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Economics of indigenous dairy products processed by milk producer in Maharashtra state

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Abstract
The Indian dairy industry is comprised of formal (Cooperatives and private) and informal (small processing units, milk merchants, and so on). The informal sector continues to dominate in terms of procuring the country's substantial milk surplus. The current study looked at the cost and return structure of informal dairy processing among milk producers in Maharashtra's Vidarbha and Marathwada region. The net returns of various traditional dairy products processing at milk producers level depends on availability market and diversification into traditional indigenous value-added dairy products. Dahi, Paneerkhoa, and Pedha are some of the most popular traditional dairy product in India. To optimize the cost of each component used in processing of indigenous dairy product, an economic analysis of this product was necessary. These costs and returns will assists these product in maintaining its presence in a competitive market. As a result, the producer and consumer will benefit from the best possible pricing. The production cost Dahi, Paneer, Khoa and Pedha was estimated and found that Rs.47.54, Rs.278.78, Rs. 299.09 and Rs. 327.77 per kg, respectively. Dahi was the most profitable product, with 68.28 percent profit over cost, followed by Khoa (33.74%).

Keywords: Dahi, Paneer, Khoa, Pedha, component-wise cost

Introduction
The Indian dairy business is characterised by the existence of formal/organized and informal/unorganized segments. Small dairy processing facilities, milk vendors and halwais, and milk producers make up the informal dairy sector, which utilized 77% of total milk production as opposed to the 23% by the formal dairy sector which consists of dairy cooperatives and commercial processors (Amit Thakur *et al*. 2020) [5]. The proportion of food budgets spent on milk and milk products has been steadily rising over time. A growing middle class, a focus on product quality, and the nutritious value of dairy have all contributed to the anticipated growth in demand for value-added dairy products. Value-added dairy products are in high demand, and the informal sector must provide helping hand to the dairy industry if supply is to keep up. The purpose of the present study was to calculate the costs and benefits of value-added dairy products and to raise the profit margin of milk producers through this process. The village's women's and women's SHGs can add value to raw milk in this way. These improvements in quality have the potential to greatly aid in the creation of new jobs and the maintenance of the current rural standard of living. It was found during data collecting that milk producer households had a general lack of scientific understanding regarding the production and sale of dairy products. Connecting these milk-producing clusters to educational resources that offer training in dairy business is crucial for enhancing their output and stimulating the local economy.

The dairy industry has enormous unrealized potential and presents excellent ground for establishing a new dairy venture. Increased demand for value-added dairy products in India can be traced to the country's rapidly changing demographics over the previous decade. The manufacturers benefited from this shift in the dairy business' dynamics since the profit margins on value-added dairy products are significantly higher than those on raw milk. Private companies are drawn to the dairy business because of its high potential returns on investment (12-18%) in comparison to the 4-5% profit margins in the raw milk space. Value-added products are expected to account for an increasingly large proportion of the milk and milk derivatives market in the near future, with current projections indicating a 25 percent annual growth rate (Mir MirajAlli *et al*. 2020) [6]

The production of indigenous dairy products at local level requires a lower initial investment to purchase smaller equipment such as khoa machines, paneer press, incubators, and deep

freezers etc. To begin value-added dairy production on their own, milk producers need only to have the appropriate scientific training in the product processing and marketing of dairy goods.

Methodology

The present study was conducted in the Vidarbha and Marathwada region of Maharashtra. The primary data was collected by actual observation and interviewing milk producers and processors cum milk producer for the year 2022-23. Data on milk inflow, its utilization pattern and output of product was taken. The expenditure incurred on quantity of raw material, labour required, expenses on refrigeration, packaging, energy and depreciation on equipment's and building were recorded. Actual observations were taken on quantity of different ingredients required and their price of the item's used for processing of dairy product. To work out the cost of production of Dahi, Paneer Khoa and Pedha, the tabular analysis technique were performed to workout different cost component of dairy products processed by milk producer at household level.

Result and Discussion

Table 1: Provides the component wise cost incurred on raw material

Sr. No.	Particulars of cost	Dahi	Paneer	Khoa	Peda
1)	Raw Material	38.42 (80.82)	260.00 (93.26)	242.64 (81.13)	255.00 (77.80)
2)	Labour	3.87 (8.14)	4.24 (1.52)	11.89 (3.98)	13.24 (4.04)
3)	Refrigeration and Electricity	1.08 (2.27)	1.76 (0.63)	1.69 (0.57)	1.28 (0.39)
4)	Water	0.14 (0.29)	0.29 (0.10)	0.29 (0.10)	0.29 (0.09)
5)	Steam/Cooking gas	1.06 (2.23)	5.48 (1.97)	39.46 (13.19)	44.56 (13.59)
6)	Packaging	1.48 (3.11)	4.00 (1.43)	1.80 (0.60)	10 (3.05)
7)	Depreciation on Building and equipment	0.09 (0.19)	0.13 (0.05)	0.13 (0.04)	0.19 (0.06)
8)	Miscellaneous	1.40 (2.94)	2.88 (1.03)	1.19 (0.40)	3.21 (0.98)
9)	Total Cost per unit	47.54 (100)	278.78 (100)	299.09 (100)	327.77 (100)
10)	Selling Price per Kilogram	80.00	350.00	400.00	400.00
11)	Net Profit per unit	32.46	71.22	100.91	72.23

Dahi

Dahi is the well known dairy product consumed in every family of the country. This product is traditionally processed in all household of the country and also known as sweet Dahi in other part of the country. Table 1 provides the component wise cost incurred on raw material for Dahi was raw milk of fat level of 4.5 percent and SNF of 8.5 percent and Culture which accounted Rs. 38.42 /Kg. followed by labour Rs. 3.87/Kg. This labour cost includes labour required for manufacturing and marketing of Dahi at household level. The refrigeration, electricity, cooking gas and packaging expenses accounted for Rs. 1.08 (2.27 percent), Rs. 1.06 (2.23 percent) and Rs. 1.48(3.11 percent) respectively. But majority of Dahi manufactures selling at door to door without any packaging in loose.

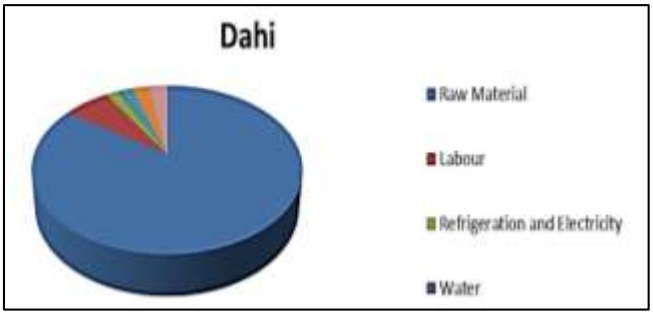

Fig 1: Contribution of different cost component in processing cost of Dahi

The table shows that the per unit cost of producing one kg. Of Dahi was worked out to be Rs. 47.54/Kg. The farmers received Rs. 32.46 per kg dahi after selling Dahi in Rs.80/Kg in local market. The farmer received additional revenue from milk due to value addition of milk into dairy product.

Paneer

Paneer is a staple in south Asian countries, which is not surprising given the importance of milk in their diet. It is also vegetarian, which complements the vegetarian diets of many Indians and makes paneer a popular vegetarian dish in Indian cuisine. There are a variety of well-known meals that can be found in any restaurant. It is an acid coagulated dairy product that can be prepared from either full-fat buffalo milk or cow milk. Table 1 provides the component wise cost incurred on raw material for paneer was raw milk of fat level of 8.5 percent and citric acid which accounted Rs. 260 /Kg (93.26 percent) followed by cooking gas Rs. 5.48/Kg (1.97 percent). The labour, packaging, refrigeration, electricity, packaging, and miscellanoius expenses accounted for Rs. 4.24/Kg (1.52 percent), Rs. 4.00 (1.43 percent), Rs. 1.76 (0.63 percent) and Rs. 2.88(1.03) respectively.

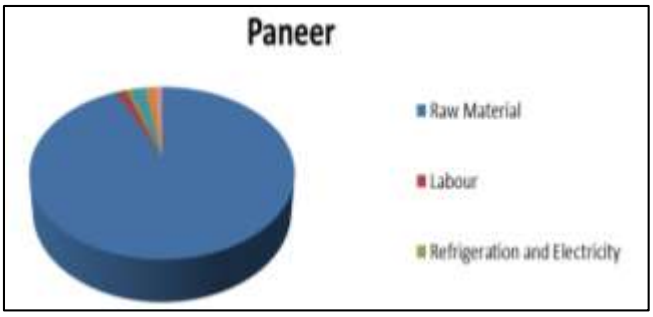

Fig 2: Contribution of different cost component in processing cost of Paneer

The table shows that the per unit cost of producing one kg. of paneer was worked out to be Rs. 278.78/Kg. The farmers received Rs. 71.22 per kg paneer after selling in Rs. 350/Kg in local market. Value addition of milk into dairy products increased the milk's profitability for the farmer.

Component wise cost of Khoa

Khoa offers attractive marketing potential compared to other milk products as a result of its growing demand from the quality-conscious segment of the population and its widespread use in a variety of dairy products. Khoa is a heat-coagulated milk product obtained from buffalo and cow milk with a fat content of 8.5% and more than 9.0% SNF, which

accounted component wise cost for raw material was Rs. 242.64/Kg (81.13%), followed by cooking gas at Rs. 39.46/Kg (13.19 percent). The costs associated with labour, refrigeration, power, packaging, and other items were Rs. 11.89/Kg (3.98 percent), Rs. 1.69 (0.57 percent), and Rs. 1.80 (0.60 percent) and Rs. 1.19(0.40) respectively.

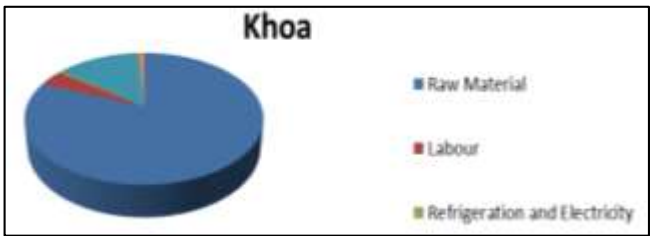

Fig 3: Contribution of different cost component in processing cost of Khoa

The table: 1 depicts that the unit cost of producing one kilogramme of khoa was calculated to be Rs 299.09 per kilogramme. The farmers additionally earned of Rs 100.91 per kilogramme of Khoa after selling it for Rs 400 per kilogramme on the local market. Adding value to milk by transforming it into dairy products increases the profitability of milk for the farmer.

Pedha

A Pedha composed of khoa, sugar, and other flavourings that is served during numerous ceremonial celebrations. Regionally distinct kinds of pedha are popular in various parts of the country. It is a heat-coagulated milk product made from buffalo and cow milk with a fat content of 8.5% and more than 9.0% SNF. The raw material cost was Rs. 255.00/Kg (77.80%), followed by cooking gas at Rs. 44.56/Kg (13.59 percent). The costs related with labour, packaging, refrigeration, electricity, and other miscellaneous were Rs. 13.24/Kg (4.04 percent), Rs. 10.00 (3.05 percent), and Rs.1.28 (0.39 percent) respectively.

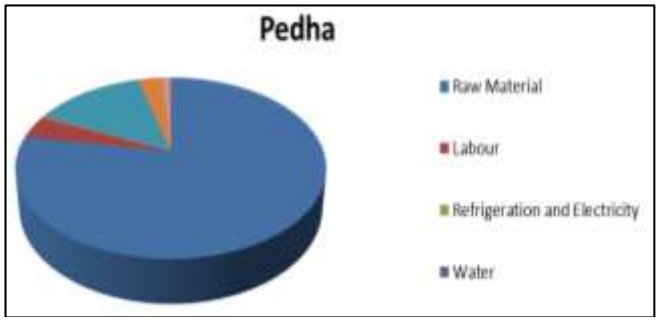

Fig 4: Contribution of different cost component in processing cost of Pedha

The unit cost of making one kilogramme of pedha was calculated to be Rs 327.77 per kilogramme, as shown in the table 1. The farmers earned an additional Rs 72.23 per kilogramme of Khoa after selling it on the local market for Rs 400 per kilogramme. Increasing value to milk through its transformation into dairy products boosts the milk's profitability for the farmer.

Conclusion

Manufacturing of traditional Indian dairy products like Dahi, Paneer, Khoa and Pedha is a profit making business and can generates lot of employment opportunities for milk producer in rural India. The cost of milk product manufacturing can be reduced by increasing the quantity of production. The manufacturing of dahi is most profitabledairy product followed by Khoa and Pedha respectively.

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