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MILKING POTENTIAL: A CASE STUDY OF DAIRY MANAGEMENT PRACTICES IN RI-BHOI DISTRICT, MEGHALAYA, INDIA

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ABSTRACT

A study was conducted to evaluate dairy cattle management practices among farmers in four villages Umthan, Nongthneng, Bleishiah, and Umkon of Ri-Bhoi District, Meghalaya, India. A total of 350 respondents were surveyed using structured interviews and field observations. The assessment focused on key aspects of scientific dairy management, including awareness of optimal calving intervals, calf weaning practices, monitoring of calf birth weight, and the use of artificial insemination (AI)**.** The results revealed a low level of awareness and adoption of scientific practices across all four villages. Only **7**.1% of farmers knew the recommended calving interval of 12 to 14 months. Similarly, just 6.8% of respondents reported practicing systematic calf weaning, while 7.4% had ever utilized artificial insemination in their herds. Regarding birth weight monitoring**,** a mere 5.9% of farmers kept records or used any means to assess the calf's weight at birth. The study also observed that most dairy management practices were based on traditional knowledge passed down through generations, with limited exposure to veterinary or extension services. About 82% of respondents had never received formal training in dairy cattle management, and **78%** had limited or no access to regular veterinary care. Moreover, logistical and infrastructural constraints-such as poor road connectivity, lack of cold-chain support for AI services, and minimal access to veterinary professionals-were identified as major barriers to the adoption of improved practices. These findings highlight the urgent need for targeted capacity-building initiatives. Strengthening extension services, promoting hands-on farmer training, and improving access to AI and veterinary care could substantially enhance dairy productivity and animal health in the region. The involvement of government agencies, local NGOs, and veterinary institutions will be crucial in creating a sustainable and knowledge-driven dairy farming ecosystem in Ri-Bhoi District.

KEYWORDS: Dairy Management, Calving Interval, Weaning Practices, Artificial Insemination, Tribal Agriculture, Veterinary Extension Services

INTRODUCTION

Dairy farming serves as a vital source of livelihood, nutrition, and economic stability for rural households across India. In the North Eastern state of Meghalaya, especially in Ri-Bhoi District, dairy production is primarily smallholder-based and integrated into mixed farming systems. Despite the region's favorable agro-climatic conditions, the average milk yield per animal remains low compared to national averages. This shortfall can be largely attributed to the reliance on traditional knowledge and limited implementation of scientific cattle management practices. Proper management of dairy cattle is critical for maintaining animal health, improving reproductive efficiency, and ensuring sustainable milk production. Key components of good dairy practices include maintaining optimal calving intervals, practicing early weaning**,** monitoring birth weights for growth tracking, and adopting artificial insemination (AI) for genetic improvement. These practices, widely recommended by animal husbandry experts and institutions like ICAR-

NDRI, contribute to improved productivity, better herd management, and economic viability of dairy farms. However, the dissemination and adoption of these practices in tribal and remote areas such as Ri-Bhoi have been slow. Limited access to veterinary services, lack of awareness, poor infrastructure, and sociocultural beliefs often hinder the uptake of modern technologies. Understanding the current status of farmer knowledge and practices in these regions is crucial to designing targeted interventions. This study was undertaken to assess the extent to which farmers in selected villages of Ri-Bhoi District are aware of and implement critical dairy cattle management practices. The findings aim to inform policymakers, veterinarians, and extension workers about key knowledge gaps and practical constraints faced by dairy farmers, thereby helping develop more effective capacity-building and outreach programs.

MATERIALS AND METHODS
Study Area
The study was conducted in the Ri-Bhoi District of Meghalaya, located in the northeastern region of India. This district has a significant population involved in livestock-based livelihoods, particularly dairy farming, at a smallholder scale. Four villages were purposively selected based on their engagement in dairy activities and accessibility: Umthan, Nongthneng, Bleishiah, and Umkon.

Sampling Design and Respondents
A purposive sampling method was employed to select dairy farmers from each village. The inclusion criteria included active engagement in dairy farming (minimum one lactating cow) and willingness to participate. A total of **350 respondents** were selected across the four villages. This sample size was considered sufficient for descriptive statistical analysis and represents a broad cross-section of local dairy farmers.

Data Collection Tools and Techniques
Data were collected using a structured interview schedule, developed in consultation with subject matter experts in animal husbandry and local veterinary officers. The questionnaire was designed in English and translated into **Khasi**, the local language, to ensure clarity and comprehension. The questionnaire included both closed-ended and open-ended questions covering key aspects of dairy management practices: awareness of calving intervals, age at which calf weaning is practiced, estimation or measurement of calf birth weight, and utilization of artificial insemination (AI) versus natural breeding.

The schedule was pre-tested on 10 farmers outside the study villages to ensure reliability and adjusted accordingly to improve clarity and relevance.

Data Collection Procedure
Face-to-face interviews were conducted by trained enumerators under the supervision of veterinary extension professionals. Farmers were interviewed at their homesteads or cowsheds to allow observation of farm conditions when possible. Interviews were conducted over a period of **two weeks** in a non-intensive format to encourage accurate responses.

Data Analysis
The collected data were coded and entered into **Microsoft Excel** for analysis. Descriptive statistics such as frequency, percentage, and cross-tabulation were used to analyze farmer responses. Due to the categorical nature of the data, no inferential statistical tests were applied. Visual aids such as tables and bar charts were used to present the data clearly.

Ethical Considerations
All participants were informed about the purpose of the study, and verbal informed consent was obtained. Farmers were assured of the confidentiality and anonymity of their responses. The study adhered to ethical guidelines as outlined in participatory rural appraisal methods (Chambers, 1994).

Results and Discussion
This section presents and interprets the findings from the survey of 350 dairy farmers in Ri-Bhoi District, focusing on four major aspects of dairy cattle management: calving interval knowledge, weaning practices, calf birth weight monitoring, and the use of artificial insemination (AI). The results indicate a substantial knowledge

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gap and low adoption of scientific dairy practices among the surveyed farmers.

Knowledge of Calving Interval

Only 14 farmers (4.0%) reported a calving interval of 9 to 12 months, while 11 farmers (3.1%)

mentioned 11 months. The remaining 325 respondents (92.9%) were either unaware of the recommended calving interval or did not respond.

Table 1: Participant Knowledge on Calving Intervals

Calving Interval Knowledge	Number of Farmers	Percentage (%)
9 - 12 months	14	4.0
11 months	11	3.1
Unknown/No response	325	92.9

An ideal calving interval ranges between 12 to 14 months for optimal milk production and reproductive efficiency (ICAR-NDRI, 2020). A shorter or undefined calving interval can lead to reduced lactation yields and increased calving complications (Rathod *et al*., 2015). The low awareness in Ri-Bhoi reflects a knowledge gap possibly due to limited extension services and informal training of local farmers. Similar findings were reported by Patbandha *et al*. (2019) in other

tribal regions of India, emphasizing the need for awareness on reproductive management.

Calf Weaning Practices

Only 25 farmers (7.1%) practiced calf weaning: 20 (5.7%) after six months and 5 (1.4%) never weaned. The remaining 325 farmers (92.9%) either did not respond or were unaware of weaning practices.

Table 2: Common Practices in Calf Weaning

Weaning Practice	Number of Farmers	Percentage (%)
After 6 months	20	5.7
Never weaned	5	1.4
Not practiced/Unknown	325	92.9

Weaning at an appropriate age is critical for calf health and nutritional management. Delayed or absent weaning often results in undernutrition and compromised immune response in calves (Khan *et al*., 2011). The lack of structured calf management in the study area is concerning and consistent with studies conducted in Assam and Odisha, where over 80% of farmers were unaware

of standard weaning practices (Rathod *et al*., 2015).

Calf Birth Weight Monitoring

Only 5 farmers (1.4%) reported actual birth weights (2 recorded 10-20 kg, and 3 recorded 20 to 30 kg), while 20 farmers (5.7%) admitted they never weighed the calf. A large proportion, *i.e.* 92.9% (325) did not provide any data.

Table 3: Calf Birth Weight Recording Practices

Birth Weight Range (kg)	Number of Farmers	Percentage (%)
10 - 20 kg	2	0.6
20 - 30 kg	3	0.9
Never weighed	20	5.7
Unknown	325	92.9

Birth weight is a vital indicator of calf health and future growth potential. According to FAO (2020), the average birth weight for crossbred calves ranges from 20-30 kg, while local breeds may weigh 15-25 kg. Failure to monitor this parameter can result in undetected growth disorders or feeding inadequacies. The near

absence of this practice among surveyed farmers highlights a lack of basic technical knowledge and resources.

Use of Artificial Insemination (AI)

Only 25 farmers (7.1%) used artificial insemination, while the majority, 325 farmers (92.9%), continued to rely on natural mating.

Table 4: Adoption of Artificial Insemination Practices

Reproductive Method	Number of Farmers	Percentage (%)
Artificial Insemination	25	7.1
Natural/Unknown	325	92.9

AI is a cornerstone technology for genetic improvement in dairy herds. Its low adoption rate in Ri-Bhoi aligns with trends observed in other tribal and hilly areas, where constraints include unavailability of technicians, lack of awareness, and poor infrastructure (DAHD, 2021). Encouraging AI adoption through mobile veterinary units and community demonstrations has shown success in similar socio-geographic settings (Kumar *et al*., 2018). The overarching trend in all assessed parameters is the limited awareness and adoption of scientific dairy practices among farmers in Ri-Bhoi. The lack of record-keeping, minimal use of AI, and poor calf management reflect not only knowledge gaps but also infrastructural and institutional barriers. This scenario is consistent with findings in other underdeveloped dairy regions in India (Rathod *et al*., 2015; Patbandha *et al*., 2019), highlighting the urgent need for:

- Strengthening veterinary extension services
- Capacity-building through farmer field schools
- Developing localized dairy development models sensitive to tribal contexts

CONCLUSION

The study reveals a generally poor adoption of scientific dairy management practices among farmers in the Ri-Bhoi District. A significant portion of the respondents demonstrated limited awareness of key aspects such as optimal calving intervals, effective calf weaning techniques, and the use of reproductive technologies like artificial insemination (AI). This lack of knowledge and implementation of best practices directly impacts herd health, reproductive efficiency, and overall dairy productivity in the region. These findings highlight the pressing need for comprehensive capacity-building initiatives aimed at empowering farmers with practical knowledge and skills. Targeted training programs, regular veterinary outreach, and extension services are essential to bridge the existing knowledge gaps. Additionally, improving the accessibility and affordability of AI services, along with robust animal health support, can significantly enhance reproductive outcomes and milk yield. Addressing these challenges through coordinated efforts involving government agencies, veterinary institutions, and local stakeholders will be vital to achieving sustainable growth in the dairy sector of the Ri-Bhoi District.

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