

Research Article



Feeding and Milking Management Practices Adopted by Indigenous Cattle Farmers in Thar Desert of Rajasthan

SUNIL KUMAR¹, S. SUBASH^{2*}, RAMETI JANGIR³

^{1,2} Dairy Extension Section, SRS of ICAR-NDRI, Bengaluru-560030, India; ³ NAU Navsari, Gujrat, India.

Abstract | The present study was conducted with selection of three major indigenous cattle breeds viz. Rathi, Tharparkar and Sahiwal from Bikaner, Jodhpur and Sri-ganganagar districts of Rajasthan with the sample size of 180 respondents, rearing at least one selected indigenous cattle for study the feeding and milking management practices adopted by indigenous cattle farmers in study area. It was found that level of adoption among majority of the respondents was medium and low. People are still depended on traditional feeding and milking management practices. Majority (58.3%) of the respondents preferred grazing and stall feeding system. Ninety per cent of the respondents did not feed any mineral mixture to cattle and nobody known about preservation of fodder. In case of milking management, majority of farmers (88.80%) used knuckling method of milking. Majority of the farmers were not aware about the drawbacks caused by the unhygienic milk handling which clearly indicated the lack of knowledge about the clean milk production practices at field level; moreover, farmers were not maintaining cleanliness in their house and milking premises. About 69.50 per cent of the farmers never washed or cleaned their cattle.

Keywords | Indigenous cattle, Respondents, Milking management, Thar desert, Rajasthan.

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***Correspondence** | Subash S, Dairy Extension Section, SRS of ICAR-NDRI, Bengaluru-560030, India; **Email:** subashagri@gmail.com

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INTRODUCTION

Integrated crop livestock system is common in the Thar Desert of Rajasthan. Livestock rearing is an important enterprise not only for livelihood of weaker section of society but it also helps in meeting nutritional requirement of farm families in arid and semi-arid areas of Rajasthan. The cows and working bullocks bear on their patient back the whole structure of Indian Agriculture. Among various species of livestock, indigenous cattle play a vital role by providing milk for nutrition and manure as fertilizer for agriculture (National commission on cattle, 2002). The same is true even today though many significant efforts have been made since independence to revolutionize Indian agriculture. Next to agriculture, Animal Husbandry sector is the most important economic activity in Thar Desert of Rajasthan and about 90 per cent of the rural household

depends upon the livestock farming as the major source of supplementary income (National commission on cattle, 2002).

Feeding constitutes play a vital role in cost of milk production. Indigenous cattle in arid zone are generally maintained on grazing/browsing and supplementary feeding of locally available crop residues, tree base fodder and agro industrial by-products at house hold level (Bohra, 2012). Most components have multiple purpose for example crop and tree residues have a role of animals feed while indigenous bulls are important sources of drought power. It is therefore, important that feed costs are to be kept at lowest possible level in order to make milk production profitable. Producing more milk by timely feeding of good quality ration in required quantity is ultimately profitable than feeding otherwise. Selection of proper feeding standards

using right combination of feeding the adequate quantity with other related practices are some of the ways which will enable the farmer to feed his cows and buffaloes more economically, increase their efficiency and make the dairy more paying. Nutrition is one of the important aspects, which influence livestock production. Hence, tremendous research work has been done at different part of the country on the various aspects of animal nutrition (Yatoo et al., 2013). Therefore, it is very important to survey the livestock population in rural areas in respect of nutritional status of animals, which differ from region to region and district to district as per availability of crop residues and other feeds. Nutritional status of indigenous cattle is different in Rajasthan state because the availability of crop residue, dry and green fodder, plant material and feeding system have variability in state, which influences nutritional status of animals. Therefore, the present study was planned to study feeding practices adopted by dairy farmers for management of indigenous cattle.

MATERIAL AND METHOD

The present study was conducted in Rajasthan state during the year 2015-16. Rajasthan has been divided into 33 districts and a total eight indigenous cattle breed are located in different parts of Rajasthan state. Out of the eight indigenous cattle breeds, the three important major breeds of indigenous cattle i.e. Sahiwal, Tharparkar and Rahti breed were chosen and accordingly Sri-Ganganagar, Jodhpur and Bikaner district were selected purposively based on cattle population. Further, six blocks from three districts viz, Suratgarh, Gharshana from Sri-Ganganagar; Balesar and Phlodi from Jodhpur; and Lunkarnsar and Dhungargarh from Bikaner were selected randomly and from each block one village was selected randomly and a total of 180 indigenous cattle holder were selected as a primary respondent for the present study. The data was collected with the help of semi-structure interview schedule, personal meeting with local healers, focus group discussion and direct observation in the study area to analysed feeding and milking management practices of study area. Percentage and mean were used for analysis of collected data using MS-Excel spreadsheets.

RESULTS AND DISCUSSION

FEEDING SYSTEM FOLLOWED IN THAR DESERT

Indigenous cattle are extensively grazed whole days though out the year in Thar Desert of the Rajasthan. On return home in the morning and evening cattle are given water and may be feed some dry fodder and on the time of milking they fed some fermented grain mash made mostly from Bajra or Barely to milking cattle. This is prepared in the morning by crushing the grain and mixing with water.

The grain which used for cattle fed is may be home grown or purchased from market. Farmers mostly depended on dry fodder round the year, green fodder are available only in rainy season which is in pasture or arable land as a weed or other natural grasses. Farmers also provide some other concentrate like cotton cake, mustered oil cake and other readymade fed which are available in market. In case of lactating cattle they provide some supplement feed like boiled cluster bean, jiggery juice and boiled methi seed jiggery etc.

MAJOR FODDER PLANTS/TREES OF THAR DESERT

Major fodder tree and plant which used as a fodder for feeding to animals during drought or scarcity of fodder have been summarized in Table 1. People stored these plant leaves like Khejri tree leaf or they used it as a daily grazing of cattle on filed after milking morning as well as evening.

Table 1: Plant name and their useful part used by farmers for cattle feeding

S. NO.	Plant name	Botanical name	Season	Part used
1.	Dhaman grass	<i>Garuga pinnata</i>	Round the year (rainy season)	Leaves
2.	Lucerne	<i>Medicago sativa</i>	March – May	Leaves
3.	Safed kikar	<i>Acacia leucophloea</i>	Feb-March	Leaves and pod
4.	Khejri (loong)	<i>Prosopis cineraria</i>	Oct-Jan.	Leaves and pod
5.	Berseem	<i>Trifolium alexandrinum</i>	Dec- April	Leaves
6.	Ber (Pala)	<i>Ziziphus mauritiana</i>	Nov– Jan.	Leaves
7.	Sewan	<i>Lasiurus scindicus</i>	Round the year (rainy season)	Leaves

FEEDING MANAGEMENT PRACTICES ADOPTED IN THAR DESERT

It could be inferred from the Table 2 that majority (58.3%) of the respondents preferred grazing and stall feeding system, followed by 41.7 per cent of them practiced only stall feeding. (Jarial et al., 2015; Das et al., 2003) also found that most of the respondents prefer stall and grazing feeding system. Migration of cattle from their place to other pasture area was found in the study area due to non availability of fodder crops during summer or drought seasons. In the case of types of fodder fed to cattle, mostly dry fodder was fed due to its availability round the year and the green fodder was available only during the rainy seasons. Majority of the respondents fed concentrate feed to cattle and 61.6 per cent people given both type of concentrate

i.e. homemade and purchased, followed by 38.4 per cent of the respondents depend on only purchased feed materials. (Jarial et al., 2015) also reported that majority of the respondents fed concentrate feed to cattle. The materials used for preparing homemade concentrate feed were bajra, wheat, barley, gram grain and guar. On the whole, the respondents provided concentrate feed only to milch cattle. (Jarial et al., 2015) also found similar results of feeding concentrate to only milch animals. The average quantity of concentrate feed given was 4.9 kg /day /animal and average cost per kg of concentrate was Rs. 23.68 / kg. In the case of mineral mixture, majority (90.0%) of the respondents did not feed any mineral mixture to cattle and only 10.00 per cent of them were aware about it and fed mineral mixture to their cattle. None of farmers knew about preservation of fodder crop methods like hay and silage. In respect to calf management practices, 63.8 per cent of the respondents fed colostrum to calf after the placenta was shed, followed by 25.00 per cent fed immediately after birth of calf. (Mahla et al., 2015; Jarial et al., 2015; Das et al., 2003) also reported that majority of the respondents fed colostrum to calf after the placenta was shed. The present study revealed that most of the respondents did not have complete knowledge about good dairy farming practices including balanced feeding strategies.

MILKING MANAGEMENT PRACTICES ADOPTED IN THAR DESERT

Basic hygienic way of milking involves method of milking, gender of milking, practices for let-down of milk, washing of udder before milking, drying of udder after washing, cleanliness of milkman, removing of hairs near to udder and removing first stream of milk from each teat (Abdessemed et al., 2016). It could be inferred from Table 3 that, majority of farmers (88.80%) used knuckling method of milking followed by, 8.5 per cent full hand milking method and 2.7 per cent used stripping method. (Kumar et al., 2014; Mathur et al., 2010) also reported that majority of farmers used knuckling method but (Bashir et al., 2013) reported that majority of the respondents adopted full hand method for milking. It shows that, the respondents of the present study are not much aware about the benefits of the full hand milking method.

In respect of gender of milkmen, 53.80 per cent women were involved in milking followed by 1.6 per cent men and the rest (44.42%) was reported as both men and women were alternatively involved in milking as per their convenience. (Sheikh et al., 2015) reported similar finding of mostly women's involvement in milking activity. The findings of the present shows that, the majority of the milking related activities are carried out by women at household level. Hence, farm women need to trained more especially in the area of clean milk production practices. In case of calf rearing practices, none of the farmers followed weani-

Table 2: Feeding management practices adopted by cattle farmers of Thar Desert of Rajasthan

Feeding management practices				
S. No	Particulars		Respondents (n=180)	
			Frequency	Percentage
1	Feeding system			
	i	Grazing	0	0
	ii	Stall feeding	75	41.7
	iii	Stall + grazing	105	58.3
2	Type of feeding			
	i	Intensive	70	38.8
	ii	Extensive	110	61.2
3	Grazing land			
	i	Own land	42	23.3
	ii	Community land	112	62.2
	iii	Migrate for grazing	26	14.4
4	Type of fodder			
	i	Green	60	33.4
	ii	Dry	180	100
5	Chaffing of fodder			
	i	Yes	145	80.5
	ii	No	35	19.5
6	Concentrate feeding			
	i	Yes	180	100
	ii	No	0	0
7	Type of concentrate			
	i	Homemade	0	0
	ii	Purchased	69	38.4
	iii	Both	111	61.6
8	Feeding of mineral mixture			
	i	Yes	18	10
	ii	No	162	90
9	Preservation of fodder crops			
	i	Yes	0	0
	ii	No	180	100
10	Time of calf feeding			
	i	After the placenta is shed	115	63.8
	ii	Immediately after birth	45	25
	iii	When the calf stand on its feet	20	11.2

ng practices for calf rearing and most (48.80 %) of the respondents adopted calf suckling practices for milk let-down followed by, 45.70 per cent adopted both calf suckling and

Table 3: Milking management practices adopted by cattle farmers of Thar Desert of Rajasthan

Milking management practices			
S. No	Particulars	Respondents (n=180)	
		Frequency	Percentage
1	Method of milking		
	i Machine	0	0
	ii Hand	180	100
2	Method of hand milking		
	i Knuckling	160	88.8
	ii Stripping	5	2.7
	iii Full hand milking	15	8.5
3	Gender of milking person		
	Man	3	1.6
	Woman	97	53.8
	Both man and woman	80	44.6
4	Weaning		
	i Yes	0	0
	ii No	180	100
5	Practices for let-down of milk		
	i Allow calf for suckling	88	48.8
	ii Feeding concentrate + udder massaging	10	5.5
	iii Both of above	82	45.7
6	Suckling of calf		
	i Before milking	22	12.3
	ii During Milking	0	0
	iii After milking	0	0
	iv Both time	158	87.7
	v Not allowed	0	0
7	Frequency of milking		
	i Once in a day	0	0
	ii Twice in a day	180	100
	iii Thrice in a day	0	0
8	Drying of cattle		
	i Self	157	87.3
	ii Intermittent milking	23	12.7
Status of clean milk production			
1	Washing/Cleaning of milking persons hand		
	i Yes	36	20
	ii No	144	80
2	Washing/ Cleaning of dairy animal		
	i Daily	0	0
	ii Alternate day	0	0
	iii Once in week	55	30.5
	iv Never	125	69.5

3	Cleaning of the udder		
	i Yes	180	100
	ii No	0	0
4	Removal of hair around the udder		
	i Yes	0	0
	ii No	180	100
5	Removal of first two streams of milk from each teats		
	i Yes	0	0
	ii No	180	100

udder massaging and 5.50 per cent adopted feeding concentrate for let-down of milk. (Mahla et al., 2015) found that majority of the respondents adopted calf suckling practices for milk let-down. Further, vast majority (87.7%) of the respondents allowed calf for suckling both the times before and after milking, followed by 12.3 per cent allowed only before milking. (Bashir et al., 2013) also found that, majority of the respondents did not allow calf for suckling. Frequency of milking followed was generally twice a day morning and evening that is in agreement to report of (Bashir et al., 2013).

Majority (87.3%) of the respondents followed self-drying of cattle followed by, 12.7 per cent followed intermediate milking for drying of cattle for high milk production in next calving period. The respondents have started intermediate milking 2.5 to 3 months before next calving period of cattle. (Jarial et al., 2015) found that most of the respondents follow self-drying of cattle. In the case of clean milk production, only 20 per cent of the respondents followed washing of hands before milking. Because majority of the farmers were not aware about the drawbacks caused by the unhygienic milk handling which clearly indicated the lack of knowledge about the clean milk production practices at field level. Majority of the farmers were not maintaining cleanliness in their house and milking premises. About 69.50 per cent of the farmers never washed or cleaned their cattle, followed by 30.50 per cent had bathed their cattle weekly once in summer season and monthly once in winter season. (Jarial et al., 2015) also revealed that most of the farmers never wash or clean their cattle. Most of the people follow washing of udder with normal water before milking but (Jarial et al., 2015) reported that majority of the respondents did not followed this practice. Further, most of the respondents were not aware of removal of hair from the udder and the practice of discarding the first two streams of milk from each teat. Further, after milking majority of the respondents were not following the practice of not allowing the animal to sit soon after milking at least for twenty minutes which is very helpful in prevention of mastitis. Very less percentage of farmers were found using properly cleaned milk utensils which is very important in hygienic milking practices. Instead of using separate uten-

sils for milking, most of them were habitual in using of utensils which were commonly used in their kitchen and most of the time they uses only normal water for cleaning of milking utensils.

CONCLUSION

The main resources for indigenous cattle feeding in Thar Desert of Rajasthan consisted of two categories; i.e., natural pastures, and crop residues. Most of the feed was not given to indigenous cattle at optimum level and not to optimum period of growth thus the feeding management quality is poor. Feed availability is a major constraint for smallholder farmers. Majority of the respondent in Thar Desert faced scarcity in the dry season. Farmer were not aware about the drawbacks caused by the unhygienic milk handling which clearly indicated the lack of knowledge about the clean milk production practices at field level. Majority of the farmers were not maintaining cleanliness in their house and milking premises; and they never washed or cleaned their cattle. It showed that status of feeding and milking management practices for indigenous cattle management is very poor at field level arid region of Rajasthan. Hence, it is important to enhance feeding and milking management practices of indigenous cattle through trainings and awareness programmes that ultimately increase the socio-economic status of indigenous cattle farmers.

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CONFLICT OF INTEREST

The authors have declared no conflict of interest.

AUTHORS' CONTRIBUTION

All authors contributed equally in constructing the experimental study, collection, analysing data and preparing Manuscript.

REFERENCES

- Abdessemed D, Avdeenko VS, Avdeenko AV (2016). Diagnosis and therapy of subclinical mastitis in lactating dairy cows. *J. Anim. Health. Prod.* 4(3): 95-100.

- Anonymous (2002). Report of the National Commission on Cattle (Rashtriya Govansh Ayog) July 2002. Department of Animal Husbandry & Dairying Ministry of Agriculture Government of India, New Delhi.
- Bashir BP (2013). Milking management practices followed in selected areas of the Kottayam district of Kerala state. *J. Life Sci.* 5(1): 53-55.
- Bohra HC (2012). Feed production technologies for sustainable livestock production in arid area. Central arid zone research institute, Jodhpur. Pp 38.
- Das S (2003). A multivariate analysis of dairy farming practices among rehabilitated and nomadic Van gujjars in Hardwar, Uttaranchal, Ph.D. thesis (unpublished), NDRI Karnal.
- Jarial S, Kumar A, Padmakumar V (2015). Assessment of feeding practices, nutritional status and gap for dairy buffaloes in hilly districts Tehri Garhwal and Pithoragarh of Uttarakhand, India, *Indian J. Anim. Sci.* 83(9): 960-963.
- Kumar S (2014). Studies on breeding, health care and milking management practices adopted by the dairy owners in Shahdol district of MP, India. *Int. Res. J. Biol. Sci.* 3(10).
- Mahla V (2015). Study about socio-economic status and calf rearing management practices adopted by cattle keepers of western Rajasthan, India. *Indian J. Agric. Res.* 49(2). <https://doi.org/10.5958/0976-058X.2015.00029.3>
- Mathur P (2010). Problems and prospects of improved cattle management in arid western plain zone of Rajasthan.
- Sheikh AS (2015). Kankrej cattle management practices followed in rearing at northern part of Gujrat. *LSL.* 78-86.
- Yattoo MI, Dimri U, Sharma MC (2013). Status of micro mineral deficiency in cattle in kashmir valley. *J. Anim. Health Prod.* 1(3): 24-28.