



Assessment of the Existing Feeding and Housing Management Practices of Dairy Animals in Rajbanshi Dairy Farmers

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Authors' contributions

This work was carried out in collaboration among all authors. Author BB conceptualised and designed the study, collected data, and prepared the manuscript. Author AM supervised the entire study process. Authors UK, GCE, CYL, and PY contributed to writing and editing. All authors read and approved the final manuscript.

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ABSTRACT

Feeding and housing play a very significant role in utilizing the real potential of dairy animals as both are prerequisite factors for milk production. The study was conducted in the Coochbehar district of West Bengal to explore the existing feeding and housing management practices followed by Rajbanshi dairy farmers. A total sample size of 200 dairy farm families was taken using

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multistage random sampling for the present study. It was observed that the majority of dairy farmers (63.00%) followed the system of stall feeding and for feeding green fodder majority (94.50%) of dairy farmers depended on naturally grown vegetation/ pastures. The study revealed that the majority (68.00%) of dairy farmers fed paddy straw as dry fodder followed by 32.00 percent of dairy farmers who fed both paddy straw and wheat straw to their animals. The majority (83.00%) of the dairy farmers did not feed mineral mixtures to their animals. Among animal sheds a vast majority (83.50%) were kaccha and the maximum percentage (87.50%) of the housing systems were single row. The majority (83.00%) of the sheds had a full wall in addition to this the walls were made up of tin sheets (45.00%) as well as jute sticks (37.00%). Rice straw was used as bedding material in the winter season by 62.00% percent of dairy farmers. The existing feeding and housing practices among Rajbanshi dairy farmers need improvement, including increased awareness of fodder cultivation, promotion of home-prepared feed, mineral supplementation, better shed construction, sanitation, and waste management.

Keywords: Feeding; housing; management practices; dairy farming; rajbanshi farmers.

1. INTRODUCTION

Dairy farming provides employment and supplementary income to many rural households [1]. It is one of the major sources of income for most of the small and marginal farmers in India, particularly for rural households who live below the poverty line [2]. Livestock farming plays an important role in addressing the issues faced by rural areas and the majority (70%) of the rural population is engaged in it (Biswas *et al.*, 2012). Many workers engaged in farm employment under the unorganized sector in rural West Bengal were also engaged in dairying [3].

Optimum feeding and housing play a very significant role in exploiting the real potential of dairy animals [4] as both are prerequisite factors for milk production [5,6]. They constitute 75% of the total cost incurred on milk production in dairy animals [7]. Despite the highest number of milk producers in the world, the productivity of our milch animals is very low [8] due to the non-availability of a balanced ration for dairy animals, [9]. It also affects various physiological functions including long-term animal health, fertility, and productivity [10].

The main constraint to livestock development in developing countries is the scarcity and fluctuation in the quality and quantity of animal feed. The crop residues and agro-industrial by-products form the bulk of the ration supply to the animals resulting in less availability of nutrients to the lactating animals [11]. The composition of feed varied depending on the availability of crop residues and by-products, the socioeconomic conditions of farmers and the availability of common grazing land [12]. The composition of feed influences the quality of milk. Suitable

animal housing should be followed to get hygienic milk commercially [13]. There is a reduction in milk production and animal welfare due to improper housing comfort [14].

'*Rajbanshi*' literally means "royal community", which is an indigenous ethnic group majorly found in Northern West Bengal, Assam, Arunachal Pradesh, Meghalaya, and various North-Eastern parts of India. Other than India many people from this community are living in Nepal, Bangladesh, and Bhutan. A huge number of Rajbanshi people now live in the Northern part of West Bengal. Coochbehar district of West Bengal is having the highest population of the Rajbanshi community and mostly depends on agriculture and allied activities. So, it is crucial to know the unexplored existing dairy management practices to identify the strengths and weaknesses of practices of Rajbanshi farmers and devise appropriate Govt. intervention. The present study was undertaken to gather information regarding existing housing and feeding practices followed by the Rajbanshi dairy farmers.

2. METHODOLOGY

The study was conducted in the Coochbehar district of West Bengal in the year 2022. A field survey was conducted to collect information related to housing and feeding practices followed by Rajbanshi dairy farmers. In West Bengal, the Rajbanshi people have been granted the status of Scheduled Caste and the 2nd highest Scheduled caste population in the country is also living in this state. Coochbehar district was selected for the study as the majority of people in the district belong to the Rajbanshi community [15]. The Coochbehar district consists five of

sub-divisions viz. Coochbehar Sadar, Mathabhanga, Mekhliganj, Tufanganj and Dinhata. A multistage sampling technique was followed for the selection of the study area. Coochbehar Sadar and Dinhata sub-divisions were selected using simple random sampling and subsequently, from each selected sub-divisions, four blocks were selected. A total sample size of 200 dairy farm families, fifty respondents from each selected block viz. Coochbehar I, Coochbehar II, Dinhata I and Dinhata II were taken for the present study. Respondents were selected ensuring that they had at least 50.00 percent income from dairy husbandry to truly represent existing management practices. The selected farmers were interviewed, and the desired information was collected with the help of a pre-tested interview schedule.

3. RESULTS AND DISCUSSION

Feeding Management Practices: Table 1 represents the feeding management practices followed by Rajbanshi dairy farmers. The majority of dairy farmers (66.00 %) adopted the stall-feeding system and around 63.50 percent of farmers fed milch animals individually while 36.50 percent of farmers fed in groups. Farmers recognized the benefits of confining animals in stalls for better management, feed control, and waste management. Similar findings were observed by Sabapara et al. [16] and Kumar et al. [17]. It was observed that for green fodder 94.50 percent of dairy farmers depended on naturally grown vegetation/ pastures while the rest of the farmers cultivated and purchased from others. This suggests that farmers are utilizing the available natural resources efficiently. Bunds or uncultivated lands were the sources of fodder for 85.00 percent of dairy farmers. The reason might be that they were not aware of the benefit of fodder. About 73.50 percent included legumes and non-legume and 39.00 percent included only non-legume as feed for their animals. The findings were in line with the work of Sabapara et al. [18]. Further, it was found that the majority (68.00%) of dairy farmers fed paddy straw as dry fodder followed by 32.00 percent of dairy farmers who fed paddy straw + wheat straw to their animals. Tudu and Roy [1], Kumar et al. [17], Sabapara et al. [10] and Deoras et al. [19] in their

studies found similar results. The reason might be its availability due to extensive rice cultivation in the study area.

Commercial cattle feed was the major (49.50%) concentrate feed which was fed to the animal whereas 35.00 percent of farm households fed feed which was prepared at home. It indicates its importance in meeting the nutritional requirements of animals. Many farmers bought concentrates from the market such as maize flour, oil cake, himul dana etc. Some farmers cultivated maize for feeding cattle, apart from that they were using rice husk from homegrown paddy. On average, the dairy farmers fed 10.50 kg of fodder (green + dry) to lactating cows followed by 9 kg to dry cows and 3.90 kg to heifer. In the case of concentrate, it can be observed that the dairy farmers fed an average of 3.45 kg to lactating cows followed by 1.85 kg to dry cows and 1.20 kg to heifer. For the newborn calf, they did not feed any fodder or concentrate except milk. Milk production was the major criterion (60.50%) for feeding the milch animal. This was in accordance with the finding of Shirsat et al. [20], Deoras et al. [19], Malik et al. [21] and Kumar et al. [17]. Special feeding after calving was followed by 64.00 percent of dairy farmers. Similar findings were reported by Divekar and Saiyed [22]. The practice of colostrum feeding was done by 77.00 percent of dairy farm families. It might be due to the awareness of the benefits of colostrum feeding. It was also found that 85.00 percent of them did not follow any special feeding practices for calves while 15.00 percent followed special feeding practices. The majority (83.00 %) of the dairy farmers did not feed mineral mixtures to their animals. Tudu and Roy [1] found in the Nadia district found that only 17.25 percent of the respondents incorporated a mineral mixture. Lack of knowledge about their benefits and potential cost concerns might be the major reasons behind this. Similar findings were reported by Sohane et al. [23] and Chowdhary et al. [24]. All the dairy farmers fed salt to animals as mentioned whenever they fed something to the animal, they added some amount of salt to it. The majority (97.50%) of dairy farmers did not follow balanced feeding. The reason might be the lack of knowledge about balanced feeding.

Table 1. Feeding management practices of dairy animals followed by rajbanshi dairy farmers (n=200)

Feeding practices and types	Frequency	Percentage
Feeding system		
a. Stall feeding	132	66.00
b. Stall feeding + Grazing	68	34.00
Feeding of milch animal		
a. Individual feeding	127	63.50
b. Group	73	36.50
Source of green fodder		
a. Cultivated	7	3.50
b. Naturally grown vegetation/ pastures	189	94.50
c. Purchased from others	4	2.00
Type of fodder fed to animal		
Green		
a. Non-legume	78	39.00
b. Legume + non-legume	147	73.50
c. Not cultivating but feeding grasses from bunds or uncultivated lands	170	85.00
Dry		
a. Paddy straw	136	68.00
b. Paddy straw +Wheat straw	64	32.00
Kinds of concentrate feeds		
a. Prepared in home	70	35.00
b. Commercial cattle feed	99	49.50
c. Prepared in home + commercial cattle feed	32	15.50
Quantity of fodder (green + dry) used per animal per day (kg)		
Animal	Average quantity per day (kg)	
a. Lactating cow:	10.50	
b. Dry cow:	9	
c. Heifer:	3.90	
d. New born calf:	0	
Quantity of concentrate used per animal per day (kg)		
Animal	Average quantity per day (kg)	
a. Lactating cow:	3.45	
b. Dry cow:	1.85	
c. Heifer:	1.20	
d. New born calf:	0	
Feeding norms followed		
a. Body weight	59	29.50
b. Milk production	121	60.50
c. Availability of feeds	13	6.50
d. Age	7	3.50
Special feeding after calving		
a. Yes	128	64.00
b. No	72	36.00
Special care for the calf		
I. Colostrum feeding:		
a. Yes	154	77.00
b. No	46	23.00
II. Special feeding of calves:		
a. Yes	30	15.00
b. No	170	85.00
Feeding of mineral mixture		
a. Yes	34	17.00

Feeding practices and types	Frequency	Percentage
b. No	166	83.00
Feeding of salt		
a. Yes	200	100.00
b. No	0	0.00
Balanced cattle feeding		
a. Yes	5	2.50
b. No	195	97.50

Table 2. Housing management practices of dairy animals followed by rajbanshi dairy farmers (n=200)

Housing practices and types	Frequency	Percentage
Types of housing for animals		
a. Kaccha	167	83.50
b. Pucca	33	16.50
Time of keeping animals inside the shed		
a. During night	157	78.50
b. Both day & night	43	21.50
Settlement of animals outside the shed	157	78.50
If yes, then	Average duration (Hour)	
a. Winter	7.47	
b. Summer	9.04	
c. Rainy season	6.29	
Location of animal shed		
a. Attached to human dwelling	69	34.50
b. Nearby their dwelling	113	56.50
c. At the field of the farmer	17	8.50
Direction of shed		
a. East-west	115	57.50
b. North-south	85	42.50
System of housing		
a. Single row	175	87.50
b. Double row	25	12.50
Size of house		
a. Optimum	167	83.50
b. Not optimum	33	16.50
Light		
a. Adequate	83	41.50
b. Inadequate	117	58.50
Ventilation		
a. Poor	25	12.50
b. Fairly good	167	83.50
c. Good	8	4.00
d. No provision of ventilation	0	0.00
Provision & practice to protect animals from extreme weather		
a. Yes	115	57.50
b. No	85	42.50
Type of floor		
a. Pucca (cement concrete)	36	18.00
b. Earthen/soil floor	155	77.50
c. Wooden	0	0.00
d. Brick paved	9	4.50
e. Stone paved	0	0.00
Type of pillar/ pole		
a. Wooden	10	5.00

Housing practices and types	Frequency	Percentage
b. bamboo	143	71.50
c. Iron	0	0.00
d. Cemented	47	23.50
Wall of house		
a. Full	166	83.00
b. Half	34	17.00
c. No wall	0	0.00
Materials used in walls		
a. Thatched	2	1.00
b. Jute sticks	74	37.00
c. Brick	23	11.50
d. Tin sheets	90	45.00
e. Half brick and half tin sheets	11	5.50
Type of roof		
a. No roof	0	0.00
b. Tin roofing sheet	181	90.50
c. Asbestos sheets roof	4	2.00
d. Thatched roof	15	7.50
e. Tiles as roofing material	0	0.00
Features of the roof of a shed		
a. Single slope	86	44.00
b. Double slope	112	56.00
Is there a provision for the manger		
a. Yes	198	99.00
b. No	2	1.00
If yes, which type of manger		
a. Kaccha	95	47.50
b. Pucca	36	18.00
c. Temporary	67	33.50
Provision of a drainage system in the animal shed		
a. Pucca drain	30	15.00
b. Earthen	170	85.00
Bedding material used on the floor in the winter season		
a. Rice straw	124	62.00
b. No bedding	76	38.00
c. Any other	0	0.00
Disposal of cow dung		
a. Manure pit	36	18.00
b. Open place	164	82.00

Housing Management Practices: Table 2 represents the housing management practices followed by Rajbanshi dairy farmers. The study revealed that 83.5% of the animal sheds were kaccha. Similar findings were reported by the work of Tudu and Roy [1], Bainwad et al. [25] and Kalyankar et al. [26]. Most dairy farmers (78.5%) kept their animals inside the shed during the night only to protect them from environmental calamities. This highlights the farmers' awareness of the need to safeguard their animals. Whereas 21.5% of dairy farmers kept their animals inside all day because of lack of space and difficulty in movement. Sabapara et al. [16] reported in south Gujarat that animals were

kept outside during the day for cleaning and kept inside the shed during night-time to protect them from wild animals. The settlement of animals outside was different from season to season. During winter average duration (hour) was 7.47 hours, during summer it increased to 9.04 hours and during the rainy season it was reduced to 6.29 hours. This variation was due to variability in climatic conditions. It was found that 56.5% of the cattle sheds were located near the human dwelling followed by 34.5% of sheds being attached to human dwellings. This proximity facilitates animal management and reduces construction costs. Similar results were reported by Kushwaha et al. [27], Bainwad et al. [25] and

Patel et al. [28]. The majority (57.5%) of the sheds were directed towards the east-west which provides optimal ventilation and lighting conditions, contributing to the animals' well-being. In most of the cases (87.5%) the housing system was a single row and the size of the cattle shed was optimum for 83.5% of respondents. The finding was supported by the study of Sinha et al. [4]. Ventilation was fairly good for the majority (83.5%) of sheds.

Farmers (57.5%) demonstrated efforts to provide comfort to animals during extreme weather conditions. Measures such as electric fans and bathing during summer and the use of bedding materials like rice straw in winter indicate a concern for animal welfare. The majority of the floor (77.5%) of animal sheds were earthen which may pose challenges for cleanliness and hygiene. It was consistent with the findings of Sabapara et al. [18] and Singh et al. [29]. In 71.5% of sheds, the pillars were made up of bamboo as it is easily available and very cheap. The majority (83%) of the sheds had a full wall and walls were made up of tin sheets (45%) as well as jute sticks (37%). Double-sloped roofs were the majority (56%) and the roofs were made up of tin sheets (90.5%). Almost in all the sheds, there was a provision for a manger out of these 47.5% of mangers were kaccha. In addition to this in some sheds (33.5%), the manger was temporary which was made up of mainly soil or cemented materials. The provision of proper mangers in most sheds indicates an understanding of the importance of feed management. The results are supported by the findings of Patel et al. [28] and Sinha et al. [4]. Further, it was revealed that 85% of the drainage system was earthen. The findings are supported by Sabapara et al. [16]. Sixty-two percent of dairy farmers used rice straw as bedding material in the winter season while 38% of dairy farmers did not use any bedding materials. The practice of dung disposal was not scientific as 82% of farmers disposed of dung in open places [30].

4. CONCLUSION

The study explored existing dairy feeding and housing management practices followed by the Rajbanshi farmers and identified their strengths and weaknesses. Farmers were utilizing the available natural resources efficiently but lacked awareness about the benefits of fodder cultivation. There is a need to explore options for improved fodder cultivation to supplement the existing resources and ensure consistent quality

feed availability. Promoting the use of home-prepared feed as a cost-effective alternative could help reduce dependency on commercial feed. Extension intervention can be organised to show the benefit of green fodders for increasing milk production. Subsequently, inputs can be provided to promote dairy farming. The farmers should be encouraged to feed mineral supplementation for animal health and productivity. Promoting the construction of pucca or semi-pucca sheds and the use of concrete flooring materials can facilitate better sanitation, protection, and comfort for the animals, leading to improved health and productivity. The proximity of the animal shed facilitates animal management and reduces construction costs. However, it is essential to ensure proper sanitation to prevent zoonotic diseases. Farmers demonstrated efforts to provide comfort to animals during extreme weather conditions. The provision of proper mangers in most sheds indicates an understanding of the importance of feed management. Most farmers were disposing of dung in open places implies the encouragement of the adoption of proper waste management systems, such as composting or biogas generation, which can mitigate environmental pollution. Specialized training and first-hand knowledge of scientific dairy farming practices can increase animal productivity, which is only possible through the intervention of extension services.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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