

Marketable surplus, pattern and constraints faced by smallholder dairy farmer in Punjab

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Abstract

The present study examined marketed surplus, disposal pattern of milk and constraints faced by smallholder dairy farmers in Punjab. For the purpose Amritsar district was selected and a sample of 80 dairy farmers consisting of 20 dairy farmers each from landless (LL), marginal (MR), small (SM) and others (OT) categories were selected from two blocks and four villages of Amritsar district. It was found that milk production, consumption and marketed surplus has direct relationship with farm size. The average production of milk was 27.55, 37.05, 40.95 and 45.2 litres/day for LL, MR, SM and OT dairy farm and per capita availability of milk was 690, 843, 869 and 935 gm/day which was quiet above the national average of 290 gm/day and minimum recommendation of ICMR of 250 gm/day. On an overall basis 11.26, 6.40, 7.40 and 18.12 litres of milk/day was sold by sample households through dairy cooperatives, private milk processors, milk vendors, consumers and halwaiis. Except MR farmers rest all of the selected dairy farmers sold their produce through modern milk marketing channels which includes milk cooperatives and private milk processor in the study area. Thus SM holder dairy farmers have equal access to modern milk marketing channel in the study area. Various constraints ranked by dairy farmers as costly feed and fodder ranked first followed by lack of A.I. and veterinary facilities in village. The lack of organized milk marketing was at the bottom of the constraints identified by dairy households. The sample dairy farmers faced all the constraints with almost equal intensity irrespective of the size categories.

Keywords: Smallholder dairy farmers, marketing channels, marketable surplus and constraints.

Dairying is the most important segment of India's livestock economy and is an integral part of the total farming system. This sector plays an important and vital role in providing nutritive food, rich animal protein to the general public and in supplementing family incomes and generating gainful employment in the rural sector, particularly among the landless, marginal and small farmers. Emerging trends indicate that the demand for milk is growing faster than the production especially in view of faster growth in GDP. Increasing population, urbanization and sustained rise in per capita income are fuelling rapid growth in demand for animal food products in India (Brithal and Taneja, 2006). The demand of milk was worked 114.93 million tonnes in 2011 and will increase to 181.95 million tonnes in 2030 at a growth rate of 7% (Sekhon *et al* 2012). This makes available to

consumers larger share of income that can be spent on milk and dairy products. The demand for milk will double with the increasing income and expanding urbanization are likely to boost the demand for more formally processed milk products in 2020, which the traditional markets generally do not cater for. This will fuel the growth of a modern, formal and organized milk market (Delgado *et al* 1999). Milk production is only profitable if there is proper marketing facility, so that it can be quickly disposed to particular place where it can be processed due to its perishable nature. In India more than 80% of milk is still marketed through traditional milk marketing channels (Staal *et al* 2006 and Kumar *et al* 2010). As a result of land fragmentation, the number of operational holdings across the landless, marginal and small categories has increased over the years resulting in reduction

in the average size (GOI, 2006). Majority of milk producers are smallholders and contribute more than 70% to total milk production in India (Dries *et al* 2004 and Minten *et al* 2007). The Punjab state cooperative milk producers federation limited popularly known as MILKFED came in to existence 1973 with the twin objectives first to carry activities for promoting production, procurement and dairy processing of milk for the economic development of milk and second to provide quality milk and milk products to consumers at reasonable rates. Dairy cooperatives also provide inputs, information and technical support to producers, which eventually lead to improvement in production efficiency and reduction in marketing and transaction cost. Gupta *et al* (2006) observed that member of dairy cooperatives in Punjab, could realize 9% higher milk yield and 29% higher profit than that of independent suppliers in the open market. The production and marketing costs to member- suppliers were also lower by about 30%. The growth of dairy cooperative in some states like Tamilnadu, Maharashtra and Gujarat has brought significant economic betterment and well being of the rural population as compared with other states (Benni, 2005). The traditional marketing systems, dominated by ad-hoc transactions and intermediaries such as milk vendors, consumers/halwaiis, restaurants and tea stalls etc. are being replaced by Cooperatives Producers Associations and Contract Farming. Further, the corporate sector is entering in to the food retailing business in a big way, accelerating the process of transformation of agri-food markets. The new marketing systems are expected to improve marketing efficiency and induce a shift in livestock production from subsistence to a commercial enterprise. The moot question here is whether the small holder dairy farmers which constitute more than 70% of their production have equal access to modern milk marketing chain. In this backdrop the present study analyses i) The marketing channels of milk ii) The small holder dairy farmers access to modern milk marketing chain and iii) The constraints faced by the milk producers in dairy farming.

Data and Methodology

The study is based on primary data collected from dairy farmers in the year 2013-14. For the selection of sample households multistage random sampling

technique was followed. Amritsar district was selected at the first stage of sampling having higher milk productivity than the state average and well established milk cooperative structure. In the second and third stage of sampling two blocks and two villages from each block were randomly selected. In the fourth stage of sampling, a list of all the dairy farm households from all the four villages were prepared and farmers were categorized in to landless farmers (having no land), marginal farmers (< 1 ha), small farmers (1-2 ha) and other dairy farmers (> 2 ha). At the last stage of sampling five dairy farm households from each category were selected from each selected villages. Thus a sample of 20 dairy farmers of each size category of landless (LL), marginal (MR), small (SM) and other (OT) was selected making a sample of 80 dairy farm households from the selected categories.

Descriptive statistics was used to examine milk production, consumption, marketed surplus and disposal pattern of milk. Garrett's ranking technique was used to analyze the production and marketing constraints faced by dairy farmers. As per this method, respondents have been asked to assign the rank for all the problems and the outcome of such ranking has been converted into score value with the help of the following formula:

$$\text{Percent position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where

R_{ij} = Rank given for the i th variable by j th respondents

N_j = Number of variable ranked by j th respondents

With the help of Garrett's Table, the % position estimated is converted into scores. Then for each factor, the scores of each individual are added and then total value of scores and mean values of score is calculated.

Results and Discussion

Socio-economic profile of sample dairy households

Before discussing the small holder dairy farmers access to modern milk marketing chain brief description of socio economic profile of sample households has been presented in Table 1. The perusal of Table 1 revealed that the operational size

of holding of MR, SM and OT dairy farmers was 0.65, 1.75 and 3.08 ha respectively. The family size of landless dairy farmers was 5.1 where as in all other categories of dairy farmers the family size was almost same. The number of working members was higher in other categories of dairy farmers. Majority of working members engaged in agriculture as other avenues were unexplored by these farmers. Age and education particularly head of family members has great bearing on the socio-economic status. Average age in almost all the categories were more than 40 years, indicating towards that young population of the state have lost their interest in agriculture as well as in dairy farming.

Similar trend was also expressed from the education level which was less than 10 in all categories. The herd size was to the tune of 6.35, 7.70, 9.40 and 10.05 dairy animals. The milch animals constituted the 63.77, 66.24, 65.43 and 63.68% of the total herd size. The herd size and number of milch animals has direct relationship with farm size. The percentage of buffaloes was 51.96, 50.00, 50.53 and 47.76 and cows were 11.81, 16.24, 14.90 and 15.92 for LL, MR, SM and OT dairy farmers.

Milk production, consumption and marketed surplus among sample dairy households

Table 2 incorporates milk production, consumption and marketed surplus of milk among sample dairy farms size category wise. The per day production of milk followed direct relationship with farm size having 27.55, 37.05, 40.95 and 45.2 litres of milk for LL, MR, SM and OT farm size categories. The marketed surplus also followed direct relationship with farm size both in absolute term and percentage term. It varied from 24.03 litres/day to 40.15 litres/day and 87.22 to 88.83% of total milk production among different farm size categories. On an average marketed surplus formed 87.54% of total milk produced.

The home consumption of milk was 4.73 litres/day per households. The per capita milk consumption was higher for OT farm size categories at 935 gm/day followed by 690, 843 and 869 gm/day for LL, MR and SM dairy farmers. The per capita availability of milk on an average basis was 897 gm per day. It is quiet above the national average of 290 gm/day and minimum recommendation of ICMR of 250 gm/day.

Table 1: Socio economic profile of sample dairy households

Sr. No.	Particulars	Land-less	Marginal	Small	Other
1.	Average operational holding (ha)	-	0.65	1.75	3.08
2.	Average size of family (number)	5.1	5.4	5.3	5.4
a)	Working members (number)	1.65	1.40	1.60	1.90
b)	Engaged in agriculture (number)	-	1.75	1.70	1.70
3.	Average Age of head of family (years)	42.90	41.05	44.60	42.60
4.	Education status of head of family (years)	8.30	8.80	9.05	7.10
5.	Herd size (number)	6.35 (100.00)	7.70 (100.00)	9.40 (100.00)	10.05 (100.00)
6.	Milch animals (number)	4.05 (63.77)	5.10 (66.24)	6.15 (65.43)	6.40 (63.68)
a)	Buffalo (number)	3.30 (51.96)	3.85 (50.00)	4.75 (50.53)	4.80 (47.76)
b)	Cow (number)	0.75 (11.81)	1.25 (16.24)	1.40 (14.90)	1.6 (15.92)

Table 2: Milk production, consumption and marketed surplus among different farm size categories in Punjab, 2013-14

(litre/day/households)

Particulars	Landless	Marginal	Small	Other	Overall
Production	27.55 (100.00)	37.05 (100.00)	40.95 (100.00)	45.2 (100.00)	37.9 (100.00)
Home consumption	3.52 (12.78)	4.55 (12.28)	4.6 (11.23)	5.05 (11.17)	4.73 (12.46)
Marketed surplus	24.03 (87.22)	32.5 (87.72)	36.35 (88.77)	40.15 (88.83)	33.18 (87.54)
Per capita milk consumption (gm/ day)	690	843	869	935	897

Figures in parentheses indicate the percentages to the total milk production.

Disposal pattern of milk among sample dairy households

The information related to marketing channels, percentage of dairy farmers approaching different agencies for disposal of milk, quantity of milk marketed by sample households to different agencies and total milk marketed by sample households to organized and unorganized marketing chains has been discussed.

There were six channels for disposal of milk in the study area. In channel- I producer directly sold milk to the consumers. In channel- II producers sold the milk to nearest cooperative society that was well organized channel through this channel producer receive good price according to fat percentage of their milk and very less exploitation of producers. In channel- III producers sold milk to private milk processors then they process the milk in to curd and ghee etc and sold it to consumers. In channel- IV the producers sold the milk to milk vendors then milk vendors sold milk to urban consumer at higher price. In channel- V producers sold the milk to milk vendors then milk vendors sold milk to halwais. Halwais make by-products (Khoa, cheese and curd) from milk then sold it to urban consumers or directly sold the milk to urban consumers.

Channel-I Producer – Consumer

Channel-II Producer – MILKFED – Consumer

Channel-III Producer – Private milk processor – Consumer

Channel-IV Producer – Milk vendor - Consumer

Channel-V Producer – Milk vendor – Halwaii –

Consumer

Channel-VI Producer –Halwaii – Consumer

Frequency distribution of sample households according to disposal pattern of milk has been presented in Table 3. All the categories of dairy farmers mostly preferred dairy cooperatives as compared to milk vendors, consumers/halwais and private milk processors. LL dairy farmers mostly prefer dairy cooperatives as compared to private milk processors and consumer/halwais. MR dairy farmers prefer milk vendors as compared to dairy cooperatives and consumers/halwais, SM dairy farmers also prefer dairy cooperatives as compared to milk vendors and consumer/halwais and OT dairy farmers prefer private milk processors as compared to dairy cooperative and milk vendors. Almost all the farmers have an equal access to modern milk marketing agencies.

Table 3: Frequency distribution of farmers according to disposal pattern of milk

(multiple response)

Sr. No.	Particulars	Land-less	Marginal	Small	Others
1.	MILKFED	18	16	17	15
2.	Private milk processor	12	9	14	20
3.	Milk vendors	10	18	11	11
4.	Consumers/halwais	14	17	16	13

Disposal of milk marketed to different agencies by the sample households has been compiled in Table

4. Majority of dairy farmers sold 33.94% of milk out of the total produce to Milkfed; second source in importance was consumers/halwaiis where about 24.47% milk out of the total produce. The percentage of milk sold to milk vendors was 22.30% and 19.29% to private milk processor out of the total produce. The OT farmers sold only 30.39% to Milkfed and 30.76% to directly milk vendors and 23.41% to private milk processors. The LL farmers sold the greater part of their produce to Milkfed (36.20 %), 22.89% milk to milk vendors and only 18.73% to consumers/halwaiis.

Table 4. Disposal pattern of milk among sample households

(litre/day/farm household)

Marketing agencies	Land-less	Marginal	Small	Other	Overall
MILKFED	8.70 (36.20)	11.1 (34.15)	12.73 (35.02)	12.20 (30.39)	11.26 (33.94)
Private milk processor	5.33 (22.18)	4.35 (13.38)	8.32 (22.89)	9.4 (23.41)	6.40 (19.29)
Milk vendors	5.50 (22.89)	8.10 (24.93)	5.80 (15.95)	12.35 (30.76)	7.40 (22.30)
Consumer/halwaiis	4.50 (18.73)	8.95 (27.54)	9.50 (26.14)	6.20 (15.44)	8.12 (24.47)
Total marketed surplus	24.03 (100.00)	32.5 (100.00)	36.35 (100.00)	40.15 (100.00)	33.18 (100.00)

Figures in parentheses indicate the percentages to the total marketed surplus.

The MR farmers sold the major part of milk to Milkfed (34.15%) followed by consumers/halwaiis 27.54% and milk vendors 24.93% out of the total produce. The SM farmers sold greater part of milk to Milkfed (35.02%), 26.14 and 15.95% to consumers/halwaiis and milk vendors respectively. This figure clearly indicates that the proportion of selling milk to Milkfed was comparatively much higher (33.94%). The SM holder dairy farmers equally approaching modern milk market as counter parts other farmers. The main drawbacks of Milkfed are the delaying payment of farmers produce and another one is not calculate the accurate fat and SNF of their milk. The farmers preference of Milkfed is because of the benefits given by Milkfed in the form of bonus, medical facilities etc. From the above analysis, it is observed in spite of

growing presence of modern milk supply chains in Indian milk market, traditional milk supply chain is still important in the study area due to their regular payment receipts.

Table 5 incorporates information regarding the per day total quantity of milk sold by different size categories of farmers to different organized/unorganized agencies. Organized milk marketing chains include dairy cooperatives and private milk processors whereas unorganized milk marketing chains include milk vendors, tea stalls and consumers/halwaiis. Overall 53.22% milk was marketed through modern milk marketing chain and 46.78% milk through traditional milk marketing chain. Total 663.60 litres of milk per day was sold by sample households during the survey period.

Perusal of Table shows that except MR farmers all the farmers sold more than 50% of milk to organized channel. LL farmers daily sold 41.61% to traditional milk marketing channel and 58.39% to modern milk marketing chain, MR farmers sold 52.46% milk through traditional milk marketing channel and 47.54% milk through modern milk marketing channel, SM farmers sold 42.09% through traditional milk marketing channel and 57.91% milk through modern milk marketing channel and OT dairy farmers sold 46.20% through traditional milk marketing channel and 53.80% milk through modern milk channel.

Table 5. Quantity of milk sold by sample households to different agencies

(litres/day)

Sr. No.	Particulars	Traditional channel	Modern channel	Total milk marketed
1.	Landless	200 (41.61)	281 (58.39)	481 (100.00)
2.	Marginal	341 (52.46)	309 (47.54)	650 (100.00)
3.	Small	306 (42.09)	421 (57.91)	727 (100.00)
4.	Others	371 (46.20)	432 (53.80)	803 (100.00)
5.	Overall	310.40 (46.78)	353.20 (53.22)	663.60 (100.00)

Figures in parentheses indicate the percentages to the total milk marketed.

Table 6. Constraints faced by different size categories of dairy farmers in Punjab, 2013-14

Sr. No.	Problems	Landless		Marginal		Small		Others		Overall	
		Mean Score	Rank	Mean Score	Rank	Mean Score	Rank	Mean Score	Rank	Mean Score	Rank
1.	Lack of A.I and veterinary facilities	55.55	2	50.6	3	58.05	2	55.55	2	54.93	2
2.	Availability of green fodder	44.5	5	47.95	4	49.45	4	43.25	6	43.25	6
3.	Availability of dry fodder	51.5	4	53.95	2	52.5	3	51.25	4	52.3	3
4.	Cost of feeds and fodder	60.55	1	58.1	1	61.45	1	62.1	1	60.55	1
5.	Organized milk marketing	40.1	7	46.9	5	42.3	7	36.1	7	40.71	7
6.	Animal insurance	51.8	3	42.3	7	44.15	5	53.7	3	48.81	4
7.	Credit facilities	43.8	6	44.05	6	44.05	6	48.35	5	44.98	5

Constraints faced by dairy farmers

Despite impressive growth in milk production during the past three decades, and adoption of dairy farming as a commercial activity, there exist some constraints which were faced by dairy farmers of all farm size categories. The various constraints faced by selected dairy farmers were presented in Table 6. The scores were assigned to various constraints ranked by the sample dairy farmers using Garret ranking technique.

Among these constraints the major constraint was high cost of feed and fodder with the mean score was 60.55, 58.10, 61.45 and 62.10 for LL, MR, SM and OT dairy farmers and ranked first by all categories of dairy farmers in the study area. The cost of fodder increases from ₹ 250 to ₹ 650 per quintal during the lean season. The second constraint was lack of artificial insemination and veterinary facilities in village with the mean score was 55.55, 58.05 and 55.55 for LL, SM and OT dairy farmers. Veterinary facilities in the village were not up to that mark. For serious problems like difficult birth, high fever and other diseases they had to go to cities for proper treatment of their animals. For MR farmers second main constraint was low availability of dry fodder with mean score was 53.95. Large farmers made hay and silage for the future use or during lean period of dry fodder but in case of MR and SM dairy farmers they cannot make hay and silage due to lack of sources land. The third main constraint was lack of insurance in case of death of animals for LL and

OT dairy farmers. For MR dairy farmers the third constraint was lack of artificial insemination and veterinary facilities in village. In case of SM low availability of dry fodder was third main constraint. The fourth constraint was lack of availability of green fodder round the year for MR and SM dairy farmers. During the *kharif* season the availability of green fodder was less due to lesser yield of summer maize as comparison to berseem. In case of LL and OT dairy farmers fourth constraints was low availability of dry fodder. All the constraints were faced by almost equal intensity by all categories of sample dairy households with the marginal differences.

Conclusion

The study concluded that in spite of growth of modern milk marketing chain, traditional marketing chain also persist in the study area with almost equal intensity. The existence of traditional channel was because they offer reasonable price to attract the consumers and also give money at a time. The farmer's preference of modern channel was because of the benefits given by dairy cooperatives in form of bonus, medical facilities etc. In channel-I the producers share was higher because they directly sold the milk to consumers. In channel- II cooperative societies buy milk from producers and sold it to consumers and there was low exploitation of producers and consumers in this channel. The dairy sector also faced some constraints exist in the study area these constraints should be overcome by

training programme and guidance to the rural dairy farmers so that they can know that during slack period of fodder which alternative they should adopted without effecting the milk production and health of animal. Mostly 70% of milk was produced by small holder dairy farmers so there is need to increase the productivity of milk to meet the increasing demand by providing some benefits in the form of wages and subsidies to small farmers.

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