

**SWINE PRODUCTION CHARACTERISTICS AND MANAGEMENT SYSTEMS OF
SMALLHOLDER PIGGERIES IN KADUNA AND BENUE
STATES OF NORTH CENTRAL NIGERIA**

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SUMMARY

A study of the production characteristics, management systems, holding sizes and their herd structures was conducted in 500 smallholder swine herds in some parts of Nigeria. Two hundred and fifty-eight (51.6%) farmers kept 1-5 pigs while twenty-four (4.8%) farmers kept 16-20 pigs. Average herd size, litter size at birth, litter size at weaning and percentage pre-weaning piglet mortality were 8.4 (1-20), 8 (2-4), 6.6 (0-10) and 18.5% respectively. Nematode parasites of economic importance in the study area include *Ascaris spp.*, *Strongyle spp.* and *Trichuris spp.* Segments of tapeworm were seen grossly in faeces of some piglets. Similarly, ectoparasites of importance in the study areas were ticks, lice and mange. Smallholder farmers practised semi-intensive system of management where pigs usually scavenge for food and supplemented with cereal brans, kitchen wastes and vegetables. Farmers provide housing and veterinary services to enhance the productivity of pigs. Swine production in Nigeria is a permanent and a widespread socio-economic activity among small-scale piggery farmers.

KEYWORDS: Swine production, management systems and smallholder

INTRODUCTION

Very little effort is made to improve pig production in developing countries compared to similar efforts for cattle, poultry or small ruminant production (FAO, 1981). Pigs in Nigeria thrive well under a wide range of ecological conditions (Balogun and Olumeyan, 1988). Nigeria has the second highest population of pigs in africa which accounts for about 4.45% of the total supply of meat in the country (Adebambo, 1982). Traditionally, pigs found in many Nigerian villages are reared under the extensive (range) system (Pathiraja *et al.* 1996). An investigation into pig production in Northern Nigeria showed that the indigenous breeds of domestic pigs were mainly used because of their low

production costs and ability to resist endemic diseases (Ikeme and Nduaka, 1974). Fetuga *et al.* (1976) reported and average litter size of 6.7 for indigenous pigs under improved management conditions at the University of Ibadan, while Pathiraja *et al.* (1986) reported a litter size of 6.5 for pigs kept under village conditions in some parts of Nigeria.

Productivity of pigs in developing countries is generally low due to high piglet mortality, slow growth rate, lack of adequate feedstuffs and poor feed conversion ratio (Pathiraja *et al.* 1986). Pre-weaning piglet mortality and neonatal wastage are of conspicuous economic importance in pig production. Pre-weaning piglet mortality in traditionally managed piggery farms has been reported to be 15%

with a range of 5-20% (Pathiraja *et al.*, 1986). Pre-weaning piglet mortality was found to be 29.3 and 44.8% in exotic and indigenous piglets, respectively; occurring during the first week of life (Uko *et al.*, 1994). Estimated pre-weaning piglet mortality rate in commercial herds in Zimbabwe has been reported to be 10-20% (Chigaru, 1981). In the late 1930s and early 1940s, the Department of Agriculture in Nigeria (1940, 1941 and 1943), imported exotic breeds like the Large White and Landrace for the upgrading of indigenous pigs in some areas in the country. A lot of research has been done in Nigeria, particularly in the area of nutrition under research station conditions (Fetuga *et al.*, 1975a; b; Ogunfowora *et al.*, 1975; Tegbe *et al.*, 1984). This research work attempted to describe management systems of pig husbandry, and to provide information on production characteristics to enable comparisons with production in other places and to provide a basis for future work.

MATERIALS AND METHODS

Location

This research was carried out in Kaduna and Benue States of Nigeria for a period 24 months. In Kaduna State, the research was conducted in Basawa, Zonkwa, Kwoi and Gwantu involving a total of 280 farmers. The five areas lie between latitude 9° and 12°N and 7° and 9°E in the Northern Guinea savanna. In Benue State, the research was conducted in Otukpo, Gboko, Katsina-Ala, Kwande, Vandeikiya and Ado involving and total of 220 farmers. The six locations lie between latitudes 6.5° and 8°N and longitudes 6° and 10°E in the Southern Guinea savanna. The study locations have two distinct seasons: dry (November-April)

and rainy seasons (May-October). Daily temperatures ranged from 13° to 36°C with a relative humidity of 23% during the harmattan period. The average temperature and humidity during the rainy season were 25°C and 69%, respectively.

Data collection

A study of production and management systems of 500 smallholder swine herds in the different locations in Northern Nigeria was conducted for a period of 24 months. The farms were classified as smallholders if they had no more than 20 pigs; farms holding more than 20 pigs were excluded from the study. The herds were visited regularly on monthly basis for 24 months to study the production and management systems of pigs in the study areas. Information on management and production characteristics were recorded by use of structured questionnaires and researchers' observation. Questionnaire data collected included: herd sizes, litter sizes at birth, pre-weaning piglet mortality, management systems such as housing, veterinary health care and feeding of pigs. The data was collated and analysed using student t-test (Steel and Torrie, 1980).

Veterinary health care

A total of 250 fresh faecal samples from piglets (aged between 2 and 6 months) were collected per rectum and examined for prevalence of helminths and coccidia. Faecal samples were immediately examined grossly for adult roundworms and segments of tapeworm. The faecal samples were then placed in a cold box with ice-blocks and later stored in the fridge at 4°C and analysed within two days of collection using the simple egg floatation (SEF) technique (Benbrook and Sloss, 1961).

A total of 400 adult sows were examined for presence of external parasites such as ticks, lice and mange. Ten pigs with skin infections had their skin scrapings taken for diagnosis of mange. Skin scrapings were boiled in 10% potassium hydroxide for 10 minutes and allowed to cool. Samples were filtered, decanted and a wet mount of the sediment was made on a glass slide and examined under the phase contrast microscope (x 100) using oil immersion for parasite identification (Breckenridge, 1953).

RESULTS

Average herd and litter sizes at birth for smallholder farms were 8.4 (1-20) and 8.1 (2-14), respectively (Table I).

TABLE I: Herd size distribution of small holder piggeries

Herd size distribution	No. of farmers		Total
	Kaduna State	Benue State	
1-5	150	108	258 (51.6%)
6-10	82	50	132 (26.4%)
11-15	36	50	86 (17.2%)
16-20	12	12	24 (4.8%)

The number of piglets at weaning was 6.6 (0-10), giving a pre-weaning piglet mortality of 18.5%. For small piggery farms, most respondents (77%) kept between 1-10 pigs, while 51.6% kept between 1-5 pigs (Table I). Pigs observed in the study areas were varying grades of crossbreeds between indigenous breeds and exotic breeds. From our study, 85% of the respondents were willing to purchase improved breeds (Table II).

Feeds of small farms included kitchen wastes, bran from cereal crops like maize, rice, millet, sorghum, vegetables and

weeds. Sweet potato (*Ipomea batatas*), peels of cocoyam (*Colocasear spp.*), yam (*Dioscorea spp.*) and cassava (*Manihot utilissima*) were also fed to pigs. Fifty four percent of the respondents were willing to grow crops to feed the pigs, while 67% were using hotel wastes to feed their pigs. It was observed that 71% of the respondents practised mixed farming. While 86% of them indicated the need for credit facilities (Table II). In the rainy season (May-October), when all the available land is heavily cropped, the pigs are totally confined and hand fed. In the dry season (November –April), the reverse was the case where the pigs were allowed to scavenge freely and were supplemented. The majority of the pig houses or pens in the survey areas are the simple low-cost type. Fifty-nine percent of the respondents indicated interest and willingness to improve housing and sanitation (Table II).

TABLE II: Farmers affirmative answers on swine production

Production parameters	% of affirmative answers
Swine production is profitable	79.4
Will expand	61.0
Will improve housing and sanitation	58.7
Will spend money on veterinary care	55.0
Will use technical assistance	79.1
Will need improved breeds	85.3
Will grow crops to feed pigs	53.7
Use kitchen and hotel wastes	67.0
Will need credit facilities	85.8
Will buy feed	39.7
Will practise mixed farming	71.0

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Table III: Prevalence of endo-and ectoparasites of small holder piggeries in Northern Nigeria

Parasites	No. Sampled	No. (%) infected
Roundworms (adults)	250	30 (12.0)
Segments of tapeworm (adults)	250	10 (4.0)
Ascaris ova	250	209 (83.0)
Strongyle ova	250	220 (88.0)
Trichuris ova	250	86 (34.4)
Coccidia oocysts	250	25 (10.0)
Ticks	400	30 (7.5)
Lice	400	80 (20.0)
Mange	400	10 (2.5)

Many respondents (97.4%) viewed swine production to be profitable and about 61% of them were willing to expand if certain bottlenecks were removed (Table II). Fifty-five (55%) of the respondents were willing to spend money on veterinary health care, while 79% of the respondents were willing to use technical assistance (Table II). Prevalence rates of 7.5, 20.0 and 2.5% of ticks, lice and mange, respectively; were found (Table III). Infection rates of 4.0, 10.0, 34.3, 83.6, and 88.0% of tapeworm, coccidia oocyst, *Trichuris* ova, *Ascaris* ova and *Strongyle* ova, respectively; were also seen.

DISCUSSION

Most of the small piggery farmers practised semi-intensive systems of backyard management, where pigs scavenge and roam freely in the day time with supplementation during the confinement period in the evenings and this corroborates the study of Malynicz (1970). The holding sizes in the present study are within the range reported by Somoye and Fianu (1991a, b) and Pathiraja *et al.* (1986) under similar management systems. It is said that "sow is a prolific mother", with the high capacity to over produce progeny, probably in-built by nature in order to compensate

for early mortality (Leece, 1986). The above statement corroborates our present findings of 8.1 (2-14) litter size at birth and 6.6 piglets at weaning; the latter representing 18.5% of pre-weaning piglet mortality. Starvation, primarily during the first week of life has been the direct and indirect cause of at least 50% of pre-weaning piglet mortality in swine herds (England, 1986; Fetuga *et al.*, 1975a, Smith, 1982; Pathiraja *et al.*, 1986). The pre-weaning piglet mortality of 18.5% in this study, agrees with the values reported by other workers (Fetuga *et al.*, 1975a, Smith, 1982; Pathiraja *et al.*, 1986). Acute gastro-enteritis of pre-weaning pigs leading to high mortality has been associated with *Escherichiae*, *Samonellae* and helminths infections (Falade *et al.*, 1983; Fayomi *et al.*, 1988). Predisposing factors for piglet mortality include lack of milk-let down or colostrum, traumatic injuries to piglets by dams, neonatal diseases, premature farrowing and poor management practices (Payne, 1990).

Economic losses arising from gastrointestinal parasitism in pigs are highly enormous (Ikeme and Nduaka, 1974; Ikeme, 1980; Fayomi *et al.* 1988). Predominantly encountered in the gastrointestinal tract and causing most problems in pigs, are the ascarids (Babatunde and Fetuga, 1973; Ikeme, 1980). The prevalence of roundworms, tapeworm and coccidia in many smallholder piggeries in this study support the earlier findings (Ikeme and Nduaka, 1974; Ikeme, 1980). In Northern Nigeria, pigs are owned by both men and women; and ownership of pigs enhances man's social status; as evident by his financial capability to keep and sustain pig production (Pathiraja *et al.*, 1986). Many pig farmers view pig production not

only as a source of income especially during periods of cash shortages, but also as part of the tradition. It is concluded that swine production in Northern Nigeria is a permanent and a widespread socio-economic activity among small-scale farmers. Farmers' affirmative answers on swine production could give clues for successful extension research programmes with productive goals in accordance with resources available to the farmers. Information on pig production characteristics of smallholder piggeries in Northern Nigeria could be used for successful extension research programmes for the improvement of pig production.

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