

STUDY OF BUFFALO HUSBANDRY PRACTICES IN RURAL AREA OF CENTRAL GUJARAT IN INDIA

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ABSTRACT

An extensive survey was made to collect the information on buffalo husbandry practices in the Panchmahals district of central Gujarat through specially designed questionnaires on buffalo husbandry practices. Buffaloes were reared under intensive and semi intensive system of management. They were allowed for grazing on forage and foliage along with the road side, community land, forest land and fallow field for 4 to 6 h daily in rainy season in the year when green grasses are available. Only 27.08% and 15.42% of the farmers regularly fed common salt and mineral mixture respectively. Majority (72.08%) of the respondent fed concentrate to lactating buffaloes after the milking and 81.25% respondent fed concentrate mixture as a special ration to advance pregnant buffaloes. It was also observed that 95.41% of the respondent resorted to Artificial Insemination and 82.08% inseminate their buffaloes at mid heat stage. Majority (85%) farmer's believed in quick treatment for anestrus/repeater animals and 69.58% buffalo's rearers followed pregnancy diagnosis. It was also observed that 73.74% of the respondent got treated their sick animal by live stock inspector /veterinary doctor. Regarding vaccination against foot-and

mouth disease and hemorrhagic septicemia disease 76.25% of the respondents got vaccination their animals. Majority 63.75% of the buffalo's keeper isolated their sick animals from healthy animals.

Keywords: breeding, buffalo keepers, feeding, health care, management practices

INTRODUCTION

Livestock sector plays a critical role in the welfare of India's rural population. It contributes 9% of GDP and employs 8% of the labour force. This sector has emerged as an important growth leverage of Indian economy (Kurup, 2000). The role of buffalo as a main milk producing species is well known especially because buffalo is the main source of marketable surplus milk in India. There is no dichotomy about the view that if the buffalo is properly looked after, it can emerge as a more suitable animal for milk production than the imported Holstein (Kurian, 1988). India ranks first in the world with a total of 108.70 million buffalo population (GOI, 2012). Feeding management plays a very significant role in exploiting real potential of dairy animals (Sinha *et al.*, 2009).

Breeding and Health care management like

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preventive measures, vaccination, deworming and timely treatments ensure proper health of animals that promotes their productivity. In India 73% households have their own livestock. Tending, grazing, feeding and milking cows and buffaloes is one the largest sources of productive employment in rural India. In Gujarat state, especially in rural areas, the majorities of buffalo keepers are agriculture farmers and have not yet developed a commercial attitude towards dairy farming. Understanding the livestock management practices followed by farmers is necessary to identify the strengths and weaknesses of the rearing systems and to formulate suitable intervention policies. Keeping in view, above a comprehensive study was conducted to find out the various husbandry practices followed by the buffalo keepers in rural area of central Gujarat in the aspects of feeding, breeding and health care management.

MATERIALS AND METHODS

The present study was conducted in the tribal dominated area of Panchmahals district of central Gujarat during the year 2012 to 2014. The area of study is characterized as hot semi-arid climate and rainfed farming and livestock husbandry are the way of life of the rural masses. The mean summer temperature is 34.9°C while the mean winter temperature is 21.3°C indicating that the area falls under hyperthermic soil regime. The annual water needed or potential evapotranspiration of the area ranges between 1500 to 1600 mm, whereas actual mean usual precipitation is about 831 mm thus causing an annual water deficit of nearly 769 mm, Rain is confined to three months (July to September) with average rainy days about 31. The mean monthly maximum temperature

ranges from 26 and 40°C, while the minimum monthly temperature varies between 9°C and 26°C. The percentage of buffalo's population of district is 4.45% of Gujarat state and the breed viz Surti, Mehsana, and Banni are being reared. For data collection, four tehsil i.e. Godhra, Kalol, Goghamba and Jambughoda were selected from the district. Six villages from the each selected tehsil and ten buffalo rearing families from each village were selected randomly. Thus the data for study were collected from a total of 240 household by adopting the Proportionate Random Sampling Method. The data were collected by personal interview techniques through an interview schedule by administrating a developed questionnaire and also by direct observation in the farmer's flocks. The existing management practices relating to feeding, breeding and health care management were separately enlisted. The collected data were subjected to basic statistical analysis as per Snedecor and Cochran (1989).

RESULTS AND DISCUSSION

Feeding management practices

The data related to existing feeding management practices followed by buffalo keepers are presented in Table 1. The results of the present study revealed that the majority of buffalo keepers follow semi stall feeding system (66.25%) followed by stall feeding (33.75%). 65.42% of the respondents are allowed for grazing on forage and foliage along with the road side, community land and forest land and about one third (34.58%) of the respondents grazed their animals on their own pasture land with harvested and fallow field for 4 to 6 h daily in rainy season in the year when green grasses are available. Majority of (87.92%) farmers

Table 1. Feeding management practices.

Particulars	Frequency	Percent
Feeding system of animals		
Stall feeding	81	33.75
Semi stall feeding	159	66.25
Grazing only	00	00.00
Grazing site		
Common pasture land	157	65.42
Harvested/fallow field	83	34.58
Method of feeding for milch animals		
Group feeding	29	12.08
Individual feeding	211	87.92
Type of dry fodder		
Paddy straw	32	13.33
Maize, Bajra and Jowar stover	168	70.00
Paddy straw+Maize, Bajra stover+Wheat straw	40	16.67
Method of dry fodder feeding		
As such	219	91.25
Chaffed	21	08.75
Green fodder feeding		
Yes	240	100.00
No	00	00.00
If yes, then		
Round the year	91	37.92
Seasonal	149	62.08
Method of green fodder feeding		
As such	233	97.08
Chaffed	07	2.92
Green fodder production		
Round the year	91	37.92
Seasonal	149	62.08
Type of concentrate mixture		
Home prepared	14	5.83
Readymade	158	65.84
Mixture of home prepared and Readymade	68	28.33
Method of concentrate feeding		
As such	00	00.00
Soaking	189	78.75
Soaking and boiling	51	21.25

Table 1. Feeding management practices. (Cont.)

Particulars	Frequency	Percent
Mode of concentrate feeding to lactating buffaloes		
Before milking time	18	7.50
At milking time	49	20.42
After milking	173	72.08
Concentrates feeding to advanced pregnant buffaloes		
No special feeding	00	00.00
For last one month	36	15.00
For last two month	195	81.25
Confirmed to pregnancy	09	03.75
Special feeding after calving		
Yes	240	100.00
No	00	00.00
Concentrate feeding to young calf		
Yes	240	100.00
No	00	00.00
Concentrate feeding to heifer		
Yes	197	82.08
No	43	17.92
Quantity of concentrate fed to the lactating buffaloes per day		
1-2 kg concentrate	19	7.92
2-3 kg concentrate	189	78.75
3-5 kg concentrate	32	13.33
Feeding of common salt		
Regularly	65	27.08
Occasionally	78	32.50
Not feeding	97	40.42
Feeding of mineral mixture		
Regularly	37	15.42
Occasionally	104	43.33
Not feeding	99	41.25
Frequency of Watering		
2 times	49	20.42
3 times	174	72.50
Free assess of water	17	7.08

adopted individual feeding system to their milch animals as well as others to maintain the uniform plane of nutrition for milk production. Adoption of this practice shows full awareness of farmers in this behalf. This finding was in conformity with that of Modi (2003); Patel *et al.* (2005); Chowdhry *et al.* (2006) and Sabapara *et al.* (2010). The study also indicate that the 70% farmers fed their animals Maize, Bajra and Jowar stover as dry fodder followed by Paddy straw and Maize, Bajra, Jowar stover and Wheat straw (16.67%) and rest fed only paddy straw (13.33%). In addition to Maize, Bajra and Jowar stover and Paddy straw all the respondents provided some quantity of dry grasses collected during crop weeding to their animals as dry fodder.

The similar findings were observed by Deoras *et al.* (2004); Rathore *et al.* (2010) and Sabapara *et al.* (2010) in their studies in various regions of India. Majority of farmers (91.25%) practiced to feed dry fodder as such only 8.75% of the farmers offered chaffed dry fodders and all the farmers fed green fodder as such to their animals. It was observed that majority of farmers were unaware about the importance of using chaffed fodders. It might be due to inadequate knowledge of efficient utilization of feed and fodders. All the farmers practiced to feed green fodder to their animals as shown. Cultivation of green fodder Jowar, Maize, hybrid Napier grass and Lucerne is done round the year only by the farmers who had irrigation facilities (37.92%). The majority (65.84%) of the respondent fed readymade concentrate mixture to their animals followed by mixture of home prepared and readymade (28.33%) and home prepared (5.83%). Contrasting to these finding Chowdhry *et al.* (2006) and Sabapara *et al.* (2010) reported that majority of the respondents fed home prepared concentrate mixture to their animals. The main reason for fed

readymade concentrate mixture to their animals is to provide cheap and nutritious concentrate mixture for all the dairy farmers on subsidized rate from the Panchmahal District Cooperative Milk Producer Union, Godhra. Regarding pre treatment of concentrate mixture 78.75% of the respondents soaked concentrate mixture before feeding and 21.25% soaked and boiled concentrate mixture before feeding.

These findings are almost similar as observed by Malik *et al.* (2005); Kumar *et al.* (2006) and Rathore *et al.* (2010). Concentrate mixture was offered to the buffaloes twice in a day. Further it was observed that 72.08%, 20.42% and 7.50% of the farmers practiced to fed concentrates after milking, during milking and before milking, respectively. Practice of feeding concentrates mixture after milking was done with the idea to inculcate in them the habit of let down milk without concentrate being offered during milking. The present findings are in conformity with Sabapara *et al.* (2010). Contrary to report by this Rathore *et al.* (2010) reported that majority of animals were fed concentrates during milking. The data related to concentrate feeding to advance pregnant buffaloes were encouraging, because majority of buffalo keepers (81.25%) practiced to feed concentrates to their dairy animals during last 2 months of pregnancy. This is a good practice adopted by buffalo keepers because maximum development of fetus occurs during last 6 to 7 weeks of pregnancy. Present finding is an indication of successful communication by the technical agencies working in this area resulted in proper adoption by the farmers.

This finding was in agreement with findings of Sabapara *et al.* (2010). Modi (2003) and Chowdhry *et al.* (2006) also reported that the concentrates feeding during last 2 to 4 weeks

of pregnancy in 70% and 74% of dairy animals, respectively. Their findings are also in agreement with the present findings. All the respondents followed to feed special feeding after calving. They fed energy rich guar, wheat, barley, coconut etc. feed mixed with ajuvayan, Asaliya, Suva, Methi, etc. to prevent stress and to provide sufficient energy for freshening and increasing milk production. Similar findings were reported by (Patel *et al.*, 2005; Sabapara *et al.*, 2010). All the respondents followed to feed concentrate feeding for young calves and majority (82.08%) to feed concentrate feeding to their heifers. Farmers were feeding concentrate to their animals on the basis of their milk production. The majority of (78.75%) farmers fed 2 to 3 kg concentrate to the lactating buffalo per day. Only 27.08% respondents regularly provided extra salt to their milch animals whereas 32.50% of farmers occasionally follow this practice.

Very low percent of followers to feeding extra salt may be due to the practice of feeding compound cattle feed by about 94.17% of the farmers in the present study. Compound cattle feed contains nearly 2% to 3% of salt. Similar findings were reported by Singh *et al.* (2007a); Rathore *et al.* (2010) and Sabapara *et al.* (2010). In contrast to present findings Sohane *et al.* (2004) and Malik *et al.* (2005) observed supplementation of common salt followed by 60.74% and 88% respondents, respectively, in their surveys. Mineral mixture supplements were provided regularly by only 15.42% farmers to their milch animals where as 43.33% of farmers follow this practice occasionally. It might be due to the dairy farmers not aware about the benefits of mineral mixture feeding and unwillingness in use due to additional cost of mineral mixture they have to incur for feeding. More or less similar findings were reported by Modi (2003); Sohane *et al.* (2004); Patel *et al.*

(2005); Chowdhry *et al.* (2006); Rathore *et al.* (2010) and Sabapara *et al.* (2010). Contrasting to these finding Madke *et al.* (2006) reported very low (6.67%) of farmers fed mineral mixture to their animals. Almost all farmers provided water to their milch animals *ad lib.* in quantity but restricted in frequencies in which two and three times 20.42% and 72.50% respondents, respectively in a day were common in summer. Whereas, 7.08% respondents allowed buffaloes to free access for watering as water troughs were attached with manger. These findings are in line with Chowdhry *et al.* (2006) reported that the 72% of the respondents provide water 3 times a day but as much as the animals can drink.

Breeding management practices

The results regarding various breeding practices followed by the buffalo keepers are presented in Table 2. The results of the study revealed that all the respondents followed heat detection practice regularly based upon behavioral signs of estrus only. Among the various behavioral signs of estrus, majority (80.00%) of farmers believed on mucus discharge and bellowing as the symptoms of heat, whereas others trusted only on mucus discharge, frequent urination, mounting and continuously let down of milk as sole symptom of heat. It was also found that estrus symptoms were mostly pronounced in morning or cool hours of day. Similar findings were reported by Patel *et al.* (2005); Chowdhry *et al.* (2006) and Sabapara *et al.* (2010) in North Gujarat. The majority of buffaloes come in heat during the month of October to December. As regards to the stage of heat at which buffaloes were allowed for insemination 13.33%, 82.08% and 4.58% of the respondents followed the practice in early heat, mid heat and later heat, respectively. Majority of farmers (95.41%) used

Table 2. Breeding management practices.

Particulars	Frequency	Percent
Heat detection		
Yes	240	100.00
No	00	00.00
Methods of heat detection		
Symptoms	240	100.00
Teaser	00	00.00
Symptoms of heat detection		
Mucus discharge	27	11.25
Mucus discharge + bellowing	192	80.00
Frequent urination	07	2.91
Mounting	11	4.58
Any other	03	1.25
Stage of heat at which buffaloes were allowed for insemination/service		
Early heat	32	13.33
Mid heat	197	82.08
Later heat	11	4.58
Method of breeding		
Natural service	06	2.5
Artificial insemination	229	95.41
Both	05	2.08
Quality of breeding bull if natural service is follow		
Pure-bred	11	100.00
Nondescript	00	00.00
Pregnancy diagnosis (PD)		
Yes	167	69.58
No	73	30.42
If yes, then		
Own judgments	23	9.59
Qualified veterinarian	29	12.08
LI or AI worker	188	78.33
Treatment of Anoestrous/repeaters		
Yes	204	85.00
No	36	15.00
If yes, then		
By veterinary doctor/ stockman	169	70.42
By quacks	71	29.58

Table 2. Breeding management practices. (Cont.)

Particulars	Frequency	Percent
Breeding after calving		
2–3 months	93	38.75
3–5 months	131	54.58
After 5 months	16	6.67
Calving interval		
12–15 months	26	10.83
16–18 months	198	82.5
More than 18 months	16	6.66

scientific method of artificial insemination (AI) for breeding their dairy animals. Higher proportion for use of artificial insemination may be due to the availability of good infrastructure facilities, for the preservation and timely AI services with satisfactory results provided by AI workers in villages. Similarly, Chowdhry *et al.* (2006) and Sabapara *et al.* (2010) observed that majority of farmers adopted AI in dairy animals in North Gujarat. Regarding quality of breeding bull all the respondents used purebred bull. Regarding practice of pregnancy diagnosis was followed by 69.58% of the buffalo keepers, whereas remaining 30.42% of the respondents did not follow pregnancy diagnosis practice for their buffaloes. Among pregnancy diagnosis practice adopted, 78.33% pregnancy diagnosis were done by either livestock inspectors or AI workers followed by qualified veterinarian (12.08%) and own judgments (9.59%) at about 3 months of pregnancy. This finding is in accordance with findings of Sabapara *et al.* (2010). 85.00% respondents reported that they treated to their buffaloes for anoestrous and repeat breeding. Regarding the treatment of anoestrus and repeat breeding problem, majority 70.42% of the respondents properly treated their problematic buffaloes with the help of veterinary doctor and

stockman.

These findings are almost similar to Malik *et al.* (2005). Contrasting to this finding Rathore *et al.* (2010) reported that only 18.00% of the respondents properly treated their problematic cows by veterinary doctor and stockman. The majority (54.58 %) of the farmers breeding their buffaloes 3-5 months after calving followed by 2 to 3 months (38.75%) and after 5 months (6.67%). Calving interval was 10.83%, 82.50% and 6.66% of buffaloes had 12 to 15 months, 16 to 18 months and more than 18 months, respectively. These observations are similar to that of Patel *et al.* (2005); Chowdhry *et al.* (2006) and Sabapara *et al.* (2010) for crossbred cattle and buffaloes. The results of the present studies are indicative of very high level of awareness regarding this most important economic trait of dairy animal. Thus, it quite evident from the emerging results of various breeding practices followed by the buffalo keepers in the study area that majority of the respondents were adopting the recommended breeding practices.

Health management practices

The data related to health management practices followed by buffalo keepers are

Table 3. Health care management practices.

Particulars	Frequency	Percent
Vaccination against FMD and HS		
Yes	183	76.25
No	57	23.75
Deworming of milch animal		
Regular	64	26.67
Occasional	152	63.33
Not practiced	24	10
Deworming of calves		
Regular	87	36.25
Occasional	136	56.67
Not practiced	17	7.08
Navel disinfection of calf after birth followed		
Yes	31	12.92
No	209	87.08
Practices to control ecto- parasites		
Followed	240	100
Not followed	00	00
If yes, then		
Manual	165	68.75
Dusting of insecticides	75	31.25
Sanitary condition of shed / shelter / standing place		
Good	33	13.75
Satisfactory	62	25.83
Poor	145	60.42
Treatment of sick animal by		
Veterinary doctor	52	21.66
Livestock Inspector	125	52.08
Quacks	63	26.25
Isolate the sick animals from healthy animals		
Yes	153	63.75
No	79	36.25
Availability of veterinary facilities		
Good	63	26.25
Satisfactory	140	58.33
Poor	37	15.42



Figure 1. Housing and feeding system at progressive farmer's flock.



Figure 2. Feeding system at tribal poor farmer's flock.

presented in Table 3. The results of the present study revealed that the vaccination was adopted by 76.25% respondents for their animals against foot-and-mouth disease and hemorrhagic septicemia disease, while, 23.75% farmers did not follow vaccination practice against these diseases. No regular vaccination for BQ and anthrax was done in this area. The present findings are encouraging than finding of (Singh *et al.*, 2007 and Sabapara *et al.*, 2010). This practice was widely accepted by farmers which might be due to high level of awareness regarding protecting the animals from diseases by vaccination. Regular deworming in milch animals were followed by only 26.67% respondents whereas 63.33% respondents followed occasionally and remaining 10.00% did not give any medication to control the endo-parasites. This finding is well comparable with finding of Pawar *et al.* (2006) and Sabapara *et al.* (2010). It is also observed that very few (36.25%) respondents practiced deworming to their calves at regular interval while 56.67% respondents practiced deworming for calves in occasionally. Majority (87.08%) of respondents did not follow any practice to navel disinfection of calf after birth. However, Pawar *et al.* (2006) and Rathore *et al.* (2010) reported cutting and disinfection of navel cord in 31% to 37% cases. All the respondents practice to control ecto-parasites.

The majority (68.75%) of the buffalo keepers follow manual method of picking followed by (31.25%) dusting of insecticides to control ecto-parasites. However, Sabapara *et al.* (2010) reported that the majority of respondents (78.50%) did not follow any practice to control ecto-parasites in south Gujarat. Regarding to Sanitary condition of shed it was found that 13.75% animals sheds cleaned and good condition followed by satisfactory (25.83%). While 60.42% farmers did

not give more attention towards sanitary condition of shed. This might be due to that the farmers not aware about sanitary and hygienic condition in animal shed and insufficient space, inadequate drainage facility in shed thus ultimately leads to dampness and insanitary condition. The majority of (52.08%) respondents got treated their sick animals by livestock inspector followed by 26.25% of the respondents got treated their sick animals by quacks first and if sick animals were not recovered, then they contacted to veterinary doctor or stockman for treatment but that time the condition of sick animal become very serious. Only 21.66% of the buffalo keepers got treated their sick animals properly by veterinary doctor. Our study revealed that 63.75% of the buffalo keepers isolated their sick animals from healthy ones. This finding is well comparable with finding of Rathore *et al.* (2010) but lower than reported by Kumar *et al.* (2006). The percentage of respondents regarding veterinary facilities as good, satisfactory and poor was 26.25%, 58.33% and 15.42% respectively. It is observed that majority of buffalo keepers are not aware about scientific rearing of buffalo's particularly balanced feeding, vaccination, deworming and health care. Based on the observations collected it may be concluded that enhanced productive and reproductive performance of buffaloes and also a good amount of income can be generated by providing scientific knowledge to the buffalo keepers about buffalo rearing, which will not only be remunerative as source of income for livelihood but also contribute to the nutritional security.

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