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Challenges, Opportunities and Management Practice of Pig Production in Debre Markos Town, East Gojjam Zone in Amahra Regional State, Ethiopia

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Abstract

The present study was conducted in Debre Markos city, Amhara National Regional State, East Gojjam Administrative Zone. The town is situated in the north west of the capital city of Ethiopia, Addis Ababa at a distance of 300 Km. On the title of challenges, opportunities and management practice of pig production in Debre Markos Town, East Gojjam Zone in Amahra Regional State, Ethiopia. The objectives of the study were to assess the existing production system of pig in Debre Markos town, to investigate challenges and opportunities of pig production in the study area, and to examine the religious and cultural restriction of pork consumption. The data were collected through purposive sampling method based on the pig producer and non-producer perception of pig by using semi-structural questionnaire on 30 household who live in Debre Markos town. The collected data were analyzed using central tendency of descriptive statics. Based on the result the majority of producer fallowed semintensive production 42.8% and fallowed by two production system (extensive 28.6% and intensive 28.6%). The majority of pigs give their first piglet were ranges between 3-5 months of age (85.6%) and minimum number of pigs give their first piglet at the age of above five months (14.4%). This shows good productivity and reproductivty of pigs in the study area. The major feed resources of pig feeds as ranked by keepers were grass (100%) followed by hotel food residues (86%) and cereal grain (43%). The major feeding system of pig in the study area were combination of grazing with stall feeding (43%) fallowed by stall feeding and frees grazing (29%) and few are feed pigs grazing on pasture land. The frequency feeding pigs in the study area were majorly three times per day (43%) in the morning at the midday and at night and the rest feeds their pigs free choice and 2 times per day (29%) for each. The major water resources of pigs water supply as ranked by keepers were river (71%) followed by tape water (43%). Majority of constraint faced by producer to pig production in the study areas reported according to their order of importance include lack of market (100%), poor attitude of society (100%), followed by feed availability and cost (57.1%), shortage of water (42.8%), lack of labor (42.8%), lack of skilled veterinarians (28.6%), high cost of medicine (14.3%) and on pig diseases and poor preventive health care (14.3%). From the results of this study it can be concluded that pig production system resulted in significantly higher returns compared with other production of farm animals but religious taboos 100% restrict to consume the meat of pork.

Keywords: Non-producer; Pig; Pork; Producer; Religious taboos

Introduction

Ethiopia is known to have one of the largest livestock populations in the world. The livestock sector counts for over 26 percent of agricultural GDP (2009/10) and 8 percent of export earnings [1]. Yet, the domestic consumption of livestock products remains low compared with other African countries [2].

Pig production is one of the oldest forms of livestock farming as early as 5000 BC. It is believed to have been domesticated either in the Near East or in China from the wild boar. Pigs were mostly used for food, but people also used their hides for shields and shoes, their bones for tools and weapons, and their bristles for brushes pigs have other roles within the human economy. Their feeding behaviour in searching for roots churns up the ground and makes it easier to plough; their sensitive noses lead them to truffles; an underground fungus highly valued by humans; and their omnivorous nature enables them to eat human rubbish, keeping settlements cleaner [3].

Pig production in developing counties is characterized by traditional small scale subsistence driven production systems in which pork provide much more than meat unlike in western countries where pig production is based on human edible foods. Pigs in such low-input systems provide value added for farmers by consuming feed that would otherwise be wasted. Hence, pork might contribute to food security and provide protein, but the animals might also constitute a financial safety net, fulfil a role in cultural traditions, or provide additional cash for school fees, medical treatment, or small investments [4].

The main purpose of pig production, among others, is for carcass products, porcine and to generate income from the sale of live pigs. Pigs have high dressing percentage that mostly ranges from 69.4–80.7% [5,6] compared to other livestock species such as sheep (40-47.1%) [7-9] and beef (52.9-58.7%) [10-12]. Pigs are also reportedly to have superior meat quality [13,14]. However, more than ruminant animals, which mostly depend on natural pasture and crop residues, shortage of feed are the main bottle neck in pigs as they mainly rely on grain crops as staple feed.

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The pig population in Ethiopia was estimated to be 29,000 heads representing 0.1% of African pig population (FAO, 2005). In many rural parts of Ethiopia, pig production was characterized by extensive production system whereby pigs are allowed to scavenge at backyard and municipal garbage dumping sites [15].

Pig production in Ethiopia is in its infant stage. For the last number of years adequate emphasis was not given for the sector. Unlike other livestock distribution, swine farms are restricted to central part of the country near, Addis Ababa. For instance, tradition of keeping swine is improving and their population is increasing from time to time in and around Holetta, west of Addis Ababa. Currently large numbers of swine are widespread in these areas and some are kept mixed with other livestock's [15].

According to Ethiopian livestock development master plan [3] 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 [3]. On the other hand, extensive husbandry system coupled with poor environmental hygiene and voracious feeding behavior of pig 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 [16]. The domestic pig is an animal which has been very much neglected by the scientific community in Ethiopia [4]. Limited researches were conducted regarding the production system, and challenges and opportunities of pig production in Debre Markos town. Having considered the above limitations the present study is designed with the following objectives.

- To assess the existing production system of pig in Debre Markos town.
- To investigate challenges and opportunities of pig production in the study area.
- To examine the religious and cultural restriction of pork consumption.

Materials and Methods

Description of the study areas

Location: The study was conducted in Debre Markos town, one of the self-administrative towns of the Amhara National Regional State, which serve as the capital of East Gojjam Administrative Zone. The town is situated in the north west of the capital city of Ethiopia, Addis Ababa at a distance of 300 Km. Geographically, it is located at 1020'N latitude and 3743'E longitude. The town has a total area of 6,160 ha [17].

Altitude and temperature: Its altitude range from 1302 to 17000 m above sees level and it receives annual rainfall that fall from 1300 to 1380 mm. The area has a *Woina Dega* climate. The temperature ranges from 15°C to 22°C with average temperature of the 18.5°C [17].

Population: According to CSA [1] the study area has estimated to be total population of 119,000 of which 97.07% Ethiopian orthodox Christian religion while 1.7% of population were Muslim and 1.1% were protestant. The town has 12,393 cattle (1016 cross breed), 4,140 sheep, 92 goats [17] but in the case of pig the population is not defined.

Data collection method

The research was carried out by collecting primary and secondary data. Semi structured questionnaire was employed for data collection. Different data were collected from primary sources. The primary data included household characteristics of producers, pig holding, feeding and housing management and the attitude of the household and other living society against pig production and pork consumption. Secondary data included previous data of production system and challenge and opportunity of pig production in the study area from agricultural office.

Sampling technique and sample size

The study design was cross-sectional survey with multistage purposive sample was chosen based on the pig population and production practices. All households engaged in pig production were addressed for data collection. A total of 30 households from the non-producing household were randomly selected.

Method of data analysis

Both qualitative and quantitative data were used and SPSS version 17 was used for analysis. The collected data were analyzed in descriptive statistics and the data presented in means, frequency distribution and percentage.

Result

Age and sex characteristics

The age characteristic of households of producers as shown in Table 1, the result indicates that all of pig keepers in the study area were males (100%). The majority of the respondents are less than 45 years. This range is the active working age and so would include those who have gone to seek off farm activities in urban area. The majority of the younger group members combine pig farming with nonfarm jobs. The advantage of these types of age groups engaged in livestock activities will help in easy technology transfer easily as youth are more flexible to new techniques and applications.

Type of respondent/Variable		Number of respondents in each Keble							
		Keble 1	Keble 2	Keble 3	Keble 4	Keble 4	Keble 5	Total	Percent
Producer	Age	<45	1	1	0	2		4	57
		>45	0	2	1	0		3	43
		Total	1	3	1	2		7	100
Non-Producer	Age	<45	7	8			7	22	73.3
		>45	3	2			3	8	26.7
		Total	10	10			10	30	100
	Sex	Male	4	4			6	14	40
		Female	6	6			4	16	60
		Total	10	10			10	30	100

Table 1: Age and sex structure of pig producer respondents (N=7) and of non-producer respondents (N=30).

The age characteristic of households of non-producer indicates that the respondents in the study area were males (60%) and females (40%) . The majority of the respondents were less than 45 years.

Educational characteristics of respondents

The educational status of pig keepers in the study area is shown in Table 2. All of the respondents in the study area that produce pig were literate people 100%. These kinds of educational status may facilitate the implementation of more appropriate farming procedures. The educational status non-producer households in the study area is that majorities of households that give their opinion concerning with pig in the study area are literate people (70%) with few illiterate groups (30%). These kinds of educational status may facilitate the positive attitude towards pig production.

Production systems

The production system of pig in the study area as shown in Table 3 was practiced by three different systems. The majority of producer fallowed semi intensive production 42.8% and fallowed by two production system (extensive 28.6% and intensive 28.6%).

Reproductive and productive performance of pig

The productive and reproductive performance of pig in the study area is shown in Table 4. The majority of pigs give their first piglet were ranges between 3-5 months of age (85.6%) and minimum number of pigs give their first piglet at the age of above five months (14.4%). This shows good productivity and reproductivity of pigs in the study area. The majority of pigs pelting the consecutive piglet were ranges between 4-5 months (57.1%) and minimum number of pig pelting their consecutive piglet bellow and above two extremis (42.9%). This shows pigs are more productive than other livestock animals.

The majority (85.7%) ofpig leting piglets per sow ranging from 10 to 15 and minimum number (14.3%) of piglets per sow is below 10 which is mainly for extensive production systems.

Management practices

As shown in Table 5, the major feed resources of pig feeds as ranked by keepers were grass (100%) followed by hotel food residues (86%) and cereal grain (43%). This shows in the study area the major source of pig feed is grass and hotel residue specifically does not compute with other livestock and human being.

The major feeding system of pig in the study area was combination of grazing with stall feeding (43%) fallowed by stall feeding and frees grazing (29%) and few are feed pigs grazing on pasture land.

The frequency feeding pigs in the study area were majorly three times per day (43%) in the morning at the midday and at night and the rest feeds their pigs free choice and 2 times per day (29%) for each.

As shown in table 5, the major water resources of pigs water supply as ranked by keepers were river (71%) followed by tape water (43%). This shows in the study area the major source of pig water is river water either faced by the household or pig drink themselves without intermediate in extensive production. The frequency of water

Variable		Number of respondent in each Keble						
		Keble 1	Keble 2	Keble 4	Keble 5	Keble 7	Total	Percent
Producer level of education	Literate	1	3	1	1		6	100
	Illiterate	0	0	0	0		0	0
	Total	1	3	1	1		6	100
Non producer level of education	Literate	5	9			7	21	70
	Illiterate	5	1			3	9	30
	Total	10	10			10	30	100

Table 2: Educational status of producer respondents (N=6) and educational status of non-producer respondents (N=30).

Type of production system	No of producers in each Keble					
	Keble 1	Keble 2	Keble 4	Keble 5	Total	Percent
Extensive	0	1	1	0	2	28.6
Semi intensive	1	1	0	1	3	42.8
Intensive	0	1	0	1	2	28.6
Total	1	3	1	2	7	100

Table 3: Production system of pig (N=7).

Variable		No of producers in each Keble					
		Keble 1	Keble 2	Keble 4	Keble 5	Total	percent
Age at first pigeleting	5-6 month	0	1	1	1	3	42.8
	7-9 month	1	1	0	1	3	42.8
	Above 5	0	1	0	0	1	14.4
	Total						100
	3-4 month	1	0	0	1	2	28.6
Pigleting interval	4-5 month	0	2	1	1	4	57.1
	Above 5	0	1			1	14.3
	Total						100
	5-9 month	0	1	0	0	1	14.3
No of piglets at once	10-16 month	1	2	1	2	6	85.7
	Total						100

Table 4: Productive and reproductive performance of pig (N=7).

supplying to pigs in the study area were majorly free choice (86%) at ***river and from tape water*** and the rest supplies' water to their pigs three times per day (14%) at the morning at the midday and at night accompanied with feed.

Housing of pigs is shown in Table 5. Majority of pig keepers (43%) construct simple shade house the indoor during the night to protect them from predation and rustling and the other respondents use barn house (29%) and living with household (29%) indoor during the night to protect them from predation and rustling. Majority pig household keeps pigs during the day around homestead area to graze surrounding pasture.

Constraints of pig keeping

As indicated in Table 6, majority of constraint faced by producer to pig production in the study areas reported according to their order of importance include lack of market (100%), poor attitude of society (100%), followed by feed availability and cost (57.1%), shortage of water (42.8%), lack of labor (42.8%), lack of skilled veterinarians (28.6%), high cost of medicine (14.3%) and on pig diseases and poor preventive health care (14.3%).

Similar production constraints were reported in Mocha, in Uganda and Namibia. The production constraints might hinder improvement to productivity of pigs. According to Ayele et al. 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 (Table 7) [18]. According to the findings of workers in Ethiopia, the government should also work on cultural and behavioural change of the people and also formulate an appropriate policy regarding pig production in the livestock production constraint.

Taboos of pork consumption

As shown in the study area, it was found that all respondent (100%) of the sample did not consume pork.

Discussion

Management system

Pig production was integrated into the traditional mixed farming system. In addition to pig, 94% of the producers were keeping at least one species with pigs involving cattle, sheep, goats or chicken. According to Abdu and Gashaw 24% of the farms visited in central Ethiopia were under mixed farming system [15]. On the other hand, Tomass et al. pointed out that the integration of pigs into the traditional

Variable		No of respondents in each Keble					
		Keble 1	Keble 2	Keble 4	Keble 5	Total	Percent
Fb	Grass	1	3	1	7	5	100
	Hotel food residue	1	2	1	2	6	86
	Cereal grain	1	2	0	0	3	43
	Grazing grassing & stale feeding	0	0	1	0	1	14
Feed t		0	1	0	2	3	43
	Stale feeding	1	1	0	1	2	29
	Free grasssing	0	1	1	0	2	29
	1 time	0	0	0	0	0	0
Feeding frequency	2 times	1	0	0	1	2	29
	3 times	0	1	1	1	3	43
	Fiery choice	0	1	0	1	2	29
	Spring	0	0	0	0	0	0
Source of water	River	1	2	1	1	5	71
	Tape water	0	1	1	1	3	43
	1 time	0	0	0	0	0	0
	2 times	0	0	0	0	0	
Frequency of watering	3 times	0	1	0	0	1	14
	Fiery choice	1	2	1	2		86
	Simple shade	1	1	1	0	3	42
Housing type	With family	0	2	0	0	2	29
	Barn	0	0	0	2	2	29

Table 5: About feeding, watering and housing (N=7).

Variable	No of respondents in each Keble					
	Keble 1	Keble 2	Keble 4	Keble 5	Total	Percent
Disease	0	1	0	0	1	14.3
Lack of feed and feed cost	1	2	1	0	4	57.1
Lack of vet service	0	1	0	1	2	28.6
Lack of water	1	1	1	0	3	42.8
Lack of market	1	3	1	2	7	100
Poor attitude of society	1	3	1	2	7	100
Lack of labor	1	1	1	0	3	42.8
High cost of medicine	0	1	0		0	14.3

Table 6: Major constraints of pig (N=7).

Variable		No of respondent				
		Keble1	Keble2	Keble7	total	percent
Christian	Consumer	0	0	0	0	0
	Not consumer	9	7	8	24	100
Muslim	Consumer	0	0	0	0	0
	Not consumer	1	3	2	6	100
Culture		3	2	2	7	23
Personal attitude		2	3	2	7	23

Table 7: Taboo of pork consumption (N=7).

mixed farming system might contribute to disease transmission taking the role of pigs as reservoirs of diseases [16]. In this study it was found that pig husbandry was 99% based on low input system farming system. On the other hand, Tomass et al. pointed out that the integration of pigs into the traditional mixed farming system might system contribute to disease transmission taking the role of pigs as reservoirs of diseases [16].

In this study it was found that pig husbandry was 99% based on a low input with minimal inputs mainly feed and facilities such as housing. Batch management was entirely unknown. Inadequate provision for confinement during the night without considering age, sex and production status as in pregnancy was a common observation during our field visits. This study has shown that the pigs were not provided with proper and adequate confinement. The pig management was not based on sex, age or production status. According to Banerjee (2010) separation of various age and sex groups and classes of pigs has great advantage in feeding and management which will help to improve growth because it will help to avoid competition among animals. This study has shown that the pig production was based on scavenging and all pig owners let their pigs to scavenge on public garbage damping sites and pigs were commonly seen wandering along the streets in all the study areas.

Even though we have agreed with Tomass et al. study we have also disagreement or deferens in our study. Difference like we get three types of production system (extensive 28.6%; so intensive 42.8% and intensive 28.6%) even if there is no batch management with same feeding system. And also work as additional work [16].

Production parameters

Production parameters the same study area mean herd size of 20.8+2.89 has been reported and an average herd size of 29 swine has been reported elsewhere in Ethiopia [15,16]. The declining herd size as indicated by lower herd size might be associated with the demonization of pig producers due to lack of market incentives. Pig producers were reporting strong opposition from the community and municipal offices for disposing their pigs as a result of the extensive and scavenging of pigs on the streets, around villages and public garbage damping sites.

In all the study sites, pig production was integrated into the traditional mixed farming system. All of the respondents were keeping pigs entirely as means of income generation. Litter size, multiple furrowing per year, short generation interval, feeding behaviour and orientation of pigs was appreciated by majority of the producers. All producers were against the slaughter of pigs for household consumption [17-19]. So pig population is almost destroyed or only three pigs left because of some constraints [20,21].

Constraints to pig production

The major constraints to pig production in the study areas reported according to their order of importance include poor marketing opportunities, increasing feed cost, lack of basic knowledge on pig management practices, poor extension service, lack of skilled veterinarians on pig diseases and poor preventive health care. Similar production constraints were reported. The Government should also work on cultural and behavioural change of the people and also formulate an appropriate policy regarding swine production without delay, and should be hold in the national livestock development program [15]. We are agreeing with this points it was also constraints in this study area.

Conclusion and Recommendation

Pig production is a recently introduced activity in Debre markos Town with extensive, semi intensive and intensive management system. Most producers were based on combination of grazing with stall feeding type of feeding (semi intensive system) [22].

This study revealed that the main purpose of production was to get additional income for the household. Even though currently, the production cease due to religious restriction of pork consumption (100%), the study pointed that the pig farming in the study area enabled producers to generate additional income which in turn helps in achieving food security, self-employment for landless and unemployed people in the study area. This cross sectional study was the only and first of its kind and has limitation in analysis of whole factors available in the farming system; hereafter, detailed socioeconomic and biological studies are expected after wards. As pigs are among the animal species which are expected to fulfil the growing demand of meat in developing countries, better production system and value creation approaches should be introduced in the farming system.

Therefore, it can be recommended those producers should be doing need assessment before starting the pig production system.

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