

Socioeconomic Characteristics of Pig Producers and Their Husbandry Practices in the Sub-Humid Zone of Northern Guinea Savannah, Nigeria

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Abstract: The study attempts to investigate the socioeconomic characteristics of pig producers and their husbandry practices in the sub-humid zone of Northern Guinea savannah, Nigeria. The results show that certain socioeconomic variables are associated with the herd size of pigs kept. Household size, investment on pigs, number of pigs sold in the last 12 months, income from pigs sold, the number of pigs started with and pig keeping experience are found to be statistically significantly related with pig herd size. On the other hand, age and level of education are found to be positively related to pig herd size, although the relationships are not statistically significant. It is also shown that the management system practised in the study area is the semi-intensive system, with poor feeding, inadequate housing and healthcare attention. The implications for a programme of pig improvement and livestock extension services are noted.

Key words: Socioeconomic, pig producers, management system, 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). Pig production has therefore been advocated as a short-term measure toward alleviating the animal protein and calorie deficit especially in areas where there are no religious edicts preventing their production and consumption.

Nigeria is estimated to have 4.4 million pigs (Lufadeju *et al.*, 1995; Shaib *et al.*, 1997). About 78% of this population are found in the sub-humid zones of Northern and Southern Guinea Savannah (Lufadeju *et al.*, 1995). Most of the pigs reared in these areas are local breeds managed under extensive system. Their

productivity has been reported to be low (Adebambo, 1981). Efforts have been directed towards improving their productivity through adequate nutrition (Bambote and Tewe, 1995; Iyayi and Steinbach, 1997) improved health and management (Guobadia, 1997) and breed development specifically through cross-breeding with superior exotic breeds and to a lesser extent they are kept as pure breeds especially in institutional farms (Adebambo, 1993).

The pig is a potential protein deficit-gap filler considering the short generation interval among other favourable attributes of the animal. The pig is not only a source of protein, it serves as an investment alternative and source of additional income especially in the rural areas. The rearing of pigs in Nigeria is usually an individual concern and herds are not usually found in commercial quantities. Pig keeping is a secondary enterprise and represents some proportion of the income earned by households, most especially women (Ajala *et al.*, 2006). Incomes derived from the sale of pigs are usually spent on acquisition of household goods and in meeting social and cultural obligations such as paying children's school fees, paying of taxes and so on.

Since pig keeping is not usually a full-time occupation, and as the animal is not usually kept in commercial quantities, the average herd size does not usually exceed 10 in high producing areas of the country. Improvement in quantity as well as the quality of pig herds will not only go a long way in meeting the nutritional requirements of Nigerians but it will also cut down drastically the colossal bill resulting from the

importation of animals and animal products. Such improvement will also bring the country nearer to the road to self-sufficiency in livestock production with the attendant advantages of increased rural employment and income.

In the light of the above observations, there is a need to understand the fundamentals of the present production parameters of pig improvement in the country. In this fashion, appropriate technology which is compatible with the socio-cultural and socioeconomic characteristics of the producers is better evolved and utilized to the advantage of the producers themselves. The objectives of the study therefore are:

- To describe the socioeconomic and personal characteristics of pig producers in the study area;
- To describe the mode of pig production, that is, the management practices as being practiced at the present.

MATERIALS AND METHODS

The study area: The study area is southern Kaduna area of Kaduna state, Nigeria. The state was chosen for the study primarily because it ranks among the highest pig production area in Nigeria, such as Benue (703,438 pigs), Plateau (535, 319), Gongola (473, 143) and Ondo (291, 304). The pig population of Kaduna state is 249, 651 representing about 7.3% of the total pig population in Nigeria (RIM, 1992). Furthermore, Kaduna state has 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 seasons (May-October).

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 Kauru 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 soil is rich and suitable for the cultivation of a wide range of crops. Most of the ethnic groups are farmers that keep a good number of pigs, small ruminants (sheep and goats) and poultry in addition to arable cropping.

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. In Jama'a LGA alone, out of the total of 2, 368 farm families identified, 1,804 representing 75% of the farm families, rear

pigs (KADP, 1990). Secondly, the area is a known potential pig market in the country (Ajala and Sanni, 2002).

Data collection: The data presented in this paper are 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. From a list of pig producers derived from village listing of the study area, a purposive sample based on pig herd size of not less than three pigs were drawn. Total samples of 200 households were sampled from the two LGAs. One hundred households were randomly drawn from each LGA. Within an LGA, five village areas were selected with at least twenty households interviewed in each village area. The sampled population comprised households which kept pigs at the time of the study.

Variables investigated include socioeconomic characteristics of pig owners, such as age, household size, investment on pigs in the last 12 months, education, number of pigs sold in the last 12 months, income from pigs sold in the last 12 months, pig keeping experience and number of pigs started with.

RESULTS AND DISCUSSION

Socioeconomic characteristics of pig producers: There are several dimensions of socioeconomic variables but only some of such indicators have been reported in this study. In any society, the measure of an individual's socioeconomic characteristics depend on that individual's age, level of education, income, occupation, household size, farm and/or herd size, among others. For the purpose of this study, the following socioeconomic variables were investigated. These independent variables have been selected to relate to the herd size as well as to determine the characteristics of the majority of pig producers in the study area.

In the study that follows, attention is focused on some of the socioeconomic variables as they relate to the respondents' pig herd size.

Analysis of data as shown in Table 1 indicates that 77.7% of the respondents have 10 pigs or less. Pig herd size varies between 3 and 46, with a mean of 9 pigs.

The analysis in Table 2 shows the relationship between pig herd size and a number of independent variables. The table reveals a positive relationship between the age of pig keepers and the number of pigs kept. The relationship is however, not statistically significant although respondents over 36 years have larger herd size than those less than 36 years. In fact 85% of the respondents less than 36 years have less than 10

Table 1: Relationship between pig herd size and selected socioeconomic variables

Variables	Pig herd size	
	Below10	10 and above
Age		
Below 36 years	170(85)	30(15)
36-49	152(76)	48(24)
50 and above	144(72)	56(28)
Household size		
Below 6 persons	156(78)	44(22)
6-10	164(82)	36(18)
11 and above	123(61.5)	77(38.5)
Education		
No formal education	142(71)	58(29)
Formal education	115(57.5)	85(42.5)
Investment on pigs		
Below N2,000	180(90)	20(10)
N2,001-N3,000	118(59)	82(41)
N3,001-N4,000	80(40)	120(60)
Number of pigs sold last 12 months		
1-4 pigs	144(72)	56(28)
5 and above	108(54)	92(46)
Income from pigs sold last 12 months		
Below N5,000	163(81.5)	37(18.5)
N5,001-N10,000	118(59)	82(41)
N10,001-N15,000	91(45.5)	109(54.5)
Pig keeping experience		
Below 10 years	143(71.5)	57(28.5)
10-19 years	117(58.5)	83(41.5)
20 years and above	105(52.5)	95(47.5)
Number of pigs started with		
Below 5 pigs	152(76)	48(24)
5-10 pigs	100(50)	100(50)
11 pigs and above	68(34)	132(66)

N indicates Naira, Nigerian currency. US \$1 = N128 as at 2002. Figures in parentheses indicate percentages, Source: Fieldwork, 2002

Table 2: Correlation between pig herd size and selected independent variables

Variables	Pearson's R
Age	0.1046
Household size	0.3368*
Investment on pigs last 12 months	0.4670*
Education	0.0417
Number of pigs started with	0.3152*
Number of pigs sold last 12 months	0.4159*
Income from pigs sold last 12 months	0.5230*
Pig keeping experience	0.1349**

*Significant at .01 level, **Significant at .05 level

pigs while 76% of those more than 36 years have less than 10 pigs. But 24% of respondents over 36 years have 10 or more pigs while 15% of younger respondents have 10 or more pigs. This finding is not surprising since the older the respondent, the more the pig keeping experience and household size factors which contribute substantially to pig keeping.

It is also observed in Table 2 that a statistically significant relationship exists between household size and pig herd size. This is equally not surprising because those respondents with larger dependents would have more persons as labour force to look after the pigs. There is a visible difference between respondents with 5 or less

household members and those with more than 10. While about 78% of respondents with less than 6 persons have less than 10 pigs, the same category of pig herd size is owned by 61.5% of respondents with more than 10 household members. On the other hand, only 22% of the respondents with less than 6 household members possess 10 or more and 38.5% of those with more than 10 household members have 10 or more pigs. Table 2 also shows a statistically significant relationship between investment on pigs and pig herd size. There is a difference between respondents who invested N2,000 and those who invested N3,000 and more. While about 90% of those who invested N2,000 or less keep less than 10 pigs, about 40% of those who invested N3,000 and above possess less than 10 pigs. On the other hand, while only 10% of those who invested less than N2,000 own 10 or more pigs, 60% of those who invested more than N3,000 own more than 10 pigs. This finding is not surprising since more investment in terms of more and better inputs is likely to yield more dividend in terms of output.

Table 2 also reveals a very weak and non-statistically significant relationship between level of education and pig herd size. About 70% of the respondents have no formal education while about 22.5 and 7% respondents have some primary and secondary school education, respectively. The remaining 0.5% respondents attempted tertiary school. The number of pigs sold is also found to be positively and statistically significantly related to pig herd size. It is evident from Table 1 that there is a marked difference between respondents who sold 5 or more pigs. While 72% of the respondents who sold 4 or less pigs own less than 10 pigs, 54% of those who sold 5 or more pigs fall within the same category. On the other hand, while 46% of those who sold 5 or more pigs own 10 or more pigs, only 28% of respondents who sold 4 or less pigs are in the same category. This finding is expected since the more pigs at a respondents' disposal the more likely the number of sale of such animal tend to be. Like the number of pigs sold, the income derived from the sale of pigs is observed to be statistically significantly related to pig herd size. In fact, the relationship is the strongest of all the relationships reported in this study. It is observed in Table 1 that there is a marked difference between respondents with income of more than N10,000 and those that earn N5,000 or less from pig sales. While 81.5% of those who earn between N1 and N5,000 own less than 10 pigs, 45.5% of respondents who get more than N10,000 from the same source fall within the same category. On the other hand, while 54.5% of those who get more than N10,000 from the sale of pigs own 10 and more pigs, only 18.5% of those who earn less than N5,000 from the same source fall in the same category. This is

expected because the more pigs that are owned the more that are available for sale and hence the more income that is likely to be earned. Therefore, it seems that respondents with larger pig herd tend to be more commercially-oriented than those with lesser animals.

Respondents with more years of pig keeping experience are more likely to have larger pig herds. Table 2 shows a positive and statistically significant relationship between pig keeping experience and pig herd size. This relationship is however significant at the .05 level. A cursory look at Table 1 indicates that the difference between respondents who have less than 10 years of pig keeping experience and those with more than 20 years experience is marked. While 71.5% of those who have been keeping pigs for less than 10 yrs have less than 10 pigs, 52% of those with more than 20 years pig keeping experience fall in the same category. On the other hand, while 47.5% of those with over 20 years experience own 10 or more pigs, only 28.5% of those with less than 10 years pig keeping experience fall within the same category. Those who started pig keeping with a larger number of pigs are likely to own larger herds. The analysis in Table 2 shows that the number of pigs started with is significantly related to pig herd size. It is also evident from Table 1 that while 76% of those who started with less than 6 pigs own less than 10 pigs, 34% of those who started with 11 or more pigs own less than 10 pigs. On the other hand while only 24% of those who started with less than 5 pigs own 10 or more pigs, 66% of those who started with more than 10 pigs fall in the same category.

Pig management system: Virtually all the pigs in the study area are managed under the semi-intensive system. Pigs under this management system are totally confined and hand-fed during the rainy season when all the available land are heavily cropped. During this period, pigs depend entirely on their owners for feed and water. Some pigs are tethered with ropes tied around heart girth or hind legs to trees near the compound and are also hand-fed. In the dry season or immediately after harvest the pigs are allowed to scavenge freely but are given supplementary feed at the end of the day when they return to their owners houses.

Feeds, feeding and watering: The pigs kept under village conditions in the study area are provided with feeding and watering troughs made either of metal, concrete or wood. Pigs are fed on left-overs from the owner's kitchen, brans from cereal crops like maize, sorghum and millet as observed by Dawuda *et al.* (1990). Spoiled grains, crushed raw cassava (*Manihot utilissima*) or its peels, cooked cocoyam (*Idocasea sp.*) or its peels, sweet potato

(*Ipomea botatas*), which are usually pounded before being mixed with left over or cereal brans and powdery pulp from locust bean fruits (*Parkia clappertoniana*) and fresh grass were also being fed to the pigs. A similar pattern was observed by Rekwot *et al.* (1990). This is usually not supplemented with any extra protein source. Feeds are generally bulky and of low nutritional quality. Feeding in some cases is done only once a day with little or no extra clean water supplied to the pigs besides that used to mix the feed. All respondents admit confining their animals during the planting season.

From the analysis of data, it is established that pigs gain less weight during the dry season when they are allowed to roam and fend for themselves. They gain more weight during the period of restriction (rainy season). Over 90% of the respondents admit they notice weight gains in their animals during the months of restriction. This is indicative of some serious implications on any future plan to improve the Nigerian pigs. When respondents were asked if there was any need to feed the animals better than they have been fed, 94% of the respondents answered in the affirmative.

Housing: All the respondents provided some form of housing to pigs. Various types of housing materials were used by the respondents depending on their scale of production (size of holding). Three types of pig houses were identified in the study area, namely

- The mud-brick walls with thatched roof and rammed earth floor type,
- The cement brick walls with zinc roof and concrete floor type,
- The burnt-brick walls with zinc roof and concrete floor type.

Majority of the respondents had low cost pig houses built mainly from locally available materials and household labour. Majority (62%) of the respondents used mud-brick walls with thatched roof type of housing while 30% of the respondents used the cement brick walls with zinc roof and the remaining 8% used burnt brick walls with zinc roof and concrete floor. Although most of the respondents kept their pigs in the mud-brick walls with thatched roof and rammed earth floor because of its cheapness. Apart from the undurability of the building, it predisposes the pigs to diseases. The cement block walls with zinc roof and concrete floor had been advocated because of its durability and high level of hygiene. Apart from durability and hygiene, the economy of better housing would favour such housing in the long run (Bawa *et al.*, 2004).

Table 3: Matrix of zero-order relationships obtained using Pearson correlation

Variables	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉
X ₁ Age	1								
X ₂ Level of education	0.018	1.000							
X ₃ Household size	0.236	.202	1.000						
X ₄ Investment on pigs	0.072	.182	.376	1.000					
X ₅ Pig keeping experience	0.621	.085	.248	.004	1.000				
X ₆ Number of pigs started with	-0.042	.072	.367	.242	.037	1.000			
X ₇ Total pigs sold last 12 months	-0.056	-.068	.222	.364	-.020	.102	1.000		
X ₈ Income from pigs sold	-0.069	.014	.261	.429	.061	.114	.911	1.000	
X ₉ Pig herd size	.105*	.042	.337*	.467*	.135*	.315*	.416*	.523*	1.000

*Significant at .05 level

Breeding and cross-breeding: During confinement, pigs are not separated into sex, or age groups. This encourages inbreeding and early mating of gilts. Most herds however, do not keep breeding boars but take their sows and gilts on heat to stock owners with apparently good boars for breeding. Cash payments are often made for this service or a promise of one piglet after farrow is made. This is some form of controlled breeding. In the dry season, however, the pigs roam about freely and mate indiscriminately.

Data analysis revealed that cross-breeding is practiced by 22% of the respondents. Respondents were asked if they ever kept any exotic breed. Twenty-two percent of the respondents said they ever kept a different breed of pigs from the ones found in the study area. Observations revealed that the exotic breeds kept for the purpose of crossing with the indigeneous (local) breed are Large White, Hampshire and Duroc. Although, only few respondents are familiar with crossing animals for better progeny, others indicated their willingness to use a good exotic breed to improve their stock.

The sex ratio of male to female pig (on the average) is 1: 3. This is considered a good management practice, as respondents report selling male pigs (boars) to maintain this proportion. However, no controlled breeding is practiced. Male pigs are allowed to run freely with female pigs. This does not restrict farrowing to a favourable period of the year.

Health care: Health care delivery for animals is a major problem facing livestock owners. This is demonstrated by the incidence of morbidity and mortality. Of the 64% of the respondents who reported facing problems of disease in their herd, well over half reported that the most serious disease is gastro-enteritis (diarrhoea). This disease is reported to be claiming about 56% of the total pigs lost in the study area. Other diseases of importance include cough, mange and worms.

The problem of disease is more prevalent during the rainy season when animals are usually confined. This incidence of disease could be attributable to the lack of preventive and adequate curative measures, coupled with poor management practices. Although quite a number of respondents (69%) are aware of the existence of a veterinary clinic in the area, only 12% of them had ever

sought for and utilized any form of assistance from the veterinary office concerning the health of their animals. Most of the respondents use local herbs (ethnoveterinary medicine) in the treatment of their animals which they admit is usually not helpful. More animals than necessary are therefore lost through disease which could either be prevented or cured through the help of the veterinary clinic.

Table 3 represents a matrix of zero-order relationships between the selected independent variables and pig herd size. The intercorrelation between the independent variables are also shown in the Table 3.

CONCLUSION

The study shows that a number of socioeconomic variables are associated with pig herd size. The result of correlation analysis particularly reveals that such economic variables as the income from pigs sold, number of pigs started with, investment on pigs and the number of pigs sold last 12 months are strongly related to herd size. Other variables that are statistically related to pig herd size are household size and pig keeping experience. These findings may be an indicator of the respondents' commercial orientation towards pig keeping. The implication of this for a programme of improved pig production in Nigeria is that the producers are investing and are even willing to invest more on pig production, hence need help and encouragement from the government.

To raise the productivity of pigs in Nigeria, one important and crucial step is to improve the health of the animals. It is imperative to pay adequate attention to animal health because of the adverse effect infectious diseases and parasites can have on the mortality rate and the performance of animals.

It is equally important to improve nutrition and shelter. Analysis of data revealed that disease is a major constraint to pig production. About 65% of the respondents mentioned disease as the major problem facing their herds. In spite of the availability of veterinary services, only 12% of the respondents made use of veterinary service to solve pig problems.

From the foregoing, a number of implications can be drawn. One such implication is that which concerns

feeding and watering of pigs. If there is to be any successful programme of pig improvement, animals must be well fed among other things. It is in this regard that government should help pig owners by providing such essential inputs as feedstuffs and drugs at subsidized rates. Credit facilities should be made available to pig producers. With regard to the provision of shelter for pigs, producers should be encouraged to provide adequate shelter and made to appreciate the importance of adequate shelter for animals. This could be effected through extension work in educating livestock producers. Also the health problems and other management problems can be taken care of through this programme of educating livestock owners. Farmers should be educated on feeding methods using non-conventional feeds and the need of the inclusion of protein, mineral and vitamin in the diet of pigs.

Analyses revealed that in spite of the problems confronting pig production at the rural level, producers are willing to invest some appreciable amount of capital for the maintenance and the improvement of their animals, but lack the technical know-how or the means to adequately get rid of their problems.

The study therefore suggests the setting up of strong, well-defined and properly planned extension outfit (service) for livestock producers to be educated on the essentials of good livestock management and the provision of essential inputs such as feeds, water and drugs for the animals.

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