



Existing cattle husbandry practices followed by the farmers in semi-arid region of central Gujarat

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ABSTRACT

An extensive survey was made to collect the information on cattle husbandry practices followed by the farmers in semi-arid region of central Gujarat through personal interview using a well-structured questionnaire. Majority of cattle keepers practised semi stall feeding system (57.08%) followed by stall feeding (42.92%). The majority of respondents (65.42%) fed readymade concentrate mixture to their animals followed by mixture of home prepared and readymade (28.33%) and home prepared (6.25%). Only 28.75 and 23.75% of the farmers regularly fed common salt and mineral mixture, respectively. Majority (67.50%) of the respondent fed concentrate to lactating cows after the milking and 81.25% respondent fed concentrate mixture as a special ration to their dairy animals during last 2 months of pregnancy. All the respondents followed heat detection practice regularly based upon behavioural signs of estrus, majority (80.00%) of farmers believed on mucus discharge and bellowing as the symptoms of heat. Majority of farmers (90.42%) used artificial insemination for breeding their dairy animals and 80.42% inseminate their cows at mid heat stage. Majority (81.67%) farmers' believed in quick treatment for anestrus/repeater animals and 69.58% cattle rearers followed pregnancy diagnosis.

Key words: Breeding, Cattle keepers, Feeding, Management practices

Livestock sector plays an important role in the national economy and in the socio-economic development of the country. The contribution of livestock sector to the national economy in terms of Gross Domestic Product is 3.9% at current prices (BAHFS 2013). India ranks first in the world with a total of 190.90 million cattle population and the share of milk production by exotic/crossbreed and indigenous cows were 24.3 and 20.9% of total milk production, respectively. Feeding management plays a very significant role in exploiting the real potential of dairy animals (Sinha *et al.* 2009). Breeding management practices like proper methods of heat detection, insemination at appropriate time, following pregnancy diagnosis and timely treatment of anoestrous/repeaters animals that promote their productivity. Given the genetic potential of the livestock, its production depends mostly on the managerial practices, which exhibits high variation across agro-climates. 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

study was conducted to find out the existing cattle husbandry practices followed by the farmers in semi-arid region of central Gujarat.

MATERIALS AND METHODS

The present study was conducted in the tribal dominated area of Panchmahal district of central Gujarat during the year 2013-14. The climatic condition of the study area is as hot semi-arid. The mean summer and winter temperatures are 34.9° and 21.3°C, respectively, indicating that the area falls under hyperthermic soil regime. The annual water needed or potential evapotranspiration of the area ranges between 1,500 to 1,600 mm, whereas actual mean usual precipitation is about 831 mm thus causing an annual water deficit of nearly 769 mm, rain is confined to 3 months (July to Sep) with average rainy days about 31. Multistage sampling method was adopted for the selection of respondents, 4 tehsil i.e. Godhra, Kalol, Goghamba and Jambughoda were selected from the district by random sampling method. Purposively 6 villages were selected randomly from the each selected tehsil. Representative cattle (10) rearing families having at least 2 milch cows from each village were selected randomly. Due care was taken to ensure that the selected respondents truly represented cattle managerial practised prevailing in the area. Thus 240 selected respondents were interviewed and the desire information was collected by using random sampling

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technique. The data were collected by personal interview techniques through an interview schedule by administering a developed questionnaire and also by direct observation in the farmer's flocks. Collecting information pertaining feeding and breeding management practices adopted by cattle rearers, questions were included in interview schedule regarding system and method of feeding, available feed and fodder, concentrate, common salt and mineral mixture feeding for different categories of cattle, etc. and breeding practices regarding methods and symptoms of heat detection, stage of heat at which cows were allowed for insemination/service, method of breeding, adoption of pregnancy diagnosis, treatment of anoestrous/ repeaters, duration of next breeding, calving interval, etc. The responses to each question in the schedule were coded and tabulated respondent-wise in a master sheet. The qualitative data were quantified accordingly and tabulated to draw meaningful inferences. Therefore, appropriate tables were prepared, keeping in view the specific objectives of the study. The collected data were subjected to basic statistical analysis (Snedecor and Cochran 1989).

RESULTS AND DISCUSSION

Existing feeding management practices: The data related to existing feeding management practices followed by cattle keepers are presented in Table 1. The results revealed that the majority of cattle keepers follow semi stall feeding system (57.08%) followed by stall feeding (42.92%). Sizeable respondents (62.92%) are allowed for grazing on forage and foliage along with the roadside, community land and forest land and about one-third (37.08%) of the respondents grazed their animals on their own pasture land with harvested and fallow field for 4-6 h daily in rainy season in the year when green grasses are available. Majority of farmers (84.16%) adopted individual feeding 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. These findings are in conformity with that of Patel *et al.* (2005), Chowdhry *et al.* (2006) and Sabapara *et al.* (2010). The study also indicated that the 70.00% farmers fed their animals maize, *bajra* and *jowar* stover as dry fodder followed by paddy straw+ maize, *bajra* and *jowar* stover + wheat straw (16.67%) and rest fed only paddy straw (13.33%). In addition to above all the respondents provided some quantity of dry grasses to their animals as dry fodder. Rathore *et al.* (2010) and Sabapara *et al.* (2010) observed similar findings in their studies in various regions of country. Majority of farmers (84.58%) practiced to feed dry 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 practised 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 (40.83%). The majority

(65.42%) of the respondent fed readymade concentrate mixture to their animals followed by mixture of home prepared and readymade (28.33%) and home prepared (6.25%). Contrasting to these findings 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 feeding 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. Concentrate mixture was offered to the cows twice in a day. Further, it was observed that 67.50, 25.00 and 7.50% of the farmers fed concentrates after milking, during milking and before milking, respectively. Practice of feeding concentrates mixture after milking was done 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 cows were encouraging, because majority of cattle keepers (81.25%) practised to feed concentrates to their dairy animals during last 2 months of pregnancy. This is a good practice adopted by cattle keepers because maximum development of fetus occurs during last 6-7 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. Chowdhry *et al.* (2006) also reported that the concentrates feeding during last 2 to 4 week of pregnancy in 70 and 74% of dairy animals, respectively. 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. All the respondents followed to feed concentrate feeding for young calves and majority (79.58%) to feed concentrate feeding to their heifers. Farmers were feeding concentrate to their animals on the basis of their milk production. The majority of farmers (58.75%) fed 2-3 kg concentrate to the lactating cow/ day. Only 28.75% respondents regularly provided extra salt to their milch animals, whereas 32.08% 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 93.75% of the farmers. Compound cattle feed contains nearly 2-3% of salt. Similar findings were reported by 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

Table 1. Existing feeding management practices (N-240)

Particular	Frequency	Per cent	Particular	Frequency	Per cent
<i>Feeding system of animals</i>			For last two month	195	81.25
Stall feeding	103	42.92	Confirmed to pregnancy	09	03.75
Semi stall feeding	137	57.08	<i>Special feeding after calving</i>		
<i>Grazing site</i>			Yes	240	100.00
Common pasture land	151	62.92	No	00	00.00
Harvested/fallow field	89	37.08	<i>Concentrate feeding to young calf</i>		
<i>Method of feeding for milch animals</i>			Yes	240	100.00
Group feeding	38	15.83	No	00	00.00
Individual feeding	202	84.16	<i>Concentrate feeding to heifer</i>		
<i>Type of dry fodder</i>			Yes	191	79.58
Paddy straw	32	13.33	No	49	20.42
Maize, bajra and jowar stover	168	70.00	<i>Quantity of concentrate fed to the lactating cows per day</i>		
Paddy straw+maize, bajra stover + wheat straw	40	16.67	1-2 kg concentrate	62	25.83
<i>Method of dry fodder feeding</i>			2-3 kg concentrate	141	58.75
As such	203	84.58	3-5 kg concentrate	37	15.42
Chaffed	37	15.42	<i>Feeding of common salt</i>		
<i>Green fodder feeding</i>			Regularly	69	28.75
Yes	240	100.00	Occasionally	77	32.08
No	00	00.00	Not feeding	94	39.17
If yes, then			<i>Quantity of common salt fed to the cow per day</i>		
Round the year	91	37.92	30-40g	49	33.56
Seasonal	149	62.08	40-50g	73	50.00
<i>Method of green fodder feeding</i>			Above 50g	24	16.44
As such	214	89.17	<i>Logic of common salt fed</i>		
Chaffed	26	10.83	Increase milk production	27	18.49
<i>Green fodder production</i>			Increase feed intake	48	32.88
Round the year	98	40.83	Both	71	48.61
Seasonal	142	59.17	<i>Feeding of mineral mixture</i>		
<i>Type of concentrate mixture</i>			Regularly	57	23.75
Home prepared	15	6.25	Occasionally	87	36.25
Readymade	157	65.42	Not feeding	96	40.00
Mixture of home prepared and readymade	68	28.33	<i>Quantity of mineral mixture fed to the cows per day</i>		
<i>Method of concentrate feeding</i>			30-40g	33	22.92
As such	00	00.00	40-50g	89	61.81
Soaking	189	78.75	Above 50g	22	15.27
Soaking and boiling	51	21.25	<i>Logic of mineral mixture fed</i>		
<i>Mode of concentrate feeding to lactating cows</i>			Increase milk production	106	73.61
Before milking time	18	7.50	Health improvement	17	11.81
At milking time	60	25.00	Both	21	14.58
After milking	162	67.50	<i>Frequency of watering</i>		
<i>Concentrates feeding to advanced pregnant cows</i>			2 times	66	27.50
For last one month	36	15.00	3 times	151	62.92
			Free assess of water	23	9.58

regularly by only 23.75% farmers to their milch animals whereas 36.25% of farmers followed this practice occasionally. It might be because the cattle rearers are not aware about the benefits of mineral mixture feeding and they are unwilling in use due to additional cost of mineral mixture, which they have to incur for feeding. Almost all farmers provided water to their milch animals *ad lib.* in quantity, but restricted in frequencies in which 2 and 3 times 27.50 and 62.92% respondents, respectively, in a day were common in summer. Whereas, 9.58% respondents allowed

cattle to free access for watering as water troughs were attached with manger.

Existing breeding management practices

The cattle keepers revealed that all the respondents followed heat detection practice regularly based upon behavioral signs of estrus only (Table 2). 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

Table 2. Existing breeding management practices (N-240)

Particular	Frequency	Per cent
<i>Heat detection</i>		
Yes	240	100.00
No	00	00.00
<i>Methods of heat detection</i>		
Symptoms	240	100.00
Teaser	00	00.00
<i>Symptoms of heat detection</i>		
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
<i>Stage of heat at which cows were allowed for insemination/service</i>		
Early heat	35	14.58
Mid heat	193	80.42
Later heat	12	5.00
<i>Method of breeding</i>		
Natural service	09	3.75
Artificial insemination	217	90.42
Both	14	5.83
<i>Quality of breeding bull if natural service is follow</i>		
Pure-bred	19	82.61
Nondescript	04	17.39
<i>Pregnancy diagnosis (PD)</i>		
Yes	167	69.58
No	73	30.42
<i>If yes, then</i>		
Own judgments	27	11.25
Qualified veterinarian	33	13.75
LI or AI worker	180	75.00
<i>Treatment of anoestrous/repeaters</i>		
Yes	196	81.67
No	44	18.33
<i>If yes, then</i>		
By veterinary doctor/stockman	167	69.58
By quacks	73	30.42
<i>Breeding after calving</i>		
2-3 months	91	37.91
3-5 months	132	55.00
After 5 months	17	7.08
<i>Calving interval</i>		
12-15 months	67	27.92
16-18 months	154	64.17
More than 18 months	19	7.91

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 the morning or cool hours of day. Similar findings were reported by Patel *et al.* (2005) and Sabapara *et al.* (2010) in North Gujarat. As regards to the stage of heat at which cows were allowed for insemination 14.58, 80.42 and 5.00% of the respondents followed the practice in early heat, mid heat and later heat, respectively. Majority of farmers (90.42%) used 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. Regarding practice of pregnancy diagnosis was followed by 69.58% of the cattle keepers. Among pregnancy diagnosis practice adopted, 75.00% pregnancy diagnosis were done by either livestock inspectors or AI workers followed by a qualified veterinarian (13.75%) and own judgments (11.25%) at about 3 months of pregnancy. This finding is in accordance with findings of Sabapara *et al.* (2010). Nearly 81.67% respondents reported that they treated their cattle for anoestrous and repeat breeding. Majority of the respondents (69.58%) properly treated their problematic cows with the help of veterinary doctor and stockman. 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 (55.00%) of the farmers breeding their cows 3-5 months after calving followed by 2-3 months (37.91%) and after 5 months (7.08%). Calving interval was 27.92, 64.17 and 7.91% of cows had 12-15 months, 16 to 18 months and more than 18 months, respectively. These observations are similar to that of Chowdhry *et al.* (2006) and Sabapara *et al.* (2010) for crossbred cattle and buffaloes. Our results are indicative of very high level of awareness regarding this most important economic trait of dairy animal. Thus, it is quite evident from the results of various breeding practices followed by the cattle keepers in the study area that majority of the respondents were adopting the recommended breeding practices.

Majority of cattle keepers were found to have very high level of awareness regarding breeding management but were not aware about scientific feeding management of cattle particularly feeding of balanced ration, mineral mixture and chaffed dry and green fodder. Based on the observations collected it may be concluded that enhanced production and reproductive performance of cattles and also a good amount of income could be generated by providing scientific knowledge to the farmers about cattle rearing, which will not only be remunerative as source of income for livelihood but also contribute to the nutritional security.

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REFERENCES

- Basic Animal Husbandry and Fisheries Statistics. 2013. Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India.
- Chowdhary N R, Patel J B and Bhakat M. 2006. An overview of feeding, breeding and housing practices of dairy animals under milk co-operative system in Banaskantha district of North Gujarat region. *Dairy Planner* 5 (12): 8-10.
- Madke P K, Murkute J S, Upadhye S V and Vedpathak C P. 2006.

- Adoption of scientific feeding practices by dairy farmers. *Indian Journal of Animal Research* **40** (2): 155–57.
- Malik B S, Meena B S and Rao S V N. 2005. Study of existing dairy farming practices in Uttar Pradesh. *Journal of Dairying, Foods and Home Science* **24** (2): 91–95.
- Patel J B, Patel N B, Prajapti K B and Brahmxatri K G. 2005. Animal husbandry practices for dairy animals in semi- arid region of Patan district. *Proceeding of National Seminar on Recent Advances in Conservation of Biodiversity and Augmentation of Reproduction and Production in Farm Animals*. pp 253. Sardar Krushinagar Dantiwada Agricultural University, Sardar Krushinagar.
- Rathore R S, Singh R, Kachwaha R N and Kumar R. 2010. Existing management practices followed by the cattle keepers in Churu district of Rajasthan. *Indian Journal of Animal Sciences* **80** (8): 798–805.
- Sabapara G P, Desai P M, Kharadi V B, Saiyed L H and Singh R R. 2010. Housing and feeding management practices of dairy animals in the tribal area of South Gujarat. *Indian Journal of Animal Sciences* **80** (10): 1022–27.
- Sinha R R, Dutt K T, Singh R R, Bhushan B, Singh M and Kumar S. 2009. Feeding and housing management practices of dairy animals in Uttar Pradesh. *Indian Journal of Animal Sciences* **79** (8): 829–33.
- Snedecor G W and Cochran W G. 1989. *Statistical Methods*. 8th edn. Iowa State University Press, Ames, Iowa.
- Sohane R K, Jha P B and Kumari A. 2004. Land utilization, feed resources, feeding practices, milk production and disposal pattern in some districts of North Bihar. *Rajasthan Agriculture University Journal of Research* **14** (1): 157–60.