

Pig Production in Gulu and Omoro Districts of Northern Uganda

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Citation: Kasima JS, Mugonola B and Ndyomugyenyi EK (2021) Pig Production in Gulu and Omoro Districts of Northern Uganda.. Technolock Vet Sci 1:1-9

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ABSTRACT

The potential of pig production to improve the livelihoods of smallholder farmers is constrained by inadequate use of pig production technologies. Technologies like the use of artificial insemination (AI) to improve breeds have been suggested to improve pig production. Pig production in Northern Uganda, however, remains low suggesting limited use of such technologies. Three technologies (Indigenous Micro-organism (IMO) technology, artificial insemination and use of feed formula from dominant locally available feedstuffs) were introduced to the smallholder farmers in Gulu and Omoro districts of northern Uganda. Prior to implementation, however, it necessitated that the status of pig production among farmers be established against which the impact of the initiative to introduce these technologies will be assessed. This paper therefore aimed at determining the status of pig production in northern Uganda. A cross-sectional survey was carried out among 109 purposively selected pig farmers recruited to participate in technology implementation. 59.6% were males, aged between 36-64 years (53.2%), married (78%), with household size of 7-9 members (42.2%), had attained primary education (58.7%) and had 1-5 acres of land (54.1%). The average herd size was 4.6 pigs with 67.4% farmers keeping local pigs. Piglets dominated the herds in both districts with 89% farmers keeping pigs as the main livestock species. Income generation was the primary reason for keeping pigs. Piggery was constrained by expensive feeding (82.6%) and diseases (47.7%). 93.6% farmers fed pigs on local feedstuffs with no definite formula, 59.6% housed their pigs but none used either artificial insemination or indigenous micro-organism technologies. In conclusion, there exists limited knowledge on, and use of the three technologies. There is therefore need to train farmers on these technologies and later assess their acceptance and adoption, and their impact on status of pig production.

Keywords: Artificial insemination, livelihoods, Indigenous Micro-organisms, Local Feed Formula

List of Abbreviations

AfrII: Africa Innovations Institute; AI: Artificial Insemination; ASF: African Swine Fever; FAO: Food and Agriculture Organisation of the United Nations; IMO: indigenous Micro-Organisms; RUFORUM: Regional Universities Forum for Capacity Building in Agriculture; SPSS: Statistical Package for Social Scientist; UBOS: Uganda Bureau of Statistics

Introduction

Worldwide, pig production is one of the fastest growing livestock sub-sectors primarily because pigs are characterised by their ability to effectively convert feed to meat, provide quicker returns on investment [1,2] and are highly prolific [3]. Furthermore, the demand for animal protein as a result of increasing population, urbanization and rising incomes in the developing countries has encouraged pig production [4,2,5]. In Uganda, however, low pig population (4,037,000 pigs) was registered as compared to other livestock species such as poultry (46,291,000 birds) goats (15,725,000), and cattle (14,368,000 heads) [6]. The low pig numbers in Uganda could be due to inadequate use of improved technologies such as artificial insemination (AI) to improve breeds and indigenous microorganisms (IMO) to reduce smell from pig stys [7].

Despite the low pig population in Uganda, there is a potential of pigs to improve and sustain livelihoods if farmers used pig production technologies. Although the use AI and IMO have been suggested to increase pig production, northern Uganda still lags behind in the sector [8] suggesting limited use of these technologies. This could be a result of limited efforts to introduce these pig production technologies to pig farmers in northern Uganda.

Consequently, three pig production technologies were introduced to pig farmers in the districts of Gulu and Omoro of Northern Uganda. These included: (1) use of Indigenous Micro-Organism solution to reduce smell in pig houses (IMO); (2) Use of artificial insemination to improve pig breeds; and (3) Use of locally formulated feeds prepared from dominant locally available feedstuffs. It was however important to first establish the status of pig production in the two districts prior to technology implementation. This study therefore aimed at determining the status of pig production before implementation of the three technologies in the two districts of Gulu and Omoro. The study will act as a basis against which the impact of the technologies on pig production in the region can be measured in the future.

Materials and Methods

Study area and design

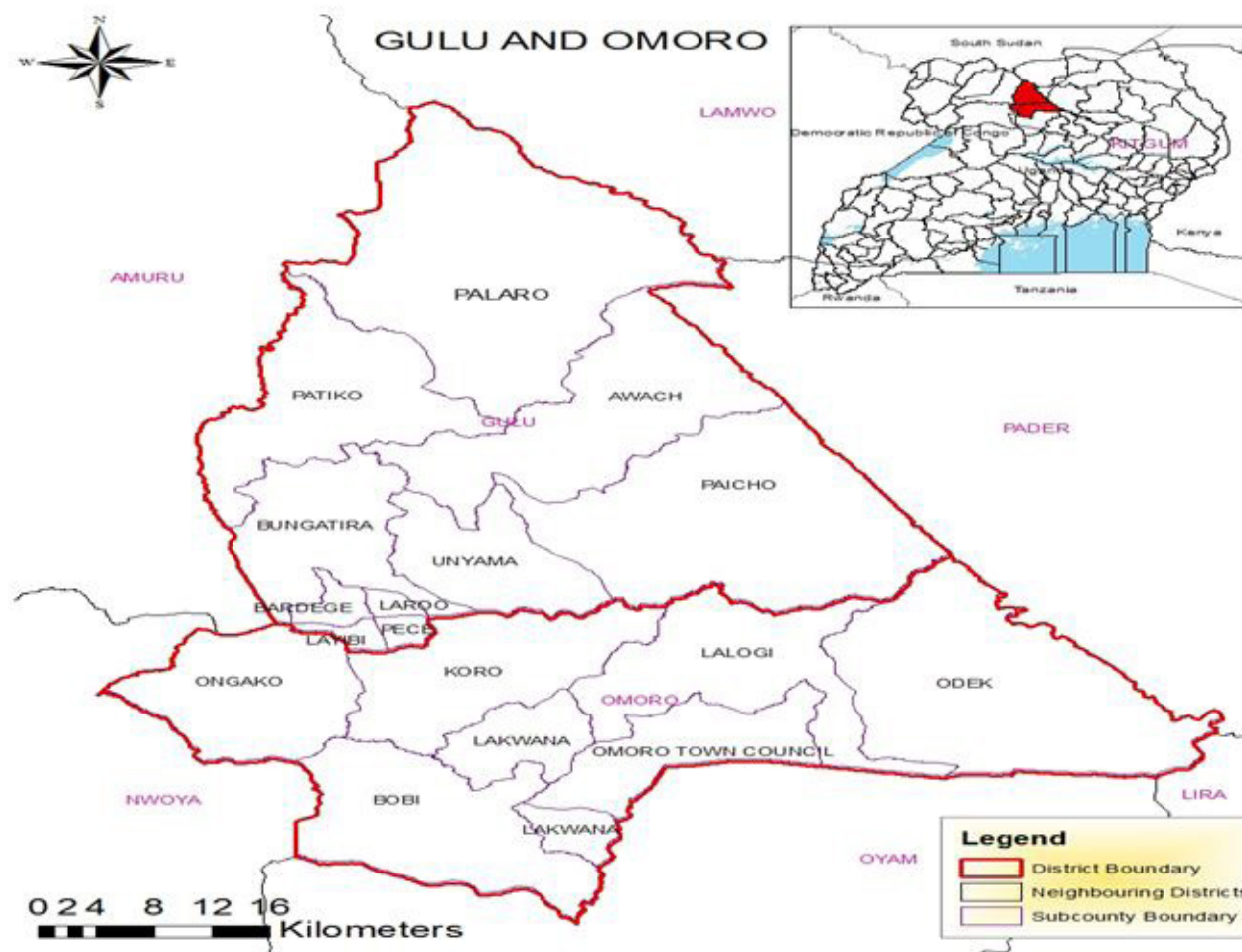
The study, which adopted a cross-sectional survey design (August to October, 2018), was conducted in the districts of Gulu (Paicho sub-county) and Omoro (Koro and Ongako Sub-counties) in Northern Uganda (Figure 1). Gulu district is located between longitudes 30-32 degrees East and latitudes 02-4 degrees North. It is bordered by Omoro district in the south, Amuru district in the west, Lamwo district in the north and Pader district in the east. Omoro district is located between 02°35'N and 32°22'E. It is bordered by Gulu district in the north, Pader district in the east, Oyam district in the south and Nwoya district in the west.

Up to 109 (48 in Gulu district and 61 in Omoro district) pig farmers, who were recruited to participate in the technology implementation exercise were purposively selected. Data were collected using semi-structured questionnaire and observations. The questionnaire consisted of three parts: (1) demographic characteristics of respondents; (2) different aspects of pig production like herd size and characteristics; and (3) use of different technologies. Secondary data sources were also reviewed especially from journal publications and district production reports. Data were analysed using Statistical Package for Social Scientist (SPSS) version 15.0 and Microsoft Excel where descriptive statistics like frequencies, means and percentages were generated.

Results

Socio-demographic characteristics of pig farmers in Gulu and Omoro district

The study revealed that most (59.6%) pig farmers were males, aged between 36-64 years (53.2%) with the mean age being 38.94 years (Table 1). 78% of the pig farmers were married with household size of 7-9 members (42.2%), had attained at least primary level of education (58.7%) and had 1-5 acres of land (54.1%). The average acreage of land possessed was 2.51 acres.



Variable	No. of respondents (N = 109)	% of respondents
Gender		
14-35	48	44.0
36-64	58	53.2
Over 64	3	2.80
Marital status		
Married	85	78.0
Single	13	11.9
Divorced	1	0.9
Widowed	10	9.2
Household size		
1-3	6	5.50
4-6	32	29.4
7-9	46	42.2
10 and above	25	22.9
Level of education		
No formal education	4	3.7
Primary	64	58.7
Secondary	28	25.7
Tertiary	13	11.9
Land size		
< 1 acre	6	5.5
1-5 acres	59	54.1
6-10 acres	26	23.9
>10 acres	18	16.5

Table 1: Socio-demographic characteristics of the respondents

Herd characteristics

Most (67.3%) of the farmers had 1-5 pigs with the average number of pigs being 4.6 pigs (Table 2). Local breeds of pigs were kept by most farmers (67.4%) followed by the 11.8% who kept cross breeds. The herds were dominated by piglets with Omoro district having the number of piglets more than twice that of Gulu district, and having more pigs.

Variable	N = 109				
	Gulu (n = 48)		Omoro (n = 61)		Average%
	Frequency	%	Frequency	%	
Herd size					
1-5 Pigs	30	62.5	44	72.1	67.3
6-10 Pigs	16	33.3	12	19.7	26.5
Above 10 Pigs	2	4.2	5	8.2	6.20
Breed kept					
Local	34	70.8	39	63.9	67.4
Cross	5	10.4	8	13.1	11.8
Exotic	2	4.2	8	13.1	8.7
> One breed	7	14.6	6	9.8	12.2
Category of pig kept by number (No. of pigs = 496)					
Category	Gulu		Omoro		
Sows	39		36		
Boars	20		11		
Growers	74		55		
Piglets	75		176		
Castrates	0		10		

Table 2: Herd characteristics of pig farmers in Gulu and Omoro districts

Major livestock species kept, reason for keeping pigs and challenges faced by pig farmers

Most (89%) pig farmers kept pigs as the major livestock species, followed by cattle (5.5%) and chicken (4.6%) (Table 3). Most farmers (64.2%) kept pigs as a means of raising income for meeting household needs while others (58.7%) used pigs as a store of money for sale when it is time for paying school fees. Only 11% pig farmers used pigs as a source of capital for supporting other businesses. The commonest challenges faced by the pig farmers were expensive feeding (82.6%) and diseases (47.7%).

Variable	Frequency/109	% of respondents
Livestock species		
Pigs	97	89.0
Cattle	6	5.5
Chicken	5	4.6
Fish	1	0.9
Reason for keeping pigs		
Paying school fees for children	64	58.7
Income for meeting domestic needs	70	64.2
Source of capital for other enterprises	12	11.0
Challenges to pig production		
Expensive feeding	90	82.6
Poor housing	40	36.7
Diseases	52	47.7

Table 3: Reasons for keeping pigs and challenges to pig production

Use of pig production technologies

Over 93% of the farmers were using local feedstuffs but none reported use of a definite formula from these feedstuffs (Table 4). Most (84.4%) pig farmers mated their farmers using natural mating because they did not know Artificial insemination as an alternative to mating in pigs (42.4%) and had access to boars for mating their sows (35.9%). 59.6% of the farmers provided housing to their pigs, of which none used the IMO system as a means of reducing smell in pig houses.

Variable	No. of respondents (N = 109)	% of respondents
Type of feed		
Local	102	93.6
Commercial	1	0.9
Both	6	5.5
Formulated feeds from local feedstuffs	0	0
Breeding System		
Natural mating	92	84.4
Artificial Insemination	0	0.0
Have not yet bred	16	14.7
Only keeping male	1	0.9
Reason for using natural mating	(n = 92)	
Lack of knowledge about AI	39	42.4
Natural mating is cheap	16	17.4
Easy access to boar	33	35.9
Other reasons	4	4.3
Providing housing to pigs		
Housing pigs	65	59.6
Not housing	44	40.4
Use of IMO system (for those housing pigs)	(n=65)	
Using IMO	0	0
Not using IMO	65	100

Table 4: Type of feed, breeding system, housing and use of IMO technology

Discussion

Socio-demographic characteristics

Most pig farmers were males which could be attributed to the drudgery involved in handling pigs. The findings in the current study agree with [9-11] who also reported high male participation in pig production. To the contrary, however, some authors have reported high female participation in pig production claiming that women provide more labour in pig production [12, 13]. The average age of most farmers in the current study (38.94 years) could imply that pig production is carried out by adult farmers of the middle age as a means of raising income to meet the household needs. This age is commensurate with the 38 years reported by [14]. More married farmers were found to be participating in pig production in the current study. As with the current study, [9] also reported high participation of married farmers in pig production. Since pigs are highly prolific [3] and have ready market [15], they could easily avail income to married farmers to acquire the household basic needs. Married farmers in the current study may therefore have opted for piggery to this end. Furthermore, most farmers had large household sizes and had attained only up to primary level of education which, in Ugandan setting, could not enable them obtain formal employment. They might therefore have opted for pig production to earn a living. Most pig farmers have been reported to at least have attained up to primary level of education [16, 17]. The findings in the current study however disagree with [18] who reported over 53% pig farmers to have

attained tertiary education as opposed to the 2.4% who had completed primary education. With the average land size of 2.51 acres possessed by most farmers, they could ably keep their pigs as these have small space requirements [19].

Herd characteristics

The average of 4.6 pigs which was kept by most farmers in the current study is a typical characteristic of smallholder pig farmers. The current findings agree with those of [20] in Sri Lanka and [21] in Tanzania, who reported a herd size of 4 and 4.9 pigs, respectively. To the contrary, [22] reported a lower herd size of up to 2 pigs as was also reported by [23].

Local breeds were kept by most farmers probably due to their low capital demand and ability to survive in harsh conditions as those in the study area. In addition, local pigs can move long distances [5] to look for food and are cheap to maintain by the resource-constrained farmers [24]. The 64.7% farmers keeping local pig breeds in the current study was higher than the 24% reported by [20]. More farmers (62% and 67.4%) were however reported to keep cross-bred pigs by [22,25], respectively, compared to the 11.8% in the current study. The difference in breed kept could be because the current study was carried out in a rural setting where most farmers could hardly sustain the requirements of cross-bred and exotic pigs. The studies by [22,25] were, however, carried out in a more urban setting where farmers are profit-oriented and can afford the requirements of improved breeds of pigs. Piglets were the commonest category kept as was also reported by [21].

Major livestock species kept, Reason for keeping pigs and challenges faced by pig farmers

Pigs were kept as the major livestock species which agrees with [1] who also reported high preference for pigs compared to other livestock species. This, they attributed to the high prolificacy and small land requirement which were also reported by [3,4]. These characteristics may also be preferred by farmers in the current study.

Irrespective of the purpose for which the income would be used for, all farmers kept pigs as an income source. This was either for meeting household needs, paying school fees for children or for raising capital to support other businesses. In agreement with the current findings, the primary reason for keeping pigs is income generation [26,20].

Most farmers faced a challenge of costly feeding followed by diseases. Feeding contributes over 70% to the total production costs in pig production [8], and it is therefore key to ensure optimum output. This calls for cheaper alternatives to mitigate the expensive feeding, a challenge which was also reported by [27], if pig production among smallholder farmers is to be sustained or even improved. Contrary to the current findings, [26] reported diseases as the commonest challenge faced by pig farmers. In another study, [18] reported that pig farmers were majorly limited by inability to access credit and expensive feeding.

Use of pig production technologies

Most farmers fed pigs on local feedstuffs which included cassava, sweet potato vines, wandering Jew, milk weed among others, probably because they are cheap and readily available. The use of locally available feedstuffs by pig farmers was also reported by [21] in Tanzania. Feeding pigs with local feed materials, according to [8], has constrained progress of the piggery sub-sector. However, commercial feeds are expensive [27]. Earlier authors reported some local feedstuffs in Uganda as having the potential to sustain pig production as they can provide the required nutrients [28]. However, farmers lack adequate knowledge on efficient utilisation of these feedstuffs to ensure that pigs obtain the required nutrients [29]. Developing a formula from the local feed materials as recommended by [19], and training farmers on how to formulate the feeds could enable farmers utilise these feedstuffs. Most farmers who used natural mating reported that they did not know of any other alternative to mating pigs. The use of natural mating was however reported as a candidate of disease spread among herds as a result of contact [19]. It is therefore important to train farmers on the importance of artificial insemination and avail them with artificial insemination services. Although most farmers reported lack of knowledge of mating alternatives, some (35.9%) said that they had easy access to breeding boars which concurs

with the findings of [30]. Provision of housing by most farmers in the current study could be due to fear of disease transmission particularly African Swine Fever (ASF), injuries from tethering and destruction to neighbours' crops. The ASF was reported to be endemic in northern Uganda [31], with high prevalence reported among pigs which are not housed [25] as they roam from place to place looking for food. The injuries from tethering and destruction to crops as a result of lack of pig housing were reported by [32]. The 59.6% farmers who housed pigs in the current study were lower than the 61% reported by [33] and the 96.9% reported by [34]. Although the IMO system was not used by any of the pig farmers, its advantages reported by [7] indicate that in case farmers take it up, pig production may be improved in the region.

Conclusion

Based on the finding from the current study, male farmers participate more in pig production enterprises than do the females. Most pig farmers fed their pigs on locally available feedstuffs with no defined formula. However, none was using artificial insemination for breeding their pigs nor was any using the indigenous micro-organism technology as a means of smell reduction in the pig houses.

Recommendation

Farmers need to be trained on the use of the different pig production technology so as to close the exposure gap. This may enhance pig production in the region. There is also need to ascertain the acceptance of the technologies by the participating farmers, and later assess the impact of the intervention to the general community of Northern Uganda.

Acknowledgement

The authors are grateful to The MasterCard Foundation through The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) for funding the Community Action Research Project titled "Enhancing Pig Production and Marketing for Smallholder Farmers' Livelihood Improvement in Northern Uganda" under which the study was conducted. Great thanks also go to the pig farmers in Gulu and Omoro districts for consenting to participate in the study.

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