**Constraints Faced by Dairy Farmers in the Kumaon Region of Uttarakhand: An Analytical Study**

**Abstract**

*The rural economy predominantly relies on dairy as a key sector—whether to meet the food and nutritional needs of the family, supplement household income, or pursue dairy farming as a full-time occupation.Dairy farming plays a pivotal role in sustaining the economy in hilly regions like the Kumaon division of Uttarakhand, where agricultural land is fragmented and infrastructure is limited. Despite its potential to provide livelihood, nutritional security, and reduce rural outmigration, dairy farmers in the region face several challenges that hinder productivity and profitability. This study aims to identify and analyze the primary constraints encountered by dairy farmers in the Kumaon region. Using a structured survey of 100 randomly selected dairy farmers across Almora and Pithoragarh districts, data were collected and categorized into three domains: management practices, feeding, and reproduction/production-related issues. The results indicate that the most pressing constraints include lack of knowledge about modern management practices (76%), feed shortages during the dry season (84%), and post-disease productivity loss in animals (98%). The study concludes that improving extension services, feed resource management, and veterinary care are essential for addressing these challenges. Targeted policy interventions and context-specific support systems are recommended to enhance the viability and sustainability of dairy farming in the hills of Uttarakhand*.

*Keywords: Dairy farming, constraints, Kumaon, feeding, reproduction, disease, management practices*

**Introduction**

The dairy sector is a cornerstone of India’s agricultural economy, serving as a vital source of livelihood, nutrition, and employment for millions. It contributes significantly to the national and agricultural Gross Value Added (GVA), with the livestock sector accounting for 30.23% of agricultural GVA and 5.5% of the national economy (Annual Report 2024–25, Department of Animal Husbandry, Dairying and Fisheries, Government of India). Within this, animal husbandry alone contributes approximately 28.6% to the total agricultural output (Annual Report 2017–18).

India holds the distinction of being the world's largest producer of milk, contributing over 20% of global milk production. This growth from 17 million tonnes in 1950–51 to 165 million tonnes in 2016–17 reflects a remarkable 9-fold increase, driven primarily by small and marginal farmers. The sector not only provides year-round income in rural areas, where agriculture is often seasonal, but also plays a vital role in nutritional security. Milk is an accessible source of high-quality protein, calcium, and essential micronutrients, particularly critical in addressing undernutrition in vulnerable populations.

Beyond its economic and nutritional significance, dairying fosters rural empowerment, especially among women. Women are actively engaged in animal husbandry tasks such as feeding, milking, and product processing, thereby enhancing household income and gender equity.

Despite these achievements, the Indian dairy sector continues to face structural and systemic challenges. These include high feed and fodder costs accounting for over 75% of total variable costs (Jakhar et al., 2020)—labour shortages, low milk yield, poor milk quality, and limited access to veterinary services (Santhosha & Dhananjaya, 2022). Environmental pressures like droughts, floods, and increasing scarcity of drinking water in rain-fed areas (NITI Aayog, 2018) further exacerbate these constraints. Technological innovations and improved input management practices are essential for addressing these issues, but their implementation remains uneven across regions.

In this context, the challenges are even more acute in geographically fragile and economically vulnerable regions like the hill state of Uttarakhand. With its mountainous terrain, scattered settlements, and limited cultivable land, traditional farming in Uttarakhand is often unsustainable. Dairy farming, by contrast, offers a feasible alternative that requires less land and capital investment. Smallholder farmers in the region largely rear indigenous breeds, well-suited to the local climate and available fodder. Dairy thus plays a critical role in supplementing household income, improving nutrition, and stemming rural outmigration by creating local employment opportunities—particularly for women and the elderly.

However, the sector in Uttarakhand also suffers from region-specific constraints, including poor market access, inadequate infrastructure for milk collection and storage, limited veterinary services, and lack of awareness about modern dairy practices (Adhikari et al., 2020). These barriers result in low productivity, inefficiency, and underutilization of the region’s dairy potential.

To address these gaps and unlock the sector’s potential, it is essential to understand the real-world constraints faced by dairy farmers through a process known as constraint analysis. This method identifies the economic, infrastructural, educational, and socio-cultural barriers hindering technology adoption and productivity improvements. For example, challenges such as lack of cold chains, limited access to veterinary care, unavailability of green fodder year-round, and non-remunerative milk prices can all be better addressed through targeted interventions once clearly identified.

Constraint analysis also informs policy formulation, making it more grounded and region-specific. It allows researchers, extension workers, and policymakers to develop and implement solutions that are tailored to the actual conditions of farmers, rather than applying one-size-fits-all strategies. In areas like Uttarakhand, bridging the “lab-to-land” gap through such informed, participatory research is crucial to enhancing the socio-economic resilience of hill communities.

Objectives of the Study

In light of the above, the present study was undertaken with the following objectives:

1. To analyse the present scenario of dairy farming in India.
2. To identify the major constraints faced by dairy farmers in the hill regions, with a specific focus on Uttarakhand.

**Materials and Methods**

The study was conducted in the Kumaon region of Uttarakhand in 2024. Kumaon region of Uttarakhand state in India was purposely selected for the study as the researcher is well familiar with the geography and culture of the area. From Kumaon region two ditricts*viz.* Pithoragarh and Almora were selected randomly to randomly select five villages from each district and from each randomly selected village ten farmers were selected making a sample size of 100 dairy farmers to collect information on constraints perceived by the dairy farmers. Data were collected through structured interviews using a pre-tested schedule. The constraints were grouped into three categories: management practices, feeding, and reproduction/production-related issues. Each constraint was ranked based on the frequency of responses and analyzed using percentage distribution.

**Results and Discussion**

1. **Constraints in Management Practices**

Constraints related to the management of dairy farming practices were studied under four key areas: adherence to traditional management practices, lack of knowledge regarding improved practices, availability and use of manpower, and water scarcity. The findings related to these constraints have been summarized and presented in Table 1.Among general management challenges, the most frequently reported issue was **lack of knowledge about improved practices** (76%), followed by **dependence on traditional methods** (72%). Labour scarcity (56%) and water availability issues (52%) were also significant concerns (Table 1).Similar results were reported by Reddy *et al* (2024), Kumar *et al* (2024), Gour(2002) and Shrivstava (2003).

1. **Feeding Constraints**

Providing the right feed to dairy animals at the right time is essential for maintaining productivity and profitability in the dairy business. However, farmers often face multiple feeding-related constraints. In the present study, key challenges such as the seasonal availability of feed, feed shortages during the dry season, high cost of concentrate feed, and limited availability of land for fodder cultivation were examined and analyzed in depth. The results related to these feeding constraints are presented in Table 1. Feeding constraints were critical during the dry season, with **feed shortages** being the most reported issue (84%), followed by **seasonal feed availability** (82%). Other notable problems were **high costs of concentrate feed**(80%) and **limited land for fodder production** (78%). Similar observations were reported by Reddy *et al* (2024), Gamit *et al* (2021)

1. **Reproduction and Production Constraints**

Animal health and reproduction constitute a critical component of the dairy farming system, directly influencing the overall efficiency and profitability of dairy enterprises. In the present study, key constraints affecting this domain were examined, including the high frequency of diseases, reduced productivity following illness, low success rates of artificial insemination (AI), and a high incidence of reproductive problems such as repeat breeding and anoestrus. The results pertaining to these constraints are systematically presented in Table 1. The **low productivity of dairy animals post-disease** was reported by 98% of respondents, making it the top constraint overall. This was followed by a **high frequency of disease** (89%), **reproductive problems** like repeat breeding and anoestrus (84%), and a **low success rate of artificial insemination (AI)** (82%).The problems associated with adoption of feeding and health carepractices were ranked first by Singh *et. al*(2015)

Table 1: Constraints faced by dairy farmers in Kumaon Region of Uttarakhand

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| S.No | Problem/Constraint | Dairy Farmers  *(n=100)* | | |
| Frequency | Percentage | Rank |
| **Management practices** | | | | |
| 1 | Following traditional management practices | 72 | 72 | II |
| 2 | Lack of knowledge about the practices | 76 | 76 | I |
| 3 | Crises of manpower in dairy farms due to labour scarcity | 56 | 56 | III |
| 4 | Water scarcity problems faced by dry areas | 52 | 52 | IV |
| **Feeding** | | | | |
| 1 | Seasonal availability of feed | 82 | 82 | II |
| 2 | Feed shortage in dry season | 84 | 84 | I |
| 3 | High cost of concentrate | 80 | 80 | IV |
| 4 | Limited availability of land for feed fodder production | 78 | 78 | III |
| **Reproduction and production diseases** | | | | |
| 1 | Higher frequency of disease in dairy animals | 89 | 89 | II |
| 2 | Low productivity of dairy animal after diseases | 98 | 98 | I |
| 3 | Higher rate of reproductive problems repeat breeding and anoestrous | 84 | 84 | III |
| 4 | Low success rate of AI | 82 | 82 | IV |

**Conclusion**

Dairy sector has been vital throughout the human history of development and always been source of food, nutrition and income. Rearing animals in any form brings pressure on resources to fulfill the need of increasing population. Such pressure become more tangible in hill terrain and it is very much required to conduct constraint analysis from time to time. Findings in the present studyreveal that dairy farmers in Kumaon face multidimensional constraints, primarily stemming from knowledge gaps, feed unavailability, and disease-related productivity losses. These challenges, if unaddressed, will continue to hinder the growth of the dairy sector. The study recommends strengthening extension services, improving fodder management, and enhancing veterinary healthcare support to mitigate these constraints.

Disclaimer (Artificial intelligence)

I hereby declare that No generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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