



**A STUDY OF THE PROBLEMS AND CHALLENGES FACED BY
THE DAIRY INDUSTRY IN PUNE CITY**

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Abstract

This research paper delves into a comprehensive study of the challenges encountered by the dairy industry in Pune city, exploring issues related to fodder availability, weather fluctuations, veterinary services accessibility, market volatility, and regulatory complexities. Simultaneously, the study investigates the perceived impact of advanced technologies on the economic sustainability of dairy farms, encompassing aspects such as efficiency, productivity, health, reproduction outcomes, and profitability. The findings reveal a consensus among dairy farmers regarding the existence of significant challenges, while also indicating a positive perception of the role of modern technologies in addressing these challenges and promoting economic sustainability. The implications of these findings extend to practitioners and policymakers, highlighting the need for targeted interventions and supportive policies to overcome challenges and encourage the adoption of advanced technologies in the dairy sector. This research contributes valuable insights to the ongoing discourse on sustainable dairy farming practices, paving the way for informed decision-making and strategic planning within Pune city's dairy industry.

Keywords: dairy industry, challenges, advanced technologies, economic sustainability, Pune city, fodder availability, weather fluctuations, veterinary services, market volatility, regulatory processes.

Introduction

The dairy industry in Pune city stands as a pivotal component of the region's economic and agricultural landscape, contributing significantly to both employment and food production. As we embark upon a comprehensive exploration of this sector, it becomes imperative to delve into the myriad problems and challenges that confront it. Pune, known for its vibrant urban milieu and burgeoning population, poses a unique set of obstacles to the dairy industry, ranging from infrastructural constraints to market dynamics.



At its core, the dairy industry in Pune grapples with issues related to inadequate infrastructure, hindering the smooth flow of production and distribution. The lack of modernized facilities and technological advancements poses a bottleneck to the sector's efficiency and growth potential. Moreover, the demographic dynamics of Pune city, characterized by rapid urbanization and changing consumer preferences, present challenges in aligning dairy production with the evolving needs of the populace.

Market intricacies further compound the challenges faced by the dairy industry in Pune. Fluctuating demand patterns, influenced by factors such as economic conditions and cultural shifts, necessitate a nuanced understanding of consumer behavior. Additionally, the industry contends with issues related to supply chain management, ensuring that dairy products reach consumers in a timely and cost-effective manner.

Furthermore, environmental considerations and sustainability have emerged as critical concerns in the contemporary discourse surrounding the dairy industry. Balancing the economic imperatives of the sector with the need for ecologically responsible practices adds another layer of complexity to the challenges faced by stakeholders.

This study endeavors to meticulously dissect these multifaceted challenges, providing a nuanced understanding of the impediments that the Pune dairy industry encounters. By doing so, it aspires to offer actionable insights and recommendations that can inform policy decisions, technological interventions, and strategic initiatives aimed at fostering the resilience and sustainability of the dairy sector in Pune city.

Review of Literature

Mathur (2000) extensively discusses the prevalent issues and challenges confronted by the dairy industry in India, offering valuable insights that resonate with the context of our investigation into the challenges faced by the dairy industry in Pune city. The author emphasizes the imperative of expediting the integration and uptake of modern technologies in the Indian dairy sector to enhance productivity and reduce operational costs, thereby ensuring a more abundant supply of milk and milk products. Drawing parallels to the Indian scenario, where national development initiatives must align with state-level programs on animal husbandry and dairying, poverty alleviation, and research and development strategies, our exploration of the dairy industry in Pune similarly underscores the necessity for cohesive efforts between local and national initiatives. Mathur's advocacy for strengthening infrastructure to improve milch breeds aligns with our consideration of infrastructural challenges faced by the Pune dairy sector. Moreover, the call for financial and scientific inputs for mechanizing manufacturing processes echoes the need for technological advancements in Pune's dairy industry. Lastly, Mathur's suggestion for the development of new dairy products resonates with our exploration into meeting the evolving needs of urban consumers in Pune, emphasizing health, safety, convenience, and shelf-life. This literature review effectively connects Mathur's seminal work with the specific challenges encountered by the dairy industry in Pune, establishing a robust foundation for our further analysis.

In summary, while the literature provides valuable insights into the multifaceted aspects of the dairy industry globally, there is a notable gap in the research concerning the early stages of sustainability indicators. Future research endeavors should focus on addressing this gap by conducting more in-depth studies to develop and refine sustainable



measures in the dairy sector. This will not only contribute to the advancement of knowledge in the field but also provide practical guidance for policymakers and stakeholders striving for a more sustainable and resilient dairy industry.

Objectives of the study

1. To study the problems and challenges faced by the dairy industry in Pune city.
2. To suggest remedial measures to overcome some of the challenges that the dairy industry faces in Pune city.

Hypotheses

H1: The dairy industry in Pune city faces several challenges and problems.

H2: Dairy farms that embrace and implement advanced technologies exhibit higher levels of economic sustainability.

Research Methodology

The research employed a quantitative methodology to investigate the problems and challenges encountered by the dairy industry in Pune city and propose remedial measures. A comprehensive survey was conducted among a representative sample of 115 dairy farms in Pune. The sampling frame involved selecting a diverse range of dairy farms, considering factors such as size, location, and production scale. A structured questionnaire was designed, incorporating Likert-scale questions to assess the perceived challenges faced by dairy farmers. The study adhered to ethical guidelines, ensuring participant confidentiality and voluntary participation, and the results contribute valuable insights for policymakers and stakeholders seeking to enhance the sustainability of the dairy industry in Pune city.

Data Analysis

H1: The dairy industry in Pune city faces several challenges and problems.

Table 1. One-Sample Test – Challenges and Problems

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
The availability of quality fodder for my dairy farm operations is a significant concern.	8.538	114	.000	1.00870	.7747	1.2427
Weather fluctuations and environmental conditions pose challenges to the health and productivity of my dairy livestock.	3.620	114	.000	.46957	.2126	.7266
Accessibility to veterinary services and expertise is a persistent issue in Pune city for dairy farmers.	6.329	114	.000	.73043	.5018	.9591
Market volatility and unpredictable pricing for dairy products contribute to the challenges faced by my dairy business.	5.390	114	.000	.69565	.4400	.9513
Regulatory compliance and bureaucratic processes create hurdles for smooth operations in the Pune dairy industry.	6.853	114	.000	.82609	.5873	1.0649

The results of the one-sample t-tests, presented in Table 1, provide valuable insights into the perceived challenges and problems faced by dairy farmers in Pune city, supporting Hypothesis 1 – "The dairy industry in Pune city faces several challenges and problems."



The first statement regarding the availability of quality fodder reveals a statistically significant mean difference of 1.00870 ($t = 8.538$, $df = 114$, $p < .001$), with a 95% confidence interval ranging from 0.7747 to 1.2427. This suggests that dairy farmers express a significant concern about the availability of quality fodder for their operations in Pune city, indicating a collective acknowledgment of this challenge.

Similarly, the second statement addressing weather fluctuations and environmental conditions exhibits a statistically significant mean difference of 0.46957 ($t = 3.620$, $df = 114$, $p < .001$). The confidence interval, spanning from 0.2126 to 0.7266, supports the conclusion that dairy farmers perceive challenges related to weather fluctuations affecting the health and productivity of their livestock.

The third statement concerning the accessibility to veterinary services and expertise shows a statistically significant mean difference of 0.73043 ($t = 6.329$, $df = 114$, $p < .001$). The confidence interval (0.5018 to 0.9591) underscores the persistent issue of inadequate access to veterinary services and expertise faced by dairy farmers in Pune city.

Moreover, the fourth statement addressing market volatility and unpredictable pricing for dairy products indicates a statistically significant mean difference of 0.69565 ($t = 5.390$, $df = 114$, $p < .001$). The confidence interval (0.4400 to 0.9513) emphasizes the challenges posed by market dynamics and pricing uncertainties in the dairy business.

Lastly, the fifth statement regarding regulatory compliance and bureaucratic processes demonstrates a statistically significant mean difference of 0.82609 ($t = 6.853$, $df = 114$, $p < .001$). The confidence interval (0.5873 to 1.0649) highlights the hurdles faced by dairy farmers in Pune city due to regulatory complexities and bureaucratic processes, aligning with the hypothesis that the dairy industry encounters various challenges and problems.

H2: Dairy farms that embrace and implement advanced technologies exhibit higher levels of economic sustainability.

One-Sample Test- Impact of advanced technology

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
I believe that adopting modern technological solutions can enhance the overall efficiency of my dairy farm.	5.080	114	.000	.65217	.3978	.9065
The use of advanced milking equipment and automation positively impacts the productivity of my dairy operations.	7.943	114	.000	.90435	.6788	1.1299
Implementation of technology-driven herd management systems contributes to better health and reproduction outcomes for my livestock.	8.943	114	.000	.93913	.7311	1.1472
I perceive a positive correlation between the adoption of technology and the profitability of my dairy farm.	8.091	114	.000	.88696	.6698	1.1041
Investing in innovative dairy processing technologies is crucial for ensuring the economic sustainability of dairy farms in Pune city.	6.545	114	.000	.75652	.5275	.9855



The results of the one-sample t-tests, presented in Table 1, provide insights into the perceived impact of advanced technologies on economic sustainability, supporting Hypothesis 2 – "Dairy farms that embrace and implement advanced technologies exhibit higher levels of economic sustainability."

The first statement, addressing the belief that adopting modern technological solutions enhances overall efficiency, shows a statistically significant mean difference of 0.65217 ($t = 5.080$, $df = 114$, $p < .001$). The 95% confidence interval (0.3978 to 0.9065) suggests that dairy farmers in Pune city perceive a positive impact of adopting modern technological solutions on the overall efficiency of their farms, aligning with the hypothesis.

The second statement, focusing on the positive impact of advanced milking equipment and automation on productivity, reveals a statistically significant mean difference of 0.90435 ($t = 7.943$, $df = 114$, $p < .001$). The confidence interval (0.6788 to 1.1299) indicates that dairy farmers recognize the positive influence of advanced milking equipment and automation on the productivity of their dairy operations, supporting the hypothesis.

Similarly, the third statement concerning the contribution of technology-driven herd management systems to better health and reproduction outcomes shows a statistically significant mean difference of 0.93913 ($t = 8.943$, $df = 114$, $p < .001$). The confidence interval (0.7311 to 1.1472) underscores the acknowledgment among dairy farmers that implementing technology-driven herd management systems positively affects the health and reproduction outcomes of their livestock.

The fourth statement, exploring the perceived positive correlation between technology adoption and farm profitability, exhibits a statistically significant mean difference of 0.88696 ($t = 8.091$, $df = 114$, $p < .001$). The confidence interval (0.6698 to 1.1041) indicates that dairy farmers in Pune city believe in a positive correlation between the adoption of technology and the profitability of their dairy farms, reinforcing the hypothesis.

Lastly, the fifth statement addressing the importance of investing in innovative dairy processing technologies for economic sustainability shows a statistically significant mean difference of 0.75652 ($t = 6.545$, $df = 114$, $p < .001$). The confidence interval (0.5275 to 0.9855) emphasizes the perceived crucial role of investing in innovative dairy processing technologies for ensuring the economic sustainability of dairy farms in Pune city, supporting the hypothesis.

Findings

The findings of the study provide valuable insights into the challenges faced by the dairy industry in Pune city and the perceived impact of advanced technologies on economic sustainability among dairy farmers. The research aimed to address two hypotheses, and the results are summarized below:

Hypothesis 1: The dairy industry in Pune city faces several challenges and problems.

The analysis of Likert-scale responses on various challenges reveals that dairy farmers in Pune city significantly acknowledge the existence of challenges in the industry. The availability of quality fodder, weather fluctuations affecting livestock, accessibility to veterinary services, market volatility, and regulatory complexities all emerged as substantial



concerns. The statistically significant mean differences and confidence intervals indicate a consensus among dairy farmers regarding these challenges, supporting the hypothesis.

Hypothesis 2: Dairy farms that embrace and implement advanced technologies exhibit higher levels of economic sustainability.

The investigation into the impact of advanced technologies on economic sustainability suggests a positive perception among dairy farmers in Pune city. The adoption of modern technological solutions, including advanced milking equipment, automation, and technology-driven herd management systems, is perceived to enhance overall efficiency, productivity, health, reproduction outcomes, and profitability. The statistically significant mean differences and confidence intervals for each statement affirm the positive association between technology adoption and economic sustainability, supporting the second hypothesis.

In conclusion, these findings shed light on the multifaceted challenges faced by the dairy industry in Pune city and highlight the positive perceptions of dairy farmers regarding the role of advanced technologies in enhancing economic sustainability. These insights can inform policymakers, industry stakeholders, and practitioners in developing targeted interventions and strategies to address challenges and promote the adoption of technology for the sustainable development of the dairy sector in Pune.

Suggestions

Addressing the identified problems and challenges in the dairy industry in Pune city requires a multifaceted approach that involves collaboration among stakeholders, strategic planning, and targeted interventions. The following suggestions and recommendations are proposed:

1. Enhance Fodder Availability:
 - a. Promote sustainable practices for fodder cultivation and preservation.
 - b. Establish partnerships with agricultural extension services to educate farmers on efficient fodder management.
 - c. Introduce subsidy programs or financial incentives for farmers investing in fodder production.
2. Mitigate Weather Fluctuations:
 - a. Provide farmers with access to weather forecasting services to enable better planning.
 - b. Encourage the adoption of climate-resilient livestock breeds.
 - c. Develop insurance schemes to compensate farmers for weather-related losses.
3. Improve Veterinary Services Accessibility:
 - a. Strengthen veterinary infrastructure in Pune city, including clinics and mobile veterinary units.
 - b. Facilitate training programs for veterinarians to enhance their expertise.
 - c. Establish a robust information system to connect farmers with veterinary services.
4. Stabilize Market Conditions:
 - a. Establish market intelligence systems to provide farmers with real-time pricing information.



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- b. Implement risk management programs to hedge against market volatility.
 - c. Facilitate the formation of cooperatives to collectively negotiate fair prices with buyers.
 5. Streamline Regulatory Processes:
 - a. Collaborate with regulatory bodies to simplify compliance procedures.
 - b. Conduct awareness programs for farmers to enhance their understanding of regulatory requirements.
 - c. Establish a dedicated helpline or support system to assist farmers in navigating bureaucratic processes.
 6. Promote Technology Adoption:
 - a. Provide financial incentives or subsidies for the purchase of advanced milking equipment and automation.
 - b. Conduct training programs to enhance farmers' skills in using technology-driven herd management systems.
 - c. Establish technology demonstration farms to showcase the benefits of innovation in dairy farming.
 7. Facilitate Research and Development:
 - a. Invest in research initiatives to address specific challenges unique to Pune city's dairy industry.
 - b. Collaborate with agricultural universities and research institutions to develop context-specific solutions.
 - c. Encourage public-private partnerships for the development and implementation of innovative technologies.
 8. Support Farmer Education and Training:
 - a. Establish training programs on best practices in dairy farming.
 - b. Provide financial support for educational initiatives related to dairy farming.
 - c. Foster a culture of continuous learning and skill development among dairy farmers.

By implementing these suggestions, Pune city's dairy industry can work towards overcoming challenges, fostering economic sustainability, and creating a conducive environment for the growth and development of dairy farming practices.

Conclusions

In conclusion, this study has provided a comprehensive understanding of the challenges faced by the dairy industry in Pune city and the perceived impact of advanced technologies on economic sustainability according to the perspectives of dairy farmers. The findings reveal a consensus among farmers regarding significant challenges, including issues related to fodder availability, weather fluctuations, veterinary services accessibility, market volatility, and regulatory complexities. Concurrently, there is a positive perception among farmers regarding the beneficial effects of advanced technologies on various aspects of dairy farming, from efficiency and productivity to health, reproduction outcomes, and overall profitability.



The implications of these findings are substantial for both practitioners and policymakers in the dairy sector. Recognizing the acknowledged challenges allows for the formulation of targeted interventions and policies to address these specific issues. Improving fodder availability, enhancing veterinary services, and streamlining regulatory processes are crucial aspects that demand attention. Furthermore, the positive perception of advanced technologies suggests that promoting and facilitating technology adoption can contribute to the economic sustainability of dairy farms. Policymakers can consider incentivizing the adoption of modern technologies, providing support for training programs, and fostering an environment conducive to innovation within the dairy industry.

Future research avenues can build upon these findings to delve deeper into specific challenges and technological interventions. Further studies can explore the socio-economic factors influencing the challenges faced by dairy farmers and investigate regional variations in these challenges within Pune city. Additionally, in-depth analyses of the economic and environmental sustainability outcomes associated with the adoption of specific technologies can provide nuanced insights. Longitudinal studies tracking the evolution of challenges and technology adoption trends over time can contribute to a dynamic understanding of the dairy industry's trajectory in Pune city. Moreover, comparative studies across different regions or countries can offer valuable benchmarks and insights into best practices for sustainable dairy farming.

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