

## Milk Collection Systems and Profitability of Commercial Dairies in Bikaner (Rajasthan)

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**Abstract:** The overall net return and family labor income from a liter of milk were Rs. 1.93 and 2.76, respectively. The milk producers were selling the milk directly to consumers, sweet manufacturing units and organized dairy plants, etc. The auctioning and contractual procurement of milk is the special feature of milk marketing in Bikaner. The contract ensures a remunerative floor price to milk producers. The study has revealed the increased profitability of milk production, which is reflected through increase in the number of dairy herds by about 30% in a period of three years.

**Key words:** Milk, collection systems, profitability, commercial dairies.

In the emerging agricultural scenario of the country, livestock production in general and dairying in particular has a special place as an instrument for enhancing the income and employment of farmers. Sizable increase in milk production has taken place from about 17 million tonnes in 1950-51 to over 70 million tonnes in 1996-97, making India the world's largest milk producing country (Anonymous, 1997).

In addition to rural milk production a large number of commercial dairy herds have come up in urban areas, where animals are maintained on purchased feeds and fodder. Although the share of these dairy herds in the total milk production of the country is not very high, yet they influence the economy of the respective areas to a great extent. In the light of GATT agreement, the working group on animal husbandry and dairying has also proposed to encourage commercial dairy herds with a minimum herd size of 50 milch animals. The idea

is to promote the production of high quality raw milk for dairy plants to make value added dairy products for exports. With the delicensing of the industry in July 1991, there has been an increasingly heavy participation of the private sector in the dairy industry. Consequently, the competition among various agencies for the procurement of milk has also increased, which must have positively influenced the milk price. In this context, present study attempts to analyze the contractual arrangements in milk procurement, profitability of milk production and break-even level of milk output on commercial dairy herds in Bikaner city of Rajasthan.

### Materials and Methods

A complete enumeration of commercial dairy herds in Bikaner city of Rajasthan was made. The dairy herds were categorized into small, medium and large, based on cumulative square root method of

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Table 1. Cost and returns of cow milk production in Bikaner city (Rs. L<sup>-1</sup> of milk)

Items	Herd size category			
	Small	Medium	Large	Overall
<b>A. Fixed costs</b>				
Interest on fixed capital	0.60 (8.50)	0.56 (7.67)	0.55 (7.57)	0.57 (7.92)
Depreciation on fixed assets	0.30 (4.25)	0.30 (4.11)	0.29 (4.00)	0.30 (4.16)
Total	0.90 (12.75)	0.86 (11.78)	0.84 (11.57)	0.87 (12.08)
<b>B. Variable costs</b>				
Dry fodder	2.24 (31.73)	2.31 (31.65)	2.43 (33.47)	2.31 (32.08)
Concentrates	2.89 (40.93)	3.08 (42.19)	3.05 (42.01)	3.00 (41.67)
Total feed cost	5.13 (72.66)	5.39 (73.84)	5.48 (75.48)	5.31 (73.75)
Human labor	0.84 (11.90)	0.86 (11.78)	0.75 (10.33)	0.83 (11.53)
Miscellaneous expenditure	0.19 (2.69)	0.19 (2.60)	0.19 (2.62)	0.19 (2.64)
Total	6.16 (87.25)	6.44 (88.22)	6.42 (88.43)	6.33 (87.92)
<b>C. Gross cost (A+B)</b>	7.06 (100.00)	7.30 (100.00)	7.26 (100.00)	7.20 (100.00)
<b>D. Value of dung</b>	0.24	0.28	0.22	0.25
<b>E. Net cost (C-D)</b>	6.82	7.02	7.04	6.95
Milk yield (L)	7.72	7.30	7.13	7.43
Price of milk (Rs. L <sup>-1</sup> )	9.13	8.76	8.66	8.88
Net return (Rs. L <sup>-1</sup> )	2.31	1.74	1.62	1.93

Note: Figures in parenthesis indicate percentage of gross cost.

stratification. A total of 100 dairy herds consisting of 39 small (1 to 20 milch animals), 39 medium (21 to 37 milch animals) and 22 large herds (above 37 milch animals) were selected on the basis of probability proportional to the number of dairy herds in each category. Relevant data were collected by personal interview method for the year 1996-97. Tabular analysis was employed for working out cost and returns in milk production.

#### Break-even level of milk production

It is that level of milk production where herd owner is neither in loss nor in profit. For estimating break-even level of milk production per animal per year (BELO), following method was used:

$$\text{BELO} = \frac{\text{Total fixed cost per animal}}{\text{Price per liter of milk} - \text{Variable cost per liter of milk}}$$

#### Results and Discussion

The data collected from the commercial dairy herds were subjected to tabular analysis and results are discussed below.

#### Cost and returns from milk production

The cost structure on dairy enterprise is an important aspect for milk producers, consumers and the policy makers. It provides an effective linkage between the milk producers and consumers for fixing the sale price of milk. The milk production and the returns accrued from it are also very important to study the viability of stalls.

Category-wise per liter cost and returns of milk production are presented in Table 1. The gross cost of milk production was higher on medium (Rs. 7.30) and large category (Rs. 7.26) of herds than small ones (Rs. 7.06) due to high expenditure on feed. The break-up of the cost components revealed that the sizable portion of the cost was shared by feed cost. It was observed to be more than 70% of the gross cost in all the herd categories. Human labor cost was the next and accounted for around 12% and it decreased with the increase in the size of stall. The proportion of fixed cost in the gross cost per liter of milk also decreased with the increase in herd size, which could be attributed to the economies of scale.

In the overall cost of milk production, the fixed and variable costs accounted for 12 and 88% of gross cost, respectively. Since dairy owners in the study area were not feeding green fodder to the animals, the feed cost comprized of dry fodder and concentrates only. The proportion of dry fodder and concentrates in the overall feed cost was 44 and 56%, respectively.

The productivity of milch animals and price realized per liter of milk showed decreasing trend with the herd size. The highest milk yield per milch animal per day was observed on small stalls, which could be due to the better personal care given to the individual animal. Since 66% of the total milk production on small herds was being sold to the consumers directly, the price received per liter of milk was the highest. The net returns per liter of milk were Rs. 2.31, Rs. 1.74 and Rs. 1.62 on small, medium and large herds, respectively, which again shows that small producers are better managers and took better care of their

animals. The sale price of milk varied according to seasons. The price per liter of milk was Rs. 8.60, Rs. 9.50, Rs. 9.40 (small category), Rs. 8.50, Rs. 9.00, Rs. 8.85 (medium category) and Rs. 8.40, Rs. 8.90 and Rs. 8.75 (large category) in winter, summer and rainy seasons, respectively. The profitability of milk production was highly associated with the price structure, sale price and assured milk market, which is a unique phenomenon in Bikaner city.

#### *Break-even level of milk production*

Break-even level of milk production is the production level that covers total cost of milk production and below which dairy owner will be in loss. The data were analyzed for all the categories of herds are presented in Table 2. It was revealed that the break-even output level was 30, 37 and 38% of the total output on small, medium and large herds, respectively. The results indicated that small stall owners were able to cover their total expenditure much earlier than medium and large ones. The highest price received per liter of milk was one of the major reasons for lower break-even level on small dairy herds. The break-even level of output was found to be 928 L per milch animal per year, which varied from 850 L on small herds to 991 L on medium size herds. The break-even level of output on a large sized herd was 983 liters.

#### *System of milk marketing in Bikaner*

An enterprise cannot flourish whatever the output or the production cost is, unless it is backed by sound marketing system. Dairy enterprise is no exception to this phenomenon. In Bikaner, there were four agencies engaged in the collection of milk, viz., consumers, sweet manufacturing units,

Table 2. Break-even level of milk production across categories of herds

Herd size category	Average milk yield (L)	Fixed cost animal <sup>-1</sup> (Rs.)	Variable cost animal <sup>-1</sup> (Rs.)	Variable cost per L of milk (Rs.)	Price per L of milk (Rs.)	Break-even output (L)	% of break-even output to total output
Small	2817.80	2525.80	17352.10	6.16	9.13	850.44	30.18
Medium	2664.50	2299.50	17162.30	6.44	8.76	991.16	37.20
Large	2602.45	2200.95	16695.10	6.42	8.66	982.57	37.75

organized dairy plants and others (tea shops, milk vendors, etc.).

A peculiar system of sale of milk is prevalent in the area. Everyday in the morning and the evening the auction of milk takes place in the vicinity of commercial dairy herds. The price decided through such auctions is being paid by the sweet manufacturing (Rasogolla) units to the dairy herd owners. Organized dairy plant has made a procurement contract directly with the milk producers for a specific period of time at a fixed price. As per this contract, dairy herds could sell any amount of milk to the dairy plant. The day, when nobody lifts the milk or the price of milk falls below a certain level, the dairy plant lifts the entire milk.

Small owners were selling maximum quantity of milk (66%) directly to the consumers (Table 3) while the medium and large sized herds sold 39 and 42% of their production, respectively, to the dairy plant. The producers obtained highest profit from sale of milk when it was sold directly to consumers, followed by sweet manufacturing units and private dairy plant. Overall, the dairy plant had the largest share in total milk procurement because of better procurement price and timely payments. Due to procurement contract

made by the dairy plant, producers were getting assured price of milk, which ultimately influenced the milk price during daily auction also. The price fixed by the dairy plant served as the baseline and helped the producers to get good price in the auction. Contractual arrangements for procurement of milk by dairy plant have benefited the milk producers through assured price. Consequently, the number of dairy herds has increased by more than 30% in the span of three years after setting up of the dairy plant.

It could be concluded from the present study that the commercial dairy herds with crossbred cows could very well be maintained profitably in arid conditions. Average production of these animals was estimated to be 7.40 L day<sup>-1</sup>. Dairy owners were selling the milk to consumers, sweet manufacturing units, dairy plant and milk vendors, etc., prior to introduction of dairy plant. Fluctuations were higher in the procurement price of milk. Sometimes during flush season, prices were so low that dairy owners were not even able to meet the cost of milk production. In the procurement contract made by the dairy plant, prices are fixed at least for a season. The private dairy plant is bound to procure total milk produced at this price. The assured floor price helped in increasing milk production, milch animals and the

Table 3. Disposal pattern of milk (in litres per year)

Marketing agency	Herd size category			Overall
	Small	Medium	Large	
Directly to consumer	28533 (66.10)	16258 (22.10)	172881 (18.20)	55510 (21.81)
Sweet manufacturing unit	5110 (11.83)	22445 (30.51)	370174 (38.97)	92185 (36.22)
Private dairy plant	9534 (22.07)	28706 (39.02)	399810 (42.09)	102872 (40.42)
Other (Tea shops, Milk vendors, etc.)	-	6158 (8.37)	7029 (0.74)	3948 (1.55)
Total	43197 (100.00)	73567 (100.00)	949894 (100.00)	254515 (100.00)

Note: Figures in parentheses indicate percentage of the total milk disposed.

number of herds in the city. The contractual arrangement for milk procurement by dairy plant has benefited the milk producers by giving them assured remunerative price and consequently ensuring the supply of milk for full capacity utilization. Hence it makes

a case for other dairy plants to initiate similar type of contracts for the benefit of both the producers and processors.

#### Reference

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