

A Study on Existing Level of Milk Handling and its Products in Selected Co-operative Milk Plants of Punjab

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Abstract

Co-operative milk plants are the major vehicle to balance the farm produced milk between producers and consumers. The existing level milk and its products handling has been investigated in the present study, as it helps in estimating the working standard of the plants. The study was confined to co-operative milk plants in Punjab state. Two milk plants were selected i.e, Verka milk plant at Ludhiana and Mohali. The data were collected from records of the milk plants for the year 2017-18. The study revealed that the raw milk procurement at the plants fluctuated according to the season and high procurement was during the winter season. The products were produced as per required fat and SNF (solid not fat) content and production revealed the preference of the consumers. The revenue generated was high from standardized milk and profits were high from whole milk powder and lassi at both the milk plants. The study brought out some policy measures for increasing the profit of the plants such as; re-organization of product-mix, development of new product and sales promotion activities, increase in dairy co-operative societies and milk procurement according to capacity of the milk plants.

Keywords: *Handling, Revenue, Profit, Fat and SNF (solid not fat)*

JEL Classification: *C83, Q13*

Introduction

India has been the largest milk producer in the world for about 15 years and contributes about one-fifth of the global milk production. The milk production during 2017-2018 in India, was 176.3 million tonnes and per capita milk availability was 375 grams per day. In India the annual growth rate has increased by 6.6 per cent in the milk production and world

annual growth rate has increased by two per cent during 2014-18 (Anonymous, 2016). This increase in milk production has enhanced the dairy farmers income significantly. The milk production in Punjab was 118.55 lakh tonnes during 2017-2018 and milk per capita availability was 1120 grams per day during 2017-2018 (Anonymous, 2018).

The milk co-operative in Punjab is popular by the brand name Verka. Their primary objective is to provide a remunerative price to

the milk producers through value addition and its effective marketing. There are 11 district milk producing unions in Punjab covering all the villages. The co-operatives provide attractive and transparency prices based on SNF and fat content in the milk (Anonymous, 2018).

There are various studies suggesting the improvement in performance of their existing level of milk and its products handling in milk plants. This will have some utility in better management of milk plants, producers and consumers. Also, this will avoid waste expenditure on the production of different products and appropriate adjustment in output production for better profitability (Chauhan *et al.*, 2006).

Data Sources and Methodology

The research methodology started with the selection of dairy plants, then the collection of data was done regarding raw milk procurement and its products production. Technique and methodology of analysis was undertaken for estimating the revenue generated from the selected products, profit margin and profit percentage obtained from selected products.

Punjab state co-operative milk producers federation limited came in existence in 1973. It was established with the target to improve dairy farming by providing technical inputs for enhancement of milk production, with the primary objective to provide lucrative milk market to producers and value addition of milk to consumers. For the study, two milk plants has been selected i.e. Verka milk plants at Ludhiana and Mohali. These plants have been selected because of their well maintained working capacity, computerized dairying,

unions with managed distribution and transportation, clean milk production, community milking parlours and good quality milk products production.

To attain the objectives of the study, a detailed operational data were collected from both selected plants for the selected products. The selected products are most commonly produced with high quantity contributing more than 60-70 per cent to total revenue of both selected plants. The secondary data were collected for the year 2017-18 from the records of different production units of products and the account section (Chauhan *et al.* 2006, Alli 2015 and Doni 2016).

The data were collected regarding the raw milk procurement with its value of the procurement in both the plants. Fat percentage and SNF percentage of selected products of both the selected plants were obtained. Annual production data of the selected products were obtained from both the selected plants. Per product can be calculated as:

$$\% \text{ Profit} = \frac{\text{Profit margin}}{\text{Cost of production}} \times 100$$

Profit obtained from the selected products was calculated by subtracting cost of manufacturing of the product from the price received by the plant. Total revenue generated from the selected products is the total sales of a particular product multiplied by its sale price and its per cent share was obtained taking selected product into consideration.

Results and Discussion

The raw milk procurement data of both the plants has been presented in Table 1. The raw milk procurement at milk plants, Ludhiana and

Table 1. Raw milk procurement at Verka milk plants, Ludhiana and Mohali, 2017-18

Total raw milk procurement				
Months	Milk plant, Ludhiana		Milk plant, Mohali	
	Quantity (million litres)	Value of milk procurement (Rs in million)	Quantity (million litres)	Value of milk procurement (Rs in million)
April	3.87	128.58	14.84	535.50
May	3.70	123.17	12.90	453.20
June	3.05	99.17	11.55	400.40
July	0.80	26.39	10.64	369.14
August	1.09	35.83	10.78	381.65
September	0.82	40.2	12.21	488.41
October	1.92	59.12	13.85	518.40
November	5.39	168.32	14.90	607.70
December	4.51	104.98	17.62	664.38
January	3.19	99.5	19.58	713.30
February	1.16	35.89	18.34	659.90
March	15.85	52.87	21.13	752.47
Total	45.35	974.02	178.34	6544.45

Mohali was 45.35 and 178.34 million litres, respectively. The total value of milk procurement at milk plants Ludhiana and Mohali, for the year 2017-18 was worth Rs 974.02 and Rs 6544.45 million, respectively. The month of March has the highest quantity of milk procurement in both the milk plants. The least milk procurement was observed during the month of September at Ludhiana milk plant and in case of Mohali milk plant was in the month of July. The difference in the milk procurement in Punjab was due to the seasonal impact and the milking cycle of the milch animals. It was observed that there was high production during the winter season as compared to the summer. The value of procurement depends mainly upon the

transportation charge, fixed and variable cost, wages, size of the handling capacity at the plant and pay paid to workers and payment made to the milk producers.

The current major producing common products which has been selected for the study are SMP (skimmed milk powder), WMP (whole milk powder), SM (standardized milk), FCM (full cream milk), TM (toned milk), DTM (double toned milk), curd, ghee, paneer, butter, and lassi.

The fat percentage and SNF percentage content of these products has been shown above in the Table 2. It was observed that the fat and SNF percentage in both the plants was all most the similar with a small difference in

the percentage, the purity was maintained according to the customers represents. It can be seen that ghee has the highest fat content with zero per cent SNF content, where as the SMP has the highest SNF content with only 1.12 per cent of fat content. The fat and SNF play a major role in the determination of the price of the products.

The production details of the selected major producing products have been shown in Table 2. It was focused that the annual total production of the products at milk plant, Ludhiana, SM has the highest production with 67.19 million litres(m lt) and the least production was in case of paneer with 0.24 million kg(m kg). Total SMP production was 4.85 m kg, WMP production was 1.07 m kg, FCM production was 4.72 m lts, TM production was 0.51 m lts, DTM production was 6.64 m lts, curd production was 2.92 m lts, ghee produc-

tion was 1.25 m lts, butter production was 0.49 m kg and lassi production was 5.4 m lts, respectively for the period 2017-18. The information regarding the production of total production of milk products of the milk plant, Mohali has been shown in Table 2. Among these, SM has the highest production with 94.15 m lts and the least production was in case of WMP with .03 m kg. Total SMP production was 1.54 m kg, FCM production was 8.80 m lts, TM production was 0.64 m lts, DTM production was 28.65 m lts, curd production was 12.35 m lts, ghee production was 0.68 m lts, paneer production was 1.71 m kg, butter production was 1.00 m kg and lassi production was 15.46 m lts, respectively for period 2017-18. It was seen in both the plants there was high preference for SM followed by DTM, FCM and there less preference of TM by the people around Ludhiana and Mohali region.

Table 2. Production of selected milk products along with fat and SNF percentage at Verka milk plants, Ludhiana and Mohali, 2017-18

Products	Milk plant, Ludhiana			Milk plant, Mohali		
	Fat (%)	SNF (%)	Total production (million)	Fat (%)	SNF (%)	Total production (million)
SMP (kg)	01.12	95.68	04.85	00.60	96.00	01.54
WMP(kg)	27.00	70.00	01.07	25.00	67.00	00.03
SM (litre)	04.55	08.55	67.19	04.55	08.55	94.15
FCM(litre)	06.05	09.05	04.72	06.55	09.05	08.80
TM (litre)	03.50	08.50	00.51	03.05	08.55	00.64
DTM(litre)	01.55	09.05	06.64	01.55	09.05	28.65
Curd(litre)	03.00	10.00	02.92	03.10	10.50	12.35
Ghee(litre)	99.80	00.00	01.25	99.70	00.00	00.68
Paneer(kg)	27.50	50.00	00.24	28.33	48.73	01.71
Butter (kg)	82.00	00.86	00.49	82.00	00.00	01.00
Lassi(litre)	02.25	04.25	05.44	02.30	04.30	15.46

The information regarding the contribution of different products in annual revenue of the period 2017-18 of Verka milk plant, Ludhiana has been depicted in Table 3. During this financial year, the plant has sold the product worth Rs 5269.60 million. The highest revenue was generated from SM (56.7%) followed by SMP (9 %), ghee (8.45 %), butter (6.99 %), FCM (5.22 %), DTM (4.12%), curd (3.35 %), WMP (3.28 %), lassi (1.98 %), paneer (0.61 %) and TM (0.35%). Likewise, the data regarding the contribution of different products in annual revenue of the period 2017-18 of Mohali plant has also been given in Table 3. During this financial year the plant has sold the product worth Rs 8558.40 million. The highest revenue was generated from SM (52.38 %) followed by DTM (14.51 %), FCM (11.8 %), curd (7.79 %), paneer (4.99 %), lassi (3.36 %), ghee (2.75 %), butter (1.85 %), SMP and WMP (0.01 %).

The data given in Table 3, shows that each plant specialized in its own way, and obtains high revenue in different products. The Mohali milk plant obtains the highest revenue from SM followed by DTM but at Ludhiana milk plant, the highest revenue from SM was followed by SMP and ghee. The profit margin calculation helps in proper management decision making of the production-mix at the plants. The profit margin is calculated by comparing the unit cost of production with the unit price of the product.

The cost of production, price and profit margin of the product details of the selected major producing products are shown in Table 4. A perusal of the Table reveals the profit margin and per cent profit of different products of the plants for the annual year 2017-18. At the Ludhiana plant, WMP turns out to be the most profit margin product with Rs 42

Table 3. Total sales, price of products and revenue generated from Verka milk plants, Ludhiana and Mohali, 2017- 18

Products	Milk plant, Ludhiana				Milk plant, Mohali			
	Total sale (million)	Price (Rs)	Revenue (Rs million)	Share (%)	Total sale (million)	Price (Rs)	Revenue (Rs million)	Share (%)
SMP (kg)	02.31	205.5	474.08	9.00	0.01	205.5	00.9	0.01
WMP (kg)	00.54	322.8	172.67	3.28	0.003	322.8	0.82	0.01
SM (litre)	66.40	45.0	2988.05	56.70	99.62	45.0	4482.87	52.38
FCM (litre)	05.39	51.0	274.98	5.22	19.80	51.0	1009.90	11.80
TM (litre)	00.45	37.0	16.75	0.32	1.27	37.0	046.82	0.55
DTM (litre)	06.03	36.0	217.03	4.12	34.49	36.0	1241.54	14.51
Curd(200ml)	19.39	9.1	176.40	3.35	73.22	9.1	666.31	7.79
Ghee (litre)	01.21	366.7	445.03	8.45	0.64	366.7	235.69	2.75
Paneer (kg)	00.11	300.0	32.07	0.61	1.42	300.0	427.22	4.99
Butter (500g)	01.27	290.4	368.17	6.99	0.55	290.4	158.47	1.85
Lassi (200ml)	20.87	5.0	104.37	1.98	57.57	5.0	287.86	3.36
Total			5269.60	100			8558.40	100

Table 4. Price, cost of production and profit margin obtained from different Verka milk products at milk plants, Ludhiana and Mohali, 2017-18

Products	Milk plant, Ludhiana				Milk plant, Mohali			
	Price received by the plant (Rs)	Cost of production (Rs)	Profit margin (Rs)	Profit (%)	Price received by the plant (Rs)	Cost of production (Rs)	Profit margin (Rs)	Profit (%)
SMP (kg)	205.5	250.6	-45.1	-17.99	205.5	238.8	-33.3	-13.94
WMP (kg)	322.8	280.8	42.0	14.96	322.8	275.7	47.1	17.08
SM (litre)	45.0	38.5	6.5	16.94	45.0	39.9	5.1	12.81
FCM (litre)	51.0	45.1	5.9	13.08	51.0	46.2	4.8	10.39
TM (litre)	37.0	34.8	2.2	6.38	37.0	34.6	2.4	6.94
DTM (litre)	36.0	32.6	3.4	10.46	36.0	32.7	3.3	9.99
Curd(200ml)	10.0	9.1	0.9	9.89	10.0	9.3	0.7	7.76
Ghee (litre)	366.7	328.6	38.1	11.60	366.7	326.5	40.1	12.28
Paneer (kg)	225.0	215.3	9.7	4.50	225.0	220.7	4.3	1.95
Butter (500g)	297.3	290.4	6.9	2.38	297.3	284.2	13.1	4.59
Lassi(200ml)	5.00	4.40	0.60	13.64	5.00	4.20	0.80	19.05

followed by ghee with Rs 38.1, paneer with Rs 9.7, butter with Rs 6.9, SM with Rs 6.5, FCM with Rs 5.9, DTM with Rs 3.4, TM with Rs 2.2, curd with Rs 0.9 and lassi with Rs 0.6. SMP produced has a negative margin with the loss of Rs 45.1. Also the Table 4 perusal the profit margin and per cent profit of Mohali milk plant. Here WMP turns out to have the highest profit margin product with Rs 47.1 followed by ghee with Rs 40.1, butter with Rs 13.1, SM with Rs 5.1, FCM with Rs 4.8, paneer with Rs 4.3, DTM with Rs 3.3, TM with Rs 2.4, curd with Rs 0.7 and lassi with Rs 0.8. SMP produced has a negative margin with the loss of Rs 33.3. It was observed that both the cooperative milk plants has high profit margin in case of WMP, followed by ghee and butter and both plant has negative margin in case of SMP.

Conclusion and Policy Implications

The raw milk procurement at plants was the highest during the winter period whereas it was low in the summer period. Fat and SNF per

cent decides the price of the products produced at the milk plants. It was observed almost same per cent of fat and SNF was present in all the products at the plants, as per the requirement. Ghee has the highest fat content and SNF has the least. There was high production in case of standardized milk and low in case of paneer and whole milk powder. Production depends upon the preference of consumers. The liquid milk preference by consumers: standardized milk (SM) > double toned milk (DTM) > full cream milk (FCM) > toned milk (TM). Revenue generated from standardized milk was more as it was produced the most, and has a share of 52-56 per cent among all the products. Products worth sold were seen higher in case of Mohali milk plant by 1.6 per cent than Ludhiana milk plant. Both the milk plants earn a high amount of revenue from lassi and paneer. Profit margin obtained was high from whole milk powder and lassi compared to other products and a negative margin was

observed in case of skimmed milk powder.

Policy implications required to increase the profit of the milk plants are the re-organization of the product mix and new product development in the plants will increase the profit of plants. The sale promotion measures may be developed for profitable production to increase its demand. The efforts should be made to increase milk procurement so that full of milk plants capacity can be utilized which can play a vital role to increase their profit.

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