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A review of Indian dairy industry

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Abstract

The primary goal of the study is to comprehend the state of the Indian dairy sector today and the different concerns that the industry's stakeholders are facing. This is an overview of studies on the dairy sector. A random selection of 24 research articles related to data for various Indian states was made. Primary data gathered from dairy farmers (members or non-members of cooperative organizations) was the basis for 14 out of 24 publications. The main problems identified were inadequate supplies of concentrates and forage, limited access to veterinarian and diagnostic services, and inadequate knowledge of technology. Dairy producers in majority of India's areas dealt with these common problems. Some of the problems were region-specific; for example, milk and milk products were not part of the everyday diets of the people in Assam, which is not the case in other states in the nation. The remaining ten studies either dealt with cooperative and private dairy farms, cooperative federations, or the state's overall dairy situation. It was discovered that the primary source of total expenditures was procurement, with processing coming in second. The economic sustainability of the dairy units in question was assessed by these investigations.

Keywords: Indian dairy industry, dairy sector challenges, dairy farmers

Introduction

With the effective execution of initiatives like "Operation Flood," the government and populace's determined efforts allowed India to shift from being the world's lowest producer of milk to the top producer. The world's largest population of buffalo and cattle is found in India. The primary milch animals, cows and buffaloes, account for 96% of the nation's total milk production. Even though Indian buffaloes have a moderate output, Indian cows have among of the lowest average yields. Together, buffaloes and cows produce significantly less milk on average than the world average. The country's dairying industry is structured differently depending on the location. The Indian dairy business has a variety of challenges, some of which are regional in nature and others of a general one. The goal of the current study is to comprehend these problems and the difficulties that dairy stakeholders encounter.

Objective of the study

An overview of the Indian dairy industry is the study's main

goal. to comprehend the nuances and complexity of numerous topics, as well as the challenges faced by the dairy sector units. The purpose of the study is to determine the scope of the research conducted in the field and to identify any unresolved issues that may open the door to more research in the area.

Research methodology

The accessible material that was taken from several databases served as the study's foundation. The goal of this qualitative study is to comprehend the problems associated with the Indian dairy industry, including its structure, various industry participants, the function of various government agencies, government programs, and the effectiveness or inadequacy of these initiatives for the development of the dairy industry.

The articles come from a variety of sources, including Google, Ebsco host.com, J-gatePlus, and others. Understanding the development of the dairy business in India, the advancements made thus far, and the initiatives,

initiatives, and activities that have contributed to those advancements are the main goals. The research depends on

a total of 24 bi-fergated articles as follows:

| Sr. No. | Region | State | Total of the Region |
|---------|----------------------|---|---------------------|
| 1 | Southern Region | Tamil Nadu (3), Karnataka (2), Andhra Pradesh (1) | 6 |
| 2 | Western Region | Maharashtra (4), Gujarat (3) | 7 |
| 3 | Northern Region | Haryana (2), Rajasthan (1) | 3 |
| 4 | North Central Region | Bihar (1), Uttarakhand (1) | 2 |
| 5 | Eastern Region | West Bengal (2) | 2 |
| 6 | North East Region | Assam (1), Nagaland (1), NE States (2) | 4 |
| | | Total | 24 |

Literature review

On the basis of primary data gathered from one cooperative and one commercial dairy plant, five transport routes, and six chilling plants, the authors examined the milk and milk product value chains in the co-ops and private dairy plants in the Salem region of Tamil Nadu. Because of increased expenses for shipping, chilling, and receiving milk, the authors have noted that the cooperative dairy plant's procurement cost per liter of milk was greater than that of the private plant. Value chain research showed that while ice cream, and ghee were produced in the private plant, items like peda, khoa, and SMP might gain a higher value after traveling through the value chain in the cooperative facility. For the private plant, toned milk, standardized milk, and butter had greater marketing margins and marketing efficiency than full cream milk, ghee, and SMP did (Babua *et al.* 2010)^[1].

The purpose of the study was to evaluate the marketing effectiveness of Tamil Nadu's private and cooperative dairy factories. Primary data was gathered from 20 milk producers' cooperative societies, 20 milk collecting centers, and 20 transportation routes (from both cooperative and private sources) in order to assess the marketing efficiency. With the exception of toned milk, the cooperative dairy plant's marketing effectiveness for all dairy products has been shown to be comparatively lower than that of the private dairy plant (Rangasamy *et al.* 2008)^[13].

The goal of the study was to create a model for determining milk prices. Several elements, including input prices and non-price aspects like technology, were taken into consideration when constructing the price determination model. The study's authors created a pricing model based on manufacturing costs. They claim that the technique may be used to forecast milk prices in the future. The authors found that there was a positive and smaller than one elasticity of production cost with regard to the pricing of variable inputs. The cost of producing buffalo milk was significantly increased by the price of concentrate and dry food. It was mentioned in the study that the milk price should be changed within that range where net income elasticity floats between zero and one based on primary data obtained from 160 homes in the financial year 2002–03 (Saravanakumara *et al.* 2009)^[16].

The purpose of the study was to determine how dairy cooperative performance affected employment, revenue, and milk output. The four milk cooperatives in the Karnataka district of Kolar provided the raw data. During the years 1995–96 to 2004–05, a trend study of physical markers such as total membership, total staff, and total milk output revealed a rising tendency year over year. Additionally,

based on financial indicators such as share capital, sales value, net profit, net worth, etc., the financial performance for the same period was examined. It was noted that during the time, every financial indicator had a favorable tendency. Because cooperative society members received many services from the societies at no cost or reduced cost, the employment creation and income gained by dairy cooperative members was higher than that of non-members (Srikanth *et al.* 2007)^[23].

The study evaluated the Karnataka Dairy Development Project's effects on the state's dairy industry. The primary data was gathered by surveying 10 villages with non-cooperative dairy operations and 21 villages with cooperatives. The average output in villages with milk cooperatives was double that of communities without cooperatives, indicating that the initiative had a favorable effect on milk production, according to the author. A change in the makeup of the herd allowed for an increase in milk output. Cross-bred cows, called bufellos, took the place of the native cows. The project resulted in a larger herd and more cattle investment. The experiment affected milk prices in cooperative communities but had little effect on wage earnings or labor pattern changes (Harold; 1987)^[4].

The study examined the idea of profitability and how it was measured in the Andhra Pradesh dairy industry between 2001 and 2011 in relation to total investment, sales, and shareholders' money. The assessment of earning potential, operational and financial efficiency analyses, and a Z-score study of the financial health of Andhra Pradesh's dairy industry were also included. Over the course of ten years, data was gathered from five Andhra Pradesh dairy businesses (2000-01 to 2010-11). The financial soundness of four of the five dairy units was determined. But one was discovered in the bankruptcy zone (HimaBindu *et al.* 2012)^[5].

The "Gokul" cooperative union in western Maharashtra was the subject of the case study. They conducted a SWOT analysis on behalf of the cooperative union. 150 dairy producers participated in a pretested interview that was planned in order to gather data. The survey included information on the 46 livestock services provided by "Gokul" as well as the opinions of 150 respondents on the quality of the services. According to the author, by offering livestock services, the union has successfully strengthened dairy production and marketing. Nonetheless, the author discovered that the union needed to lower the cost of these services and raise the caliber of the services provided (Rathod; 2011)^[15].

The purpose of the research was to comprehend the problems that the cooperative union's employees and dairy

producers were facing. 150 farmers and staff members participated in interviews to provide the data for this purpose. The limitations were categorized into four groups: financial, administrative, policy-related, and human resource limitations. The main obstacles mentioned by the farmers were a shortage of veterinarians, inadequate healthcare, expensive concentrates, and convoluted insurance procedures. Conversely, the main problems with cooperative workers included low compensation, inadequate coordination between agencies, inadequate diagnostic capabilities, and inadequate cold storage facilities (Rathod *et al.* 2012)^[14].

The author researched the distribution and marketing plans of several dairy product varieties. The Kolhapur district of Maharashtra provided the cooperative, commercial, and public sector dairy operations with the data used for the study. It was discovered that every dairy unit solely conducted local product advertising. The media outlets used for the advertisements were local TV and radio stations, local newspapers, and point-of-purchase advertisements. A few had their own vacation rentals in different parts of Maharashtra. Most of them lacked a broad network of distribution (Ingavale; 2012)^[6].

In India, the dairy industry and other related fields are not commercialized. They continue to be regarded as millions of small farmers' primary source of income. To compete in the global market, the dairy and agricultural sectors must go commercial. The goal of the study was to determine if various dairy unit sizes would be profitable. A capital investment, cost, return, and profitability study was conducted using information gathered from 40 dairy farms in Maharashtra's Ahmednager area. There were three sizes of farms that were chosen: large, medium, and tiny. Dairy product commercialization increases revenue and output. Small dairy farms were shown to have greater cow productivity in terms of milk production than medium and big farms. The authors came to the conclusion that although dairy production requires a significant amount of cash, large farms invested more in cattle than small farms, which mostly invested in infrastructure development. Commercial dairy farms favored growing their own fodder rather than relying on fodder that was purchased. Since feed costs accounted for the largest portion of the overall cost (Ghule *et al.* 2012)^[3].

Based on secondary data, a trend study of the productivity of several species and their composition in total milch animals was conducted for eighteen years, from 1990–1991 to 2008–2009. The performance of the native cows has steadily increased throughout the state, according to the writers (Gujrat). It was discovered that the primary factor contributing to the rise in milk output was the number of animals. But the incremental number was discovered to be unfavorable beyond a certain point. The authors have proposed that in order to ensure a sustained increase in milk output, consideration should be given to the milk yield of milch animals (Shah *et al.* 2010)^[19].

Through the study, the performance of Gujarat's dairy sector was examined and evaluated. Based on secondary data, the study evaluated the financial standing of nine district milk producer's unions in Gujarat during a ten-year period (1993–94 to 2002–03). The analysis of the sales cost components led to the identification of the causes of the high expenses. It

was discovered that between 75% and 80% of the whole cost was incurred in procurement. Procurement costs increased as a result of annual increases in transportation costs. After labor charges, processing costs accounted for the second-highest portion of the overall cost structure (Patel; 2005)^[11].

The purpose of the study was to evaluate the efficiency of dairy cooperatives and the benefits of producing milk at a larger scale. The research took into account different cost components (such as labor, cow feed, housing, and fodder) as well as different prices for milk produced in the summer and winter. A survey of 300 milk farmers was conducted. It was discovered that owning a buffalo resulted in negative income even though buffalo milk had a higher procurement price than cow milk. However, the number of farmers who owned buffaloes exceeded that of cows. For the majority of farmers, milking was determined to be their secondary source of income. It was discovered that the whole expenses, including labor, caused the owners of buffaloes and cows to have negative incomes. According to the author, milking is not a business but rather an economic activity that yields compensation, much like a job (Shah; 2012)^[20].

For the study, an ISO-9002 dairy factory with an installed capacity of 60,000 litres per day (LPD) located in the northeastern region of the state of Haryana was chosen. An analysis was conducted on the expenses and income generated by the four products. It was found that the primary cost factor—which accounted for 90% of the overall costs—was the raw material, followed by the cost of packaging for all four goods. All of the products—aside from the double-toned milk—were produced above the estimated break-even points, according to the research. Manufacturing ice cream was discovered to be the most lucrative option (Chauhan *et al.* 2006)^[2].

Using five years' worth of financial data, the author has examined the operational performance of HDDCF (Haryana Dairy Development Cooperative Federation Ltd) and MILKFED (The Punjab State Cooperative Milk Producers' Federation Limited) based on a number of metrics. It has been noted that while the HDDCF and MILKFED have established milk booths in urban and semi-urban regions, they do not have any in rural areas. It was discovered that there were fewer HDDCF societies in 2009–2010. While Milkfed was earning more from other sources than HDDCF, the ratio of interest income to total income of HDDCF was determined to be higher. It has been discovered that while Milkfed used its resources more effectively than HDDCF, HDDCF spent a greater percentage of its overall costs on its personnel. By comparison, HDDCF's rate of return on investment was higher than MILKFED's. The author came to the conclusion that HDDCF outperformed MILKFED in terms of finances (Kaur; 2011)^[7].

The main goal of the study was to compare the economic performance of members and non-members. It was also done to compare the costs and benefits of producing milk for various herd sizes. To fulfill these objectives, information was gathered from 75 members and 75 non-members in the Alwar District of Rajasthan. It was discovered that the member group's daily net maintenance cost was more than the non-member group's. It was shown to be more common in the summer and to be higher in the

case of buffalo than cows. It was found that the cost per litre of producing milk from cows and buffalo was greater, in comparison to the membership group for the non-member. While the same tendency was not seen in the case of cow milk production, the cost per litre of producing buffalo milk fell as the herd size increased over the course of several seasons. It was also discovered to be higher in the summer. The daily net return was found to be both greater in the winter and comparatively higher in the member group as compared to the non-member group. It was found that the non-member group's per-litre cost of producing buffalo and cow milk was greater than that of the member group (Meena *et al.* 2012)^[9].

The milch animals in this study were divided into three categories: buffaloes, native cows, and crossbred cows. It was discovered that although farmers with modest herd sizes (6) chose native cows and buffaloes, those with big herd sizes (10–12) preferred crossbred cows. The author discovered that the state's average daily milk output increased as a result of more scientific dairy farming techniques and a rise in the percentage of crossbred cows among all milch animals. It was also noted that a larger herd produced a lower level of output. Compared to members of a combined family, single family members gave their dairy cows more care. The average daily milk contribution made by dairy producers to the DCS milk pool was significantly impacted by the size, time, season, and kind of animals in their herd. Regarding their respective shares of the consumer's rupee, the herd sizes were identical to one another. The study went on to analyze the per-litre cost of milk production, which is one of the factors used in farm-level decision-making. It was discovered that crossbred cows had a lower per-litre cost of milk production (10.4) than local cows (13.99) and buffaloes (14.34). Compared to rural and semi-urban settings, the cost of producing milk per litre in urban areas was shown to be considerably greater, most likely as a result of increased feed, labor, and fixed expenses (Singh *et al.* 2012)^[21].

Based on primary data gathered from 320 dairy farmers, this article has examined the main challenges encountered by cooperative and non-cooperative dairy producers. 38 limitations, divided into 5 sections (Infrastructural limitations (11), Economic Constraints (10), Marketing Constraints (6), Technical Constraints (5), and Socio-Psychological Constraints (6)), contained the significant difficulties. It was discovered that: In order to increase milk production, non-cooperative dairy farms encountered significant obstacles that were more severe than those experienced by cooperative farms. The cooperative farms were found to be mostly constrained by their financial situation. The primary restrictions pertaining to infrastructure were the unavailability and sporadic visits of veterinary medical practitioners. The main marketing restriction was cooperative organizations' failure to implement appropriate management techniques in support of their associated farms. Members of cooperative farms faced severe technical difficulties due to a lack of expert supervision. Regarding the sociopsychological restrictions, the main ones were the members' lack of collaboration and coordination and their lack of free time as a result of their home or agricultural activities (Sarker *et al.* 2010)^[17].

This research compared the costs, returns, and profitability

of dairy farming in West Bengal—cooperative and non-cooperative. A study was done on 320 households. The results of the cost study showed that, for both cooperative and non-cooperative dairy farms, the variable cost accounted for the majority of the overall cost. It was discovered that the two main sources of variable expenses were labor and feed costs. It was discovered that the primary fixed cost component was interest expense. Dairy farms' financial performances were assessed using NPV, IRR, and benefit cost ratios as metrics. The authors discovered that certain cooperatives, referred to as excellent cooperatives, outperformed all other dairy farms, including non-cooperative dairy farms and poor cooperatives (Sarker *et al.* 2008)^[18].

Initiating organized milk processing development in the mid-1960s was Assam. Pasteurization and chilling units in the State have installed capacities of 159 thousand and 28.5 thousand liters per day, respectively. Nevertheless, the analysis discovered that the developed infrastructure was either glaringly underutilized or essentially nonexistent. According to the authors, the installation of milk processing units without a proper evaluation of input supply and output demand or a determination of the plants' economic feasibility was the cause of the plants' subpar performance. The functioning facilities were found to have a small range of products, high milk returns from sales, significant losses from handling and curdling, low labor and capital productivity, and significant operational losses. The investigation also discovered that no systematic business and management strategy had been developed to operate the system, nor had the requisite institutional and infrastructure mechanisms been put in place. The authors found many variables contributing to the subpar performance, including inadequate milk procurement, an ineffective milk collecting network, and a lack of non-monetary incentives. Additionally, the state's total demand was determined to be lower than the national average (Sirohi *et al.* 2009)^[22].

The goal of the study was to determine Nagaland's problems with milk production and marketing. The primary production restrictions were found to be the scarcity and high cost of concentrate, as well as the unavailability of green feed, according to an examination of data gathered from 120 families. The main obstacle for cooperative members was the low cost of liquid milk, whereas the main obstacle for non-cooperative members was payment delays. It was discovered that whereas native cows had negative net returns, cross-bred cows had positive net returns. In comparison to the other two, small farms had the highest net returns (Michael Khoveio *et al.* 2012)^[10].

According to the authors, the northeastern states of Assam, Tripura, and Manipur produced the most milk and had the greatest number of cross-bred animals. These states were thus chosen for the investigation. In order to determine the parameters influencing the milk output of cross-bred animals, a total of ninety-one households were questioned. Technological and socioeconomic constraints were the main factors affecting the milk yield of crossbred animals in the Northeastern states. These could be addressed by implementing better management and feeding practices, controlling diseases, and improving the socioeconomic conditions of farmers through education, training, and easier access to funding. According to the authors' assessment,

addressing these restraints would result in an actual milk output increase of almost 66%, which will be adequate to fulfill the region's shortfall in milk requirements. The largest increase in milk yield will be achieved by medium category families, according to the authors' category-wise yield gap study (small, medium, and big). According to the authors and the study, the following factors had a major impact on milk output at the household level: the number of human days allotted to each animal, the amount spent on concentrate, the farmer's economic standing, and the availability of green fodder nearby. Even if a significant breakthrough was not anticipated right away, these improvements would help the area's milk shortage (Paula *et al.* 2010)^[12].

The secondary data served as the study's basis. The cattle industry in the northeast is growing slowly, according to the authors. Nonetheless, they discovered a number of variables affecting the families' choice to raise animals, including labor availability, occupation, caste, farm size, irrigation availability, and information source accessibility. Farmers were further encouraged to retain animals since the guaranteed irrigation guaranteed the supply of feed. The research suggested that in order to enhance breeds, feed availability, disease management, and livestock food safety, the Northeastern states should implement institutional, technological, and regulatory efforts. The study included a comparative investigation of the number of maternity homes, the area used for growing fodder, and the average milk production of various animal species by state (Kumar *et al.* 2007)^[8].

Conclusion

To comprehend the many problems associated with the dairy business in India, 24 research articles are examined. Every one of these publications focuses on a certain area of India. Six geographical areas of India are covered by these papers: the southern, western, northern, northeastern, central, and eastern regions.

Primary data gathered from dairy farmers—both members and non-members of cooperative societies—formed the basis of 14 out of 24 research. The main problems identified by these research included the high cost and scarcity of concentrates and feed, the inconsistent and dearth of veterinarian and diagnostic services, and the lack of cooperation between various government organizations. The bulk of the 14 research publications shared the following common findings:

1. Little size of herd. The average size of the herd is reported to be less than ten to fifteen animals.
2. Dairy production remains a means of subsistence and has not been commercialized.
3. The largest percentage of the overall expenses is contributed by concentrate and fodder combined.
4. The two main components that make up the whole investment in dairy farms are infrastructure and cattle.
5. Farmers sometimes overlook incurred labor expenses and the cost of land required for feed when calculating their earnings from dairy production.
6. The livestock services are provided to cooperative members at no cost to them or at a nominal fee. As a result, the non-members spent more money than cooperative members.

7. Milk production and revenue generating benefit from cooperatives.
8. Local buffaloes and cows are giving way to cross-bred animals.
9. Owning a buffalo resulted in negative revenue even though buffalo milk has a higher procurement price.
10. The price of milk per liter drops as herd size grows.

The performance analysis of dairy factories or federations, whether private or cooperative, or the overall dairy situation in the chosen region were the subjects of the remaining ten studies. It was discovered that the procurement cost accounted for the majority of the overall expenditures for the milk processing plants, with the processing cost coming in second. Private dairy facilities were shown to be more cost-effective for some dairy products than cooperative dairy plants for others. A few of the articles examined the dairy factories' or cooperatives' financial sustainability.

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