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Assessment of Pig Production, Health and Marketing Constraints in Bishoftu, Central Ethiopia

[1]Adugna Kasa, [2]Dereje Tulu and [1]Chaluma Negera

[1]Southwest Shoa Zone Livestock Development
and Fishery Office, Woliso, Ethiopia
[2]Ethiopian Institute of Agricultural Research,
Tepi Agricultural Research Center, P.O. Box: 34, Tepi, Ethiopia

Abstract: A swine production form is an integral part of a farmer's economy in many parts of the world. Swine production in Ethiopia is in its infant stage. A cross-sectional study was conducted on farms found in Bishoftu from November 2018 to November 2019 to identify the production, health and marketing constraints of swine in the study area. The collected data was analyzed using Statistical Package for Social Scientists (SPSS) on the descriptive statistical tools. Religious influence, health problems, lack of extension service and market access and market information, feed shortage were identified in this study. Productivity was generally low, because of people's culture and tradition, lack of market access and information, inadequate extension service, inadequate slaughter facilities, health problem and diseases. Therefore, these constraints should be given attention in this area to increase swine productivity. The government should consider the sector as a poverty alleviating sector, should have swine production policy, building pig breeding capacity, encouraging investment in breeding, integrating swine production into processing industries. The abattoir should be expanded, alleviating constraints to marketing, improving marketing and market information and upgrading marketing and changing the behavior and culture of people.

Key words: Constraints · Health · Marketing · Swine Production · Bishoftu

INTRODUCTION

Swine production forms are an integral part of a farmer's economy in many parts of the world. Many countries practice different kinds of production approaches. Swine production is increasing from time to time in many parts of tropical countries. Increased demand on the international market, due to the increased number of pork consumers and the profit obtained from the sector make the production increase rapidly [1].

The importance of pig production as a likely solution to deficiency of animal protein and as a tool for fighting poverty in the tropics has been indicated by Ajala [2]. Furthermore, small scale pig production has been indicated as a viable livestock system in many east African countries, playing an important role in pork production either for home consumption or sale and income generation [3]. Pigs are also of considerable importance in customs and traditions in many developing countries [4]. However many constraints are known to limit the improvement of the productivity of pigs on smallholder farmers.

Experiences from Africa showed that intensive pig farming is stagnant and the sustainability of the traditional sector is better than that of the intensive sector. Pig farming systems in sub-Saharan Africa may be classified into traditional systems, in which pigs are free-ranging or at most confined at night and/or seasonally to protect the crops and semi-intensive and intensive systems, in which the pigs are mostly confined. Many of the semi-intensive farms are backyard farms in peri-urban areas; large-scale intensive pig farms are the exception rather than the rule. In the majority of countries, most pigs are kept in traditional systems that generally make use of local breeds of pigs or their crosses that are hardy and undemanding in terms of nutrition and management [5].

Corresponding Author: Dereje Tulu, Ethiopian Institute of Agricultural Research, Tepi Agricultural Research Center, P.O. Box 34, Tepi, Ethiopia.

The productivity of pigs is generally low because the investment is low, the price received for the pig is usually higher than the cost of producing it and so the system is seen as unprofitable at subsistence level [6]. On the other hand, commercial pig production using improved breeds of pigs or even local breeds has often proven unprofitable and unsustainable owing to high input costs that include housing, feed and infrastructure and market prices that are too low to justify the investment [5, 7].

Swine production in Ethiopia is in its infant stage. The pig population in Ethiopia was estimated to be 29,000 heads representing 0.1% of African pig population [8]. In many rural parts of Ethiopia, pig production was characterized by an extensive production system whereby pigs are allowed to scavenge at backyard and municipal garbage dumping sites [9]. The domestic pig is an animal that has been very much neglected by the scientific community in Ethiopia; hence very few information is available focusing mainly on gastrointestinal parasites [9] and prevalence of tuberculosis [10]. On the other hand, an extensive husbandry system coupled with poor environmental hygiene and voracious feeding behavior of pigs has been indicated as a major risk factor for infection of pigs with helminths and gastrointestinal parasites where pigs may act as potential reservoir hosts of human gastrointestinal parasites such as ascariasis [11].

African swine fever (ASF), is recognized as a major limiting factor for pig production in sub-Saharan Africa, but the most serious constraints that have been identified in many countries are lack of suitable feed at affordable prices, poor or no access to animal health services, cost of housing pigs, poor genetics of breeding stock and lack of knowledge and information about pig production and health [12-19]. These constraints become critical with the intensification of pig production when pigs are permanently confined and completely dependent on their owners for all aspects of their wellbeing.

High feed prices and low quality of available feed have been identified as a major constraint for smallholder and commercial farmers in many African countries [5, 7, 13, 14]. Lack of resources to feed pigs is a major contributory factor to the maintenance of extensive pig-farming systems [17-19, 20-22]. Even in semi-intensive systems where pigs are in theory permanently housed, they may be liberated for shorter to longer periods during the day to forage for themselves [15, 19, 23, 24].

For the last number of years, the adequate emphasis was not given for the sector. Unlike other livestock distribution, swine farms are restricted to the central part of the country. According to Ethiopian livestock development master plan all the pig population in Ethiopia has been under private ownership and in strictly religious terms members of the Ethiopian Orthodox church as well as people of the Islamic faith are not in favor of consuming pork which effectively means that there is only very limited pork market within Ethiopia and in those solidly Islamic surrounding countries. Hence, no public intervention has been promoted on pig production in Ethiopia [25].

In tropical highland areas, including, Ethiopia swine production is low due to lack of access to market, religious influence, low management practice, poor quantity and quality of feed, high feed prices and inadequate slaughter facilities. Furthermore, there is a gap of information about opportunities as well as constraints of swine production. Therefore, it was necessary to undertake a study to generate baseline information on swine production. Hence, the contribution of this paper lies in the identification of different problems related to swine production, health and marketing constraints in Bishoftu. So this study was conducted with an attempt to address production constraints, health and marketing constraints of swine in Bishoftu, central Ethiopia.

MATERIALS AND METHODS

Description of the Study Area: The study was conducted in swine farms found in and around Bishoftu which is located 45 km along South East of Finfinne in central Ethiopia. The area is located at 9°N latitude and 40°E longitude at an altitude of 1850 masl with an annual rainfall of 866 mm of which 84% is in the long rainy season June to September. The dry season extends from October to February. The mean annual maximum and minimum temperatures are 26°C and 14°C respectively, with a mean relative humidity of 63.3%.

Study Design and Method of Data Collection: A cross-sectional study was conducted from November 2018 to November 2019 in Bishoftu town. Detailed and organized semi-structured questionnaire (open and closed-ended) was designed in an attempt to generate baseline information related to swine production, health and marketing constraints in Bishoftu. There are also questionnaires for a supermarket in Addis Ababa and Bishoftu to know the balance of supply and demand and questionnaires for some consumers to understand the perception of consumers.

Also, there were questionnaires for a government office to know the policy on swine production and market. Standard was given for farms by observation

(poor, medium and good) depending on the sanitation of feed, water, house and area around the farms. Diseases were assessed by asking the clinical sign occurring on the farms.

Data Analysis: The collected data was analyzed using Statistical Package for Social Scientists (SPSS) on the descriptive statistical tools interface and summarized into frequencies and other descriptive parameters.

RESULTS

Socio-demographic Characteristics: The majority of pig producers in the study area are educated people from basic education and high school to degree level (86.4%) with few illiterate groups (13.6%) The majority of the respondents were between ages 30 and 45years which was 63.6%. The result indicates that the majority of swine producers in the study area were males (81.8%) with a small proportion of females 18.2%. (Table 1).

Majority of the farms (55%) in study area used temporary labor and some of they used their family (9%) (Figure 1).

Health and Related Problems: Out of sampled farms owners of 95.5% farms responded that they had health problem in their farms. The owners of 59.1% of farms responded that they had not extension service. Out of sampled farms, 77.3% of farms had poor sanitation and 13.6% of them had medium sanitation standard and the rest had good sanitation standards. Out of sampled farms, 68.2% of farms had not encountered any reproductive problem, whereas 31.8% of farms encountered reproductive problems (Table 2).

Marketing Constraints of Pigs' Farms: Out of sampled farms, 68% of farms had no market advice and 72% of farms have no market information. Out of the sample, the buyers of the pig were from foreigners which were 86%. Out of sampled farms, 50% of farms determined the price of a pig by negotiation with the buyer, 27% of farms determined their price by the seller. Out of sampled farms, 90.9% of farms were unsatisfied with the present market price of a pig. Out of 30 people asked for their perception of consuming pork meat 29 of them said that we had no interest in consuming pork meat and seven supermarkets, five from Addis Ababa and two from Bishoftu were asked about the balance between their supply and demand of the customer. They responded that there was no balance between supply and demand (Table 3).

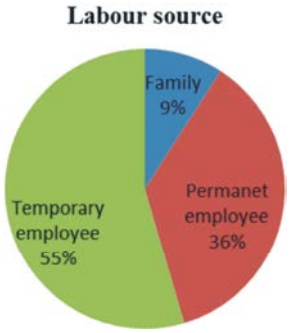

Fig. 1: Percentage of labor source in the study area

Table 1: Socio demographic characteristics of respondents

Variables	Frequency	Percentage
Educational level		
University/College	7	31.8%
High school	8	36.4%
Elementary		
illiterate	3	13.6%
Basic education	4	18.2%
Age category (years)		
< 30	4	18.2%
30-45	14	63.6%
> 60	4	18.2%
Sex		
Female	4	18.2%
Male	18	81.8%

Table 2: Health and the related problem of pig farms

Variables	Frequency	Percentage
Presence of health problem		
Yes	21	95.5%
No	1	4.5%
Presence of extension service		
Yes	9	40.1%
No	13	59.1%
Presence of reproductive problem		
Yes	7	31.8%
No	15	68.2%
Farm sanitation		
Poor	17	77.3%
Medium	3	13.6%
Good	2	9.1%

Production Constraints of Farms: Out of sampled farms, 59.1% of farms had feed shortage and 50% of the farms provided their pigs with supplements. In addition to this, 54% of the farms used smooth floor types of the house and the rest used rough floor types. Furthermore, 86.4% of the farms kept their pigs in the closed type of roofing system and the rest used open type of roofing system. Besides, 81.8% of farms had separate piglet house with ventilation and also 81.8% of farms had separate parturition houses. Hence, 95.5% of the farms used boar for breeding and 63.6% of farms had no record-keeping system (Table 4).

Table 3: Marketing constraints of pigs' farms

Marketing	Frequency	Relative proportion
Advice on market		
Yes	7	31.8%
No	15	68.2%
Market information		
Yes	6	27.3%
No	16	72.2%
Buyer		
Ethiopian	3	13.6%
Foreigners	19	86.4%
Price determiner		
broker	5	22.7%
Negotiation b/n buyer and seller	11	50%
seller	6	27.3%
Market price satisfaction		
Satisfied	2	9.1%
Unsatisfied	20	90.9%
Presence of consumer interest		
No	29	97%
Yes	1	3%
Presence of balanced supermarket supply and customer demand		
Yes	-	-
No	7	100%

Table 4: Production constraints of farms

Variables	Frequency	Relative proportion
Presence of piglet house		
Yes	18	81.8%
No	4	18.2%
presence of piglet house ventilation		
Yes	18	81.8%
No	4	18.2%
Presence of Separate parturition house		
Yes	18	81.8%
No	4	18.2%
Floor-type of the house		
Rough	10	45.5%
Smooth	12	54.5%
Roofing system		
Open	3	13.6%
Closed	19	86.4%
Use for breed		
AI	1	4.5%
Boar	21	95.5%
Use of record keep		
Yes	8	36.4%
No	14	63.6%
Feed shortage		
Yes	13	59.1%
No	9	40.9%
Supplement provision		
Yes	11	50.0%
No	11	50.0%

DISCUSSION

The majority of pig producers in the study area are educated people from basic education and high school to degree level with a few illiterate groups. This finding agrees with the finding of Theodres, Abreha and Tsegabirhan [26] who reported 78% of the pig producing households were having elementary school and above educational background in Mecha district of Ethiopia and also in line with the finding in western Kenya [12]. These kinds of educational status may facilitate the implementation of a more appropriate farming system. The majority of the respondents were between ages 30 and 45 years which closely related to the finding of Theodros *et al*. [26] who reported the age of pig producers ranged from 19 to 54. The advantage of these types of age groups engaged in livestock activities will help in easy technology transfer easily as they are more flexible to new techniques and applications.

The majority of swine producers in the study area were males with a small proportion of females which is similar to a survey on pig rearing in Botswana [27] and in contrast with the study in western Kenya i.e. women are kept pig [12]. Consideration of gender will be important in the adoption and transfer of technology as well as in the improvement of animal husbandry. Most of the farms used temporary labor in the area of study. This disagrees with the labor system in Vietnam that most farms used family labor for pig production [28] which they did to reduce the cost of production. Most farms in the study area were used boar for breeding purposes which is similar to finding in the North East Indian state of Nagaland [29]. They used boar due to a lack of AI service in the area.

Pig production in the study area was mainly for income generation, which is under the influence of religion. The result of this study indicated that all of the farms assured that the purpose of pig keeping in the study area was for income generation and there was a religious influence on their production. All pig owners were against the slaughter of pigs for home consumption. This is an indication that, in Ethiopia religion, culture and traditions play an important role in the pig sector [15, 30]. Hence, pig production and consumption are not widespread in the study area. This agrees with the finding of Tekle *et al*. [30] in Ethiopia and in contrast to the study in Namibia, Uganda and Kenya where pig keeping is for income and pork consumption [17]. This in turn explains the lack of local market and in turn calls market orientation towards organized export market and value chain creation.

In the study area, most of the farms have not to get market advice and most of them have no market information. People's perception and imbalance between the supply of supermarket and demand of customers is one of the major constraints to the marketing in Ethiopia. Marketing as constraints has also reported in several studies [31, 32]. Poor and unorganized marketing has also been highlighted to be a limitation to pig production in Kenya [15] as well as reported by farmers in Nan Gabo sub-country, Wakiso district. These contradict the study conducted in Nigeria which was established that information concerning prices, demand and supply circulate freely and rapidly among the market participants operating within the marketing system [34].

Most of the farms have separate piglet houses with ventilation and also most of them have separate parturition houses. The majority of the farms in the sampled farms were housed their pig all the time. This result disagrees with the result of [35] which indicates that from the total of respondents in Mecha district only 20% have separate piglet houses, while the remaining keep piglets with adult pigs and also with the finding in western Kenya [12] which freely leaves their pig and to some extent confined their pigs. The major constraints to pig production in the study areas were religious influence (culture and tradition), health problem, lack of market advice and information, feed shortage and lack of trained extension service. Similar production constraints were reported by Banerjee [36] in Uganda, Petrus *et al*. [17] in Namibia and by Kagira *et al*. [12] in western Kenya.

The type of feed available in the study area was leftover from home, leftover from restaurants and hotel, agricultural leftover, vegetables/ fruit leftovers were given to pigs as common feeds. Very few farms were supplying purchased feeds such as furushka and large farms (Alema, Alpha, Debrezeit, Tseddy and fair field) supply their pigs concentrate feed. Some parts of this finding confirm the condition happening in the intensive farms of central Kenya in which poor nutrition status of the pig was observed related to lack of provision of formulated feeds to pigs [3]. These disagree when compared to Europe in which pigs are provided with a good quality feed like legumes seed, fruits cereals, root and tuber, green forages and animal products [37]. The provision of extension service in the study area was poor which is similar to finding in central Kenya [12] and North-East Indian state of Nagaland [29]. This is related to inadequate training, a poor salary of extension agent and lack of interest.

Most of the farms' owner responds that there was diseases occurrence in the farms mostly affecting all age group in the farms and they explain the clinical sign of diseases that occur in their farms i.e. cyanotic skin, coughing, fever, ocular discharge, diarrhea, weakness and depression which are tentatively the clinical sign of African swine fever. Also, they said that there was drooling of saliva, inappetence, fever, shivering, the lesion (vesicle) on the mouth, leg, under the belly, teat and gums affecting allage group which is related to the clinical sign of foot and mouth diseases. This is related to the report in the northern Lao that around 65% of respondents, who mainly rear pigs in free scavenging and semi-scavenging production system reported that losses due to diseases usually ranged from 40% to 80% of the head, but in some cases, mortality was high [38-41].

CONCLUSIONS AND RECOMMENDATIONS

Pig farming systems in sub-Saharan Africa can be generalized into traditional systems, in which pigs are free-ranging or at most confined at night and/or seasonally to protect the crops and semi-intensive and intensive systems, in which the pigs are mostly confined. In tropical highland areas, including Ethiopia, swine production and productivity is generally low due to lack of access to market, religious influence, diseases, low management practice, poor quantity and quality of feed, high feed prices and inadequate slaughter facilities. Therefore, the following recommendations are given to solve the problem.

- The government should work on cultural and behavioral change of the people and also formulate an appropriate policy regarding pig production in the livestock production strategy.
- Alleviating constraints to marketing, improving marketing and market information and upgrading marketing infrastructures will potentially increase the welfare of smallholder producers and urban consumers and improve the national balance of payments.
- The abattoir (licensed premises) should be extended to pig farms for better margins are usually realized for fresh or cooked meat than a live pig.
- The government should consider the sector as a poverty alleviating sector and should build pig breeding capacity, encouraging investment in breeding, integrating commercial pig production into processing industries.

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