Int.J.Curr.Microbiol.App.Sci (2019) *8*(3): 2426-2435

International Journal of Current Microbiology and Applied Sciences
***ISSN: 2319-7706* Volume 8 Number 03 (2019)**
Journal homepage: http://www.ijcmas.com

Original Research Article https://doi.org/10.20546/ijcmas.2019.803.286

Breeding, Calf and Health Management Practices Opted by Buffalo Owners in Junagadh and Porbandar Districts of Gujarat: A Comparative Study

B.A. Pata, M.D. Odedra, H.H. Savsani, A.R. Ahlawat*, T.K. Patbandha and A.B. Odedara

College of Veterinary Science & A.H., Junagadh Agricultural University, Junagadh – 362001, India

**Corresponding author*

A B S T R A C T

The study was conducted in Junagadh and Porbandar districts of Gujarat to compare breeding, calf and health management practices opted by buffalo owners (n=300). Majority of farmers practiced natural service (59%), late heat for insemination (76.34%), pregnancy diagnosis (90%) and treatment of anoestrous/repeaters buffaloes (90.33%). Most of respondents attended calving and took care of calves after parturition (98%) and cleaned calves (93.67%). However, few farmers practiced ligation/ cutting and disinfection of navel cord (14.33%) and feeding colostrum to calf (33.33%). Such above managemental practices varied between Junagadh and Porbandar districts ($P \leq 0.05$). Majority of owners dewormed their calves (71.67%), allowed to suckle (77%) one teat (91.33%) and offered greens (96.67%) or concentrate (94.67%) to calves at 3 months of age. Majority of respondents practiced vaccination (84.67%) particularly F.M.D. (68.67%), but few farmers dewormed their animals (11%). Buffalo owners cleaned water trough/ manger on every day in most cases (59.67%), but cleaned the shed on every alternate day (47.67%). Cleaning practices of waterer/ manger and shed differed statistically between the two districts ($P \leq 0.05$).Majority of owners isolate sick buffaloes (87.67%), used medicine for ectoparasites (80.67%), washed hind quarter after placenta expulsion (93%) and called livestock inspector to treat their buffaloes (55.33%). Calling livestock inspector or veterinary doctors for treatment of buffaloes varied in both districts ($P \leq 0.05$). Metabolic disorder was major problem in buffaloes (50.33%). Comparatively more number of owners in Porbandar reported reproductive problems but in less instance metabolic disorder than Junagadh district ($P \leq 0.05$).Above results indicated that farmers were aware about different breeding, calf and health care management practices. Further, certain managerial practices also differed markedly between Junagadh and Porbandar districts.

Keywords

Breeding, calf, health, management, buffaloes

Article Info

Accepted:
20 February 2019
Available Online:
10 March 2019

Introduction

India is leading the world in terms of milk production since 1998 and produced 165.4 million tonnes milk with per capita availability of milk 335g during 2016-17. Buffalo shared about 49.2% of the total milk produced in India (Anonyms, 2018). Buffaloes not only contributed significantly to national milk pail of the country but also have great demand for

meat owing to banning of cattle slaughter. Buffaloes also efficiently utilize the poor quality crop residues and convert to milk and meat as compared to cattle (El-serafy, 1991). Calves are considered as future replacement stock of herd. Hence, proper care and management could result a healthy replacement stock in a dairy farm. It has been reported that calf managemental as well as health care practices of dam play significant role on calf morbidity and mortality (Pal *et al.,* 2016, Patbandha *et al.,* 2017). Previous field studies in Gujarat revealed that farmers were aware about some aspects of calf management practices with wide variation from one part to another part of the state (Chaudhary *et al.,* 2016, Divekar *et al.,* 2016, Sabapara *et al.,* 2015, Patbandha *et al.,* 2017). In dairy buffaloes the production could be sustainable only when they remain healthy. Proper care and preventive measures could reduce the risk of disease outbreak or the negative impact on productivity due to disease (Kumar, 2015).

However, owing to money constraint or ignorance, some farmers treat their animals at home by paravets or traditional means (Sabapara, 2014) which incurred huge production and economic loss. Similar to calf management, the health care management of dairy animals varies in different parts of Gujarat as cited by different authors (Sabapara, 2014, Divekar *et al.,* 2016). The present experiment was designed to compare calf managemental and health care practices followed by the buffalo owners in Junagadh and Porbandar districts of Gujarat.

Materials and Methods

The study was conducted in Junagadh and Porbandar districts of south-west Gujarat during Jan-2017 to Feb-2018. Large number of farmers in this area reared buffaloes as well as the researcher was also familiar to the area, hence selected purposefully. Five talukas, 2 from Porbandar (Porbandar and Kutiyana) and 3 from Junagadh (Keshod, Mangrol and Manavadar), six villages from each taluka and 10 respondents from each village were selected randomly with total sample size of 300. The respondents selected were evenly distributed in the village and true representative of animal management practices prevailing in the study area. Information related to calf management and health care practices were collected using a pre-designed structured interview schedule. The interview schedule was prepared based on review of literatures and consultation with experts. The information related to buffalo calf management and health care management was collected.

Statistical analysis

Collected data were compiled, tabulated and presented as frequency and percent for better interpretation. The parameters between the two districts (Junagadh and Porbandar) were compared by chi-square test and considered as significant if $P \leq 0.05$.

Results and Discussion

Breeding management practices

Breeding management practices opted by the buffalo owners in Junagadh and Porbandar districts are depicted in Table 1. The different managerial practices related to buffalo breeding were similar between two districts. In the study area, overall majority of farmers practiced natural service (59%) and rest used artificial insemination. In Junagadh and Porbandar about 60.56 and 59% farmers practiced traditional natural service using the village bull which is comparable to Patel *et al.,* (2005), who found that 63% cases natural service practiced by the farmers. However, Sunil *et al.,* (2011) reported higher number of respondents practising natural service.

On an average 76.34% respondents reported that late heat is the best time for insemination, with 72.78 and 81.67%, respectively in Junagadh and Porbandar districts. These findings are in contrary with Khadda *et al.,* (2017) who found that 82.08per cent inseminate their buffaloes at mid heat. Moreover, Rangamma *et al.,* (2016) reported that 67.67% respondents followed AM-PM rule for insemination of buffaloes. In both Junagadh and Porbandar, majority of farmers preferred pregnancy diagnosis for confirmation of pregnancy (89.44 and 90.83%, respectively) and the overall value was 90%. These findings are comparable with other studies on dairy buffaloes (Singh *et al.,* 2015, Rangamma *et al.,* 2016). Farmers on an average 90.33% cases treated anoestrous/repeaters buffaloes which comprised of 87.78 and 94.17% in Junagadh and Porbandar district, respectively. The results are comparatively higher than Rangamma *et al.,* (2016), who observed that 68% farmers adopted treatment practices for anoestrous/repeaters buffaloes. Additionally, Sunil *et al.,* (2011) who found that only 5% farmers treated their milch animals for anestrous and repeat breeding problem.

Calf rearing practices

The buffalo calf rearing practices opted by dairy farmers in Junagadh and Porbandar districts are presented in Table 2. About 98% respondents attended calving and took care of the calves after parturition in the study area which differed significantly between Junagadh and Porbandar districts (99.45 vs. 95.83%, $P \leq 0.05$). The results are inconsonance with previous researchers (Bais and Singh, 2013, Sabapara *et al.,* 2015 and Kumar and Mishra, 2011), who reported presence of 95.33-100% farmers at the time of parturition. Though majority of buffalo owners in Junagadh and Porbandar districts cleaned calves after calving, there was marked variation of such practices between the two districts (96.67 vs. 89.17%, $P \leq 0.05$) and the overall value was 93.67%. These findings are supported by the others (Bais and Singh, 2013, Sabapara *et al.,* 2015 and Kumar and Mishra, 2011).

The results indicated that 95.56 and 70.83% respondents, respectively in Junagadh and Porbandar districts did not practice ligation/cutting and disinfection of the navel cord with overall value 85.67%. Such calf management activity differed statistically between the two districts (Table 2). The results are similar to the reports of Yadav *et al.,* (2016) and Godara *et al.,* (2017) but contrary to Bais and Singh, 2013, Sabapara *et al.,* 2015. The variation of results in different studies might be associated with the regional variation or the knowledge level of respondents.

Majority of respondents (66.67%) did not feed colostrum to new born calves within 1-2 hours after calving in the study area and such practice differed statistically between the two districts i.e. 61.11 and 75%, respectively in Junagadh and Porbandar district ($P \leq 0.05$). On the other hand, very less number of buffalo owners fed colostrum to calves within the recommended time of 1-2 hours soon after birth (Table 2). There was significant difference between Junagadh and Porbandar district in relation to feeding of colostrum to new born calf with time (38.89% vs. 25%, $P \leq 0.05$).These results are in accordance with study of Kushwaha *et al.,* (2007) and Maousami *et al.,* (2013). However, Sabapara *et al.,* (2015) reported that majority of respondents (97%) in South Gujarat offered colostrum to calves which might be attributed to their knowledge level on importance of feeding colostrum.

In this study, managerial practices like deworming of calves, weaning age of calves, number of teats allowed for suckling and age

at which greens or concentrated offered to calves were similar between the two districts (Table 2). In Junagadh district majority of respondents (72.22%) dewormed calves regularly. Similarly, in Porbandar 70.83% respondents dewormed calves regularly and the overall value was 71.67%. These results are in accordance with study of Rathore and Kachwaha (2009) and Godara *et al.,* (2017). Contrary to our result, Sabapara *et al.,* (2015) cited that about 48.76 and 40.67%, respectively farmers dewormed their caves regularly and occasionally.

In both Junagadh and Porbandar districts majority of buffalo owners allowed the calf to suckle their dam till natural weaning (72.22 and 76.67%, respectively), but in few cases the farmers weaned the calves (Table 2). Moreover, overall 77 per cent respondents allowed the calf to suckle their dam followed by 20.33% respondents practiced weaning of calf at the age of more than 3 months of age followed by 1.67 and 1%, respectively weaned the calf at 2 and 3 months of age.

These results are in accordance with study of Kushwaha *et al.,* (2007). Majority of respondents (93.89%) allowed suckling of calf to one teat of their dam and remaining 6.11% allowed two teats of dam in Junagadh district. However, in Porbandar, 87.5% buffalo owners allowed to suckle calf only one teat of their dam followed by 12.5% allowed two teats of their dam to suckle. Overall 91.33% respondents allowed to suckle calf to one teat of their dam followed by 8.67 allowed two teats of their dam. These findings are supported by Yadav *et al.,* (2016) and Sabapara *et al.,* (2015).

In the study area, overall 96.67 and 94.67%, respectively buffalo owners started offering greens and concentrate when the calves attend 3 months of age. In both Junagadh and Porbandar district about 96.67% respondents started offering greens to calves at the age of 3 months. Similarly, initial offering of concentrate to calves started at the age of 3 months in both the districts as reported by majority of buffalo owners (96.67 and 91.67%, respectively in Junagadh and Porbandar district). However, very few farmers started offering greens and concentrate to the calves within 1-2 month of age (Table 2). Comparatively more number of farmers offered concentrate to calves in Porbandar district than the Junagadh district at the age of 2 months (8.33 vs. 2.22, Table 2). These findings are well supported by Yadav *et al.,* (2016) but contrary to Sabapara *et al.,* (2015). Sabapara *et al.,* (2015) reported that majority of farmers did not offer concentrate to calves (97.33%) and offered greens to calves at the age of 2 months (82.33%).

Health management practices

Informations related to health management practices opted by the buffalo owners in Junagadh and Porbandar districts are depicted in Table 3. Though the central and state government is putting much emphasis on vaccination of bovines for prevention of infectious diseases, cent per cent farmers were not following the vaccination program. About 84.67% farmers followed vaccination program for their animals which comprised of 85.56 and 83.33%, respectively in Junagadh and Porbandar districts. The results indicated that in Junagadh district 70% buffalo owners practiced vaccination against F.M.D disease followed by 15.56% owners against H.S; while in Porbandar district 66.66% practiced vaccination against F.M.D disease followed by 16.67% against H.S. Overall 68.67% buffalo owners practiced vaccination against F.M.D disease followed by 16% owners against H.S. in the study area. These findings are comparable with previous studies carried out on buffalo owners (Kumar, 2015, Vranda *et al.,* 2017).

Table.1 Distribution of the buffalo owners according to breeding practices (n=300)

Sr. no.	Particulars	Junagadh	Porbandar	Overall	χ2 - Value
1	**Method of Breeding**				
	Natural	60.56(109)	56.67(68)	59.00(177)	0.450
	A.I.	39.44(71)	43.33(52)	41.00(123)	
2	**Stage of estrus for insemination/ service**				
	Early heat	6.11(11)	1.67(2)	4.33(13)	3.431
	Mid heat	21.11(38)	16.67(20)	19.33(58)	0.912
	Late heat	72.78(131)	81.67(98)	76.34(229)	3.149
3	**Pregnancy diagnosis**				
	Yes	89.44(161)	90.83(109)	90.00(270)	0.154
	No	10.56(19)	9.67(11)	10.00(30)	
4	**Treatment of anoestrous/repeaters**				
	Yes	87.78(158)	94.17(113)	90.33(271)	3.366
	No	12.22(22)	5.83(7)	9.67(29)	

Values within parenthesis indicate frequency

Table.2 Distribution of the buffalo owners according to calf rearing practices (n=300)

Sr. no.	Particulars	Junagadh	Porbandar	Overall	Chi square value
1	**Attended calving and took care of calves after parturition**				
	Yes	99.45(179)	95.83(115)	98.00(294)	4.790^{S}
	No	0.33(1)	4.16(5)	2.00(6)	
2	**Cleaning calf after parturition**				
	Yes	96.67(174)	89.17(107)	93.67(281)	6.827^{S}
	No	3.33(6)	10.83(13)	6.33(19)	
3	**Practiced ligation/ cutting and disinfection of navel cord**				
	Yes	4.44(8)	29.17(35)	14.33(43)	35.838^{S}
	No	95.56 (172)	70.83(85)	85.67(257)	
4	**Feeding of colostrum to new born calf within 1-2 hours**				
	Yes	38.89(70)	25.00(30)	33.33(100)	6.250^{S}
	No	61.11(110)	75.00(90)	66.67(200)	
5	**Deworming of calves**				
	Yes	72.22(130)	70.83(85)	71.67(215)	0.068
	No	27.78(50)	29.17(35)	28.33(85)	
6	**Weaning calves at the age of**				
	Calf allowed to suckle	77.22(139)	76.67(92)	77.00(231)	0.013
	2 months	0.56(1)	3.33(4)	1.67(5)	3.390
	3 months	1.11(2)	0.83(1)	1.00(3)	0.056
	> 3 months	21.11(38)	19.17(23)	20.33(61)	0.168
7	**Number of teats allowed for suckling**				
	One teat	93.89(169)	87.5(105)	91.33(274)	3.713
	Two teats	6.11(11)	12.5(15)	8.67(26)	
8	**Started giving green fodder after attaining age of**				
	1 month	1.66(3)	0.83(1)	1.33(4)	0.380
	2 months	1.67(3)	2.5(3)	2.00(6)	0.255
	3 months	96.67(174)	96.67(116)	96.67(290)	0.000
9	**Started giving concentrate after attaining age of**				
	1 month	1.11(2)	0(0)	0.67(2)	1.342
	2 months	2.22(4)	8.33(10)	4.66(14)	6.044^{S}
	3months	96.67(174)	91.67(111)	94.67(284)	0.168

Values within parenthesis indicate frequency, S - significant (P≤0.05)

Table.3 Distribution of buffalo owners according to health management practices (n=300)

Sr. no.	Particulars	Junagadh	Porbandar	Overall	χ2 - Value
1	**Vaccination of animals**				
	Yes	85.56 (154)	83.33(100)	84.67(254)	3.120
	No	14.44(26)	16.67(20)	15.33(46)	
2	**If yes which disease**				
	F.M.D.	70.00(126)	66.66(80)	68.67 (206)	0.372
	H.S	15.56 (28)	16.67 (20)	16.00 (48)	0.066
	No	14.44(26)	16.67(20)	15.33(46)	0.274
3	**Deworming of buffaloes**				
	Yes	9.44(17)	13.33(16)	11.00(33)	1.112
	No	90.56(163)	86.67(104)	89.00(267)	
4	**Cleaning interval of water trough and mangers**				
	Daily	59.44(107)	60.00(72)	59.67(179)	0.009
	Alternate day	12.78(23)	30.00(36)	19.67(59)	**13.517**^{S}
	Weekly	27.78(50)	10.00(12)	20.66(62)	**13.879**^{S}
5	**Cleaning interval of animal shed**				
	Daily	17.78(32)	30.83(37)	23.00(69)	6.930
	Alternate day	40.55(73)	58.34(70)	47.67(143)	**9.122**^{S}
	Weekly	41.67(75)	10.83(13)	29.33(88)	**33.022**^{S}
6	**Isolation of sick animals from healthy ones**				
	Yes	85.00(153)	91.67(110)	87.67(263)	2.960
	No	15.00(27)	8.33(10)	12.33(37)	
7	**Practices to control ecto-parasites**				
	Yes	78.89(142)	83.33(100)	80.67(242)	0.912
	No	21.11(38)	16.67(20)	19.33(58)	
8	**Wash of hind quarters after drop of placenta**				
	Yes	94.44(170)	90.83(109)	93.00(279)	1.442
	No	5.56(10)	9.17(11)	7.00(21)	
9	**Treatment of Sick animal**				
	Using local empirical knowledge	5.00(9)	4.17(5)	4.67(14)	0.112
	Livestock inspector	66.67(120)	38.33(46)	55.33(166)	**23.386**^{S}
	Veterinary doctor	28.33(51)	57.5(69)	40.00(120)	**25.521**^{S}
10	**Diseases occurrence**				
	Reproductive	12.78(24)	23.33(28)	17.33(52)	**5.025**^{S}
	Mastitis	30.00(54)	35.83(43)	32.33(97)	1.120
	Metabolic	56.67(102)	40.84(49)	50.33(151)	**7.737**^{S}

Values within parenthesis indicate frequency, S - significant (P≤0.05)

Further, Tewari *et al.*, (2018) observed that 91.50% dairy farmers practiced regular vaccination of their animals against diseases like F.M.D. and H.S. The results are contrary to Singh *et al.*, (2007), who reported that 46% farmers practiced vaccination against H.S. Majority of respondents (89.00%) did not deworm their buffaloes which included 90.56

and 86.67% in Junagadh and Porbandar districts, respectively. In a similar line, Meena *et al.,* (2008) and Kumar (2015) observed that 11.7-13.75% of farmers practiced deworming and majority did not carry out deworming of animals. It was contrary to findings of Tewari *et al.,* (2018), who indicated that that only 55% respondents practiced deworming at regular interval for their milch animals.

In this study, overall majority of respondents (59.67%) cleaned water trough and mangers on daily basis, whereas they cleaned animal shed on alternate day (47.67%). Daily cleaning of water trough and mangers by the buffalo owners was almost similar between the two districts (59.44 and 60%, in Junagadh and Porbandar districts respectively). However, cleaning of water trough/ manger on every alternate day and on every week showed marked variation between the two districts (Table 3). In Junagadh less number of respondents reported cleaning of water trough/ mangers on every alternate day (30 vs. 12.78%), but more number cleaned on weekly basis (10 vs. 27.78%) as compared to Porbandar district. These results are in accordance with Sreedhar *et al.,* (2017). However, the results are contrary to Rathore *et al.,* (2010), who observed that dairy farmers cleaned waterer/ manger in majority cases on weekly basis (78%).

In Junagadh district, 41.67% of farmers cleaned animal shed at weekly interval followed by 40.55% on alternative day and 12.78% on daily basis. On the other hand, 58.34, 30.83 and 10.83% buffalo owners respectively cleaned the animal shed on every alternate day, daily basis and weekly intervals in Porbandar district. Cleaning practices of animal shed on every alternate day and on every weekvaried between the two districts (Table 3). These results are contrary to findings of Rathore *et al.,* (2010), who reported that 91.5% and remaining on alternate day. Sreedhar *et al.,* (2017) also reported daily cleaning of animal shed by majority of farmers (59.17%) followed by every alternate day (25.83%) and weekly (15%).

In both the districts, majority of respondents isolated their sick buffaloes from healthy herd (85% in Junagadh and 91.67% in Porbandar) and the overall value was 87.67%. These findings are supported by Khadda *et al.,* (2017), who reported that 63.75% of the buffalo keeper isolated their sick animals from healthy herd, while Kumar (2015) observed that isolation of sick animals was practiced by 20% farmers only. About 78.89 and 83.33% respondents, respectively practiced to control ectoparasites in Junagadh and Porbandar district and the overall value was observed to be 80.67%. These findings are supported by Singh *et al.,* (2015) who observed that majority of respondents (68 %) followed various practices (dusting, spraying, injectable drugs) for the control of ecto parasites. However, the results are contrary to others (Rathore and Kachwaha, 2009, Kumar, 2015), who reported that 31.25-39.50% respondents took control measures against lice and ticks.

In the study area, overall 93% farmers practiced washing of hind quarters after the expulsion of placenta and in both districts such practices were similar (94.44 and 90.83% in Junagadh and Porbandar district respectively). These findings are supported by Tewari *et al.,* (2018) who observed that 65% were disposing the placenta by burial in soil and cleaned hind quarters while the remaining 35% did not cleaned hind quarters after drop of placenta.

Buffalo owners, in majority of cases (55.33%) called livestock inspector for the treatment of their animals followed by veterinary doctors (40%) and in few cases they treat using local

empirical knowledge. In Junagadh district more number of respondents called livestock inspector as compared to Porbandar (66.67 vs. 38.33%), but less number of farmers called veterinary doctors as compared to Porbandar (28.33 vs. 57.5%). These results are supported by Singh *et al.,* (2015), who observed that 66.3% of the respondents availed services of livestock inspectors, while 33.6% availed the services of qualified veterinarians for the treatment of their animals. These findings are contrary with Rathore and Kachwaha (2009) reported that9.50 and 18.75% respondents approached veterinary doctor and livestock assistant, respectively for treatment of sick buffaloes. Moreover, 45% buffalo owners in Punjab treated their sick animals by veterinary doctors (Kumar, 2015).

The buffalo owners reported that metabolic disorders were the major problem in buffaloes (50.33%), followed by mastitis (32.33%) and reproductive disorders (17.33%) in the study area. The occurrence of different diseases particularly reproductive and metabolic conditions as reported by the buffalo owners differed statistically between the two districts (Table 3). In Junagadh district, less number of farmers reported occurrence of reproductive problems than Porbandar district (12.78 vs. 23.33%), but more number of reported metabolic disorders (56.67 vs. 40.84%). The results are more or less comparable with Thakur *et al.,* (2017). Alteration of disease occurrence between the two districts might be attributed to different managemental practices followed by the farmers.

The results indicated that farmers were aware about most of the improved breeding, calf and health care management practices. Further, certain management practices related to dairy buffaloes also varied between Junagadh and Porbandar districts. Hence, while developing extension related policies for dairy farmers the regional variation of existing knowledge on different dairy husbandry managerial practices should be taken care.

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How to cite this article:

Pata, B.A., M.D. Odedra, H.H. Savsani, A.R. Ahlawat, T.K. Patbandha and Odedara, A.B. 2019. Breeding, Calf and Health Management Practices Opted by Buffalo Owners in Junagadh and Porbandar Districts of Gujarat: A Comparative Study. *Int.J.Curr.Microbiol.App.Sci.* 8(03): 2426-2435. doi: https://doi.org/10.20546/ijcmas.2019.803.286