Feeding and other management practices of Pulikulam cattle rearers in its native tract

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Abstract: Pulikulam cattle are native cattle breed of southern Tamil Nadu reared by the nomadic herd rearers and bull rearers. A field study was conducted to collect information on existing management practices followed by the Pulikulam cattle rearers at Pulikulam cattle breeding tract during November, 2020. A total of 60 nomadic rearers and 60 Pulikulam bull rearers were randomly selected from the breeding tract. Nomadic rearers practising grazing only, 70% of them migrate for grazing throughout the breeding tract. Grazing at hilly area was practised by 16.67 percent respondents and 13.33 percent respondents grazed at common pasture land. Sale of manure and male calves were the main source of income for the nomadic cattle rearers. Milking was practiced only in the morning time by the nomadic rearers in the Sivaganga district. Concentrate feed or mineral mixture feeding was not practised by the nomadic Pulikulam cattle rearers. It is concluded that no scientific management practices especially feeding management is in practice. Adoption of balanced feeding and supplementation with mineral mixture could improve the performance of this breed of cattle.

Keywords: Bull baiting game, Feeding Management, Native Cattle breed, Nomadic herd and Pulikulam Cattle

Management practices play a major role in exploiting full potential of dairy animals. Feeding management is one of the important factors in dairy farming which constitutes 70 per cent of production cost. However, traditional animal keepers follow own feeding, breeding and housing practices for their herd (Sheikh et al. 2011). Documenting the management practices are important to understand the strength and weakness of animal rearing system and it will be helpful to identify appropriate scientific interventions to improve the management practices thereby improve the livelihood of the livestock farmers. Pulikulam cattle are native breed of southern Tamil Nadu reared in Sivaganga, Madurai and Virudhunagar districts. The breeding tract of Pulikulam cattle lies between 9°30' and 10°30'N latitude and between 77°47' and 78°49'E longitude. The climate of the region is semi-arid tropical and the mean temperature during summer is 42°C to 43°C and relative humidity is 40 to 45%. The predominant soil of Sivaganga district is black red sandy soil and it falls in the southern zone of agro-climatic zone of Tamil Nadu. (Sivaganga district groundwater brochure, 2008). Pulikulam cattle are comparatively smaller than Kankeyam cattle, other native cattle of Tamil Nadu but are very active and capable of much endurance. The average weight of female cow is 200 kgs and bull is 350 kgs. The Pulikulam cattle have moderately long face, well developed hump which is short in female and large in male, horns are long, curved inside with pointed edges and the ears are moderately long (Srinivasan and Sathiamoorthy 2020). The Pulikulam bulls are very vigorous mainly maintained for *jallikattu* or bull baiting game.

Pulikulam cattle are reared by two types of rearers. One type of rearers keep the Pulikulam cattle as a nomadic herd and other group of rearers rear only bulls for bull baiting game. The Pulikulam cattle are mainly reared in herds of 50 to 500 animals mostly kept in open area in the outskirts of villages. The main source of income for the Pulikulam cattle rearers are through the sale of manure, manure sold through a system of penning and also through the sale of male calves. The prominent male calves from the nomadic herds are being purchased by the bull rearers and trained for *jallikattu* or bull baiting game. The management practices of Pulikulam cattle show a lot of variations among the farmers. Hence, this study was conducted to document the management practices followed by the Pulikulam cattle rearers in its breeding tract.

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The present study was conducted in Pulikulam cattle breeding tract viz., Sivaganga Madurai and Virudhunagar districts of Tamil Nadu, India during November, 2020. A field study was carried out to collect information on the management practices followed by the Pulikulam cattle rearers, both nomadic rearers and bull rearers. A total of 60 nomadic rearers and 60 Pulikulam bull rearers were selected randomly from three districts viz., Sivaganga, Madurai and Virudhunagar and data were collected using personal interview technique through structural schedule. The data was tabulated and interference was drawn.

Feeding management practices adopted by the nomadic Pulikulam cattle rearers and Pulikulam bull rearers are presented in Table 1.

Majority (83.33%) of the Nomadic Pulikulam cattle rearers migrate throughout the breeding tract for the purpose of grazing their animals and follow fixed route for grazing for particular months. Mostly they migrate after harvesting of paddy crop. They keep the animals in their own village or any particular village for a period of five to six months, remaining six months they migrate for grazing, as well as to earn revenue through manure by adopting penning. Penning is a practice in which the Pulikulam

Table 1 Feeding Management followed by Pulikulam cattle rearers

S. No	Management Practice	Nomadic rearers (n=60)		Bull rearers (n=60)	
		Frequency	Per cent	Frequency	Per cent
1	Type of rearing				
	Nomadic/ Migratory	50	83.33	0	0
	Stationary	10	16.67	60	100
2	Feeding pattern				
	Grazing only	60	100	42	70.00
	Stall feeding	0	0	8	13.33
	Grazing with stall feeding	0	0	10	16.67
3	Grazing site				
	Common pasture land	08	13.33	36	60.00
	Harvested field	0	0	12	20.00
	Fallow land	-	0	12	20.00
	Hilly area	10	16.67	0	0
	Migrate for grazing	42	70	0	0
4	Feeding of cultivated green fodder				
	Yes	0	0	8	13.33
	No	60	100	52	86.67
5	Type of dry fodderfed				
	Paddy straw	0	0	48	80.00
	Others dry fodder	0	0	12	20.00
6	Concentrate feeding				
	Yes	0	0	58	96.67
	No	60	100	2	03.33
7	Type of concentrate with grazing				
	Rice bran and oil cake	0	0	44	73.33
	Rice bran, grain and gram dust	0	0	16	26.67
8	Feeding of tree fodder				
	Yes	4	6.67	22	36.67
	No	56	93.33	38	63.33
	<i>Leucaenaleucocephala/Sesbania grandiflora</i>	54	90	54	90.00
	Other tree fodder	06	10	06	10.00
9	Feeding of mineral mixture				
	Yes	0	0	0	0
	No	60	100	60	100
10	Special feeding after calving				
	Yes	02	3.33	0	0
	No	58	96.67	0	0

cattle are kept in the agricultural land of farmers for one night, the manure and urine that the animals excrete nourish the field and thereby the nutrient status of the soil of the agricultural land is improved.

Apart from that only 16.67 per cent of Pulikulam cattle rearers keep their animals in their village. They do not migrate to different places for grazing. These rearers are present only in Sivaganga taluk of Sivaganga district. In case of Pulikulam bull rearers, all the respondents (100%) keep the bulls only in their villages.

It could be inferred from Table 1 that all the nomadic rearers follow grazing practise only. However, 70.00, 13.33 and 16.67 percent of Pulikulam bull rearers followed grazing, stall feeding and grazing with stall feeding practices respectively. The data on grazing site for nomadic rearers revealed that 70% of the respondents migrate for grazing throughout the breeding tract, 16.67 percent respondents grazed at hilly area and 13.33 percent respondents grazed their animals at common pasture land.

In Pulikulam bull rearers 60 per cent grazed at common pasture land followed by 20 per cent at harvested field and 20 per cent grazed at fallow land. Patel et al. (2016) reported that majority of professional Kankrej cattle breeders in Banaskantha district were landless and marginal farmers. They mainly depend on grazing their animals on common property resources (Gochars). All the respondents in the Nomadic rearers group did not feed cultivated green fodder. Because, majority of them rearing Pulikulam cattle as a nomadic herd. In Pulikulam bull rearing group majority (86.67 %) of respondents did not feed cultivated green fodder, only 13.33 per cent respondents fed green fodder to their bulls and that was also only during the monsoon season. Similar finding was observed by Garg et al. (2005) and Sinha et al. (2009).

The nomadic rearers did not feed any dry fodder to their animals. But 80 per cent of Pulikulam bull rearers fed paddy straw as dry fodder and 20 per cent of bull rearers fed other locally available dry fodders. Results of this finding are in line with Sabapara et al. (2010) that 98 per cent of farmers in the tribal areas of south Gujarat fed only paddy straw and 2 per cent farmers fed sorghum straw. Similar findings were observed by Tomar and Thakur (2002) and Deoras et al. (2004). Rathore et al. (2010) reported that pearl millet was the main dry fodder fed by the cattle keepers of Churu district of Rajasthan. Godara et al. (2018) reported that wheat straw was the main dry fodder with pearl millet fed by the buffalo rearing farmers of western Haryana.

No respondents in the nomadic rearers group fed concentrate feed to their animals. In Pulikulam bull rearers 96.67 percent respondents fed concentrate feed to their bulls only three months prior to *jallikattu* or bull baiting game season, remaining period they did not feed concentrate feed. Results of this finding is contrary to the finding of Kumar et al. (2017) that majority of the

Table 2 Milking management and other management followed by Pulikulam Cattle rearers (n=60)

S. No	Management practice	Per cent
1	Milking method	
	Machine	0
	Hand milking	100
2	Frequency of milking	
	Once per day	100
	Twice per day	
3	Gender of milking person	
	Male	10
	Female	
	Both	90
4	Practice of let down of milk	
	Allow calf to suck	100
	Feed concentrate and udder massage	
5	Washing of hand before milking	
	Yes	100
	No	0
6	Milk production	
	Less than one liters per day	30
	1-2 lites per day	70
	More than 2 liters per day	0
7	Practice of weaning	
	Yes	0
	No	100
8	Sale of Manure	
	Yes	100
	No	0
9	Price of dry manure	
	Rs. 1/ kg	20
	Rs. 1-2/ Kg	80
10	Sale of calves	
	Male calves	100
	Female calves	0

indigenous cattle farmers of Thar district of Rajasthan fed concentrate feed to their cattle.

All the bull rearers fed only homemade concentrate mixture. 73.33 per cent respondents mix only rice bran and oilcake and 26.67 per cent respondents mix rice bran, grain and gram dust in concentrate feed mix. Result of this finding is contrary to the findings of Kumar et al. (2017) that 38.4 percent of indigenous cattle farmers fed only purchased concentrate mix and 61.6 per cent respondents fed both homemade and purchased concentrate feed. Sabapara et al. (2010) reported that 7 per cent of farmers fed only home produced concentrate mix and 4 per cent respondents provided compounded cattle feed. Similar finding was observed by Garg et al. (2005).

Majority (93.33%) of nomadic rearers did not feed tree fodder only 6.67 per cent respondents fed tree fodder. In Pulikulam bull rearers group only 36.67 percent respondents fed tree fodders to

their bulls and 63.33 per cent did not feed any tree fodder to their bulls. *Sesbania grandiflora* or *Leuceana leucocephala* is the main tree fodder fed by majority (90 %) of respondents remaining 10 per cent respondents fed other tree fodders. Cent per cent in the nomadic rearers group and Pulikulam bull rearers group did not give mineral mixture to the animals. Results of this finding is in accordance with results of Godara et al. (2018) who reported that 61 per cent of buffalo farmers in the western Haryana did not feed any mineral mixture to the animals. Findings of Manohar et al. (2014) and Dixit et al. (2010) were also at par with this result.

Majority (96.67%) of the respondents in the nomadic rearers group did not provide any special feed to cows after calving only 3.33 percent respondents provide energy rich feeds to cows after calving. Contrary to this finding of this study Sabapara et al. (2010) reported that majority of the respondents (96%) maintaining dairy animals in the tribal area of south Gujarat followed to feed special feeding after calving. They fed energy rich feed mixed with echbolic ingredients. The energy rich feed will meet out the immediate energy requirement due to colostrum or milk production. Similar finding was reported by Divekar and Saiyed (2008).

Milking management and other management practices followed by the Pulikulam cattle rearers are presented in Table 2. Milking of Pulikulam cattle is practised only in Sivaganaga district. All the respondents in the district practised hand milking only. Result obtained in the present study is similar with finding of Kumar et al. (2017) who reported that all the Indigenous cattle rearers in Thar district of Rajasthan adopted hand milking only. All the respondents in the present study milked only one time per day only in the morning. Seventy per cent of respondents reported milk yield per animal as 1- 2 liters per day and 30 percent of respondents reported less than one liter of milk per day per animal. Evening milking was not practised by any of the respondents. All the respondents (100 %) did not practise weaning of calves so calves were allowed to suck throughout the day. In respect to the gender of the milking person, 10 per cent were men only and 90 per cent were either men or women. Findings of Sheikh and Parmar (2015) and Kumar et al. (2017) were in line with the present study. All the respondents allowed calf to suck the udder to stimulate let down of milk. The results of this study are similar as observed by Garg et al. (2005) and Kumar et al. (2006). Regarding Clean milk production practice all the respondents (100%) washed their hands before milking. This finding is similar to the finding of Rathore et al. (2010).

Sale of manure was the main source of income for the Pulikulam Cattle rearers. They earn revenue either through penning practice or collect manure, dry it and sell the manure. All the respondents (100 %) practised sale of manure. Regarding sale price of dry manure only 20 per cent of respondents were selling the manure for less than Rs.1 per kg and 80 per cent respondents were selling

Table 3 Bull baiting game training followed by the Pulikulam Bull rearers (n=60)

S. No	Characteristic/ Category	Per cent
1	Swimming	
	One time per week	36.66
	Two times per week	63.34
2	Soil digging using horns	
	Twice per week	75
	More than twice per week	25
3	Long walk	
	Yes	53.33
	No	46.67
4	Age at first participation in gaming	
	2-3 years	23.33
	>3-4 years	76.67

it for Rs. 1 to 2 per kg. All the respondents (100%) sold male calves and do not sell female calves.

Data on bull baiting game practice followed by the bull rearers is presented in Table 3. Three months before the game season the bull rearers start to prepare their bulls for the game. Mostly *jallikattu* or bull baiting game is conducted during Januray and February month. Only during this period they feed concentrate feed to the bulls. Three main types of training are given to Pulikulam bulls to prepare them for bull baiting game. They include, swimming practice in local ponds, digging the soil with horns and long-distance walking. Swimming practice two times per week was adopted by 63.33 per cent respondents and 36.66 percent respondents allowed only one time swimming practice per week. Another important practice is allow the bulls to dig the soil vigorously using their horns, 75 per cent respondents allowed 2 times digging practice per week and 25 per cent respondents allowed more than two times digging practice per week. Another practice was allowing the bull for long distance walking, 53.33 per cent respondents allowed the bull for long walk once in a week and 46.66 percent respondents did not provide long walk practice to the bulls. Majority of respondents (76.67 %) allowed their bulls to participate in bull baiting for the first time at the age of three to four years and 23.33 per cent of respondents allowed their bulls to participate in the game for the first time at the age of two to three years. Results of this study were similar to the findings of Priyadharsini et al. (2019) who reported 51.7 per cent of respondents allowed their bulls to participate in the game first time in the age of 2.5 to 3.5 years.

Conclusions

Pulikulam cattle are reared by nomadic rearers following low or zero input system of management. They do not feed any concentrate feed to their animals. Migration for grazing is practised through a particular route in the breeding tract. Common pasture land and grazing area in the nearby hills are the main grazing sites. Pulikulam cattle are mainly reared for their manure

and bull calves which are used in the *jallikattu* or bull baiting game which place a major role in conservation of this breed. No scientific management practices especially feeding management is in practice. Adoption of balanced feeding and supplementation with mineral mixture could improve the performance of this breed of cattle.

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