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Addressing Veterinary Care Gaps for Tiny Dairy Enterprises in India: An In-Depth Analysis

R Kavitha[1]*, Dr. Ramakant Upadhyay[2], Zeeshan Ahmad Lone[3]

*[1]Professor, Department of Computer Sceince and Information Technology, Jain (Deemed to be University), Bangalore, India, Email Id- kavitha.r@jainuniversity.ac.in, Orcid Id- 0000-0001-6722-9297

[2]Assistant Professor, Department of Computer Science & Engineering, Sanskriti University, Mathura, Uttar Pradesh, India, Email Id- ramakantupadhyay@sanskriti.edu.in, Orcid Id- 0009-0006-8297-6278

[3]Assistant Professor, Department of Computer Science & Engineering, Vivekananda Global University, Jaipur, India, Email Id- zeeshan.ahmad@vgu.ac.in, Orcid Id- 0009-0000-5387-501X

Abstract

The livelihoods of small-scale dairy farmers in India depend on the health and productivity of their animals, which can be ensured by filling the gaps in veterinary care for microdairy operations. This study focuses on the numerous challenges that dairy producers in various Indian states confront. The main characteristic of the eastern states is their unfavorable climate. The northeastern region is mostly hilly, and the main problems faced by dairy producers were worries about the low price of milk, the lack of green fodder, repeat breeding, and insufficient treatment facilities. The largest state in India is the Central States, where dairy producers deal with issues like low milk prices, inferior animals, underproductive local cows, and subpar feed and fodder. Similar issues with time veterinary services, inadequate disease expertise, and inadequate irrigation infrastructure existed in the western states. The main issues Southern states faced were the high cost of labor and veterinary care, the high cost of dairy products, feed, and concentrate, and the low incidence of artificial intelligence conception.

Keywords: Artificial Insemination, Dairy Producers, Conception Rate, Constraints

INTRODUCTION

On dairy farms, one-quarter to one-half of the cows suffer from welfare problems such as lameness and hock injuries on average. Despite the prevalence of these welfare difficulties, farmers and other industry stakeholders have listed welfare as a top management concern on dairy farms and have expressed the need to prioritize research into these issues (1). Antibiotics are essential for the treatment of major infectious diseases in both human and veterinary medicine. Finding similarly effective alternatives to them continues to be a challenge. Thus, one of the biggest risks to the health of people and animals worldwide today is antibiotic resistance (2).The raising of livestock, in the dairy sector is essential to Indian populations' access to food and nutrition. It also boosts the nation's economy and provides jobs for a large number of farmers. India consumes a lot of antibiotics, and the country's public health is seriously threatened by germs that are Antimicrobial Resistance (AMR) (3).The production of milk in the cattle business is exemplified by the generation of income and jobs, as well as the application of technological instruments to optimize output. Even though the topic is important, it is understood that milk output, animal quality, and productivity can be improved (4). Economic structural change is a necessary step in reducing poverty and enhancing welfare. Along with labor and land productivity, it is anticipated that high-value agriculture which includes fish, fruits, vegetables, and animals will become more significant. The expectations placed on agricultural production systems will shift significantly (5). In a dairy herd, a single dominant strain of *S. aureus* typically affects several cows and spreads from cow to cow. Therefore, the milking process is the main time when *S. aureus* transmission occurs. The hands of milkers, udder towels, and milking tools like teat liners are the typical channels of transmission (6). In the industrialized world, dairy farms are getting bigger and relying more on outside labor instead of being family-run businesses. Improvements in efficiency and technology improvements are also linked to this rapid

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increase (7).Concerns that inappropriate use and abuse of antibiotics can lead to bacterial resistance to antibiotics, especially those are crucial for treating human illness, have driven international actions to promote antibiotic stewardship in animal agriculture. Antibiotic-resistant bacteria proliferate when antibiotics are used on food animals. Foodborne infections, such as contaminated animal products that are handled or prepared incorrectly, might expose humans to these bacteria (8). The fetus is influenced by the mother's interactions with the environment throughout gestation, shaping its growth and development prior to exposure to extrauterine environments and more direct impacts. The dam produces nutrient-dense colostrums which provide the offspring the physiological tools required for this extra-uterine adaption, including immunoglobulins and other bioactive substances. This is done with the intention of promoting gut maturation and providing temporary immunity (9). Dairy farmers have shifted toward fewer, larger farms in an attempt to compete in the expanding global dairy and milk market. The effects of intensifying dairy production on human-environment systems are manifold, complex, and extensive. The detrimental effects on rural development, human health, animal welfare, and the environment become acknowledged, efforts are made to envisage and sustainable dairy systems (10).

The study (11) examined smallholder farmers' adoption of food safety and milk quality measures as well as their knowledge and attitudes toward them. To gather qualitative information about the attitudes and knowledge of 71 smallholder farmers, ten Focus Group Discussions (FGDs) were conducted with them. The study (12)examined how organizational, social, political, and economic variables affect the adoption of new technology in small-scale cattle production systems using an innovation systems framework. The innovation systems framework's functions were employed to evaluate the gaps in the value chains of the dairy industry. To encourage best practices in dairy management, extensive training sessions were offered to farmers, veterinary professionals, and extension agents, along with a dairy assessment instrument. The dairy industry needs industry assistance for standardization and quality control over milk and feed, which would create possibilities for private investment (13). To create a technology-based training program to manage dairy animal mastitis. After knowledge gaps were identified, a technology package was set into place that included educating technicians and farmers, introducing mastitis detection and control tools, and promoting appropriate husbandry practices (14). The research (15) indicated that keeping crossbred native zebu by alien *Bos taurus* animals under management guidelines deemed good in comparison to local standards is the most advantageous and net-beneficial dairy cow venture that smallholder farmers might employ.The study (16) indicated that people who work in the value chains that handle milk and meat occasionally disregard rules and guidelines, which could pose a risk to consumer health and food safety. Unlike local products, food safety rules and good agricultural practices (GAPs) were followed when it came to milk and meat products meant for export. The study (17)implied that typical production disorders that impact the health and welfare of cows, like clinical mastitis and lameness, are expensive for farmers. They discovered a deficiency in information and a lack of supporting data about the long-term consequences of animal health interventions as well as their influence on farms' financial results. Farmers who were subsidized to build animal sheds and who received training to make safer milk were more adept at implementing safety measures. Crucially, producers who were less commercialized and whose production included a higher percentage of milk for domestic use also adopted safety measures at a higher rate, suggesting that the markets' demand pull was not as strong in promoting milk safety (18). The study (19)examined the husbandry methods and expertise of smallholder dairy producers and documents the challenges they confront in implementing their livelihood strategy. The study (20) highlights the significance of milk productivity per capita as a crucial means of promoting milk output. Due to the small land base and lack of grazing resources, there aren't many opportunities for milking herd expansion.

MATERIALS AND METHODS

An all-encompassing and community-focused strategy is needed to close the veterinary care gaps for small dairy farms in India. The health of their animals and overall productivity are impacted when these small-scale dairy farms

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struggle to find timely and reasonably priced veterinary care. This section covers filling the Veterinarian Care Gaps for India's Tiny Dairy Businesses.

India's Livestock Industry

Over 30.5 million individuals make their living from the husbandry of animals. Compared to the average of 13% for all rural households, livestock supplied 15% of the revenue to small farm households. For more than 70 million rural Indian households, livestock is a significant source of additional income. Two-thirds of rural communities rely on livestock for their livelihood. India produces a sizable portion of the world's livestock resources through animal husbandry. The cattle industry supports the nation's socioeconomic development as well as its national economy. In addition to having a lot of promise and making a significant contribution to the agricultural sector in recent years, animal husbandry is doing well in terms of output, value addition, and export.

Increasing the livestock's productivity is one of the important tests. Indian cows produce 1172 kg of milk on average annually, which is 50% of the world average. The main obstacles have been limited AI services due to a lack of high-quality germplasm, infrastructure, and technical people, as well as a low pregnancy rate after artificial insemination. The main area we can concentrate on the country's less than 1% worldwide trade share, the amazing progress made in milk production and other dairy development areas. India must adopt scientific management of all dairy activities, including animal breeding, feeding, rearing, and health care, as well as clean milk production if it is to become globally competitive and take advantage of the global dairy market.

Statistical Analysis

Data was organized and analyzed using a program called the Statistical Package for Social Science (SPSS). The information gathered was cross-checked and verified using focus group discussions (FGD) and observation.

RESULTS AND DISCUSSION

Constraint faced by the Maharashtra

Two villages from each block, Kalameshwar, Hingana, and Nagpur, totaling 17 villages, were chosen at random for the study. A total of 220 dairy farmers were questioned for the study; when a farmer had two or more dairy cows, they were deemed respondents. Constraints refer to the issues or challenges dairy producers encounter when implementing regular animal husbandry procedures in their dairy business. Three types of restrictions are examined in this context: financial, situational, and technological. In terms of situational restraints, it was found that the majority of respondents (70.34%) were dealing with the limitation of local breeds' low milk output. The reason behind this,it could be most farmers in the Vidarbha region use native breeds and their poverty prevent them from affording high-yielding crossbreds.

32.22% of respondents said that their obstacle was a lack of green fodder, especially in the summer, even when it was available, the cost was higher. A lack of clean water for animal management activities was cited as a barrier by 41.33% of respondents, while a lack of facilities for milk preservation was cited by 20.33% of respondents. Regarding technical limitations, 64.00% of respondents said that their main constraint was a lack of knowledge about diseases, how to prevent them, and how to control them. The lack of an AI facility and timely veterinary services was cited by 60.89% of respondents as their primary limitation, while the lack of veterinary hospitals was cited by 54.78% of respondents as their primary restraint.

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Constraint Faced by West Bengal

Sixty respondents were questioned using a structured interview schedule that was created to take into account the limitations in the field. Primary information was obtained from the chosen/surveyed households regarding the socioeconomic traits, milk production, cost, additional expenses in the milk production, factors related to milk production, and difficulties farmers encounter in managing cow husbandry.

Table (1) lists the restrictions dairy farmers must adhere to when feeding their animals. Feeding materials are the primary feeding-related issue. Koeleman claims that because there is a shortage of green fodder in India and there isn't much land available for fodder production, efforts must be directed at increasing the productivity of fodder crops and communal grazing areas. The cost of producing milk rises in tandem with the price of feeding supplies. The lack of high-quality feeds, and ignorance of balanced eating and feeding techniques are the next issues of importance. Lack of knowledge about balanced feeding reduces the amount of milk produced but also shortens the animals' milking lives.

Table (1). Constraints experienced by Commercial dairy farmers of West Bengal

(Source: Author)

Feeding Limitations	**Frequency N=90**	**Percent**	**Rank**
Exorbitant feeding expenses	88	97.7	1
Lack of access to high-quality feeds	81	90	2
Lack of available feed	63	70	3
Ignorance regarding feeding in balance	67	74	4
Feeding technique	51	56	5

Constraint faced by Kerala

There were 200 farmers from the chosen villages who made up the total number of responding farmers. Random selection was used to choose stakeholders from the study area's research and extension domains. A pre-tested, standardized, and well-structured interview schedule that was created specifically for this purpose was used to collect data. During the study, first-hand information was obtained from the respondents. To examine the limitations that the stakeholders in the study region faced, Garret's ranking technique was used. The schedule's provided factors were ranked by the respondents. The different limitations were ranked, and Table (1) displays the percent score values. Table (2) suggests that the dairy farmers were mostly hindered by the high expense of cattle feed.

Table (2). Limitation of Commercial Dairy Farmers of Kerala

(Source: Author)

Parameters	**Percentage**	**Rank**
Exorbitant price for cattle feed	77	I
Exorbitant expense of veterinary care and supplies	74	II
Dry and green fodder is not always	65	III

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available		
High cost of labor	58	IV
Absence of training based on needs	55	V
Lack of readily available milch animals with high yields	42	VI
Not enough acreage for growing fodder	40	VII

Constraint faced by Haryana

A pre-designed and pre-tested questionnaire was used to investigate the barriers to the adoption of dairy as a business. A stratified random sampling technique was used to choose fifty-five commercial dairy producers from each of Punjab's three areas. Random selections were made of five small, five medium, and five big dairy farms from each region, for a total of fifty dairy farms.There are two methods to discuss the limitations faced by Punjabi commercial dairy farmers: domain-wise and item-wise. Table (3) of the study showed that issues with the adoption of nutrition and healthcare practices were the most popular (62.8%), followed by barriers to the adoption of milking procedures (56.4%), breeding practices (52.8%), and housing practices (49.7%).

Table (3). Restrictions faced by Haryana's commercial dairy producers

(Source: Author)

Domain	**Percentage**	**Rank**
Restrictions on the adoption of feeding habits	62.8	1
Restrictions on the adoption of medical procedures	62.8	1
Restrictions on the deployment of milking techniques	56.4	2
Restrictions on the deployment of breeding techniques	52.8	3
Limitations in the implementation of housing practices	49.7	4

Small dairy proprietors in the chosen Indian states have less difficulty getting veterinary treatment, according to the statistics shown in Table (4) and Figure (1). This is because there are more institutions, including as universities, private clinics, AI institutes, veterinary hospitals, and specialty veterinarians.

Table (4). Medication shortages and a shortage of veterinarians in some Indian states

(Source: Author)

States	**Non availability of veterinarians**	**Lack of medication**
Maharashtra	2.5	2.2
West bengal	1.6	2.42
Kerala	1.3	1.82
Haryana	1.9	1.72

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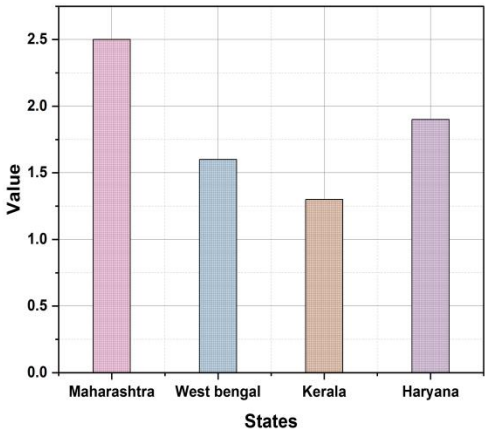

Figure (1). Scarcity of Veterinarians in several Indian states

(Source: Author)

The lack of medication in veterinary facilities across numerous Indian states is depicted in Figure (2). The majority of the constraints pertaining to veterinary hospitals and the financial burden experienced by small-scale dairy operators were found to be extremely severe. These limitations could be seen as the main obstacles to the growth of dairy entrepreneurship in that region.

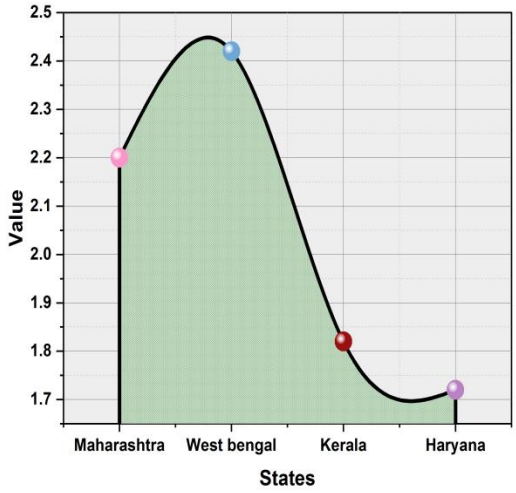

Figure (2). Medication shortages in veterinary clinics in many Indian states

(Source: Author)

DISCUSSION

A lack of veterinary services in hospitals, the high cost of medications and services from specialized doctors, and the accessibility of veterinarians in the area are the key issues. Dairy Lane Systems (DLS) also provides doorstep

services. Research revealed that who had prior experience in every area of animal rearing and had access to media and information encountered less difficulty than others in getting veterinary care. The majority of respondents believe that these issues can be resolved by building a veterinary hospital in their community and adding more doctors to those already exist. Additionally, they offer their thoughts on how to improve DLS's doorstep services.

CONCLUSION

The demand for milk is rising by 15 million tons annually worldwide in developing nations like India. Farmers need to be trained about the scientific management of dairy cows in light of the evolving global environment. Activities such as clean milk production, processing, preservation, storage, and transportation of milk and milk products must be understood. The primary challenges were inadequate understanding of the scientific management of dairy cattle, scarcity of premium feed and fodder, low genetic merit native bulls, low artificial intelligence conception rate, and inadequate veterinary care. India needs to devise a plan to address the practical issues faced by farmers if it is to emerge as a global leader in agriculture.

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