefits, many intensive swine farmers in Nigeria still rely on traditional practices, resulting in poor nutrition, higher disease incidence, and reduced reproductive performance (Akinbobola et al., 2025; Ogunsipe et al., 2024). Institutional support through extension services, technical training, and farmer cooperatives enhances dissemination of innovations and strengthens adoption capacity (Shaibu & Shaibu, 2025; FMAFS, 2025). Empirical evidence demonstrates that farmers who adopt improved feeding, housing, breeding, disease control, and waste management practices achieve higher growth rates, better reproductive performance, and improved herd health compared with those relying on traditional methods (Enahoro, Bamidele, Akerele, et al., 2026; Nwankwo et al., 2025).

Intensive swine production in Jos South Local Government Area, Plateau State, plays an important role in meeting the growing demand for pork and improving livestock-based livelihoods. Despite its economic potential, many farmers still operate with low levels of modern production practices, particularly in housing, feeding, disease control, and biosecurity. These gaps continue to result in low productivity, higher disease incidence, and reduced farm profitability. Although improved practices such as proper housing, balanced feeding, vaccination, waste management, and biosecurity are known to enhance performance, their level of adoption in the study area remains uncertain. In addition, little is known about the socioeconomic and institutional factors that influence adoption, including education, income, farming experience, access to extension services, and credit availability. Without this understanding, efforts to improve swine production remain poorly targeted. This study therefore examines the determinants of adoption of improved intensive swine production practices in Jos South LGA, with emphasis on adoption level, influencing factors, and existing constraints. The findings are expected to guide effective policy and extension interventions for improved productivity and sustainability in the sector.

Materials and Methods: The study was conducted in Jos South Local Government Area (LGA) of Plateau State, Nigeria, geographically located between latitude 9°30′N to 10°N and longitude 8°30′E of the Greenwich meridian. Jos South LGA is situated in the northwestern part of the state and is headquartered in Bukuru, approximately 15 km from the state capital, Jos. The LGA comprises four districts: Du, Gyel, Kuru, and Vwang, with a population of 650,835 (National Population Commission [NPC], 2006) and a land area of approximately 1,037 km². It shares boundaries with Barkin-Ladi LGA to the south, Ryom LGA to the southwest, Jos-East LGA to the east, and Bassa LGA to the west. The area is characterized by a cold and rocky terrain due to its high altitude of over 1,450 meters above sea level. The coldest period occurs between November and February, with average daily temperatures of 18°C, while warmer periods occur between March and April. Rainfall occurs mainly between May and October, peaking in August, with a mean annual rainfall ranging between 137.75 cm and 146.0 cm. Jos South LGA is semi-urban, with extensive agricultural land and access to water resources from mining ponds suitable for irrigation. The area supports the cultivation of crops such as rice, corn, Irish potatoes, yams, acha, sweet potatoes, cocoyam, tomatoes, peanuts, and assorted vegetables. Intensive swine production is emerging as a key livestock enterprise in the LGA, contributing to household income and food supply.

Sampling Procedure and Sample Size: The study population comprised all intensive swine farmers operating within the four districts of Jos South LGA, namely Gyel, Du, Kuru, and Vwang. A comprehensive list of registered swine farmers was obtained from the Jos South chapter of the Pig Farmers Association of Nigeria, which constituted the sampling frame. A purposive sampling approach was adopted to specifically target farmers engaged in intensive swine production. Preliminary verification of the sampling frame revealed that the total number of registered intensive swine farmers in the study area was ninety (90). Given the relatively small and manageable population size, a census approach was employed, whereby all identified intensive swine farmers were included in the study. This complete enumeration eliminated sampling bias and enhanced the representativeness and reliability of the data. The respondents were subsequently organized according to their respective districts to ensure adequate spatial coverage of intensive swine production activities across the study area.

Data Collection: Primary data were collected using structured questionnaires and oral interviews. Information obtained included: Socio-economic characteristics of the swine farmers (age, gender, education, household size, farm size, and farming experience), Types of improved swine production and management practices adopted (including improved housing, proper feeding and balanced nutrition, adequate water supply, improved breeding practices, regular vaccination, disease prevention and veterinary care, proper sanitation and hygiene, waste management, record keeping, proper weaning practices, use of improved pig breeds, biosecurity measures, proper stocking density, and use of modern feeding equipment), Access to extension and advisory services and participation in training programs and Constraints to the adoption of improved swine production and management practices

Methods of Data Analysis: Descriptive statistics such as frequencies, percentages, and mean were used to analyze the socio-economic characteristics of the respondents, examine the level of awareness of improved swine production and management practices, and identify the constraints to adoption of these practices in the study area. A five-point

Likert rating scale was used to examine the level of adoption of improved swine production and management practices, while logit regression was employed to determine the factors influencing adoption of improved practices among intensive swine farmers in Jos South Local Government Area.

Likert Scale: The level of adoption of improved swine production and management practices was measured using a five-point Likert scale. Adoption scores were calculated using the categories: Highly Adopted (HA), Adopted (A), Neutral (N), Rarely Adopted (RA), and Never Adopted (NA), weighted as 5, 4, 3, 2, and 1, respectively. Based on this five-point scale, a mid-point of 3.0 was established (i.e., (5+4+3+2+1)/5 = 3.0). Respondents with a mean score of 3.0 or higher for a given practice were considered as having adopted the practice, while scores below 3.0 were classified as non-adoption. Highly Adopted and Adopted responses were treated as positive adoption, whereas Neutral, Rarely Adopted, and Never Adopted were treated as non-adoption.

Logit Model Specification: To examine the factors influencing adoption of improved swine production and management practices, the study employed logit regression. The dependent variable is a binary outcome representing adoption:

$Y = 1$ if the farmer adopts the improved production and management practices (mean Likert score ≥ 3.0)

$Y = 0$ if the farmer does not adopt the practices (mean Likert score < 3.0)

The logit regression model is specified as:

$Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + - - - - - \beta n Xn$

Where Y = Level of adoption (1= adopted, 0 = not adopted)

βo = Intercept

$\beta_1 - - - - n$ = estimated parameters

$X_1 - - - - n$ = set of independent variables

X_1 = Age of the farmers (years)

X_2 = Educational status (years spent in school)

X_3 = Farming experience (years)

X_4 = Farm size (number of birds)

X_5 = Household size (number of persons in the household)

X_6 = Awareness of improved practices

X_7 = Access to credit (1 if yes, 0 if otherwise)

X_8 = Annual income (N)

X_9 = Extension contact (number of visit)

Results and Discussion: Socio-economic Characteristics of Swine Farmers

The demographic profile of the respondents is presented in Table 1. The age distribution shows that swine farming is mainly practiced by middle-aged individuals, with most respondents aged 41–50 years (44%) and 31–40 years (30%). The mean age of 42 years indicates that production is dominated by mature farmers who likely have adequate experience and capacity to manage intensive systems, as well as the potential to adopt improved practices. This pattern is consistent with findings by Akinbobola et al. (2025), which also reported a predominance of middle-aged farmers and low participation of younger individuals, possibly due to the labour-intensive nature of swine production. Male farmers constituted 68% of respondents, while females accounted for 32%. This indicates a male dominance in swine production, which is consistent with findings by Akinbobola et al. (2025) who reported that males accounted for approximately two-thirds of respondents in the Federal Capital Territory, highlighting a male predominance in ownership and managerial roles within pig enterprises. Most respondents were married (74%), indicating that swine farming is largely carried out by individuals with family responsibilities. This often allows farmers to rely on household labour, which can reduce costs and improve farm management. Studies such as Olorunfemi, Saliu and Adejo (2023) also show that marital status influences livestock production through its effect on labour availability and long term investment decisions. Most respondents (52%) had household sizes of 6–10 persons, with an average of about seven, indicating adequate family labour for routine farm activities and reduced dependence on hired labour. Smaller households accounted for 39%, while only 9% had more than 10 members. This suggests that moderate household sizes provide a balance between labour availability and efficient farm management, a pattern also observed by Nwankwo et al. (2025).

Education levels among respondents were relatively high, with 47% attaining tertiary education and 42% secondary education, while only 11% had primary education. This relatively high level of literacy is essential for understanding and implementing improved swine management practices such as feed formulation, vaccination schedules, hygiene control, and farm record keeping. Empirical evidence from recent studies shows that education significantly enhances farmers' ability to access information, interpret extension messages, and adopt improved agricultural technologies. Education is a key factor influencing adoption of improved agricultural practices, as it enhances farmers' ability to process information, make informed decisions, and access extension services. The relatively high educational attainment among respondents indicates a supportive environment for adopting improved swine production practices (Fidelugwuowo & Omekwu, 2023; Sani & Abdulmumini, 2024). Most farmers have substantial swine farming experience, with a mean of nine years, indicating considerable practical knowledge. Such experience enhances managerial skills, problem-solving, and risk management, enabling farmers to effectively evaluate and adopt new technologies. This aligns with evidence showing

that experience positively influences efficiency, profitability, and technology adoption in Nigerian pig production (Hamzat et al., 2025; Bello et al., 2025). Most respondents operated small- to medium-scale pig farms, with a mean herd size of 21 pigs. Herd size influences productivity and adoption, as larger herds enable economies of scale, better resource use, and greater capacity to invest in improved housing, feed, and veterinary care. Recent studies show that larger herd sizes are positively linked to farm efficiency, income, and likelihood of adopting improved technologies (Hamzat et al., 2025; Fidelugwuowo & Omekwu, 2023).

Respondents had a mean annual income of ₦2,760,000, with most earning between ₦2,500,001 and ₦3,000,000. Higher income enhances the ability to invest in improved feed, housing, disease control, and veterinary care, facilitating adoption of modern swine production practices. Studies show that financial capacity is a key determinant of technology adoption, and limited resources remain a major constraint in livestock production (Fidelugwuowo & Omekwu, 2023; Enahoro et al., 2026). Only 26% of respondents had access to extension services, indicating a significant gap in formal agricultural support. Limited extension contact may hinder awareness and adoption of best practices, especially among less experienced farmers. This aligns with Fidelugwuowo and Omekwu (2023), who noted that lack of extension support can constrain adoption of modern livestock management practices. Membership in farmers' associations was relatively high (59%), suggesting that social networks may serve as alternative channels for information sharing, peer learning, and technical support. Associations can enhance adoption by facilitating group-based training, collective purchase of inputs, and exchange of experiences (Teran et al., 2025).

Awareness of Improved Swine Production and Management Practices: The findings indicate that farmers generally exhibit a high level of awareness of improved swine production and management practices, although variations exist across specific components. Awareness was particularly high for core husbandry practices such as provision of clean water, disease prevention and veterinary care, proper feeding and balanced nutrition, vaccination, sanitation, and improved housing systems. This pattern is consistent with observations that livestock farmers tend to prioritize practices directly related to animal survival and productivity, especially those with immediate and visible outcomes (Akinbobola, Kumuyi, Olusoji, Dare, Jolayemi, & Omeje, 2025). Studies have shown that farmers' knowledge of health management practices, including disease control and antibiotic use, is relatively high because of the direct economic implications of animal mortality and morbidity (Akinbobola et al., 2025).

Moderate levels of awareness were observed for improved pig breeds, waste management, and biosecurity measures. This aligns with findings that although farmers may recognize improved technologies, adoption and full understanding are often constrained by limited extension services, cost implications, and inadequate technical knowledge (Fidelugwuowo & Omekwu, 2023). Similarly, biosecurity practices are frequently less emphasized among smallholder livestock farmers despite their importance in preventing disease outbreaks, particularly African swine fever, which has been linked to poor farm preparedness and weak biosecurity systems (Okojie et al., 2023). Awareness was lowest for record keeping, suggesting a gap in managerial capacity. This is in agreement with previous studies which indicate that farm management practices such as record keeping are often neglected by smallholder farmers due to low educational levels and lack of training, even though they are critical for monitoring productivity and making informed decisions (Fidelugwuowo & Omekwu, 2023). Poor record-keeping practices have been associated with reduced efficiency and limited ability to evaluate farm performance over time. Overall, the results suggest that while farmers demonstrate strong awareness of basic production and health-related practices, comparatively less attention is given to managerial and preventive practices such as biosecurity and record keeping. This pattern reflects a broader trend in livestock systems where immediate production needs tend to outweigh long-term management and disease prevention strategies (Akinbobola et al., 2025).

Level of Adoption of Improved Swine Production and Management Practices: The results in Table 3 indicate varying levels of adoption of improved swine production and management practices among intensive pig farmers in Jos South LGA. Adoption was assessed using a five-point Likert scale, and the weighted mean scores reflect the extent to which each practice has been embraced. Adequate water supply recorded the highest mean score (3.7), indicating widespread adoption. Water is essential for livestock productivity, supporting digestion, thermoregulation, and overall physiological functions. The high adoption rate suggests that farmers recognize its direct impact on performance. This finding is consistent with FAO reports, which emphasize that continuous water provision is fundamental to animal welfare and productivity (FAO, 2024; Schlink et al., 2010). Its relatively low cost and ease of provision further explain its high adoption. Proper feeding and balanced nutrition (mean = 3.2) were also widely adopted. Feeding directly influences growth rate, feed efficiency, and reproductive performance. The high adoption level may be linked to the immediate and visible benefits of improved feeding practices. Similar findings have been reported in Nigeria, where feeding management is a key production decision, particularly in response to rising feed costs (Ojo et al., 2025). Regular vaccination (mean = 3.2) reflects increasing awareness of disease prevention among farmers. Vaccination reduces mortality and economic losses associated with infectious diseases. This aligns with recent studies showing that Nigerian pig farmers actively adopt preventive health measures, although sometimes without adequate veterinary supervision (Akinbobola et al., 2025). Proper sanitation and hygiene (mean = 3.1) were moderately adopted. Good hygiene reduces pathogen load and disease transmission; however, it

requires consistent labour and management effort, which may limit full adoption. Previous studies have similarly noted that hygiene practices are adopted when farmers understand their role in disease control (Akinbobola et al., 2025).

The use of improved breeds (mean = 3.0) was moderately adopted. While improved breeds enhance productivity, adoption is constrained by high costs and limited access to quality breeding stock. This finding agrees with evidence that many Nigerian farmers still rely on local or crossbreeds, combining them with exotic breeds to improve performance (Akinbobola et al., 2025). Improved housing systems and waste management (mean = 2.9 each) showed relatively lower adoption. Both practices require financial investment and infrastructure, which may not be readily available to farmers. Studies on pig production economics in Nigeria identify limited capital as a major constraint to adopting improved housing systems (Hamzat et al., 2025). Similarly, waste management is often deprioritized despite its importance for environmental hygiene (FAO, 2024). Biosecurity measures recorded a mean score of 2.8, indicating low adoption. Biosecurity is essential for preventing diseases such as African swine fever; however, its adoption is often limited by inadequate knowledge and training. Studies confirm that many pig farms in Nigeria remain poorly prepared for disease outbreaks due to weak biosecurity practices (Acta Tropica, 2023; FAO, 2025). Record keeping had the lowest adoption level (mean = 2.5). Although it is critical for monitoring productivity and decision-making, many farmers rely on informal systems. Similar observations have been reported in Nigeria, where limited record-keeping practices reduce farm efficiency and management effectiveness (Hamzat et al., 2025).

Factors Influencing Adoption of Improved Swine Production and Management Practices: The logit regression analysis in Table 4 examined the factors influencing the adoption of improved swine production and management practices among farmers in Jos South Local Government Area of Plateau State. The logit regression reveals that several socio-economic and institutional factors significantly influence the adoption of improved swine production and management practices among farmers in Jos South Local Government Area of Plateau State. The likelihood ratio Chi-square value of 30.17 indicates that the model is statistically significant, confirming that the explanatory variables jointly explain variations in adoption behaviour. The pseudo R^2 value of 0.1654 suggests that approximately 16.5 percent of the variation in adoption decisions is explained by the included variables. Although moderate, this level of explanatory power is consistent with adoption studies, where behavioural outcomes are influenced by multiple interacting factors (Fidelugwuowo & Omekwu, 2023).

Educational status showed a positive and significant effect on adoption ($p < 0.10$), indicating that more educated farmers are more likely to adopt improved practices. Education enhances farmers' capacity to process technical information, understand innovations, and respond effectively to extension services. This aligns with the findings of Olorunfemi, Saliu, and Adejo (2023), who reported that education significantly improves adoption of livestock technologies by increasing farmers' access to information and decision-making capacity.

Farming experience was also positively related to adoption ($p < 0.10$), suggesting that experienced farmers are more inclined to adopt improved practices. Experience contributes to accumulated knowledge and risk management skills, enabling farmers to recognize the benefits of improved production methods. Similar evidence has been reported in livestock systems where experience enhances adoption of improved technologies (Olorunfemi et al., 2023).

Farm size exhibited a positive and statistically significant relationship with adoption ($p < 0.05$). Farmers managing larger herds are more likely to adopt improved practices due to the need for efficiency and productivity. Larger-scale farmers often have better financial capacity and stronger incentives to invest in improved feeding, housing, and health management systems. This observation is consistent with empirical findings showing that herd size significantly influences adoption decisions in livestock production (Hamzat, Taiwo, Ogunleye, Yusuf, & Ibhonitie, 2025). Household size, however, had a negative and significant effect on adoption ($p < 0.10$). While larger households may provide labour, they can also impose greater financial demands, thereby limiting resources available for investment in improved practices. Similar patterns have been observed in agricultural adoption studies where large household size may reduce per capita income and constrain adoption (Bello, Jibia, Timothy, & Ibrahim, 2025).

Awareness of improved practices emerged as the most influential factor, with a strong positive effect ($p < 0.01$). This highlights the critical role of information dissemination, extension services, and training programs in promoting adoption. Farmers who are aware of improved technologies are more likely to understand their benefits and implement them. This finding is consistent with evidence that awareness and access to information are key drivers of adoption in livestock production systems (Akinbobola, Kumuyi, Olusoji, Dare, Jolayemi, & Omeje, 2025).

Annual income also had a positive and significant influence on adoption ($p < 0.05$), indicating that financially capable farmers are more likely to adopt improved practices. Higher income enhances the ability to invest in quality inputs such as improved breeds, feed, housing, and veterinary services. This supports broader evidence that access to financial resources is a major determinant of technology adoption in agriculture (Adesida, Nkomoki, Bavorova, & Madaki, 2021).

Constraints to Adoption of Improved Swine Production and Management Practices: The results in Table 5 present the major constraints faced by swine farmers in adopting improved swine production and management practices in Jos South Local Government Area of Plateau State. Since multiple responses were allowed, the percentages represent the proportion of farmers who reported each constraint. The

findings show that the high cost of feed and other production inputs was the most prominent constraint, reported by 80% of the respondents. Feed constitutes the largest component of the cost of pig production, and the rising prices of feed ingredients make it difficult for farmers to maintain balanced nutrition for their pigs. As a result, many farmers may be discouraged from adopting improved feeding practices that require quality feed formulations. This finding supports the observation that high input costs remain a major barrier to improved livestock production among smallholder farmers. Another major constraint identified was the lack of access to credit facilities, reported by 72% of the respondents. Access to credit is essential for farmers who need financial resources to invest in improved technologies such as better housing systems, veterinary care, and improved breeds. However, many farmers face difficulties in obtaining loans due to stringent collateral requirements, high interest rates, or limited presence of financial institutions in rural areas. Without adequate financial support, farmers may find it difficult to adopt improved swine production practices.

The study also revealed that inadequate extension services constituted a significant constraint, as indicated by 64% of the respondents. Extension services play a vital role in disseminating information, providing technical guidance, and training farmers on improved management practices. Limited contact with extension agents reduces farmers' exposure to modern production techniques and innovations, thereby slowing the rate of adoption. Closely related to this is poor awareness and technical knowledge, which was reported by 60% of the farmers. Even when improved technologies exist, farmers may not adopt them if they lack adequate knowledge about their benefits or the skills required for proper implementation. Training and capacity-building programs are therefore essential for improving farmers' understanding of modern swine production practices. The high cost of improved pig breeds was another important constraint reported by 56% of the respondents. Improved breeds generally offer better growth performance, higher feed conversion efficiency, and improved reproductive capacity compared with local breeds. However, their relatively high purchase cost may discourage farmers from acquiring them, particularly when financial resources are limited.

Furthermore, disease outbreaks and inadequate veterinary services were identified by 52% of the farmers as a constraint to adoption. Frequent disease outbreaks can lead to high mortality rates and economic losses, discouraging farmers from expanding their production or investing in improved management practices. Limited access to veterinary professionals and drugs may further worsen this problem. Labour shortage was also reported by 46% of the respondents. Some improved swine management practices such as proper sanitation, waste management, and regular feeding schedules require consistent labour input. Farmers who lack sufficient household or hired labour may therefore find it difficult to implement these practices effectively. Other constraints identified include poor market access (40%) and poor infrastructure such as roads and transportation (37%). These challenges affect farmers' ability to transport pigs to markets and obtain production inputs efficiently. When market opportunities are uncertain or transportation costs are high, farmers may be less motivated to invest in improved production practices. Lastly, cultural preference for traditional practices was reported by 31% of the respondents. Some farmers may continue to rely on traditional production methods that they are familiar with rather than adopting new technologies. Such attitudes may slow down the diffusion of improved swine management practices within the farming community.

Conclusion: The study assessed the adoption of improved swine production and management practices among farmers in Jos South Local Government Area of Plateau State. The results indicate that the farmers are largely middle-aged, with moderate farming experience and a reasonable level of education. Findings show that awareness of improved practices was generally high, especially in areas such as feeding, water provision, disease control, and sanitation. However, this high level of awareness did not consistently translate into adoption. Practices that offer immediate and observable benefits, including adequate feeding, water supply, and vaccination, were widely adopted, whereas practices such as record keeping, biosecurity, and waste management recorded lower levels of uptake. The regression analysis revealed that education, farming experience, farm size, awareness level, household size, and income significantly influenced the adoption of improved practices. In particular, farmers with higher levels of education, greater experience, larger herd sizes, and higher income were more likely to adopt improved management practices. Despite the observed adoption levels, farmers faced notable constraints, including the high cost of inputs, limited access to credit, inadequate extension services, and insufficient technical knowledge, which collectively hindered the effective adoption of improved swine production technologies.

Recommendations: Based on the findings of the study, the following recommendations are proposed: Extension and veterinary services should be strengthened to improve farmers' access to technical knowledge, disease control, and overall productivity in swine production.**;** Accessible and affordable credit facilities should be provided through government and financial institutions to enable farmers invest in improved inputs such as quality feed, breeds, and housing systems.**;** Regular training and capacity-building programmes should be organized to enhance farmers' skills in areas such as record keeping, biosecurity, and efficient farm management.**;** Efforts should be made to reduce the high cost of production inputs through subsidy programmes and the promotion of cooperative societies to facilitate bulk purchasing, access to credit, and better market opportunities.

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Table 1. Distribution of Swine Farmers According to Socio-economic Characteristics (n = 90)

Characteristics	Frequency	Percentage (%)	Mean	
Age (years)				
20–30	9	10.0	42	
31–40	27	30.0		
41–50	40	44.0		
>50	14	16.0		
Gender				
Male	61	68.0		
Female	29	32.0		
Marital Status				
Married	67	74.0		
Single	23	26.0		
Household Size (persons)				
1–5	35	39.0	7	
6–10	47	52.0		
>10	8	9.0		
Highest Educational Status				
Primary	10	11.0		
Secondary	38	42.0		
Tertiary	42	47.0		
Farming Experience (years)				
1–5	13	15.0		
6–10	53	59.0		
>10	24	26.0	9	
Herd Size (pigs)				
1–10	13	14.0		
11–20	27	30.0		
21–30	35	39.0		
>30	15	17.0	21	
Annual Income from Swine Production (₦)				
500,000 – 1,000,000	4	4.0		
1,000,001 – 1,500,000	9	10.0		
1,500,001 – 2,000,000	13	14.0		
2,000,001 – 2,500,000	17	19.0		

2,500,001 – 3,000,000	19	21.0	
3,000,001 – 3,500,000	14	16.0	
3,500,001 – 4,000,000	9	10.0	
Above 4,000,000	5	6.0	2,760,000
Access to Extension Services			
Yes	23	26.0	
No	67	74.0	
Membership of Farmers' Association			
Yes	53	59.0	
No	37	41.0	

Source: Field Survey, 2026

Table 2. Awareness of Improved Swine Production and Management Practices among Intensive Swine Farmers (n = 90)

Improved Practice		**Aware**		**Percentage (%)**
Improved housing system		75		83.3
Proper feeding & balanced nutrition	80		88.9	
Adequate water supply	85		94.4	
Regular vaccination		78		86.7
Disease prevention & veterinary care	82		91.1	
Proper sanitation & hygiene		76		84.4
Waste management		68		75.6
Record keeping		60		66.7
Use of improved pig breeds		72		80.0
Biosecurity measures		67		74.4

Source: Field Survey, 2026

Table 3: Level of Adoption of Improved Swine Production and Management Practices among Intensive Swine Farmers (n = 90)

Swine Production Practice		**FA (5)**	**A (4)**	**U (3)**	**RA (2)**	**NA (1)**	**Sum**	**Mean**
Improved housing system		55	100	30	72	8	265	2.9
Proper feeding & balanced nutrition	90	128	24	40	12	394	3.2*	
Adequate water supply	150	140	15	20	10	335	3.7*	
Regular vaccination		100	112	30	30	17	289	3.2*
Proper sanitation & hygiene		90	112	36	30	17	285	3.1*
Waste management		75	89	45	40	20	269	2.9
Record keeping		50	60	45	50	25	230	2.5
Use of improved pig breeds		90	88	36	36	20	270	3.0*
Biosecurity measures		75	80	45	40	20	260	2.8

FA = Fully Adopted, A = Adopted, U = Undecided, RA = Rarely Adopted, NA = Not Adopted
Mean = Weighted average of adoption scores

Table 4: Logit Regression of Factors Influencing Adoption of Improved Swine Production and Management Practices (n = 90)

Variable	**Coefficient**	**Std. Error**	**Z**	**P-value**
Constant	16.8951	6.6256	2.55	0.011
Age (X_1)	-0.0010	0.2860	-0.00	0.998
Educational status (X_2)	0.0958	0.0562	1.70	0.088*
Farming experience (X_3)	3.6930	2.1080	1.75	0.080*
Farm size (X_4)	1.3970	0.6420	2.18	0.029**
Household size (X_5)	-0.0538	0.0283	-1.90	0.057*
Awareness of improved practices (X_6)2.0490	0.6040	3.39		0.001***
Access to credit (X_7)	0.0107	0.5669	0.02	0.985
Annual income (X_8)	1.2086	0.5732	2.11	0.035**
Extension contact (X_9)	3.6509	2.3657	1.54	0.123
Number of observations = 90				
LR Chi^2 = 30.17				
Log likelihood = −76.0870				
Pseudo R^2 = 0.1654				

Note: *, Significant at 10%, **, Significant at 5%, ***, Significant at 1

Table 5: Constraints to Adoption of Improved Swine Production and Management Practices

Constraints	**Frequency**	**Percentage (%)**
High cost of feed and other production inputs	72	80.0
Lack of access to credit facilities	65	72.0
Inadequate extension services	58	64.0
Poor awareness and technical knowledge	54	60.0
High cost of improved pig breeds	50	56.0
Disease outbreaks/inadequate veterinary services	47	52.0

Labour shortage	41	46.0
Poor market access	36	40.0
Poor infrastructure (roads, transport)	33	37.0
Cultural preference for traditional practices	28	31.0

Source: Field survey, 2026
*Multiple responses allowed