RESEARCH ARTICLE

Feeding Management Practices Followed by Jaffarabadi Buffalo Owners in Rural Areas of Junagadh District of Gujarat, India

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Abstract

A field study was conducted in Junagadh district of Gujarat to ascertain the housing management practices followed by Jaffarabadi buffalo owners and data were collected from randomly selected 320 respondents through personal interview with the help of structured interview schedule. The study revealed that most (84.06%) of respondents followed stall feeding system for their buffaloes. About 59.38% of buffalo owners fed their buffaloes thrice or more in a day. Majority (75.62%) of respondents provided non-leguminous green fodder and 75.93% respondents fed groundnut gotar as a dry fodder. About 80.31, 84.06 and 91.88% of the respondents fed green and dry fodder as such, fed home-made concentrate feed and not followed scientific criteria for feeding of concentrates, respectively. Majority (62.18%) of respondents fed concentrates during milking. About 85.31, 88.12 and 96.88% of buffalo owners fed concentrates to young calves, heifers and advanced pregnant heifers, respectively. Only 23.43 and 26.25% of the respondents provided mineral mixture and salt to their buffaloes. 80.31% of respondents provided water three times in a day *ad libitum*.

Key words: Feeding, Jaffarabadi buffalo, Management, Practices, Rural areas.

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Introduction

Livestock husbandry is a major agro-economic activity since antiquity and is backbone of rural economy in India. Different dairy co-operative societies and different dairy farming development schemes accelerated the number of milch animals especially the buffalo and are considered more remunerative and productive as compared to cows (Khan and Parashari, 2019). According to 20th livestock census (Anonymous, 2020), buffalo population in India is 109.85 million showing increased by 1.1 % over previous livestock census. India holds first position in total milk production and also in buffalo population in the world. About 20.5 % of the total livestock is contributed by buffaloes (Anonymous, 2020). Buffalo contributes 48.34 % to the total milk production of India (Anonymous, 2021[b]). Gujarat contributed 7.71 % (15.29 million tonnes) of milk to the total milk production in India during 2019-20 (Anonymous, 2021[b]). Gujarat holds 3rd position with contributing 9.60 % of the total buffalo population in India (Anonymous, 2021[a]).

Understanding the buffalo husbandry practices followed by farmers in a region plays a vital role in the improvement of productivity of buffaloes and economy of milk producers. It is also useful to identify the strengths and weakness of the rearing system to help formulate suitable intervention policies (Sivaji *et al.*, 2018). Each component of management practices interacts either independently or in combination to affect the productivity of the livestock. The adoption of scientific feeding and the use of feed and fodder by-products enhances the farmer's economy in the dairy system (Kumar *et al.,* 2020). In dairy animals, poor growth, delayed

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sexual maturity, late conception and less production are mainly due to insufficient feeding (Pata *et al.,* 2018). The information regarding feeding management practices followed in Jaffarabadi buffaloes in its home tract Junagadh district is meagre. Therefore, this study was planned to collect information on these aspects being followed by Jaffarabadi buffalo owners in Junagadh district of Gujarat.

Materials and Methods

A field survey was conducted in Junagadh district of Gujarat during January, 2022 to April, 2022. Junagadh district is comprised of nine talukas, of which four talukas were randomly selected. From each selected taluka, eight villages were selected at random. Ten Jaffarabadi buffalo owners from each village were randomly selected using a multi-stage random sampling technique with the help of veterinary officer / village dairy cooperatives which constituted a total of 320 respondents. While selecting respondents due care was taken to ensure that they were evenly distributed in the village and truly represented buffalo management practices prevailing in the area. The selected respondents were single interviewed and the desired information was collected regarding housing management practices with the help of structured interview schedule. Data were tabulated and analyzed as per standard statistical tools to draw meaningful inferences (Snedecor and Cochran, 1994).

Results and Discussion

The data related to feeding management practices followed by Jaffarabadi buffalo owners are presented in Table 1. This revealed that most (84.06%) of buffalo owners followed stall feeding system, while only 15.94 % of the buffalo owners followed stall feeding as well as grazing system for their buffaloes. None of the farmers followed 100% maintenance on grazing alone. The present findings are in line with the report of Sabapara and Fulsoundar (2016). However, contrary to this Chandra and Singh (2021) reported that 83.50 % of the respondents followed the stall feeding as well as grazing system for feeding of animals. Nearly cent per cent (99.38%) of buffalo owners adopted individual feeding system to their buffaloes, while only 0.62 % followed group feeding to their buffaloes, which concurred with the results of Patel *et al.* (2019). It is a good practice to feed the buffaloes according to their production level and also to save docile animals being harassed by vicious animals during feeding. The awareness of buffalo owners was very high in adoption of this practice in the study area. Majority (59.38%) of the buffalo owners fed their buffaloes thrice or more in a day compared to twice (39.06%) or once in a day (1.56%). On the contrary Sabapara *et al.* (2016) reported that 89.2 % of the respondents supplied feed twice a day to their dairy animals in South Gujarat. Most (89.06%) of the buffalo owners cultivated green fodder crops for their animals, may be because majority of them had large size land holdings and irrigation facilities. Highly significant ($p<0.01$) difference was observed with respect to cultivation of green fodder between the talukas. Similar finding was observed by Manohar *et al.* (2014). In contrast, Sabapara *et al.* (2016) reported that 82.00 % of the respondents did not cultivate green fodder for their animals in South Gujarat.

Overall about 80.31% of the respondents fed green as well as dry fodders as such, while 19.69 % of the buffalo owners offered chaffed green as well as dry fodders to their buffaloes. Only 5.00 % of the buffalo owners used chaff cutter (Table 1). Regarding processing of green and dry fodder, highly significant ($p<0.01$) difference was observed between four talukas. These findings agreed with the results of Patel *et al.* (2019). However, present results are contrary to the earlier report of Godara *et al.* (2018), where 83.00 % farmers adopted chaffing of green and dry fodder. This might be due to fact that farmers were unaware about the importance of using chaff cutter for efficient utilization of fodders. Most (84.06%) of the buffalo owners provided home-made concentrate (prepared from home produced ingredients) to their animals followed by home-made + compound cattle feed (13.75%) and compound cattle feed as concentrates (2.19%). Present findings are in line with the report of Viswkarma *et al.* (2018), but contradicted the findings of Sabapara *et al.* (2010). Most (91.88%) of the buffalo owners did not follow any scientific criteria for feeding of concentrates to their animals, while 8.12 % of the buffalo owners followed scientific criteria for feeding of concentrates to their buffaloes. These findings are in accordance with the findings of Prajapati *et al.* (2021). In contrast to this, Kochewad *et al.* (2013) found that 70.00 % of the respondents followed scientific criteria for feeding of animals. This might be due to fact that buffalo keepers are not aware about knowledge of balance feeding for their animals. All the buffalo owners fed concentrates two times in a day to their buffaloes, of which 62.18, 30.00 and 7.82 % buffalo owners fed the concentrates during milking, before milking and after milking, respectively. These findings are similar to those of Godara *et al.* (2018), but contradicted the findings of Khadda *et al.* (2017), who found 72.08 % of the respondents feeding concentrates after milking of their animals.

Most (85.31%) of the buffalo owners fed concentrates to their young calves; while 14.69 % of the respondents did not fed concentrates to their young calves. Present findings are in line with Manohar *et al.* (2014), but contrary to the results of Kumar *et al.* (2019), who observed only 19.50 % of the respondents feeding concentrate to young calves. About 88.12% of the buffalo owners fed concentrates to their heifers, while 11.88 % of the buffalo owners did not fed concentrates to their heifers. Significant ($p<0.05$) difference in concentrate

feeding to heifers was found between the four talukas. The present findings are similar to the report of Khadda *et al.* (2017), but in contradiction with the results of Manohar *et al.* (2014) that only 13.75 % of the respondents fed concentrates to their heifers.

Majority (56.56%) of the buffalo owners fed concentrates after soaking in water to their animals, whereas 40.00 and 3.44 % of the respondents fed concentrates as such and after soaking and boiling, respectively. Highly significant ($p<0.01$) difference in process on concentrates was found between the four talukas. Present findings are in accordance with Sabapara *et al.* (2016), but lower than that of Manohar *et al.* (2014). In our study, 96.88 % of the buffalo owners provided concentrates to their advanced pregnant heifers, while 3.12 % of the buffalo owners did not provide concentrates to their advanced pregnant heifers. Further, it was found that 66.57 % of the buffalo owners provided concentrates to their advanced pregnant heifers during last two month of pregnancy followed by 17.81, 10.00 and 2.5 % of the buffalo owners provided concentrates to their advanced pregnant heifers during last one month, last 15 days of pregnancy and confirmed pregnancy to calving, respectively (Table 1). Highly significant ($p<0.01$) difference was found between the talukas. Most of the development of foetus occurs during last 6 to 7 weeks of pregnancy and high yielders become well acquainted to digest concentrates which results in improved body weight and body condition of animals too. The present findings are in accordance with results of Sabapara *et al.* (2010). Most (97.19%) of buffalo owners followed special feeding after calving to their animals. Majority of the respondents were aware about feeding care after calving of buffaloes. They fed energy and protein rich (Bajara - *Pennisetum glaucum* L., Wheat - *Triticum aresivum* L., etc.) feed mixed with echbolic ingredients, (Asaliya - *Barbarea verna*, Suva - *Anetheum sowa*, Methi - *Trigonellafoenum graecum* L. etc.) to provide sufficient energy for freshening and to prevent parturition stress. Highly significant ($p<0.01$) difference was found between the talukas in this regard. Present findings are similar to the earlier report (Khadda *et al.,* 2017). Only 23.43 % of the buffalo owners provided mineral supplements to their buffaloes, while 76.57 % buffalo owners did not provide mineral supplements to their buffaloes. Present observations are supported by Viswkarma *et al.* (2018). Feeding of mineral mixture was significantly ($p<0.01$) different between the talukas. These findings were in contradiction to Kumar *et al.* (2019), who reported 82.00 % of the respondents providing mineral supplements to their animals. Only 26.25 % buffalo owners provided extra salt to their animals. It might be due to lack of knowledge of buffalo owners. Feeding of salt was significantly ($p<0.05$) different between the four talukas, and concurred with the findings of Godara *et al.* (2018).

All of the buffalo owners provided water to their animals *ad libitum*, but restricted in frequencies in which two times (7.5% respondents), three times (80.31% respondents), four times (10.31% respondents) a day to free assess of water (1.88% respondents) were common in summer. Thus, the importance of water is known practically to all the respondents; and they provided water to their animals depending upon their resources. Significant ($p<0.05$) difference in frequency of watering was observed between the talukas. The present observations are similar to the findings of Sabapara *et al.* (2016). Majority (59.38%) of the buffalo owners depended on bore-wells followed by well (40.62%) as a source of drinking water for their animals, which varied highly significant ($p<0.01$) between the talukas. These findings are supported by the results of Patel *et al.* (2019). Majority (60.00%) of the buffalo owners practiced watering to their animals by cement tanks, while 40.00 % respondents used bucket for watering their animals.

Conclusions

From the study, it can be concluded that most of the Jaffarabadi buffalo owners in Junagadh district followed stall feeding and used cultivated green fodder crops for their buffaloes. Major ingredient used as a dry fodder in study area was groundnut gotar. Majority of the Jaffrabadi buffalo owners fed homemade feed as concentrate mainly during milking after soaking in water. Only few respondents practiced to feed green and dry fodders after chaffing. Majority of them fed concentrates to young calves and heifers, but did not provide mineral mixture supplements and salt to their animals and were not aware about scientific aspects of feeding management practices properly. So, the awareness about feeding management practices of Jaffarabadi buffalo owners need to be improved in study areas by organizing awareness camps, exposure visits and training programmes by various government organizations and NGOs. Scientific and balanced buffalo feeding management practices will be helpful for improving socio-economic condition of the buffalo owners as well as enhanced production of the buffalo.

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Table 1: Distribution of the buffalo owners according to feeding management practices followed in different talukas of Junagadh district of Gujarat

Sr. No.	Practices	Maliya Hatina (N=80)		Vanthali (N=80)		Bhesan (N=80)		Visavadar (N=80)		Overall (N=320)	
		n	%	n	%	n	%	n	%	n	%
1	Feeding system										
	Stall feeding	59	73.75	67	83.75	74	92.50	69	86.25	269	84.06
	Grazing	00	00	00	00	00	00	00	00	00	00
	Both	21	26.25	13	16.25	06	7.50	11	13.75	51	15.94
	X^2						10.89				
2	Feeding of milch animal										
	Individual	80	100.00	79	98.75	79	98.75	80	100.00	318	99.38
	Group feeding	00	00	01	1.25	01	1.25	00	00	02	0.62
	X^2						2.01				
3	No. of times of feeding										
	Once	03	3.75	00	00	00	00	02	2.50	05	1.56
	Twice	33	41.25	31	38.75	32	40.00	29	36.25	125	39.06
	More	44	55.00	49	61.25	48	60.00	49	61.25	190	59.38
	X^2						6.03				
4	Cultivation of green fodder										
	Yes	63	78.75	71	88.75	73	91.25	78	97.50	285	89.06
	No	17	21.25	09	11.25	07	8.75	02	2.50	35	10.94
	X^2						14.19**				
5	Fodder availability										
	Green										
	Non-legume	58	72.50	72	90.00	53	66.25	59	73.75	242	75.62
	Legume	00	00	00	00	02	2.50	00	00	02	0.62
	Non-legume + Legume	12	15.00	07	8.75	24	30.00	13	16.25	56	17.50
	Feeding natural grass from bunds	61	76.25	58	72.50	63	78.75	57	71.25	239	74.68
	Sugarcane top	02	2.50	01	1.25	00	00	00	00	03	0.93
	X^2						22.98*				
	Dry										
	Wheat straw	00	00	00	00	00	00	00	00	00	00
	Groundnut gotar	58	72.50	69	86.25	53	66.25	63	78.75	243	75.93
	Jowar straw + groundnut gotar	25	31.25	21	26.25	17	21.25	15	18.75	78	24.37
	Wheat & Jowar straw + GN gotar	00	00	05	6.25	07	8.75	09	11.25	21	6.56
	Any other, specify	16	20.00	19	23.75	27	33.75	26	32.50	88	27.50
	X^2						16.81*				
6	Green and Dry fodder fed										
	As such	71	88.75	53	66.25	67	83.75	66	82.50	257	80.31
	Chaffed	09	11.25	27	33.75	13	16.25	14	17.50	63	19.69
	X^2						14.44**				
7	Types of concentrate feeding										
	Home made	69	86.25	65	81.25	72	90.00	63	78.75	269	84.06
	Compounded cattle feed	02	2.50	03	3.75	01	1.25	01	1.25	07	2.19
	Homemade + Compound cattle feed	09	11.25	12	15.00	07	8.75	16	20.00	44	13.75
	X^2						6.47				
8	Scientific criteria followed for feeding										
	Yes	05	6.25	07	8.75	06	7.50	08	10.00	26	8.12
	No	75	93.75	73	91.25	74	92.50	72	90.00	294	91.88
	X^2						0.83				
9	Time of feeding concentrate										
	During milking	59	73.75	51	63.75	47	58.75	42	52.50	199	62.18
	After milking	01	1.25	06	7.50	08	10.00	10	12.50	25	7.82
	Before milking	20	25.00	23	28.75	25	31.25	28	35.00	96	30.00
	X^2						11.68*				

10	Concentrate feeding to young calves										
	Yes	66	82.50	71	88.75	67	83.75	69	86.25	273	85.31
	No	14	17.50	09	11.25	13	16.25	11	13.75	47	14.69
	X^2						1.47				
11	Concentrate feeding to heifers										
	Yes	69	86.25	77	96.25	65	81.25	71	88.75	282	88.12
	No	11	13.75	03	3.75	15	18.75	09	11.25	38	11.88
	X^2						8.95*				
12	Concentrate fed										
	Dry	51	63.75	27	33.75	29	36.25	21	26.25	128	40.00
	After soaking	29	36.25	47	58.75	49	61.25	56	70.00	181	56.56
	After soaking and boiling	00	00	06	7.50	02	2.50	03	3.75	11	3.44
	X^2						31.71**				
14	Feeding of concentrate to advanced pregnant heifers										
	No feeding	03	3.75	01	1.25	04	5.00	02	2.50	10	3.12
	For last 15 days	20	25.00	02	2.50	07	8.75	03	3.75	32	10.00
	For last one month	15	18.75	10	12.50	17	21.25	15	18.75	57	17.81
	For last two months	41	51.25	63	78.75	51	63.75	58	72.50	213	66.57
	Confirmed pregnancy to calving	01	1.25	04	5.00	01	1.25	02	2.50	08	2.50
	X^2						37.74**				
15	Special feeding after calving										
	Yes	80	100.00	80	100.00	78	97.50	73	91.25	311	97.19
	No	00	00	00	00	02	2.50	07	8.75	09	2.81
	X^2						14.97**				
16	Feeding of mineral mixture										
	Yes	09	11.25	26	32.50	19	23.75	21	26.25	75	23.43
	No	71	88.75	54	67.50	61	76.25	59	73.75	245	76.57
	X^2						10.64*				
17	Feeding of salt										
	Yes	12	15.00	29	36.25	21	26.25	22	27.50	84	26.25
	No	68	85.00	51	63.75	59	73.75	58	72.50	236	73.75
	X^2						9.42*				
18	Frequency of watering										
	2 times	08	10.00	07	8.75	04	5.00	05	6.25	24	7.50
	3 times	59	73.75	62	77.50	69	86.25	67	83.75	257	80.31
	4 times	13	16.25	06	7.50	07	8.75	07	8.75	33	10.31
	Free access	00	00	05	6.25	00	00	01	1.25	06	1.88
	X^2						17.70*				
19	Source of water										
	Well	65	81.25	22	27.50	27	33.75	16	20.00	130	40.62
	Bore well	15	18.75	58	72.50	53	66.25	64	80.00	190	59.38
	X^2						76.12**				
20	Method of watering										
	Bucket	32	40.00	23	28.75	36	45.00	37	46.25	128	40.00
	Cement tanks	48	60.00	57	71.25	44	55.00	43	53.75	192	60.00
	X^2						6.35				

n- Frequency, NS- Non-significant, * Significant at 5 % level, ** Significant at 1 % level.

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