Journal of Agricultural Development and Policy, 2022
Volume 32, No. 1, 174-179

Assessment of Marketing Structure of Different Sized Pig Farms: A Case Study in Punjab

Navjot Kaur, Inderpreet Kaur and Varinderpal Singh

Department of Dairy Economics and Business Management,
Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, Punjab, India

Abstract

Pig farming is high-yielding business with 0.57 per cent of total pig population of the country in Punjab. The study outlines the objective to examine the pig production systems and the operating marketing channels in Punjab. Three districts (Ludhiana, Mohali and Sangrur) with the highest concentration of pig population were selected from the state. Total sample size of 90 pig farmers i.e., 30 different sized pig farmers from each district were selected for the study. Different marketing channels for the disposal of live animals and pig meat were examined by selecting a sample of 10 middlemen. The study found the majority of the pig farmers (94 per cent) in Punjab were found selling live pigs whereas 3.66 per cent and 2.34 per cent were found selling pig meat and pig meat products respectively. Marketing efficiency was found higher in channel 1 (farmer- farmer) i.e., 12.79. 100 per cent of the farmers were found selling pigs in the unregulated market. Regulated piggery market, slaughter house and a system for waste disposal is required in Punjab for the farmers to secure remunerative returns.

Keywords: Live pigs, marketing channels, marketing cost, marketing margin, middleman and price spread

JEL Classification: Q1, Q11, Q12, Q13, Q19

Introduction

Livestock sector is an integral part of rural economy which plays a crucial role in national economy and socio-economic development of the country as well as in the Punjab state. Livestock sector contributes about 25.80 per cent and 38.77 per cent of agricultural gross domestic product (GDP) in India and Punjab and is continuously improving over time (Statistical Abstract of Punjab, 2019). The total pig population in India is 90.6 lakh (Basic Animal Husbandry Statistics, 2019) and Punjab accounts only 0.52 lakh of pig population which is around 0.57 per cent of total pig population of the country. The indigenous pig population of Punjab is 0.09 lakh and the exotic/crossbred pig population is 0.44 lakh (20th Livestock Census, 2019). Punjab ranks 7th with respect to pork production with the growth rate of 11.2 per cent in the country. Pig meat production in Punjab accounts for 0.47 per cent of the total meat production of the state and 0.27 per cent share of total pork produced in the country (Basic Animal Husbandry Statistics, 2019). The business contenders in the meat processing industry in Punjab are encouraged to variegate it but there is lack of meat capacity to them as per the records of Animal Husbandry Department, Punjab. Pig products such as pork, bacon, ham, sausages, lard etc. are in a huge demand in domestic market. So, there is need to increase the share of pork production in the total meat production. Pigs require minimal inputs in terms of family labour and feeding, perhaps an important motivation for farmers to raise pigs and this sector has a seemingly greater potential to reduce poverty (Mutua *et al,* 2010). Piggery is high-yielding business. A sow can be bred as early as 8-9 months of age and can farrow twice a year. They have a very short gestation period of 114 days and able to produce 6-12 or even more piglets in each farrowing. Pig farming provides quick returns since the marketable weight (80-100 kg) of fatteners can be achieved at the age of 7-9 months. Pig rearing fits in very well with mixed farming and integrated farming.

However, the piggery industry of Punjab is lacking development, so there is an acute need to pioneer scientific method of livestock rearing, distinctly a commercial scale rearing of pig. Scientific processing and preservation of piggery meat product is lacking in the state. Thus, the state can be made capable for setting up modern abattoir and other meat processing units. None of the study so far has been conducted in Punjab state to study the marketing pattern of piggery sector. The generation of the data on the status of piggery sector in the state would help in policy making.

Corresponding author email: dhindsavp@gmail.com

Table 1: Categorization of farms in selected districts on the basis of number of Sows

Category	Number of sows	Average size of the farm	Number of pig farms
Small	0 to 10	6+1	44
Medium	10 to 25	16+2	24
Large	25 & above	44+2	14
Total		66+5	82

It is very important to know the disposal pattern of pigs adopted by pig farmers because it will affect their profitability and fair share of producers/farmers in the market. With this background, the present study has been planned in this direction with the following objectives:

i) To study the composition of pig farms in Punjab.

ii) To study the pig marketing structure of Punjab.

Data Sources and Methodology

Three districts with the highest concentration of pig population (Ludhiana, Mohali and Sangrur) were selected from the state in the year 2018-19 (Statistical Abstract of Punjab, 2019). From each district, 30 different sized pig farmers were selected for the primary study. Thus, making the total sample size to be 90 pig farming units from which 82 pig breeding-cum- finisher units were analyzed as the number of only pig breeding and only finisher units were insignificant. Piggery units were divided among the small, medium and large farmers by using cumulative cube root frequency method of stratification (Jain, 1998) and the final list of farmers for the study was obtained as presented in Table 1.

Further, different marketing channels for the sale of live animals and pig meat in the study area were examined by selecting a sample of 10 middleman from the selected districts, involved in the marketing of live pigs or pig meat from the selected pig farmers to assess the cost and margins of different functionaries involved till the produce reaches in the hands of the users. In order to accomplish the objectives of the study, appropriate statistical tools and techniques like averages, percentages and other descriptive statistics were used and relevant inferences were drawn. Tabular analysis was adopted to analyse the marketing pattern associated with pig farming and the price spread of different marketing channels. In order to examine the marketing efficiency of each pig marketing channel, Acharya's formula of marketing efficiency (Acharya and Agarwal, 2012) was used which is represented as follows:

$$MME = FP / (MC + MM)$$

Where, MME= Modified measure of marketing efficiency

FP= Price received by the farmer

MC= Marketing cost

MM= Marketing margins

Results and Discussion

Composition of Pig Farms

The detailed herd composition of piggery units is important to know the category wise marketing pattern adopted by the pig farmers of Punjab. The breeding-cum-finisher unit categorizes the herd size into breeding and finisher pigs. The existing herd strength includes piglets and growing pigs for disposing purpose while breed able sows and boars are maintained for further breeding purposes. A perusal of Table 2 revealed that the overall average number of breedable sows was found to be 66, from which 40 (60.61%) were found to be pregnant and 26 (39.39 %) was found to be non- pregnant/ dry sows. The piglets on the farm were categorized into three categories depending on the age and weight of piglets as weaner (0-1 month, 1-7 kg), grower (2-6 month, 7-75 kg) and finisher (6-12 month, 75-135 kg). In study, an average of 1204 piglets were found in total out of which 194 (16.11%), 473 (39.28%) and 537 (44.60%) were found to be weaner, grower and finisher respectively. This categorization is significant with respect to marketing point of view as pigs are being sold on the basis of age and weight. Similar findings of (Mahto, 2006) supported the present study who reported that majority of the respondents (92.00%) of organized pig farms were keeping large size of stock (>15 pigs), eight percent respondents had medium size of stock (11-15 pigs) and no one respondents had small size of stock (< 10 pigs).

Existing Marketing Channels of Piggery

Marketing pattern of pigs is important from producer as well as consumer point of view because the producer need to get maximum returns from his produce with least possible intermediaries while ensuring the consumers interest with respect to prices, preferences and quality of the produce. The five major market channels are involved in the marketing of live pigs, pig meat and pig meat products. Three marketing channels are found existing for live pigs and two for meat and meat products respectively as presented in table 3. It was observed that in channel I the pig farmers or the producers were selling live pigs directly to the consumers. In channel II, the live pigs were collected by the agents/ middlemen from the farmers at village level from where it is transported to the consumers in the north-eastern states.

In the channel III of live pig marketing, producers sell

Table 2: Composition of pig farms in Punjab, 2018-19

(Number)

Particulars	Small	Medium	Large	Punjab
Sow				
Pregnant sows	4 (66.67)	10 (62.5)	26 (59.09)	40 (60.61)
Non-pregnant sows	2 (33.33)	6 (37.5)	18 (40.90)	26 (39.39)
Total breedable sows	6 (100.00)	16 (100.00)	44 (100.00)	66 (100.00)
Boar				
Boars (for breeding)	1 (100.00)	2 (100.00)	2 (100.00)	5 (100.00)
Piglets				
0-1 mn (weaner)	17 (19.32)	57 (20.07)	120 (14.42)	194 (16.11)
2-6 mn (grower)	30 (34.09)	108 (38.03)	335 (40.26)	473 (39.28)
6-12 mn (finisher)	41 (15.91)	119 (41.90)	377 (45.31)	537 (44.60)
Total piglets	88 (100.00)	284 (100.00)	832 (100.00)	1204 (100.00)

***** *The figures in parentheses signify the total number of animals*

their produce to the retailer through middleman from which consumers could purchase. Furthermore, in channel 1 of marketing of the pig meat and pig meat products, consumers were found buying the products from the producers or the farmers. The channel 2 lines the selling of live pigs to the retailers (hotels, shops, restaurants, etc.) and then to the consumers. However, the results presented by (Njuki *et al*, 2010) observed that all piglets in Mokokchung and Wokha districts of Nagaland were sold at farm gate.

Channel wise Number and Quantity of Live Pigs and Meat Sold at Pig Farms

Table 4 presents the various parameters regarding the marketing pattern of quantity of live pigs and meat sold in Punjab by small, medium and large farmers. Out of the average number of pigs, 98.52 per cent was found to be sold to the middleman, 0.87 percent to the consumer directly while 0.61 percent to the local market. Similar finding were reported by (Mahto, 2008), who opined that 88.00 percent of the organized pig farms sold their pigs as live animals. Further, no medium farmer was found selling pigs to the consumer directly and no large farmer was found selling pigs to the local market. (Deka *et al*, 2007) also reported that 70–90 per cent of pigs sold for slaughter by rearing households were supplied as meat either directly to consumers or to local pork retailers. The remaining pigs were sold to traders supplying external markets. About 90 per cent of slaughter pigs were sold to pork retailers and traders. Apart from the total average pig meat and pig meat products produced in Punjab i.e. 3096 kg, 2016 kg per year was found to be produced by large farmers out of which 60 per cent was found to be sold to the hotels, 20 per cent to the consumers and 20 per cent to the local market followed by medium farmers (1080 kg production per year) out of which 80 per cent were found selling their produce to the consumer directly and 20 per cent of their total produce to the local market.

No medium farmer was found selling their produce to the hotels. The findings of the study are in line with (Mehta and Garg, 2018) who reported that in value chain I, the farmer sells live pig to fellow villagers. In value chain II, farmer slaughters the pig and pork is consumed at household level or within the village. In value chain III, the farmer slaughters the pig and sells the pork in weekly rural markets. In value chain IV, farmer sells the live animal to butchers, who then sell the pork in the rural market, either in the village or in a nearby town. (Dzung, 2015) observed that farmers sell their pigs through middlemen who collect; buy finisher pigs from the farm/ house holders then sell them in slaughter houses. There is small amount of farmers/ householders who sell their pigs directly to slaughterhouse owners in case their farms are close to the slaughter houses. The pig slaughter houses belong to three categories: (i) Slaughterhouses selling carcass by wholesale and retailing (70%); (ii) Slaughterhouses

Table 3: Existing marketing channels for live pigs and meat in Punjab, 2018-19

Channel name	Description of channel
Live pigs	
Channel I	Producer → Consumer
Channel II	Producer → Agent/middleman → Consumers
Channel III	Producer → Middleman → Retailer → Consumer
Meat and meat products	
Channel I	Producer → Consumer
Channel II	Producer → Retailers → Consumer

Table 4. Channel wise number and quantity of live pigs and meat sold at pig farms in Punjab, 2018-19:

Particulars	Small (6+1)	Medium (16+2)	Large (44+2)	Punjab (66+5)
Live animals (No.)				
Channel I	5 (5.68)	0 (0.00)	5 (0.63)	**10 (0.87)**
Channel II	80 (90.90)	260 (98.48)	792 (99.37)	**1132 (98.52)**
Channel III	3 (3.41)	4 (1.51)	0 (0.00)	**7 (0.61)**
Total	88 (100.00)	264 (100.00)	797 (100.00)	**1149 (100.00)**
Pig meat & meat products (kg)				
Channel I	0 (0.00)	864 (80.00)	403.2 (20.00)	**1267.2 (40.93)**
Channel II	0 (0.00)	216 (20.00)	1612.8 (80.00)	**1828.8 (59.07)**
Total	0 (0.00)	1080 (100.00)	2016 (100.00)	**3096 (100.00)**

exclusively for wholesale (24%); (iii) Slaughterhouses which do retailing directly for consumers (6%). The difference in the findings to the present study could be attributed to the absence of slaughter house in the state.

Marketing Costs, Margins and Price Spread of Live Animals (Rs. /kg (animal weight), 2018-19

Table 5 presents the marketing costs, margins and price spread of live pigs. The total marketing costs per channel was found to be the highest in channel III i.e. Rs. 44.1 followed by channel II (Rs. 18.2) and channel I (Rs. 6.6) respectively.

Therefore, marketing margin was found to be the highest in channel 3 (Rs. 20.9) as middleman and retailer are involved from the producer to consumer chain, followed by channel 2 (Rs. 11.8) and channel 1 (Rs. 2) respectively.

Similar findings were reported by (Deka *et al,* 2007) that the wholesale price of pork (to the retailers) was Rs. 80 per kg, while the retail price (to the consumers) was Rs. 100 per kg. Pork retailers paid a fee to the commission agent or lessee. The fee varied from market to market i.e. Rs. 10 per day to Rs. 50 per day. Further, Table 5 shows that in channel III, the price spread was highest i.e. Rs. 65. Therefore, channel I has highest marketing efficiency of 12.79 followed by channel 2 (3.66) and channel 3 (1.69) and thus, channel I was the most efficient marketing channel followed by channel II whereas channel III was the least efficient as the producer's share in consumer's rupee and marketing efficiency was minimum in this channel in the marketing of live pigs for meat purpose. (Mehta and Garg, 2018) also reported that the average price of pork was estimated to be around Rs 150/kg. The average amount received on selling of live pig was estimated to be Rs 145/kg of live weight. The results presented by (Deka *et al,* 2007) shows that the high hidden expenses are incurred during transportation i.e. Rs.

Table 5. Marketing costs, margins and price spread of live animals, 2018-19 **Rs/kg (animal weight)**

	Channel-I		Channel-II			Channel-III			
	Farmer	Consumer	Farmer	Retailer	Consumer	Farmer	Middleman	Retailer	Consumer
Labour		2.3		4.2			4.1	8.2	
Transportation		3.1		7.6			5.7	12.7	
Commission charges		-		1.2			1.1	1.2	
Shop rent		-		2.7					
Misc. (feed & fodder,etc.)		1.2		2.5			0.5	10.6	
Total marketing cost		6.6		18.2			11.4	32.7	
Net price received by the farmer/Retailer's purchase price/ consumer's purchase price	110	118.6	110	128.2	140	110	121.4	154.1	175
MC per channel		6.6		18.2			44.1		
Marketing margin		2		11.8			20.9		
Price spread		8.6		30			65		
Marketing efficiency		12.79		3.66			1.69		

500 to 1500 per trip. In the piglet-surplus districts, a third of the marketing cost was earned by middlemen. The net daily profit per individual trader was approximately Rs. 205 in Dhemaji, Rs. 105 in Golaghat, Rs. 210 in Kamrup, Rs. 170 in Karbi Anglong and Rs. 120 in Kokrajhar. (Nsoso *et al*, 2006) reported that mature pigs were sold at prices ranging from US$10.00 to more than $50.00 depending on the size of the animal and the reason for which it was being sold for. Piglets on the other hand were mostly sold at prices ranging from $2.00 to $10.00.

Conclusion and Policy Implications

The study has examined the category wise marketing pattern for the sale of live pigs, pig meat and meat products. Consumer preferences towards pig meat and meat products showed that its consumption is mainly oriented towards the north-eastern states where major proportion of live pigs is marketed through middlemen. The study highlighted the unorganised market to be less efficient especially in channel 2 and 3. The implication of the study is that the marketing efficiency could be increased and the price spread could be decreased by establishing regulated market and meat industry in the Punjab. There are farmers who are willing to start value addition at their farms but lack of market facilities, less demand of pork and lack of slaughter house poses the hurdles for the farmers to start a good piggery enterprise at commercial scale. Higher improvement in the marketing sector could be achieved by the establishment of processing plant that would be helpful in minimizing transportation cost for marketing, increasing local employment, exploitation of international export potential of pork, increasing income of farmers and strengthening marketing opportunities to pig farmers. In order to save farmers from seasonal fluctuations, formation of pig meat products, such as pickles, at the farm level should be encouraged so that farmers can export the products to other regions and earn foreign exchange. Therefore, small farmers could increase their returns from piggery enterprise by starting value addition and processing. Government should take into consideration the needs of the pig farmers and provide subsidy for setting up value addition units at the farm level.

References

Government of India 2019. *Basic Animal Husbandry Statistics*. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, New Delhi. https://dahd.nic.in/animal-husbandry-statistics

Government of India 2019. *20th Livestock Census*. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, New Delhi. https://dahd.nic.in/animal-husbandry-statistics

Deka R, Thorpe W, Lapar M L and Kumar A 2007. *Golaghat's pig sub- sector: Current status, constraints and opportunities*. International Livestock Research Institute.ProjectReport. https://cgspace.cgiar.org/bitstream/handle/10568/1776/GolaghatPigSubsector.pdf?sequence=1

Deka R, Thorpe W, Lapar M L and Kumar A 2007. *Kokrajhar's pig sub-sector: Current status, constraints and opportunities.* International Livestock Research Institute.ProjectReport. https://cgspace.cgiar.org/bitstream/handle/10568/1779/KokrajharPigSubsector.pdf?sequence=1

Dzung N M, & TuLiem T P 2015. *Pig production and marketing in Vietnam*. National Institute of Animal Science, TuLiem, Ha Noi Vietnam. https://www.fftc.org.tw/htmlarea_file/activities/20140314102754/CR%202%20Dr.%20Nguyen%20Manh%20Dung.pdf

Government of Punjab (GOP) 2019. *Statistical Abstract of Punjab*. Economic Advisor to Government, Economic and Statistical Organization, Chandigarh. https://esopb.gov.in/static/Publications.html

Jain R K 1998. An Economic Analysis of Pig Farming in Haryana, M.Sc. thesis, Submitted to College of Agriculture, Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana, India.

Mahto V K 2006. Economic evaluation of pig farming in organized and unorganized farms in Ranchi district of Jharkhand, M.V.Sc. thesis, Submitted to Birsa Agricultural University, Ranchi, Jharkhand, India.

Mehta M P and Garg K 2018. *Pig value chain study in Jharkhand.* Jharkhand State Livelihood Promotion Society, New Delhi.

Mutua F, Arimi S, Ogara W, Dewey C and Schelling E 2010. Farmer Perceptions on Indigenous Pig Farming in Kakamega District, Western Kenya. *Nordic Journal of African Studies* **19**: 43–57. https://doi.org/10.53228/njas.v19i1.213

Njuki J, Pali P, Mburu S, and Poole J 2010. *Pig Production, Management and Marketing in the North East Indian State of Nagaland*. International Livestock Research Institute Nairobi. https://cgspace.cgiar.org/bitstream/handle/10568/29056/elks_nagaland.pdf

Nsoso S J, Mannathoko G G and Modise K G 2006. Monitoring production, health and marketing of indigenous Tswana pigs in Ramotswa village of Botswana. Department of Animal Science and Production. Botswana College of Agriculture, Gaborone, Botswana.http://moodle.buan.ac.bw/handle/123456789/2

Received: July 13, 2021 Accepted: October 10, 2021