

Analyses of Factors Affecting the Management of Pigs in Kaduna State, Nigeria

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Abstract: Personal and socio-economic factors affecting the management of pigs in Kaduna state, Nigeria were investigated. The present rural production system is viewed as a serious factor militating against an increased and improved production. Efforts to improve the present production system through the introduction of proven pig management practices need to take into crucial consideration the structure of the present pig management practices at the small-holder level. This study, therefore, concerns itself with the positive aspects of small-holder pig production. Results of analyses reveal that personal characteristics of the producers such as level of education, household size and pig keeping experience are positively and significantly ($p < 0.05$) related to the level of pig management. Pig management increases with pig herd size, investment on pigs and income derived from pigs ($p < 0.05$). The level of awareness and contact variables such as knowledge of the existence and services available at the veterinary clinic, distance of veterinary clinic are significantly ($p < 0.05$) related to pig management.

Key words: Pigs, management practices, smallholder, Kaduna state, Nigeria

INTRODUCTION

Pigs have been described as one of the most prolific and fast growing livestock that can convert food waste to valuable products (Eusebio, 1980). Their annual growth rate (3.8%) is higher than that of the human population (2.3-2.8%) (Shaib *et al.*, 1997). Pigs excel other red meat animals, such as cattle, sheep and goats in converting feed to flesh (Ikani and Dafwang, 1995). The production of indigenous pigs in recent years has been recommended as an alternative source of cheap, high quality dietary protein for the escalating human population (Okorie, 1978). This is due to the relatively low cost of pig production and fast growth rate (Osaro, 1995) short generation interval and high production potential; prolific fecundity (Holness, 1991; Osaro, 1995) high efficient carcass yield (Balogun, 1981) and easy adaptation to environmental conditions (Adekunle, 1995). Besides, pig meat (pork) has good meat to bone ratio (Ikani and Dafwang, 1995; Olomu and Oboh, 1995). These numerous attributes of the pig make it possible to improve the present animal-source protein intake of the average Nigerian especially in areas where there are no religious edicts preventing their production and consumption. Coupled with improvement in human nutrition are the derived benefits (socio-economic) which pig production brings to the producers and the country at large (Ajala, 2003).

MATERIALS AND METHODS

The study area: Kaduna State was chosen for the study primarily because the state, with 249,651 pigs (RIM, 1992) has the fifth highest pig population in Nigeria. This represents about 7.3% of total pig population and gives Kaduna State the highest number of pigs per household (RIM, 1992).

The state is situated between latitude 09°30'N and longitude 08° 30'E in the Northern Guinea Savannah. The rainy days last between 190-200 days with distinctive dry (November-April) and rainy (May-October) seasons.

The study was conducted in two Local Government Areas (LGAs) of Kaduna state: Jama'a and Zango-Kataf LGAs. The study area is bounded in the North by both Kajuru and Kaura LGAs, in the east by Lere and Kaura LGAs, in the West by both Kachia and Jaba LGAs and in the south by Akwanga LGA of Nassarawa state. The study area is sub-humid and is predominantly Christian area of Kaduna state. The location was specifically chosen for the study because majority of the farmers in the area are involved in pig production.

Data collection and sampling procedure: The data presented in this study were derived from a survey of pig keeping households in two selected Local Government Areas (Jama'a and Zango-Kataf LGAs) of Kaduna state, Nigeria between June, 2001 and May, 2002. In Jama'a LGA, out of the total of 2,368 farm families identified, 1,804

representing 75% of the farm families, rear pigs (KADP, 1990). A preliminary analysis of these data showed that out of 75% of the farm families who reared pigs, 61% owned three or more pigs. In Zango-Kataf, about 64% have more than two pigs. Based on the data above, it was decided that households with three pigs or more would be interviewed. A sample size of 100 households (respondents) from each Local Government Area was selected for interviewing. Based on the distribution of herd size among the households, about one-tenth of the total population that owned three pigs and more was selected for interviewing. From this frequency distribution of pig herds, a sample of 50 respondents was drawn from respondents owning between 3 and 10 pigs, while a sample of 50 was chosen from respondents from each of the LGA who own 20 pigs and more were all interviewed. This assumes that individuals with more or larger herd size would use a certain combination of pig management practices to maintain and improve this stock.

The questionnaire was pre-tested to ascertain that the structure, order of questions and the length of the questionnaire were satisfactory. Questionnaire administration was done by trained enumerators who were resident in the village for the period of the fieldwork.

Analytical techniques: Analysis of data largely involved the use of descriptive statistics such as percentages and means used to report the demographic and personal characteristics of the respondents. Pearson's correlation procedure was applied to test the relationship between individual characteristics of respondents and pig management practice. The R-values reported in the Tables are the Pearson's correlation coefficients.

Operational indices: In this study variables are defined as dependent in their operational terms.

Pig management variables: Variables describing pig management include provision of feed, water, shelter and healthcare for pigs. Each of these four variables has been investigated by a set of questions asked to get the relevant information.

Provision of feed: This was assessed by asking the respondents if they fed their pigs with any special feedstuff. In the context of this study, special feed refers to any type of feedstuff a respondent consciously and deliberately gives the animals. Respondents who mentioned having given some special feeds were asked to name such feeds. Feeds were then grouped into three categories, namely; concentrates (like cotton seed cake, groundnut cake, maize grain), crop residue and cut grass

Table 1 Individual traits of pig management

Provision of feeds			
Concentrates	3	Crop residue	2
Household wastes/cutgrass	1	Pigs are left on their own	0
How pigs were fed			
Individually	2	Collectively	1
Provision of water			
Water is given	1	Water is not given	0
Way water was provided			
In water troughs	2	Mixed with feed	1
Pigs are left on their own	0		
Provision of shelter			
Provide shelter	2	Leave pigs within compound	0
Is shelter necessary?			
Yes	1	No	0
Type of shelter			
Mud-brick walls with thatched roof and rammed earth floor type	1		
The cement-brick walls with thatched roof and concrete floor type	2		
The burnt-brick walls with zinc roof and concrete floor-type	3		
Is health care given pigs?			
Yes	1	No	0
Number of visits to veterinary office			
1-2 times	1	No visit at all	0
3-4 times	2		
4 and above	3		

or household wastes, with a corresponding score of 3, 2 and 1 respectively. Those who did not give any special feed or who left their animals to fend for themselves got a score of zero. Table 1 describes these categories.

Furthermore, respondents were asked whether animals were fed individually or collectively. This question was asked in order to ascertain whether pregnant and nursing sows were adequately cared for. Respondents who fed animals separately or on an individual basis were given a score of 2, while those who gave collectively score 1 point.

These components of the feeding management variable were computed as the feed management variable with a maximum score of 5. The nearer a respondent's score is to 5 the higher the respondent was ranked on the feeding management variable.

Provision of water: Respondents were also asked a number of questions on this aspect of management variable. Household heads who mentioned that they provide animals water were given a score of 1, while those who indicated otherwise got a zero (0) score. Respondents who said they provided water for their animals were asked the way water was provided. This component of the management variable was dropped in the discussion of results because all respondents hardly provided animals with water apart from the one used in mixing the feed.

Provision of shelter (housing): Respondents were asked where they usually kept their animals at night. Respondents providing some constructed shelter were given a score of 2, while those who left the animals within the compound were given a score of 1. Those respondents who left their pigs loose outside the compound were given a score of zero (0). Respondents were asked the type of housing materials they used. Those respondents who used the mud-brick walls with thatched roof and rammed earth floor type were given a score of 1. Respondents who used the cement brick walls with zinc roof and concrete floor type were given a score of 2 while those respondents who used the burnt-brick walls with zinc roof and concrete floor type were given a score of 3. The total score was computed as the shelter management variable.

Provision of health care: Respondents were asked whether they did anything to protect their stock from disease. If a respondent answered in the affirmative, a score of 1 was recorded, if not, a zero (0) was given. Respondents were also asked whether they knew the veterinary officer in the village and how frequently they visited the clinic to seek help for their animals. Respondents who mentioned visiting the veterinary office between 1 and 2 times in the last 12 months were given a score of 1 while those who visited the clinic 3-4 times scored 2 points. Those who sought help for more than 4 times in the last 12 months were given a score of 3. A respondent who neither had knowledge of the veterinary office nor paid any visit to the clinic had a score of zero (0). These scores were then put together and computed to represent the health management variable.

Socio-economic variables: These variables are described as independent. Although some of these variables are inter-dependent, an attempt is made to see the extent to which each of these variables influence pig management.

Age: This has been defined as the approximate age in years of the respondent at the time of questionnaire administration. Respondents who were less than 36 years were considered young farmers while those who fall between 36 and 49 years were considered middle-aged. Stock owners 50 years and over were classified as old respondents.

Level of education: The level of education was reported using the Western schooling. Low education for the purpose of this study, has been identified as those respondents who had 7 years of primary education. Medium education comprised respondents who had

secondary education while respondents with high education are those who had tertiary education.

In order to see the trend of relationship between the independent variables operating jointly, attempt was made to combine all the three components of the management variable to form a score.

In computing Pearson's correlation coefficient, the dependent variable components were weighted. The weighting was done with assumption that the provision of feed, shelter and health care are of importance in that order. Following this ranking of management components in order of importance, feed weighted 3, shelter and health care weighted 2 and 1, respectively. These weighted scores were then computed as the total score on pig management.

The relationship between the selected socio-economic variables and pig management variables may be positive or negative (indicated by high or low values of the correlation coefficient). Each of the management variables was related to the socio-economic variables.

RESULTS AND DISCUSSION

Table 2 summarizes the results of analysis of the selected personal characteristics of pig producers. Analysis in Table 2 shows that households with less than 11 persons make up 75% of the sampled population. The sampled population is characterized by young population with medium educational level. Most respondents have a

Table 2: Percentage distribution of selected personal characteristics of respondents

Parameter	Frequency	(%)
Age		
Young (less than 36 years)	45	22.5
Middle (36-49 years)	102	51.0
Old (50 years and above)	53	26.5
Total	200	100.0
Mean age = 45 years		
Level of education		
Low (primary school)	60	30.0
Medium (secondary school)	124	62.0
High (Tertiary school)	16	8.0
Total	200	100.0
Household size		
Small (1-5 persons)	67	33.5
Fairly large (6-10 persons)	83	41.5
Large (11 and above)	50	25.0
Total	200	100.0
Mean household size = 9 persons		
Pig keeping experience		
Less than 10 years	25	12.5
10-19 years	49	24.5
20 years and over	126	63.0
Total	200	100.0
Mean pig keeping experience = 22 years		

Source: Fieldwork, 2002

long experience of keeping pigs. The fact that most of the respondents are young with mostly secondary school education suggest that they can easily bear the risks of new innovations aimed at improving pig production. The fact that they are young also shows they can still face the challenges of pig rearing given the demand of integrating both crop and livestock enterprises especially for labour. With medium educational level (that is, secondary school education), respondents tend to be more receptive to superior management practices as they tend to readily appreciate the usefulness as well as the benefits of such practices.

Table 3: Percentage distribution of some socio-economic characteristics of respondents

Characteristics	Frequency	(%)
Herd size		
Small (10 pigs and less)	118	59.0
Medium (11-20 pigs)	58	29.0
Large (over 20 pigs)	24	12.0
Total	200	100.0
Mean herd size = 9 pigs		
Number of pigs sold		
1-4 pigs	172	86.0
5 and above	28	14.0
Mean pig sold = 3 pigs		
Income earned from pigs sold/year		
Below N5,000	122	61.0
N5,001-N10,000	56	28.0
N10,001-N15,000	22	11.0
Investment on pigs/year		
Below N2,000	131	65.5
N2,001-N3,000	45	22.5
N3,001-N4,000	24	12.0
Number of pigs initially owned		
1-4 pigs	140	70.0
5-10 pigs	49	24.5
11 and above	11	5.5
Mean number of pigs initially owned = 4 pigs		

Source: Fieldwork, 2002

Table 4: Personal characteristics as related to feed, shelter and health management scores

Variable	Management		
	Feed	Shelter	Health
	R	R	R
Age	-0.0517	0.0218	0.1037
Level of education	0.1821	0.2765	0.0396
Household size	0.2558	0.1984	0.1372
Pig keeping experience	0.0776	0.1345	0.1195

*Significant at 0.05 level

Table 5: Economic variables as related to feed, shelter and health scores

Variable	Management		
	Feed	Shelter	Health
	R	R	R
Investment	0.1094	0.1124	0.1422
Pig herd size	0.1068	0.0461	0.1696
Income from pigs sold	0.2019	0.0987	0.1456
Number of pigs initially owned	0.1718	0.0108	0.1287

*Significant at 0.05 level

Table 3 summarizes the results of analysis of the selected economic characteristics of respondents, while the results of Pearson correlation analysis are presented in Table 4-9.

Feed management is responsive to higher education, larger households, investment, herd size and pig keeping experience. Income is positively related to feed management. Shelter management increases with education, household size, experience and investment. Health management is not affected by age or education of the farmer but is affected by all other variables. Overall pig management is significantly affected by all measured variables except age of owner and the number of pigs initially owned. The effect of educational level of the respondents on their pig management scores is indicative of the persuasiveness of better educated pig producers than those with low levels of education. The former group of respondents tends to be better informed about improved pig management.

Analysis shows that a number of personal and socioeconomic variables are associated with management practices in the study area. The result of correlation

Table 6: Relationship between selected awareness and contact variables, feed, shelter and health management scores

Variable	Management		
	Feed	Shelter	Health
	R	R	R
Number of visits to veterinary clinic	0.0790	0.0139	0.1614
Distance of veterinary clinic	0.1329	0.0968	0.3565

*Significant at 0.05 level

Table 7: The relationship between total pig management scores and selected personal characteristics

Variables	Pearson's R
Age	-0.0428
Level of education	0.1472
Household size	0.1269
Pig keeping experience	0.1412

*Significant at 0.05 level

Table 8: The relationship between total pig management scores and selected economic variables

Variables	Pearson's R
Investment on pigs	0.1552
Pig herd size	0.1263
Income earned from pigs	0.1527
Number of pigs initially owned	0.0112

*Significant at 0.05 level

Table 9: The relationship between total pig management score and selected awareness and contact variables

Variables	Pearson's R
Knowledge of veterinary office	0.1283
Number of visits to veterinary office	0.1429
Distance of veterinary office	-0.1267

*Significant at 0.05 level

analysis reveals that certain variables are associated with pig management as earlier indicated. The findings on the economic variables are an indicator of the respondent's commercial orientation towards pig keeping (as the reason given by nearly all respondents for keeping pigs was associated with income supplementation). The implication of this for a programme of improved pig production in Nigeria is that the producers are investing in livestock production and hence need help and encouragement from government.

It can be deduced from the correlation between household size and management score that the larger the household the higher the management score. This is because larger households can provide adequate labour supply needed for pig husbandry activities. The positive relationship between investment in pigs and management score indicates that the more the investment that is made the better the management techniques used by the stock owner. Higher investment may imply the adoption of a variety of pig management techniques for improved pig production.

The correlation between income earned from pigs and management score indicates that more income is derived from pig raising when better management practices are adopted by farmer.

From the analyses of data it may be concluded that pig management practices are responsive to the personal and socioeconomic variables measured.

REFERENCES

- Adekunle, O.A., 1995. Farm management and record keeping in enterprise. Paper presented at the National Pig Production Workshop held at NCRI, Ibadan, pp: 84.
- Ajala, M.K., 2003. Economics of Swine Production in Jama'a Local Government Area of Kaduna State, Nigeria. Published by the Animal Science Association of Nigeria. ISSN 1119-4308. *Trop. J. Anim. Sci.*, 6: 53-62.
- Balogun, T.F., 1981. Swine production in Nigeria: Problems and prospects. *N.J. Agric. Ext.*, pp. 32-37.
- Eusebio, J.A., 1980. Pig production in the tropics, Payne W.J.A. (Ed.), Longman Group, London, pp: 111.
- Holness, H.D., 1991. *The tropical agriculturist (Pigs)*. Publ. by Macmillan/CTA Ltd., London.
- Ikani, I.E. and I.I. Dafwang, 1995. Pig production technology for piggery farmers. Extension Bulletin Livestock Series No. 1, NAERLS, A.B.U., Zaria, Nigeria.
- Kaduna State Agricultural Development Project, 1990. Contact Farmers and Extension Agents Visit Schedule in Zango-Kataf Local Government Area. pp: 3-74.
- Okorie, J.U., 1978. A guide to livestock production in Nigeria. Macmillan Ltd., London, pp: 155.
- Olomu, J.M. and S.O. Oboh, 1995. Pig production in Nigeria, principles and practice: Ajachem Publication Nigeria, pp: 1-52.
- Osaro, O.M., 1995. Enhancing production performance of smallholder pig farmers. In: Pig Production Workshop Training Manual, NAERLS, A.B.U., Zaria, Nigeria, pp: 100-130.
- RIM, 1992. *Nigerian Livestock Resources*, Vol. 2. National Synthesis. Resource Inventory and Management Ltd., Jardin House, St. Helier, Jersey, UK.
- Shaib B., A. Aliyu and J.S. Bakshi, 1997. Nigeria National Agricultural Research Strategy Plan: 1996-2010. Department of Agricultural Sciences. Federal Ministry of Agriculture and Natural Resources, Abuja. Nigeria.