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Marketing Practices and Constraints of Pig Production under Small Scale Intensive Farming in East Shewa, Ethiopia

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Abstract: This study was undertaken to describe the marketing practices and constraints of small scale intensive pig production in east Shewa, central Ethiopia. Results were based on cross-sectional survey on 105 households using structured questionnaires. Weight balace was emplyed by higher ($p<0.05$) percentage of respondents in Addis Ababa and Bishoftu than in Adama. The number of respondents which sold live pig were larger ($p<0.05$) in Addis Ababa and Adama than in Bishoftu. The mean price of live pig per kg was higher ($p<0.05$) in Addis Ababa (89.86±1.91) and Bishoftu (89.25±2.67) than Adama (69.3±4.5). Correspondingly, the average price of pork per kg was larger ($p<0.05$) in Addis Ababa (119±2.8) and Bishoftu (119.3±2.7) than Adama (98.3±3.8). The overall results indicated that there was a threefold increase in price of live pig and pork in relation to current, in the past ten years and last ten years. The pig marketing constraints in Bishoftu and Adama were lack of functioning abattoir (rank=1), price fluctuation (rank=2), high cost of transportation (rank=3), lack of price information (rank=4) and lack of market channel (rank=5) while the corresponding rank values in Addis Ababa were 4, 1, 5, 3 and 4. This implied that pig marketing obstacles varied among the study sites. Therefore, location specific development interventions should be formulated to increase the productivity of pigs and thereby improve the income and livelihood of smallholders.

Key words: Marketing Practices · Constraints · Price · Small Scale · Intensive · Pig

INTRODUCTION

The significance of pig production can include: the diversification of resources and the reduction of socioeconomic risks; the promotion of linkages between systems and resource components the generation of value added products and to bridge food gap [1, 2].

Improving the local market system could enhance the benefit of smallholder producers [3]. This explained that the financial benefit to farmers for rearing pigs depends on remunerative marketing opportunities.

According to Gausi *et al*. [4], smallholder's producers have propensity to pay no attention to new technology even when it appears to be better than their current practices due to market impediments [5].

Understanding the pig marketing system may lead to innovations, interventions, or education opportunities to increase marketing efficiencies and improve product quality, which ultimately increase profitability of farmers and make safe protein sources more accessible to resource-poor people [6].

In many parts of Ethiopia, farmers have long used pigs as a primary means to convert kitchen and restaurant refuse into meat for sale [7]. Similarly, in Central Ethiopia pigs are important for the livelihood of smallholder farmers and create income opportunities for their employees [8-10]. Despite its value and importance, there is limited information on marketing practices and challenges pertinent to market which might hold back its sustainable development. The objective of

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this research was to investigate the pig marketing practices and identify market related constraints in east Shewa, Ethiopia.

MATERIALS AND METHODS

Description of the Study Area: This research was carried out in three towns: Addis Abeba, Bishoftu and Adama that are located in the central parts of Oromia region, Ethiopia, instead of highland, midland and lowland agro ecologies, respectively. Addis Ababa is to be found at 9° N latitude 38°E longitude and average altitude of 2355 meters above sea level; Bishoftu is placed at 9°N latitude and 40°E longitudes at an altitude of 1850 meters above sea level; Adama is to be found at 8° N latitude and 39° E longitude 1400 meter above sea level. The target sites have previously been given details comprehensively [7].

Determination of the Sample Size: The sample size was calculated using Arsham's [11] formula: $N=0.25/SE^2$ Where N = Sample Size and SE = Standard Error thus Standard Error of 0.05 with 95% confidence level was used to compute the sample size (105 households) assumed all through the present reasech.

Data Collection Procedure: A cross sectional survey was carried out from January 2014 to April 2015 by means of a structured questionnaire in team work with data enumerators' engaged and trained for this reason under direction by the principal investigator. The questionnaire was planned to collect information on marketing practices and constraints of pig farming. Purposive sampling technique was employed to select sites based on availability of pig production. The number of household's interviewed in Addis Ababa, Bishoftu and Adama was 35, 40 and 30 in that order which were comparative to size.

Statistical Analysis: The data on the subject of marketing practices and constraints of pig farming were analyzed by chi-square test and one way ANOVA of statistical package for social sciences [12]. The mathematical formula used in the present study included:

$Y_{ij}= \mu + T_i + \varepsilon_{ij}$, Where,

Y_{ij} = Response variables
μ = Overall mean
T_i = Effect of towns where i = 1 is Addis Ababa, i = 2 is Bishoftu and i = 3 is Adama.
εij = is errors with normal distribution, N (0, I).

Index method of ranking was used for ranking marketing constraints in the study areas as described by Ebrahim and Hailemicheal [13].

Index = $R_n*C_1+R_{n-1}*C_2\ldots. +R_1*C_n$ / Ó $R_n*C_1+R_{n-1}*C2\ldots. +R_1*C_n$; Where,

R_n = Value given for the least ranked level (example if the least rank is 5th, then $R_n = 5$, $R_{n-1} = 4$, $R_{n-2} =3$, $R_{n-3} =2$, $R_{n-4} =1$), C_n = Counts of the least ranked level (in the above example, the count of the 5th rank = C_n and the count of the 1st rank = C_1).

RESULTS

Table 1 presents the types of buyers, main product sold, ways of buying, sources of market information, reasons of buying, selling place and methods of price estimation of pgs in small scale intensive pig production in east Shewa. In the market, the largest number of buyers comprised of traders followed by neighbors.

The primary reason to buy pigs was to sell to others while for the grounds of production go behind the former. Majority of the respondents reported that the selling place for pigs was in the slaughter house followed by farm gate.

The farmers reported that the principal mode of marketing was the negotiation among sellers and buyers while brokers were also used by minimal number of respondents. A large proportion of households obtained market information from neighboring farmers followed by from friend. The results indicated that live pig was the main product sold while selling pork was experienced by small number of pig farmers.

The method of weight estimation was associated with location. The number of respondents utilized Weight balance to measure body size of pigs were significantly higher ($p<0.05$) in Addis Ababa and Bishoftu than in Adama. The respondents explained that the traits that determine the price of pigs were body weight, color, age, body conformation and sex in that order.

The mean selling price of live pig and pork per kg across the study sites is presented in Table 2. The price per kg of live pig and pork was significantly higher ($p<0.05$) in Addis Ababa and Bishoftu than Adama in relation to current, 5 years back and 10 years back.

The level of price change of the pig marketing practices is presented in Table 3. The majority of the respondents stated that the change in price of live pig or pork was three fold, with small number of respondents said two fold increase in price.

Table 1: Marketing characteristics of small scale intensive pig production in east Shewa

Towns						
	Addis Ababa	Bishoftu	Adama	Total	Test	
Characteristics	N (%)	N (%)	N (%)	N (%)	X^2-value	*p*-value
Types of buyers						
Traders	29(82.9)[a]	33(82.5)[a]	25(83.3)[a]	87(82.9)[a]	0.008	0.996
Neighbors	6(17.1)[a]	7(17.5)[a]	5(16.5)[a]	18(17.1)[a]	0.008	0.996
Reasons of buying						
Selling to others	27(77.1)[a]	31(77.5)[a]	24(80)[a]	82(78.1)[a]	0.90	0.956
For production	8(22.9)[a]	9(22.5)[a]	6(20)[a]	23(21.9)[a]	0.90	0.956
Ways of selling						
Negotiation	11(31.4)[a]	12(30)[a]	11(36.7)[a]	34(32.4)[a]	0.37	0.831
Brokers	24(68.6)[a]	28(70)[a]	19(63.3)[a]	71(67.6)[a]	0.37	0.831
Method of Weight estimation						
Weight balance	30(85.7)[a]	35(87.5)[a]	6(20)[b]	71(67.6)[a]	43.5	0.00
Visual estimation	5(14.3)[a]	5(12.5)[a]	24(80)[b]	34(32.4)[a]	43.5	0.00
Selling place						
Producers house	15(42.9)[a]	18(45)[a]	12(40)[a]	45(42.9)[a]	0.175	0.916
Slaughter house	20(33.3)[a]	22(36.7)[a]	18(30)[a]	60(57.1)[a]	0.175	0.916
Source of market information						
Neighbor	17(32.1)[a]	21(52.5)[a]	15(50)[a]	53(50.5)[a]	0.119	0.942
Friend	18(51.4)[a]	19(47.5)[a]	15(50)[a]	52(49.5)[a]	0.119	0.942
Main product sold						
Live pig	24(68.6)[a]	15(37.5)[b]	24(80)[c]	63(60)[a]	14.51	0.001
Pork	11(34.4)[a]	25(62.5)[b]	6(20)[c]	42(40)	14.51	0.001
Price estimation						
Body size	12(34.3)[a]	15(37.5)[a]	10(33.3)[a]	37(35.2)	0.151	0.927
Color	10(28.6)[a]	12(30)[a]	8(26.7)[a]	30(28.6)[a]	0.093	0.954
Body conformation	6(17.1)[a]	4(10)[a]	4(13.3)[a]	14(13.3)[a]	0.824	0.662
Sex	1(2.9)[a]	2(5)[a]	1(3.3)[a]	4 (3.8)[a]	0.260	0.878
Age	6(17.1)[a]	7(23.3)[a]	7(23.3)[a]	20(19)[a]	0.502	0.778

N (%) depicts number or percent of respondents; SD refers to Standard Deviation; [a, b]values with one superscript letter in common are not significantly separated.

Table 2: Average selling price of live pig and pork in small scale intensive pig production in east Shewa

Towns							
		Addis Ababa	Bishoftu	Adama	Total	Test	
Commodity	Period	Mean ±SD	Mean ±SD	Mean ±SD	Mean ±SD	F-value	*p*-value
Live pig	Current	89.86±1.91[a]	89.25±2.67[a]	69.3±4.5[b]	83.76±9.7	4451.5	0
	5yearsback	39±1.2[a]	39±3.0[a]	30±2.3[b]	36.6±4.8	167.96	0
	10 years back	29±2.0[a]	29±2[a]	19.3±1.7[b]	26.3±4.8	279.1	0
Pork	Current	119±2.8[a]	119.3±2.7[a]	98.3±3.8[b]	113.2±10	491.4	0
	5yearsback	99.4±2.4[a]	99.3±2.7[a]	48.7±3.5[b]	84.9±23.2	3451.9	0
	10 years back	49.6±1.4[a]	49.4±1.7[a]	29.7±1[b]	43.8±9.1	2050.6	0

SD refers to Standard Deviation; [a, b]values with one superscript letter in common are not significantly separated

Table 3: Price change of pig marketing under small scale intensive farming in east Shewa

Towns						
	Addis Ababa	Bishoftu	Adama	Total	Test	
Price change	N (%)	N (%)	N (%)	N (%)	X^2-value	*p*-value
Slightly	1(2.9)[a]	2(5)[a]	2(6.7)[a]	5(4.8)	0.53	0.77
Onefold	5(14.3)[a]	5(12.5)[a]	4(13.3)[a]	14(13.3)	0.05	0.98
Two fold	7(20)[a]	8(22.5)[a]	5(13.3)[a]	20(19)	0.97	0.62
Three fold	22(62.9)[a]	25(62.5)[a]	19(63.3)[a]	66(62.9)	0.005	0.997

N (%) depicts number or percent of respondents; [a, b]values with one superscript letter in common are not significantly separated

Table 4: Marketing constraints of small scale intensive pig production in East Shewa

Towns						
	Addis Ababa		Bishoftu		Adama	
Factors	Index	Rank	Index	Rank	Index	Rank
Price fluctuation	0.31	1	0.31	2	0.33	2
Lack of market channel	0.29	2	0.02	5	0.02	5
Lack of price information	0.28	3	0.05	4	0.07	4
Lack of functioning abattoir	0.02	4	0.34	1	0.34	1
High cost of transportation	0.1	5	0.27	3	0.24	3

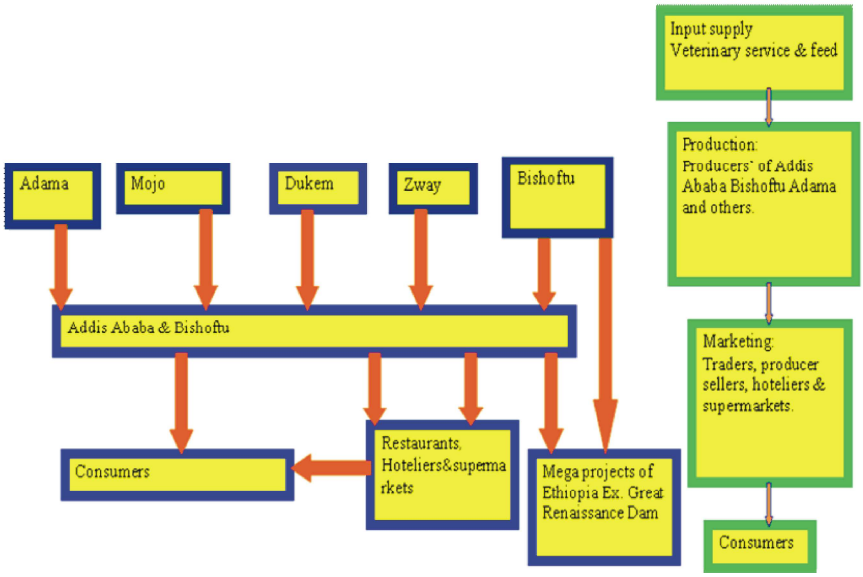

Fig. 1: Pig value chain of small scale intensive pig production in east shewa

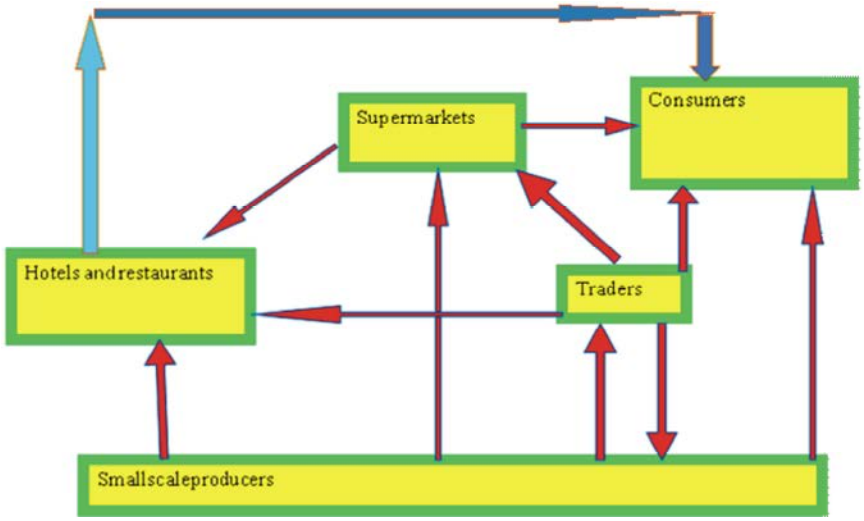

Fig. 2: Marketing channels of small scale intensive pig production in east shewa

Table 4 indicates the constraints of pig marketing in small scale intensive production in East Shewa. The dominant obstacle of pig marketing in Addis Ababa was price fluctuation. Lack of market channel was the second important marketing impediment followed by lack of price information, lack of functioning abattoir and high cost of transportation. While the main pig marketing constraint in Bishoftu and Adama was lack of functioning abattoir followed by, price fluctuation, lack of price information and lack of market channel respectively.

Figure 1 indicates the value chain of pig marketing in small scale intensive pig production in East Shewa. Smallholders produced pigs under intensive feeding management. Farmers also utilized veterinary service for their pigs when ever important. Traders were the dominant pig suppliers from different towns to the market areas. The supplied pigs were ultimately consumed by dwellers of different towns and partly exit to Mega projects of Ethiopia through official routes by the traders to obtain better price.

The marketing channels of small scale intensive pig production in east shewa are described in Figure 2. In the study area, five different marketing agents participated in the operation of pig marketing. These included producers, traders, supermarket owners, restaurant owners/hoteliers as well as ultimate consumers. Traders were the main suppliers of pigs to the market. Small scale producers sell their pigs to restaurants, hotels, traders, supermarkets and direct consumers. Traders sold their pigs to restaurants, hotels, supermarkets and consumers. The consumers were local people and foreigners (tourists, investors and ambassadors). The main marketing channel was from producer-trader-supermarket-hotel/restaurant-consumer.

DISCUSSION

Traders were the dominant types of buyers where they sold their commodities to others. This agreed with reports of Alemayehu and Getu [14]. The action of traders was to buy animals from markets where prices were low and for sell in markets where prices were high.

Weight balance was utilized by greater number of respondents to measure body size of pigs in Addis Ababa and Bishoftu. The current results were inconsistent with reports of Ebrahim and Hailemicheal [13] in North Ethiopia and Tsedeke [15] Southern Ethiopia explained the majority of the producers market their animals on eye-ball estimation and agreement to prices reached after a long one-to-one bargaining between buyers and sellers and sometimes brokers.

Slaughter house was the dominant place where marketing conducted; farm gate marketing was also utilized by considerable number of pig farmers. Selling pigs at farm gate may enable the farmers to save on transportation costs and avoid losses of pigs due to stress during transport. However, prices they receive could be lower as pick-up prices were generally low which agreed with reports of Rubzen *et al*. [16]. the frequent random farm gate selling to mobile trader's pointed to the farmers' disadvantage in comparison to middlemen [17]. Similar findings were reported by Samkol *et al*. [18] Explained such farmers as rather being price takers than price makers.

Sources of market information were not associated with location. The current market information sources indicated that there was no regular market information on prices and supplies, nor formalized grades and standards of pigs across the study sites which agreed with reports of Ayele *et al*. [19]. This could hinder producers to make timely and sound decisions on pig marketing. Accordingly, farmers may supply surplus pigs further than the demands in several periods. The more mobile trader could be well up to dated on market prices which combined with excess supply places where the trader might be in a better situation during price negotiation.

In general, farmers did not have control over prices. Prices were mainly dictated by the middlemen. Problems expressed by farmers include low commodity prices, unreliable weighing scale used by buyers, few buyers and lack of information on prices and alternative markets. The absence of market services such as animal weighing scale, grades and standards might have encouraged the activities of the brokers. Farmers expressed the need for timely information on prices and potential alternative markets. There could be disruption of dissemination efforts by traders and brokers targeted on preventing producers from accessing market information. This might put producers at a disadvantage as it could limit their ability to negotiate prices received.

The main products sold in the current study concurred with reports of Rubzen *et al*. [16] Stated live pig and pork were the foremost commodities sold by pig farmers. The characteristics that determine the price of pigs of the current results coexisted with reports of Ayalew *et al*. [20]. These preferred traits influenced the price of pigs, where buyers paid more for the desirable qualitative and quantitative traits. Pig production tailored to the interests and preferences of customers would improve the income and livelihood of small scale farmers. The average price per kg of pig and pork associated with the study sites. The higher average price per kg of live pig in Addis Ababa and Bishoftu might be connected with the presence of greater number human population. This agreed with reports of Lampheuy [21] stated that there is a trend for increasing pig production in commercial systems close to densely populated areas to meet the consumer demand for pork. Furthermore, the difference in price at diverse areas could be associated with elevated participation of trader, accessibility of the market and proximity which harmonized with reports of Ayalew *et al*. [20].

The present study confirmed reports of Workneh [22] suggested market prices may offer greater incentives for rising off-take animals among smallholders that could place serious concern to the replacement of breeding stock.

The marketing constraints varied with location. The difference in pig marketing constraints among the study sites might be due to the variation in market infrastructures. Pig slaughtering house was the least important impediment in Addis Ababa while it was the most pronounced obstacle in Bishoftu and Adama. This implied that the markets were poorly developed. However, markets could be a powerful vehicle for farmer's development [23]. The poor terms of trade of farmers at times might act as a disincentive to increase pig production. The marketing channels of the present study were consistent with reports of Ayalew *et al*. [20].

CONCLUSIONS

The characteristics that determine the price of pigs were body size, color, body conformation, age and sex in that order. The principal marketing channel was producer-trader-supermarket-hotel/restaurant-consumer. Pig marketing practices influenced by study sites, as dissimilarity were scrutinized among towns, specifically methods of weight estimation, main product sold, price of live pig and price of pork. In addition, marketing obstacles affected by location, for example lack of pig slaughtering facility was the foremost obstruction in Bishoftu and Adama while it was the least important barrier in Addis Ababa town. Therefore, prospective improvement actions in pig production in east Shewa of central Ethiopia should bear in mind the miscellaneous pig marketing practices and constraints of the towns.

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