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## PRODUCTION SYSTEM AND MANAGEMENT PRACTICES OF INDIGENOUS PIGS IN SOME SELECTED COMMUNITIES OF SOUTHERN KADUNA

BY

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### ABSTRACT

The study was conducted to determine indigenous pig production characteristics and management practices in the Southern Kaduna State of Nigeria. One hundred (100) structured questionnaire were administered across the study area to obtain data on reproductive performance, the system of production, the housing system, sources of feed at the varying seasons, prevalent diseases, and major challenges/constraints in pig farming. Data collected were analyzed using simple statistics (percentages) of the SPSS software version 23. The results obtained indicated that the majority (46 %) of the respondents acquired their parents' stock from the market. There was very low awareness of the use of commercial feeds as a result, household waste and brewers' residue were the major sources of animal feed in the dry season while brewers' residue and cut grasses were the major sources of feed in the wet season. Diarrhea and ecto-parasite infestation in the dry season, as well as pneumonia and endo-parasite in the wet season, were the major disease challenges. Semi-intensive (63 %) was the most practiced system of management. The pig producers were confronted with the major challenge of keeping records and monitoring feed quality. 62 % of the pig farmers were faced with the problem of insufficient capital. However, 97 % of the respondents gain economically from pig production. From the findings of this research, it was concluded that, with the higher animal productivity at the farmer's level, if necessary government intervention is given to the pig farmers it could enhance farmer's income and improve their living standards thereby increasing the availability of animal protein and possibly foreign exchange earnings for the country.

**Keywords:** Indigenous pig, System, Management, Practices, Communities, Southern Kaduna

### INTRODUCTION

The continuous growth in populace in Nigeria has a brilliant influence in the demand for animal protein through the years and this has prompted the supply of meat to be in low demand. The main sources of animal protein in Nigeria are beef, hen, goats, fish and recreation animals (Ajala, *et al.*, 2007). Pig manufacturing and control play an essential function in meals security, remedy of poverty, introduction of employment in Nigeria (Adebisi, 2008). Environmental restrictions due to the growing human populace, urbanization, and land use pressure have compelled most groups in Southern part of Kaduna to begin to adopt intensive and semi-intensive systems of livestock manufacturing instead of the sizable machine of control that is the conventional manner. In the intensive management system, small-scale manufacturers with a unit of approximately 50 pigs provide feed, housing

and veterinary services for the pigs. The nature of the housing is often concrete (Holmes, 1991). In the considerable (unfastened-range or traditional) management device, pigs are left without housing to scavenge on home or agricultural waste inside and outdoor the compound, without feed supplementation or veterinary care (Njoku, 1997). Social factors which have militated towards pig manufacturing in Nigeria include the notion through the overall population that pigs are dirty and represent a health hazard. It is incredibly easy to establish extensive pig production in a growing country like Nigeria if capital are available and adequate feed materials are assured (Ogunniyi and Omoteso, 2011). The indigenous pigs have been recommended as an amazing alternative supply of affordable, appropriate quality animal protein that suits intensifying human populace. Their value of manufacturing is in reality low with a rapid boom charge. They also have quick technology interval, excessive

production potential, high prolificacy and high carcass yield. Efforts were directed therefore closer to enhancing their productivity via adequate nutrition (Ladokun *et al.*, 2006), progressed fitness and control, breed improvement especially through move-breeding with superior individual breeds. The pig isn't always handiest a supply of animal protein, it also serves as a funding alternative and source of additional profits in particular within the rural regions. In the southern part of Kaduna, pig farming is stored in business quantities due to the fact there aren't any ethnic or spiritual taboos forbidding its production. Improvement production and management level of pigs as well as nicely as satisfactory and amount of pig herds will cross a long manner in assembly the nutritional requirement of Nigerians. This could also reduce down extensively at the big bill, due to the importation of animals and animal products. Such development will bridge the space among animal protein manufacturing and consumption with an attendant gain of expanded rural employment and profits.

Despite the general awareness on how profitable the low average productivity of indigenous pigs, and that indigenous breed of pig are more adaptable to environmental condition, not much attention has been focused on the management practices, the major constraints affecting pig production and the major challenges of the farmers. This study therefore, was to investigate the production system and management practices of pigs in some selected communities of Southern Kaduna.

## MATERIALS AND METHODS

### Location of the Study

The study was carried out at Southern part of Kaduna State, Nigeria. The study area is predominantly a Christian dominated area where pig production and consumption is not prohibited. The study area comprised of nine local governments: Jaba, Jema'a, Kachia, Kajuru, Kaura, Kuru, Lere, Sanga and Zongon Kataf. The area is located between latitude 09° and 11°N and longitude 06° and 09° E. the area has an estimated population of 4,564,100 people. The main annual temperature varies between 24°C and 28°C. The vegetation consists of Northern Guinea savannah in the North and the Southern Guinea savannah in the South. The length of rainfall varies from 150 days in the north and 190 days in the southern part. The annual rainfall varies from 1107mm in the north to 1286mm in the south. Relative humidity is low ranging between 60 and 80 % in July. The soil pH (level of acidity/alkalinity) ranges from 5.5 and 6.5 characterize the soil which may be generally described as sandy-loam soil. The location was purposively chosen for the study because major economic activity of the inhabitants is farming, pig production and trading. The areas are also a known potential pig markets in the State

### Sample Size and Sampling Procedure

The total of one hundred (100) pig farmers were randomly selected from five randomly selected LGAs in the Southern Kaduna Agricultural zone and used for the experiment. 20 pig farmers were randomly selected from each of the five LGAs and were used to assess production and management practices.

One hundred structured questionnaire were used to obtain data according to LGAs.

### Data Collection

Data were collected on general information of the pig farmers and the production/management practices on their farm as contained in the questionnaire.

### Statistical Analysis

Data collected were subjected to descriptive statistics procedure in Statistical Package for Social Sciences (SPSS version 23, 2015) was used to analyse the data.

## RESULTS AND DISCUSSION

**Table 1: Demographic characteristics of pig farmers (n=100) in Kaduna South Agricultural zone**

Demographic Characteristics	Frequency	Percentage (%)
<b>Age</b>		
<30	9	9.0
30-40	24	24.0
41-50	23	23.0
51-60	30	30.0
>60	14	14.0
<b>Sex</b>		
Male	31	31.0
Female	69	69.0
<b>Occupation</b>		
Farmer	38	38.0
Civil servant	24	24.0
Livestock trader	6	6.0
Others	32	32.0
<b>Marital status</b>		
Married	63	63.0
Divorce	-	-
Single	11	11.0
Widow/widower	26	26.0
<b>Household Size</b>		
1-5	38	38.0
6-10	41	41.0
11-15	19	19.0
16-20	2	2.0
>20	-	-
<b>Level of Education</b>		
No education	9	9.0
Primary education	21	21.0
Secondary education	39	39.0
OND	13	13.0
HND	6	6.0
BSc.	11	11.0

MSc.	1	1.0
PhD	-	-

n: Number of respondents, OND: Ordinary National Diploma, HND: Higher National Diploma, BSc: Bachelor of Science, MSc: Master of Science, PhD: Doctor of Philosophy

Demographic characteristics of pig farmers in Kaduna South Agricultural Zone is presented in Table 1. Majority (30 %) of the respondents were within 51 to 60 years old followed by 30 to 40 years age group. Meanwhile, only 9 % of the respondents were less 30 years of age. Females constituted 69 % of the respondents as against males' 31 %. Of this sex groups, 63 % were married, 11 % were single and 26 % were widow/widowers. Out of the respondents, none was divorced. On occupation, the result revealed that 38 % of the respondents were pig farmers, 24 % civil servant while livestock traders constituted only 6 %. Household size enquiry revealed that, 41 % of the respondents had between 6 and 10 household members. This was followed by 1 to 5 family size which constituted 38 % while only 2 % had between 16 and 20 family members. On level of education, secondary school certificate holder constituted the highest 39 %, followed by primary school 21 %. 13 % had OND; 6 % had HND; 11% were first degree holders and 1 % was a Master's degree holder. Those without formal education were 9 % and none of the respondents was a PhD holder.

The highest frequency of pig farmers is recorded for those between 51 and 60 years old. This could be as a result of them preparing for their retirement, especially those of them who work with the government, to have something to fall back on. Farmers of age 30 and below were recorded to be with the lowest value. Reason to this is very close to the fact that most of the age group could still be in school, having the time to practice swine production may be minimal. This agrees with the findings by Abiyong *et al.* (2019) who reported that ages 40-60 are the majority of the pig producers. However, these results disagree with the report of Ajala *et al.* (2007) who reported that the mean age of respondents involved in pig farming was 38 years.

**Table 2: Breeds, livestock holding of farmer, average litter size, purpose of keeping pigs, and System of pig production (n=100) in Kaduna South Agricultural zone**

Parameters	Frequency	Percentage (%)
<b>Breed of pigs</b>		
Indigenous breed	96	96.0
Cross breed	3	3.0
Exotic breed	1	1.0
<b>Livestock holding of pig farmer</b>		
1-3	22	22.0
4-6	43	43.0
7-9	20	20.0
10-12	6	6.0

>12	9	9.0
<b>Average litter size</b>		
1-10	73	73.0
11-20	25	25.0
21-30	2	2.0
31-40	-	-
41-50	-	-
<b>Purpose of keeping pigs</b>		
Personal consumption	2	2.0
Commercial purpose	97	97.0
Bristles production	1	1.0
<b>System of pig production</b>		
Intensive	33	33.0
Semi-intensive	63	63.0
Extensive	4	4.0

n: Number of respondents

Table 2 reveals information on breeds of pigs, herd size and average litter size. 96 % of the respondents reared the indigenous breed of pig. 3 % raise crossbred pigs and only 1 % rears exotic breed of pigs. Of these pig farmers, 43 % of them kept between 4 to 6 pigs, 22 % of the farmers possessed pigs between one and three; 20 % possessed between 7 and 9; 6 % possessed between 10, and 12; and 9 % possessed more than 12 pigs on their farms. The result on average litter size revealed that 73 % of the farmers had between 1 and 10 as average litter size, 25 % had between 11 and 20 and 2 % had between 21 and 30. Out of the correspondents, none had recorded 31 and 50 average litter size on their farms. The purpose of keeping these pigs were strictly commercial constituting 97 % with most of the animals kept under semi-intensive system.

In the case of gender of the farmers, it was recorded that 69 % of the farmers were females. This revealed that pig production is women business in the southern part of Kaduna. Most of the women were crop farmers, so they have pigs to take care after they must have finished working on their farms. This result agrees with Adekanye (1998) who reported that women play a dominant role in agricultural production and processing activities of developing countries, including Nigeria. This further suggests that females who are often at home, cleaning, watering and feeding pigs for their husbands have gone into full ownership. This may increase productivity and subsequently profit. This result agrees with findings of Duniya *et al.* (2013) who reported that pig production was dominated by females. Similarly, Ogunniyi and Omoteso (2011); Osondu *et al.* (2014); Irekhore *et al.* (2016) who reported that pig production was dominated by males.

63 % percent of the pig farmers were married as similarly reported by Ogunniyi and Omoteso (2011) that the majority of the adult respondents were married. Married people in society are perceived as more responsible when it comes to management issues than their single counterparts.

**Table 3: Housing system, source of parent stock and source of animal feed in the dry and wet season. (n=100)**

Parameters	Frequency	Percentage (%)
<b>Housing system of pig</b>		
Mud	47	47.0
Concrete	47	47.0
Wood	5	5.0
Metal	1	1.0
<b>Source of parent stock</b>		
Market	46	46.0
Inherited	15	15.0
Bred	4	4.0
Neighbours	30	30.0
Government farm	-	-
Borrowed	5	5.0
Others	-	-
<b>Source of Animal Feed (Dry Season)</b>		
Household waste	40	40.0
Brewer's residue (plant waste)	34	34.0
Cut grasses	1	1.0
Commercial feed	5	5.0
Animals fend for self	20	20.0
Don't know	-	-
<b>Source of Animal Feed (Wet Season)</b>		
Household waste	21	21.0
Brewer's residue (plant wastes)	45	45.0
Cut grasses	29	29.0
Commercial feed	4	4.0
Animal fend self	-	-
Don't know	-	-

n: Number of respondents

Mud and concrete housing systems are presented in Table 3. It constituted 47 % each with only 5 and 1 % respectively for wood and metal housing system. The sources of parent stock

were mostly from market 46 % followed by neighbour 30 %. During dry season, 40 % of the respondent utilized household waste as sources of feed for their pigs while 34 % uses brewers extracts. Only 5 % of respondent use commercial feed. However, during wet season, brewers extract followed by grass cutting constituted the major sources of feed with values of 45 and 29 %, respectively.

The household size (6-10) of pig producers recorded the highest frequency with 41 percent, which is in agreement with Ogunniyi and Omoteso (2011), Umar *et al.* (2015) and Abah *et al.* (2016). These authors reported that large household sizes may translate to higher usage of family labour. This implies that the pig producers may not spend more resources to hire labour as family labour will be readily available, on the other hand, it may increase feeding, educational funding, and other activities that would compete for household resources.

Most (91 %) of the respondent have attended formal education out of which secondary school holder accounted for 39 percent. This finding agrees with Abiyong *et al.* (2019) who reported that majority of the pig farmers has formal education. For the purpose of adopting new technologies, education is an important factor which if lacking can impact adversely on future swine production improvement (Ogunniyi and Omoteso, 2011; Irokhore *et al.*, 2015).

Majority (99 %) of the respondents in the surveyed area raised indigenous breed of pigs keeping 4 to 6 pigs. This strongly agreed with report of Ironkwe and Amefule (2008) who reported that, almost all the pig farmers are small scale farmers. This confirms an earlier report by Pathiraja *et al.* (1986) that pig farming in Southern North Savannah region is primarily a small holder business. This shows that pig production in the surveyed area is also an employment opportunity, as people live by it.

In reducing the cost of feeding, a semi-intensive system of production was mostly practiced. Some farmers practiced the extensive system while very few respondents (10 %) practice the intensive system of management. Rekwot *et al.* (2003) noted that under the intensive system, pigs are under better conditions like good nutrition and management. Pigs under semi- intensive system, because apart from the fact that they scavenge greatly during the day, they are supplemented by their owners. Hence, they tend to have better nutrition and body condition than pigs under the extensive system (Tegbe *et al.*, 1996). Pig production in the study area is bedeviled by so many problems, ranging from diseases, unavailability of improved stocks, high cost of pigs and scarcity of nutritionally adequate feeds capable of supporting good pig growth.

In caring for pigs in the surveyed area, mud and concrete forms of housing are best employed. Only one farm employed metal in building animal houses. This is as a result of how expensive metal is. Mud and concrete is cheaper and these farmers could even erect the buildings themselves and also because of its durability and high level of hygiene (Ironkwe and Amefule, 2008).

In procuring pigs, most of them buy from the market. This is because there are always market days in the surveyed area and



they could be quite cheap and some buy from their neighbours'. This is done mostly when they know the history of a particular herd. This agrees with Ironkwe and Amefule (2008). Their work shows that about 85% of the respondents acquired their foundation stock from the open market, while others got theirs from neighbours' herd, it was generally observed that the best breeding stock rarely goes to the market, resulting in the use of foundation stock with poor breeding qualities. The result also shows that non- utilization of improved breeds from government farms due to unavailability of such, increase use of own stock and that of neighbours, which give rise to inbreeding and consequently low productivity (Olomu *et al.*, 1995).

Most herd owners, however, did not keep breeding boars for breeding, cash payments are often made for this service or a promise of one to two piglet after farrow.

Nutrition is very important in animal production, during the dry season, most of the farmers feed with household waste unlike the wet season they feed with brewers' residue. Commercial feed is not used maximally, during dry and wet seasons. Commercial feed is expensive. This may be the reason why it is not mostly used. Household and local brewers' residue (from rice) were the major sources of pig feed. However, Adeshinwa *et al.* (2004) reported that brewers' waste is a feed ingredient, not a complete feed. Harvested grasses are fed along with household waste such as peels of yam, potatoes, cocoyam, boiled cassava, brans and cereal grains like maize, only 5 % of the respondents indicated having used any form of commercial feed.

**Table 4: Prevalent disease in the dry and wet seasons among pig farmers (n=100) in Kaduna South Agricultural zone**

Parameters	Frequen cy	Percentage (%)
<b>Prevalent disease (Dry season)</b>		
Diarrhea	36	36.0
Pneumonia	9	9.0
Ecto-parasite infestation	36	36.0
Endo-parasite infestation	9	9.0
Mastitis	5	5.0
<b>Prevalent disease (Wet season)</b>		
Diarrhea	15	15.0
Pneumonia	51	51.0
Ectoparasite	6	6.0
Endoparasite	22	22.0
Mastitis	-	-

n: Number of respondents

The most prevalent disease is presented in Table 4. In the dry season was diarrhea and ecto- parasite infestation with value of 36 % each. However, during the wet season, Pneumonia was the most prevalent disease (51 %). 22 % endoparasite infestation, 15 % of the farmers' experience diarrhea; 6 % ectoparasite infestation and none experiences mastitis, in the dry season.

Diseases that are common in the surveyed area are Diarrhea and ectoparasite infestation are the two commonest diseases in the dry season while pneumonia is common in the wet season. This may be as a result of household waste which may cause diarrhea in the dry season and too much cold which could cause respiratory disease in the wet season which is in disagreement with the survey of Ahmed *et al.* (2008), that prevalence of diarrhea was higher in the rainy season than in the dry season (33 % vs 18 %) and the results indicated differences in prevalence between areas.

**Table 5: Economic benefit and major constraints/challenges affecting production of pig farmers (n=100) in Kaduna South Agricultural zone**

Parameters	Frequency	Percentage (%)
<b>Major constraints affecting your pigproduction</b>		
Insufficient capital	62	62.0
Procurement of the animal	4	4.0
Availability of feed	33	33.0
Erratic government policy	1	1.0
<b>Major challenges affecting pig production</b>		
Keeping of record	29	29.0
Coordinate supply and transportation	10	10.0
Monitoring of feed quality	28	28.0
Good knowledge of personnel management	22	22.0
Development of a preventive maintenance program for animals	10	10.0
Handling of stakeholders- taxes	1	1.0

n: Number of respondents

Table 5 reveals information on major constraints and challenges affecting the production of pig farmers. 62 % had insufficient capital as their major challenge. 33 % had challenges with availability of feed and 4 % had a problem in procurement of animals. Record-keeping was the major problem for the majority (29 %) of pig farmers. Monitoring of feed quality and good knowledge of personnel management constituted 28 and 22 % respectively. Coordination of supply and transportation, development of preventing maintenance programme for animals and handling of stakeholders' taxes were the least among the problem faced by the respondent with value of 10 % each.

Major constraints and challenges faced by pig farmers, Insufficient capital has always been a constraint in animal production, as fund is required in procuring animals and feeding them. They are not concerned by the erratic government policy as most are not even aware of the regulatory body.

Poor keeping of records is the major challenge faced by the farmers. The case is also similar in monitoring the quality of feed. Most of the farmers are not facing challenges in handling of the stakeholder-taxes. Insufficient good knowledge of personnel is also a challenge. This could be because most of these farmers are not agriculturists. So, they have no or little technical know-how. There is therefore a functional relationship between the age of the farmers and the herd size.

## Conclusion

To boost the indigenous pig production performance, there is need to improve management system, the intensive system which has the advantage of reducing disease incidence and mortality rate is therefore advocated. Pig production offers farmers among other benefits, a readily available income and serves as sources of high quality animal protein for households in addition to its socio-economic values. Hence, there is urgent need to develop and implement intervention programmes that will educate the pig farmer on the need for quality and nutritious feeding in order to increase the level of production in the study areas. The resultant effect of higher animal productivity at the farmer's level can be seen in enhanced income and improved living standards of the farmers and their household as well as increased animal protein for Nigerians. Base on the outcome of this study, it was recommended that a deliberate effort by government to introduce extension services and loans to the pig producers to assist them in modern management practices to boost productivity and higher profits. With such scheme, pig producers would not only be educated on the essentials of good pig management, but also might be provided with such inputs as feeds and medicine (drugs) for their stock.

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