

*Original Research***Utilization Pattern of Feed and Fodder for Dairy Animals in Rajasthan State of India****Devendra Kumar Meena^{1*}, Gopal Sankhala² and Sunil Kumar²**¹College of Agriculture, Kumher-321201, Bharatpur, Rajasthan, INDIA²Division of Dairy Extension Education, ICAR-National Dairy Research Institute-132001, Karnal, Haryana, INDIA***Corresponding author:** devendrababli@gmail.com

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Abstract

The present study was conducted in semi-arid zone of Rajasthan, having the highest livestock and bovine population. Feed and fodder constitute about 60-70 per cent of cost of milk production. These feed resources, mainly consists of grasses, legumes and cereal crop residues which vary across the major agro-ecological ones of the Rajasthan. Hence, an investigation was conducted in Dausa and Tonk districts with proportionate randomly selected 240 dairy farmers who were growing at least two fodder crops in a cropping year. It was found that a combination of grazing and stall feeding was practiced by 49.86 per cent of the farmers. Whereas, majority of respondents used to provide feed and water three times in a day in study area. It was also found that 66.52 per cent of them were providing chaffed green fodder to the animals.

Key words: Dairy Animals and Utilization Pattern, Feed, Fodder**How to cite:** Meena, D., Sankhala, G., & Kumar, S. (2020). Utilization Pattern of Feed and Fodder for Dairy Animals in Rajasthan State of India. International Journal of Livestock Research, 10(3), 67-73. doi: 10.5455/ijlr.20191126035311**Introduction**

Dairying is an integral part of Indian agriculture and holds a significant place in Indian economy. At the household level, dairying plays an important role in determining the economic condition of 70 million farm families. The dairy enterprise provides insurance against crop failure and contributes directly towards increasing the crop production by making availability of draft power, organic manure and cash income on day-to-day basis. In addition, dairying is crucial in providing assured employment and nutrition to farm family. In the mixed farming systems of India; milk production is predominantly the domain of small holders. The early history of fodder growing and utilization pattern is lost in the unwritten pages of time, pre-historic man had no need for such crops, since he supported himself as well as his family-members by picking fruit, digging roots, fishing, hunting, etc. it was until he started taming animals that necessitated

fodder cultivation. The animals which inhabited in the forests and fields were numerous and of diverse types. Some of them were carnivorous, but most of them were herbivorous. They were probably fed on grasses, legumes, trees, bush leaves and other green and succulent plants. The animals initially domesticated by the farmers were dogs, horses, cattle, buffaloes, sheep and poultry. As the human population increased the number of domesticated animals also increased. It became necessary to consider how they could be fed and their maintenance, growth and reproduction was also give due consideration. Since these animals were mostly herbivorous type, the primary need was for grasses and fodder crops Meena (1997). Fodder plays a critical role in the crop husbandry, livestock rearing, and manure and soil nutrient cycle at traditional farms in the Rajasthan.

Collection of fodder is the first step that turns the wheel of agricultural economy of the rural community. This complex inter-relationship between forests, grasslands, livestock and crops in farming systems has contributed to the sustainability of agriculture for generations. Fodder is a major constituent of animal feed which contributes two-third of the animal feed requirement. It is essential to increase fodder production by increasing area under cultivation to 12 per cent of the total cultivable land and use of high yielding varieties of fodder crops. Farmers need to be educated and trained on conservation and preservation of fodder which can be used during the scarcity for sustainable milk production. Further, there is a need to carry out research on quality fodder production in dry land area Kalam (2010). Still dairy farmers of India are not well aware of importance of fodder cultivation which is essential for nutrition of the animals and maintenance of their health as well production. Harisha *et al.* (2019). Even the farmers having adequate land holding that can be utilized for cultivating fodder crops, besides the cultivation of food grain and vegetables crops. But farmers were not interested in fodder cultivation for their animals. This situation is not good for dairy farmers, who depend solely on their dairy animals for their livelihood. Without green fodder milk yield and milk production of the farm cannot be maintained. However, of late, due to the efforts made under different govt. schemes as well as other concerned agencies, now the dairy farmers have shown a little interest in this direction. Hopefully, in the long run this can contribute a lot towards improving the milk production of our country. Fodder crisis in the Rajasthan has been debated time and again and it is observed that there is a wide gap between demand and supply of green fodder due to continuous increase in demand and diminishing fodder resources in the state.

Thus, there is need to devise ways to evolve strategies and solutions to prevent large scale resource depletion which, lead to negative effects on the process aimed at achieving sustainable development. A portion of its fodder requirement is also met by lopping and cutting of trees from the agricultural fields and homestead areas. It was estimated that major consumption of crop residue and green fodder varies in different seasons. These feed resources, mainly comprise of grasses, legumes and cereal crop residues vary widely and are spread across the major agro ecological zones of Rajasthan. The role of these forage and fodder crops in

farming systems of Rajasthan is particularly reflected in their contribution to soil fertility and sustenance of livestock sub-sector of the nation's economy. Unfortunately, extensive areas of the grazing lands are composed of indigenous species, which are low in yield and quality. There is a need to improve quality of grass land fodder and forage quality on large scale. There is a need to produce more green fodder to meet nutritional requirements of animals. Cultivated fodder crops, grasses and shrubs can grow in arid and semi-arid areas of the Rajasthan to provide valuable feed to livestock during long and dry summer period and mid-winter, when herbaceous plants are dormant.

Materials and Methods

The study was conducted in semi-arid zone of Rajasthan. Out of the four districts of this region, two districts namely Dausa and Tonk were selected purposively considering minimum and maximum density of livestock. Two tehsils were selected randomly from each identified district and from each selected tehsil, three villages were selected randomly for the present study. Twenty respondents from each randomly selected village were selected by proportionate random sampling method. Thus, a total of 240 dairy farmers were taken for this study.

Results and Discussions

Feeding Methods of Animals Followed by the Farmers

It is observed from Table 1 that in Kharif season, majority (63.34%) of the farmers were practicing grazing and stall feeding, followed by 47.91 and 38.34 per cent of the respondents in rabi and zaid seasons, respectively.

Table 1: Distribution of respondents according to feeding methods of animals (n=240)

S. No.	Particulars		Kharif	Rabi	Zaid	Pooled
1	Grazing and stall feeding		152 (63.34%)	115(47.91%)	92(38.34%)	119(49.86%)
	Stall feeding only		88 (36.66%)	125 (52.09%)	148 (61.66%)	120 (50.14%)
2	Number of feeding in a day	One time	3 (1.25%)	2 (0.83%)	3 (1.25%)	2 (1.11%)
		Two time	111 (46.25%)	110 (45.84%)	112 (46.67%)	111 (46.25%)
		Three time	121 (50.42%)	120 (50%)	119 (49.58%)	120 (50%)
		Four time	5 (2.08%)	8 (3.33%)	6 (2.5%)	6 (2.64%)
3	Drinking water in a day	Two times	74 (30.83%)	155 (64.59%)	13 (5.41%)	81 (33.75%)
		Three times	141 (58.76%)	85 (35.41%)	158 (65.84%)	128 (53.34%)
		Four times	25 (10.41%)	0 (0%)	69 (28.75%)	31 (12.91%)

On pooled basis, it was found that grazing and stall-feeding method was practiced by 49.86 per cent of the respondents. Further, it was observed that majority of the respondents (61.66%) were following stall feeding method during zaid season, whereas, this method followed by 52.09 and 36.66 per cent of the farmers in

rabi and kharif seasons, respectively. It can be concluded that grazing and stall feeding was main feeding method adopted by farmers during kharif season.

Number of Feeding

The results pertaining to distribution of respondents according to the numbers of feeding in a day of animals are given in Table 1. In kharif season, 50.42 per cent respondents fed their animals thrice in a day while 46.25 per cent of them providing feed twice in a day. Only 2.08 per cent were able to provided feed four times in a day. In rabi season most of the respondents (50.00 %) were providing feed to their animals three times in a day followed by 45.84, 3.33and 0.83 per cent of them providing two, four and one time in a day, respectively. During Zaid season, majority of the respondents (49.58%) were feeding their animals thrice in a day while 46.67 per cent of respondents were feeding their animals twice in a day. On year basis feeding pattern of animals show that half of the respondents were providing feed to their animal thrice in a day closely followed by 46.25 per cent of them were feeding twice in a day.

In totality it can be inferred that most of the livestock rearers were providing feed to their animals either three times or twice in a day, irrespective of the season. It shows that farmers were adopting feeding methods for their animals to maintain productivity & production of milk. The farmers who were providing feed and fodder to their animals once in a day may be because of its lesser availability. The farmers who were feeding their animal four times a day were possessing high yielding animals which require more feed and fodder and that cannot be met without feeding them twice or thrice in a day. It is essential to maintain productivity as well as production level of their farms to make them profitable.

Drinking Water

During kharif season, it was observed that 58.76, 30.83 and 10.41 per cent of the respondents were providing water three, two and four times in a day to their animals, respectively. In rabi season, majority of the respondents (64.59%) were providing water twice in a day followed by 35.41 per cent of the respondents who were providing water thrice in a day. In case of Zaid season, most of the respondents (65.84%) were used to provide water to their animals thrice a day followed by 28.75 and 5.41per cent who providing four times and two times in a day, respectively. On pooled basis it was found that majority of the respondents (53.34%) were providing water to their animals thrice in a day. Only 33.75 and 12.91 per cent of them provided water to their animal two and four times in a day, respectively.

Results depict that majority of the respondents were providing water to their animals thrice a day except during the rabi season when majority of them were providing twice in a day and it may be due to the fall in temperature in winter which leads to decreased the water requirement of the animals. It was also observed that during kharif and zaid, season farmers provided water to their animals thrice in a day due to the rise in temperature during these seasons leading to increased water requirements of their animals.

Fodder Utilization Pattern

Green Fodder

The results presented in Table 2 revealed that in kharif season majority of the farmers (88.75%) use to provide chaffed green fodder to the animals however, 11.25 per cent of them were offering green fodder to the animals without chaffing. The farmers who were offering green fodder without chaffing were those who provide weed, tender grasses, etc. to their animals as in case of these types of green fodders chaffing is not required. In Rabi season most of the farmers (96.25%) provide green fodder to the animals after chaffing, however, few farmers provided green fodder without chaffing. They cultivated fodder crops like lucerne, kasni and oat which need to be fed after chaffing. During zaid season, only few farmers (14.59%) provided chaffed green fodder to the animals, however, none of the farmers provide dunchaffed green fodder. As fodder crops grown during the zaid season were hardy in nature hence cannot be fed unchaffed. Most of the farmers were aware about this fact and were feeding only after chaffing. Further, analysis of data shows that majority of the farmers (85.41%) in zaid season were not following any this practice due to non-availability of green fodder. Pooled data analysis shows that majority of the farmers (66.52%) were providing green fodder to the animals after chaffing. This might be due to their awareness about the scientific feeding method among the farmers and also about their awareness for efficient utilization of scarce fodder resources.

Table 2: Distribution of respondents according to the fodder utilization pattern (n=240)

S. No.	Fodder type	Particulars	Kharif	Rabi	Zaid	Pooled
1	Green fodder	Chaffed	213 (88.75%)	231 (96.25%)	35 (14.59%)	160 (66.52%)
		Without chaffed	27 (11.25%)	9 (3.75%)	0 (0%)	12 (5%)
		Green fodder un-available	0 (0%)	0 (0%)	205 (85.41%)	68 (28.48%)
2	Dry fodder	Only dry fodder	46 (19.16%)	52 (21.67%)	120 (50%)	73(30.26%)
		Mixed with green fodder	97 (40.42%)	86 (35.83%)	29 (12.08%)	71 (29.45%)
		Supplemented with concentrate	78 (32.5%)	80 (33.34%)	63 (26.25%)	73 (30.7%)
		Moistening with water	19 (7.92%)	22 (9.16%)	28 (11.67%)	23(9.59%)

Dry Fodder

As per as utilization of dry fodder in kharif season is concerned it was noted that most of the farmers (40.42 %) providing dry fodder to the animals after mixing with green fodder followed by 32.50 per cent (dry fodder supplemented with concentrate), 19.16 per cent (only dry fodder) and 7.92 per cent (dry fodder after moistening).

It can be concluded from above findings that most of the farmers were providing dry fodder either after supplementing with green fodder or concentrate. It clearly reflects that their awareness about feeding management of their animals for maintaining the productivity of the animals. In rabi season also a sizeable number of farmers (35.83%) were providing dry fodder to the animals after mixing it with the green fodder

followed by 33.34, 21.67 and 9.16 per cent of them providing dry fodder to the animals after supplementing with concentrate, only dry fodder and moistening it with water, respectively. It could be concluded that farmers were following the same trend in utilization of dry fodder similar in Kharif season too. They need to be made aware about the importance of green fodder for dairy animals and also need to be trained in green fodder cultivation. Tanusha *et al.* (2019). In zaid season, fifty per cent of farmers (50.00%) provided only dry fodder to their animals and it may be due to the non-availability of green fodder, scarcity of water for growing green fodder. Further, it was noted that 26.25 per cent of the farmers provided dry fodder to the animals after supplementing with concentrate. Only 12.08 and 11.67 per cent of them providing dry fodder after mixing with green fodder and after moistening with water, respectively.

Pooled data analysis shows that most of the farmers (30.26%) were providing dry fodder to the animals after supplementing it with concentrate. Some of the farmers (30.70%) provided only dry fodder and some of them (29.45%) were mixing it with green fodder. Few farmers (9.59%) were also providing dry fodder to the animals after moistening it with water. It can be concluded that most of the farmers were providing dry fodder to the animals either after supplementing it with concentrate or green fodder to maintain the productivity of the animals as feeding of dry fodder alone may not be sufficient.

Conclusion

It was observed that grazing and stall feeding was practiced by fifty percent of the dairy farmers and almost same number of farmers were only stall feeding. Feeding of green fodder and providing drinking water thrice in a day was the most important feeding practice recorded in the study area. Most of the farmers were providing chaffed green fodder to their dairy animals but during zaid and kharif season due to non-availability of green fodder some of the farmers were providing only dry fodder to their animals after supplementing it with concentrate. Farmers of Dausa and Tonk districts need to be made aware about the scientific feeding practices as well as they need to be trained on green fodder cultivation for more profitable and sustainable dairy farming.

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Conflict of Interest

The author has no interest of conflict with this article.

References

1. Anonymous(2014). Hydroponics green fodder feeding technology in Goa, *ICAR Research Complex for Goa, Old Goa*.
2. Gupta, R.K., T., Kaushal, P.S. and Pathania, M.S. (1998). A study on the status of fodder balance in Himachal Pradesh: *Oecologia Montana*, 37(2), 39 – 42.
3. Hugar, L.B., Umesh, K.B. and Surya Parkash, S. (2013). Constraints in diffusion of new technology: An economic evolution: *Agric. Stast. India*,47(4), 15.
4. Lassiter,C.A.,Huffman,C.F., Dexter,S.T.,Duncan,C.W.(2014). Corn versus Oat Silages as Roughage for Dairy Cattle: *America journal of Dairy science*, 41(9),1282-1285.
5. Muhammad, D. (2015). Improved fodder in smallholder livestock production in Northern Pakistan. “*Agra Khan Rural support programme (AKRSP), Gilgit, Pakistan*.”
6. Sahoo, B. K., Dash, B., Mahapatra, S. S., and Dash, G. B. (2007). Scope for forage production in degraded land of mining belts of Orissa: *Journal of Range Mgmt. & Agro forestry*,28 (2), 338-339.
7. Sergeant, A.F. (2010). Fodder conservation. “Belabula farms, Canowindra, *National development, permanent agriculture, and prosperity in Australia*: 166-121.
8. Singh, R. (2010). State Project Management Unit under District Poverty Initiatives Project. Government of Rajasthan, Jaipur.
9. Singh, K. and Singh, H.S. (2009). Forage resource development in Uttarakhand: Experience and observations, ULDB, Dehradun, 2:4.
10. Sharma, N. K. (2007). Effect of sowing time and cutting management on fodder yield of Barley: *Journal of Range Mgmt. & Agroforestry*,28 (2), 334-335.
11. Thirunavukkaras, M., Sankaran, V.M., Kathiravan, and Karunakaran, R. (2011). Dry fodder status in Tamilnadu - A Spatial analysis: *Tamilnadu Journal of Veterinary & Animal Sciences*, 7 (2), 102-104.
12. Vaity, T. B. (2002). Study of feeding of animals in Pune district. M.Sc.Thesis MPKV, Rahuri.[http://www.krishi.raj.gov.in/Deptt./Agri\(2013\)](http://www.krishi.raj.gov.in/Deptt./Agri(2013))
13. Yadav (2006). Problems of forage marketing in Jhansi district of Uttar Pradesh. M.Sc.Thesis Bundelkhand University, Jhansi.
14. Harisha, M., Desai, A., Gopala, G., Biradar, C., &Savanur, M. (2019). Dairy Production Constraints in Kolar and Chikkaballapur Districts of Karnataka: *International Journal of Livestock Research*, 9(10), 148-154.
15. Tanusha, & Tiwari, R. (2019). Assessment of Perceived Training Needs of Pack Animal Owners in the Middle Himalayan Region of India. *International Journal of Livestock Research*, 9(10), 155-162.