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Evaluating the impact of feeding and housing practices on dairy cattle productivity in Bharatpur District, Rajasthan

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Abstract

Dairy farming is a vital component of India's agricultural sector, providing livelihood and nutrition to millions. This study evaluates the impact of feeding and housing practices on dairy cattle productivity in Bharatpur district, Rajasthan. Despite being a significant milk producer, the region's arid climate poses challenges such as water scarcity, extreme temperatures, and limited access to quality feed. The research, conducted in selected villages of Kumher and Deeg blocks, used field surveys and questionnaires to gather data on animal status, housing systems, and feeding practices. Results indicated that cattle were primarily housed in open, closed, or under-tree systems, with significant numbers in each category in both blocks. Feeding practices showed a balanced use of dry, green, and concentrate fodder. However, the harsh climate and traditional housing often led to heat stress and nutritional deficiencies, affecting milk yield and economic returns. The findings underscore the need for targeted interventions to improve housing and feeding strategies, ensuring better productivity and sustainability in dairy farming under arid conditions.

Keywords: Dairy farming, cattle productivity, feeding practices, housing systems, Bharatpur district

Introduction

Dairy farming is the cornerstone of the Indian agricultural sector, serving as a primary source of livelihood for millions of rural households and contributing significantly to national milk production. According to the National Dairy Development Board (NDDB), India is the world's largest milk producer, accounting for over 22% of global milk production in 2021-22. This sector plays a pivotal role in ensuring national food security and improving nutritional well-being, particularly by providing essential protein and micronutrients. Within India, Rajasthan, a state characterized by its arid climate and harsh environmental conditions, is a major contributor to national milk production. Livestock rearing, particularly dairy farming, serves as a critical source of income and sustenance for Rajasthani communities, especially in rural areas (Singh *et al.*, 2003) ^[16]. However, optimizing dairy cattle productivity in this region presents unique challenges due to factors like water scarcity, high temperatures, and limited access to high-quality feed resources (Gupta *et al.*, 2008) ^[6].

This study focuses on Bharatpur district, located in eastern Rajasthan, to evaluate the impact of feeding and housing practices on dairy cattle performance. Understanding the current feeding and housing practices employed by farmers and their subsequent influence on milk yield, animal health, and overall productivity is crucial for implementing targeted interventions and improvements. As such nations have a judicious combination of plant and animal agriculture in a benefiting manner to meet the specific situations for the purpose. Considering the Agro-economic conditions of the country at this moment and projecting them for the next century (21st century), it can be clouded that the keeping of the larger animals like cattle and buffaloes is becoming more and more tedious and it may become impossible in times to come. (Meena *et al.*, 2023) ^[11]. Scarcity of water is a major concern, impacting not only the availability of drinking water for cattle but also hindering the cultivation of fodder crops. Limited access to green fodder and high-quality concentrates often results in imbalanced rations, leading to

deficiencies in essential nutrients and affecting cattle health and productivity. Furthermore, traditional housing practices might not be well-suited to the harsh climate, exposing animals to heat stress and associated health complications. These factors collectively contribute to lower milk yields and reduced economic returns for farmers in the region.

Materials and Methods

The present investigation entitled “Evaluating the Impact of Feeding and Housing Practices on Dairy Cattle Productivity in Bharatpur District, Rajasthan” was carried out in the department of Animal Husbandry & Dairying, R.B.S. College, Bichpuri, Agra. The study was conducted in four villages each of Kumher (name of villages - Hira Nagar, Satya Nagar, Vijay Nagar and Kanchanpura) and Deeg (name of villages- Helak, Ajau, Sikrori and Seh) blocks of Bharatpur district in Rajasthan. The data was collected through a field survey using a pre-tested questionnaire. The information collected included animal status, housing system, education status of farmers, occupation of farmers, land holding, types of housing floors, type of feed offered to animals, and who prepared the concentrate mixture. The main object of the data collection is to obtain a detailed information in account from about every cattle. The main advantage of this method is the accuracy with result. The study was conducted in the Block Kumher and Deeg, Bharatpur district of Rajasthan, during the year 2022. The study has been carried out on the basis of practical investigation in the above selected villages. Many persons in the villages were contacted individually and it was noticed that the farmers had no proper information about the management for the present study on cattle but the farmers could give only rough idea regarding the management because producers of milk under exiting condition in the villages do not keep any record nevertheless., It has been observed that some of the producers they quiet intelligent people and provide fairly accurate information from their amazing memory of events and things happening around them. District Bharatpur of Eastern Rajasthan was selected for this study. This district was selected purposely because the author is acquainted about the situation and the location of the

district as well as advanced in the adoption of technology, education and having the facilities of Agriculture Institution. Therefore, it is easy to collect the proper and nearly accurate information for study purpose from the selected villages. The main object of the data collection is to obtain a detailed information in account from about every cattle. The main advantage of this method is the accuracy with result. The method for data collection was followed.

Results and Discussion

There likely isn't a single prevalent dairy cattle housing system in Block Kumher and Deeg. The specific housing system used by farmers depends on several factors including: Farm size and resources: Large-scale dairy farms might invest in more elaborate housing systems, while smaller farms may rely on simpler setups. Climate: The hot and dry climate of Agra necessitates proper ventilation to keep cattle cool. Focus of the dairy operation: If the focus is on high milk production, cattle may be housed in confinement systems to optimize control over feed and environment. In contrast, farms with a focus on organic milk production or animal welfare might use more spacious housing with access to grazing areas.

The data was collected regarding the system of housing of cattle. In this connection the system of housing of cattle was collected as open, close and under tree from the different villages of both blocks. The results presented in Table-1 indicated that the cattle housing system in the selected household of different villages were nearly same. From the Table-1, it revealed that the total number of cattle constituting open, close and under tree systems were 20, 6 and 30 in Kumher block, while it was 18, 8 and 24 in Deeg nearly equal number of crossbred cattle were kept in closed and open system in both blocks while comparatively more cattle were kept under tree in Deeg than in Kumher. Mayne *et al.* (1986) [10] Sharma and Singh (2019) [15] found that grazing had very much effect on milk yield; while Yadav and Gupta (1985) [19] reported the open and close housing system may affect the milk yield. However, Dass (1983) [4] and worked on regarding the feeding of milk of newly born calf and found that the management can effect the calf in same extent.

Table 1: Dairy Cattle Housing System Block Kumher and Deeg

No. of village	No. of house hold	Loose house	Under tree	Open	Close house	Loose house	Under tree	Open	Close house
1	10	4	7	5	2	2	8	5	2
2	10	2	6	6	1	3	7	6	3
3	10	3	8	5	2	4	6	3	1
4	10	2	9	4	1	4	3	4	2
Total	40	11	30	20	6	13	24	18	8

Zero-grazing: Cattle are housed entirely indoors and fed a complete ration of fodder and concentrates. This system can be efficient for milk production but requires significant investment in housing and feed storage facilities. Tethered housing: Cattle are individually tethered in stalls, allowing some limited movement but restricting grazing. This system is less common than in the past due to animal welfare concerns. This system is relatively inexpensive but may not provide adequate temperature control during Agra's hot summers. The results of the present study are in agreement with the findings of Sastry *et al.* (1981) [14], Bacon (1983) [1] and Petersen and Dallum (1984) [12] who reported that the floor system for cattle in selected households were not the same. The results also support the findings of Tripathi and Gupta (1982) [17], Boxem (1982) [2], Rao and Naidu (1982) [13], Yadav and Gupta (1983) [18], Leng (1983) [9], Hazarika and Anand (1984) [7], Chauhan

et al. (1985) [3], and Gill (2003) [5] who reported that the feed given to cattle, including dry feed, green feed, and concentrate, was the same in both blocks.

Fodder Fed to Cattle

The data was collected on the types of feed given to cattle in the selected villages of the two blocks and data was summarised in Table-2 and its graphical representation is given in. The data reveals that the feed given to cattle i.e. dry feed, green feed and concentrate was same in both the blocks. Cattle in Block Kumher and Deeg are likely fed a combination of roughages and concentrates to meet their nutritional needs. Here are some of the common types of fodder: Roughages: These are dry, bulky feeds that are high in fiber and low in nutrients. They are essential for maintaining rumen health and digestive function in cattle. Some common

roughages fed to cattle in this region include: Dry crop residues: After harvest, the stalks and leaves of crops like corn, sorghum, and millet can be dried and fed to cattle. These

are a good source of fiber but may be low in protein and energy.

Table 2: Types of fodder fed to cattle in Block Kumher and Deeg

Name of Block		Kumher					Deeg				
No. of villages	No. of house hold	Dry	Green	Concentrate			Dry	Green	Concentrate		
				Compound feed	Home prepared	Single ingredient			Compound feed	Home prepared	Single ingredient
1	10	10	9	6	8	1	10	8	5	7	1
2	10	10	7	7	7	2	10	6	6	5	1
3	10	10	8	4	6	3	10	7	4	6	2
4	10	10	6	3	5	1	10	5	3	7	2
Total	40	40	30	20	26	7	40	26	18	25	6

The concentrates were extensively used in both blocks. Also dry and green fodders were given in same amounts in both block. This indicates that farmer have given equal emphasis to green, dry and concentrate fodder. Similar results were given by Tripathi and Gupta (1982) ^[17], Boxem (1982) ^[2], Rao and Naidu (1982) ^[13], Yadav and Gupta (1983). Leng (1983), Hazarika and Anand (1984) ^[7], Chauhan *et al.* (1985) ^[3] and Gill (2003) ^[5] found the country results in comparison of present results.

Water Service to Animals

Data was collected in connection with drinking water for cattle being provided by man, women and children in the selected villages of the two blocks. Cattle in Block Kumher and Deeg likely rely on a combination of water sources, with

the specific methods depending on factors like farm size and available resources. Groundwater: This is a common source for many farms. Farmers might use wells equipped with hand pumps, electric pumps, or even windmills to access groundwater for their cattle. Surface water: If available, some farms might use natural ponds, streams, or canals to water their cattle. However, the reliability of surface water can vary depending on the season and rainfall patterns. Water harvesting: Some progressive farms might collect rainwater in tanks or ponds during the monsoon season to use for watering cattle during dry periods. Supplied water: In some cases, villages or government programs might provide piped water access for agricultural purposes, which could include watering cattle.

Table 3: Water Service to cattle in Block Kumher and Deeg

No. of Villages	No. of House Hold	BLOCK – KUMHER			BLOCK- DEEG		
		Man	Women	Children	Man	Women	Children
1	10	5	4	1	6	3	1
2	10	6	4	-	3	4	3
3	10	5	3	2	5	4	1
4	10	5	4	1	4	2	4
Total	40	21	15	4	18	13	9

Seasonality: During the dry season, groundwater levels might drop, making it more challenging to access water from wells. This highlights the importance of alternative sources or water conservation techniques. Water quality: Groundwater quality can vary. Salty or high-fluoride water can be harmful to cattle, so farmers might need to test their water source or find alternative options for drinking water. Results presented in Table-3 reveals that the cattle were watered mainly by men in both the blocks. The number of men watering cattle in Kumher was slightly more than in Deeg while in Deeg more children did this job than in Kumher while Kumher the number of women were slightly more than Deeg block. The statistics for this observation for the two blocks of Kumher and Deeg are 21 men, 15 women and 4 children and 18 men, 13 women and 9 children respectively.

Conclusion

The study of feeding and housing practices in the Bharatpur district of Rajasthan highlights several key factors influencing dairy cattle productivity. The arid climate, characterized by high temperatures and water scarcity, poses significant challenges for dairy farmers. Traditional feeding practices, primarily relying on dry and green fodder, need enhancement with high-quality concentrates to ensure balanced nutrition. Housing practices, often involving open and under-tree systems, must be improved to mitigate heat stress and

improve animal welfare. Effective interventions tailored to local conditions, such as introducing drought-resistant fodder crops, improving water management practices, and promoting better housing designs, can substantially boost milk yield and overall productivity. Addressing these issues through targeted education and support for farmers can lead to sustainable improvements in the dairy sector of Bharatpur, ultimately enhancing the livelihoods of rural communities in this region.

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