

Housing and feeding management practices of dairy animals in the tribal area of South Gujarat

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ABSTRACT

A field survey was conducted to collect the first hand information on dairy animal management practices followed by the tribal dairy animal owners of Vansada taluka of Navsari district of South Gujarat. Existing housing and feeding management practices were studied through pre designed and pre tested questionnaire from 200 dairy animal owners. Close type of animal house was provided by 98% of the farmers. *Kaccha* type of floor was observed in 87% of the houses. Earthen plates with thatched roof were present in 94% of the animal sheds and wooden poles were used to support roof in 85.5% of the houses. *Pucca* drainage facility of urine was found in only 6% of animal shed. Paddy straw was used as dry fodder by 98% of farmers. All the farmers provided green natural border grasses of cultivated plots and grasses from fellow land. In addition to this 75% of farmers grew fodder crops. None of the farmers practiced silage making. Concentrates was fed to the animals after milking by 91% of the farmers. Mineral supplements were provided by only 30.5% of farmers to their milch animals.

Key words: Dairy animals, Feeding, Housing, Management practices, Tribal

Housing along with feeding management plays a very significant role in exploiting real potential of dairy animals (Sinha *et al.* 2009) and both of them constitute about 75% of total cost incurred on milk production in dairy animals (Gangwar 1988). Proper housing reduces the energy wastage in maintaining thermo neutral zone as well as reduces the incidence of diseases. It is generally agreed that an animal fail to prove its genetic potential for higher production when fed at low levels. Underfeeding of young stock leads to undergrowth, delay in maturity and lower productivity than optimum after attaining the breeding age. Understanding of livestock management practices followed by the farmers is crucial to identify the strengths and weakness of the animal rearing system and to devise appropriate intervention policies. The present study was undertaken to gather information regarding existing housing and feeding practices adopted by the tribal farmers of Vansda taluka of Navsari district and to provide help in adoption of scientific management practices in the area.

MATERIALS AND METHODS

A field survey was conducted to collect information on

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housing and feeding management practices followed by the dairy animal owners of Vansada taluka of Navsari district of south Gujarat. Vansada taluka is spread over 95 villages. Majority of the population in the taluka is tribal (Anonymous 2006). Out of 95 villages in the taluka, 20 villages having functional primary milk producers' co-operative societies were selected randomly, viz. Pratapnagar, Bhinar, Navatad, Mola amba, Khambhala, Kansariya, Dholumbar, Jamliya, Limbarpada, Manapur, Bartad, Vasiyatalav, Vaghabari, Motivalzar, Kavadej, Dubal faliya, Mindhabari, Motibhamti, Khataamba and Navanagar. Ten dairy animal owners from each selected villages were randomly selected with the help of Talati cum Mantri (Tehasildar) which constituted a total of 200 respondents. While selecting respondents due care was taken to ensure that they were evenly distributed in the village and truly represented animal management practices prevailing in the area. The selected farmers were interviewed and the desired information was collected with the help of pre-designed and pre-tested questionnaire.

RESULTS AND DISCUSSION

Housing management practices: Almost all the farmers did not keep their animals at a single place throughout the year or even for a whole day and night. The observation regarding the type of house, location of shed, type of roof, floor, manger and protection from inclement weather are

given in Table 1. Most of the tribal farmers (98%) had close type of animal house and among these 90% farmers had *kaccha* type while remaining 10% farmers had *pucca* type house for their animals. These houses are mainly made up of locally available cheap materials like bamboo, forest wood plastered with mud mixed with cow dung. Similar findings are also reported by others Srivastava and Promila 1983, Sharma 1996, Sahu 2001, Bainwad *et al.* 2007 and Kalyankar *et al.* 2008. Animals were kept outside the close shed throughout the year during day for cleaning and kept inside the shed during night time to protect them from wild animals of forest region. Kharadi *et al.* (2006) reported in their survey on Surti buffalo that majority of farmers (56.08%) keep their animals in the close house during day and night in their home tract, i.e. Charotar region of middle Gujarat. It means that such practice is followed in very wide area of Gujarat state. Out of 2 types of houses found, 51% of animals' houses were attached to human dwelling (some of them provided the partitioning wall of bamboo between them and the animals) and 49% were separate from their own dwelling but nearer to it. Similar findings were reported by Bainwad *et al.* (2007) and Kushwaha *et al.* (2007) who also worked out the situation in rural areas and observed that nearly 59.5 and 57.4% of the farmer had animal shed as part of their residence, respectively. Purpose of keeping animals within dwelling would be to save cost of construction of house as income becomes a limiting factor to spend anything on animal housing. While observing the same parameter, Srivastava and Promila (1983) observed 82% whereas Kokate and Tyagi (1991) found 95.5% of respondents were keeping animals in their houses with them. These figures are very high and are from city area or near city area. This is probably because of difficulty in getting more costly space of animals in city. Majority of animal houses (87%) had *kuchcha* floor. This *kuchcha* floor was earthen and muddy floor type in 79.5 and 7.5%, respectively (Table 1). Farmers had the belief that animals feel comfortable during sitting and standing. Rest of animal houses i.e. 13% have *pucca* floor. Patel *et al.* (2005), Chowdhary *et al.* (2006) in North Gujarat and Singh *et al.* (2007b) in Rajasthan in their survey observed that most of the animal houses had *kuchcha* floor. Their findings are in accordance with present study. It is general observation that *pucca* floor is better than earthen floor for animals to keep them free from worm problems and also from hygienic point of view. The respondents under this study showed unawareness about these problems and mainly they gave preference to earthen floor, as it remained cheap and comfortable to animals. Earthen plates with thatched roof, cemented sheets roof and galvanized iron sheets roof were used in 94, 4.5, and 1.5% of the animal sheds, respectively. The majority of animal houses have earthen plates with thatched roof, which might be due to easy availability of material locally and also might be influenced by traditional practices. Peculiarity in roof type found was a special type

designed to suit the heavy rainfall as Vansada taluka comes under heavy rainfall agro-climatic zone of Gujarat state. Similar findings were reported by Patel (1991) and Singh *et al.* (2007b) in their survey regions.

Majority (85.5%) of tribal farmers used wooden type poles while 14.5% respondents used cemented type poles in the shed of their animals as shown in Table 1. It might be due to easy availability of material locally as these villages are in the forest area and traditionally they are following their practices of using wooden poles as pillar materials. No such studies have been reported on type of pillar/pole in animal shed in any of the surveys reviewed. Only 36% of tribal farmers provided manger (Table 1). Out of those who provided manger majority, i.e. 86.11% respondents provided wooden assisted temporary manger of varying size and shape, while 13.89% made the arrangement of *pucca* constructed manger. Practically all of them feed unchaffed fodder but for concentrates they are using various types of metal bowls. In contrast to the present study Modi (2003), Patel *et al.* (2005) and Chowdhry *et al.* (2006) observed the presence of manger in more than 75% respondents' animal houses in their areas of survey. This might be due to the awareness of dairy farmers. Dairy farming under co-operative system started very late in this area whereas the above mentioned workers' areas are far ahead in this aspect. *Pucca* drainage facility of urine was found in only 6% of animal shed, while remaining (94%) had no drainage facility and urine soaked in earthen floor of animal shed as given in Table 1. Meanwhile it was also observed that some farmers practiced to change soil bedding or position of animals frequently. The results are in agreement with the findings of Patel *et al.* (2005), Chowdhry *et al.* (2006) and Bainwad *et al.* (2007) but their respondents showed slightly higher number in providing *pucca* drain. Contrary to this Modi (2003) reported very high, i.e. 82% of respondents provided *pucca* drain. This shows the degree of awareness of animal owners of Sabarkantha district. Only 8.50% of farmers followed the practices to protect their animals from extreme weather. To protect the animals from severe cold in winter (December - February), they used gunny bags while in peak summer majority of respondents practiced to tie their animal under shady tree and occasionally bathe them to lessen the heat stress. While some respondents bathed their animals 2-3 times and tied in shed to protect from direct sun light and hot winds. This shows that farmers are aware of protecting their animals against inclement weather. The results are also in accordance with findings of Bhardwaj (1999). Around 21.50% of farmers provided leveled floor to their animals in the shed.

Feeding management practices: All farmers adopted individual feeding system to their milch animals as well as others. It was observed that, to maintain the uniform plane of nutrition for milk production, in spite of having forest area all around, the animal owners are normally not sending them for grazing but fed individually. Adoption of this

Table 1. Housing management practices followed by tribal dairy farmers

Categories/characteristics	Frequency	Per cent
<i>Type of housing</i>		
Open house	004	02.00
Close house	196	98.00
<i>Kuchcha</i>	180	90.00
<i>Pucca</i>	020	10.00
<i>Placement in housing</i>		
Inside	200	100.00
Out side	000	000.00
<i>Location of shed</i>		
Attached to human dwelling	102	51.00
(b) Near by their dwelling	098	49.00
<i>Type of floor</i>		
<i>Pucca (cement concrete)</i>	025	12.50
Earthen floor	159	79.50
Muddy	015	07.50
Brick paved	000	00.00
stone paved	001	00.50
<i>Type of roof</i>		
Asbestos sheets roof	000	00.00
Galvanized iron sheets roof	003	01.50
Earthen plates with thatched roof	188	94.00
Cemented sheets roof	009	04.50
<i>Type of pillar/pole</i>		
Wooden	171	85.50
Iron	000	00.00
Cemented	029	14.50
<i>Provision and type of manger</i>		
Yes	72	36.00
No	128	64.00
Wooden assisted temporary manger	062	86.11
<i>Pucca manger</i>	010	13.89
<i>Provision of urine drain</i>		
<i>Pucca drain</i>	012	06.00
soaked at earthen floor	188	94.00
<i>Provision and practice to protect animal from extreme weather</i>		
Yes	017	08.50
No	183	91.50
<i>Floor leveling</i>		
Leveled	043	21.50
Unleveled	157	78.50

practice shows full awareness of farmers in this behalf. This finding was in conformity with that of Modi (2003), Patel *et al.* (2005) and Chowdhry *et al.* (2006). All the farmers provided green natural border grasses of cultivated plots and grasses from fellow land. In addition to this 75% of farmers grew fodder crops. Out of which majority (72%) grew and provided non-leguminous green fodder throughout year and remaining provided either leguminous fodder (1.5%) or mixture of non-leguminous and leguminous green fodders (1.5%). However, 25% farmers did not cultivate the green fodder but fed green 'shedha' grass which is mainly of non-leguminous in nature (Table 2). Not a single farmer practiced

silage making because of shortage of green fodder and lack of knowledge about silage making. The results were in agreement with Modi (2003) and Hodshil *et al.* (2007). Around 98% of farmers fed their animals only paddy straw as dry fodder and rest fed paddy + Jowar straw (2%). In addition to paddy straw and paddy with Jowar straw 34% of the respondents provided the dry border grasses (*shedha*) to their animals as dry fodder as shown in Table 2. The similar findings were observed by Kokate and Tyagi (1991), Tomar and Thakur (2002), and Deoras *et al.* (2004) in their studies in various regions of India. Almost all farmers (99%) practiced to feed green / dry fodders as such only 1% of the farmers offered chaffed green / dry fodders to their animals. We found that majority of farmers were unaware about the importance of using chaffed dry and green fodders. It might be due to lack inadequate knowledge of efficient utilization of feed and fodders. This finding was in agreement with findings of Modi (2003), Patel *et al.* (2005) and Chowdhry *et al.* (2006) in North Gujarat Region. Home made and compounded cattle feed was provided by 89% of the farmer whereas 7% of the farmers provided only home produced ingredients as concentrate and remaining 4% provided only compound cattle feed to their animals (Table 2). It was also observed that the large farmers fed more homegrown ingredients as compared to medium or small farmers. It might be due to surplus production of grain and other concentrates (chuni, husk etc.) by large farmers, which were diverted to feeding dairy animals to reduce the feeding cost. Similar findings were reported by Modi (2003) and Patel *et al.* (2005) in their study in North Gujarat region. Farmers were feeding their animals on the basis of their milk production. This was in accordance with the finding of Shirsat *et al.* (1994), Deoras *et al.* (2004) and Malik *et al.* (2005). Practice of feeding concentrates has been communicated by co-operative dairy while supplying the compound cake feed by putting one card of instructions regarding feeding. Hence, the extension method was very successful. Concentrate was offered to the animals twice in a day. Further it was observed that 91, 7 and 2% of the farmers practiced to feed concentrates after milking, during milking and before milking, respectively. Practice of feeding concentrates after milking was done with the idea to inculcate in them the habit of let down milk without concentrate being offered during milking. Contrary to this Shirsat *et al.* (1994) and Divekar and Saiyed (2008) reported that majority of animals were fed concentrates during milking. Majority of respondents (80%) practiced to feed concentrates to their dairy animals during last 2 months of pregnancy. This is a good practice adopted by respondents because maximum development of foetus 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. Modi (2003) and Chowdhry *et al.* (2006) reported concentrates feeding during last 2 to 4 week of pregnancy in 70 and 74%

Table 2. Feeding management practices followed by tribal dairy farmers

Categories/Characteristics	Frequency	Per cent	Categories/Characteristics	Frequency	Per cent
<i>Feeding of milch animal</i>			<i>Feeding of concentrates to advanced pregnant heifer</i>		
Individual feeding	200	100.00	No special feeding	006	03.00
Group feeding	000	000.00	For last IS days	000	00.00
<i>Fodder availability</i>			For last one month	029	14.50
Green			For last two month	160	80.00
Non-legume	144	72.00	Confirmed pregnancy to calving	005	02.50
Legume	003	01.50	<i>special feeding after calving</i>		
Non-legume + legume	003	01.50	Yes	192	96.00
Not cultivating but feeding	050	25.00	No	008	04.00
shedha grass			<i>Feeding of extra mineral mixture</i>		
grasses (shedha)	200	100.00	Yes	061	30.50
Dry			No	139	69.50
paddy straw	196	98.00	<i>Feeding of extra salt</i>		
paddy straw + Jowar straw	004	02.00	Yes	036	18.00
paddy straw + Jowar straw +	000	00.00	No	164	82.00
Wheat straw			<i>Frequency of Watering</i>		
dry shedha grasses	068	34.00	2 times	002	01.00
<i>Types of concentrates feeding</i>			3 times	196	98.00
Home produced ingredients	014	07.00	free assess of water	002	01.00
Compounded cattle feed	008	04.00	<i>Source of water</i>		
Home made + compounded cattle	178	89.00	Well	105	52.50
<i>Feeding standard followed</i>			Pond	000	00.00
body weight	000	00.00	Canal	000	00.00
milk production	200	100.00	River	000	00.00
age	000	00.00	Hand pump	045	22.50
flat rate	000	00.00	bore well	050	25.00
No criteria	000	00.00	<i>Feeding the colostrum to new born calf</i>		
<i>Processing of fodders</i>			Yes	172	86.00
Green fodders			No	028	14.00
As such	198	99.00	<i>Feed colostrums to new born calf before expulsion of placenta</i>		
chaffed	002	01.00	Yes	104	60.47
Dry fodders			No	068	39.53
As such	198	99.00	<i>Time given to calf for feeding</i>	006	006
chaffed	002	01.00	<i>Number of teats allowed for suckling</i>		
<i>Time of feeding concentrates</i>			One teat	200	100.00
Before milking	004	02.00	two teats	000	000.00
During milking	014	07.00			
After milking	182	91.00			
No feeding	000	00.00			

of dairy animals, respectively. Their findings are also in agreement with the present findings. However, Jagdale *et al.* (2000) and Madke *et al.* (2006) reported very low i.e. 20% and 44.67% of respondents following this practice. Majority of the respondents (96%) followed to feed special feeding after calving. They fed energy rich (guar, bajara, ground wheat or paddy, coconut etc.) feed mixed with echbolic ingredients (Asaliya, Suva, Methi, etc.) to prevent stress and to provide sufficient energy for freshening. Similar findings were reported by of Patel *et al.* (2005) and Divekar and Saiyed (2008).

Mineral supplements were provided by only 30.5% of farmers to their milch animals where as 69.5% of farmers did not follow this practice (Table 2). It might be due to lack

of knowledge of dairy animal owners and reluctance in use due to additional cost of mineral mixture they have to incur for feeding. Meanwhile, farmers who rear crossbred provided mineral mixture regularly. Similar findings were reported by Modi (2003), Sohane *et al.* (2004), Patel *et al.* (2005) and Chowdhry *et al.* (2006). Contrasting to these finding Tomar and Thakur (2002) reported that mineral mixture was not at all fed. Whereas Deoras *et al.* (2004), Madke *et al.* (2006) and Singh *et al.* (2007a) reported very low i.e. 12%, 6.67% and 11% of farmers fed mineral mixture to their animals, respectively. The findings of all workers and that of this study indicated very low level of awareness regarding feeding extra mineral mixture in their respective survey areas. Only 18% respondents provided extra salt to their milch animals

whereas majority (82%) of farmers did not follow this practice (Table 2). Very low percent of followers of feeding extra salt may be due to the practice of feeding compound cattle by about 80% of the farmers in the present study. Compound cattle feed contains nearly 3-4% of salt. Therefore, only those who do not feed compound cattle feed is probably advocating extra salt feeding. Meanwhile, farmers, who reared crossbred animal, supplied extra salt regularly to their animals. Similar findings were reported by Singh *et al.* (2007a). He reported that only 34% of respondents followed extra salt feeding. In contrast to present findings Tanmay *et al.* (2002) reported that salt is provided to the buffaloes in feeding trough from which they lick. This is a common practice followed in Tanda forest range in Uttaranchal. Sohane *et al.* (2004) and Malik *et al.* (2005) observed supplementation of common salt followed by 60.74 and 88% of respondents, respectively, in their surveys. Practice to feed colostrum to new born calf was followed by around 86% of the farmers. Out of which 60.47% of the farmers allowed the calves to suckle their dams even before expulsion of placenta but 39.53% of them allowed only after the expulsion of placenta as given in table 2. The scientific recommendation of feeding colostrum to newborn calves within 1 to 2 hours of birth was being practiced by 52% of the total farmers. This finding is well supported by finding of Hazarika and Anand (1984) and Divekar and Saiyed (2008). All farmers allowed the new born calf to suckle only one teat of their mothers for an average 6 minutes. This finding is supported by finding of Divekar and Saiyed (2008) of 8 minutes in Gir cattle.

Almost all farmers (99%) provided water to their milch animals *ad lib.* in quantity but restricted in frequencies in which 2 times (1% respondents) to 3 times (98% respondents) a day were common in summer. About 99% respondents offered 2 times water in winter. Only 1% respondents allowed animals to free access for watering as water troughs were attached with manger. Tanmay *et al.* (2002) reported that the Gujjars provide water twice a day in summer and once a day in winter to their buffaloes and is a common practice followed most of the animal keepers. In contrast to the present finding, Chowdhry *et al.* (2006) reported only 3% respondents allowing free access, but 72% of the respondents provide water 3 times a day but as much as the animals can drink. Depending upon resources they provide water to their animals. Majority of the respondents depended on wells (52.5%) followed by Bore well (25%) and Hand pump (22.5%) as a source of drinking water to their dairy animals (Table 2). The present findings are comparable with those observed by Malik *et al.* (2005) and Singh *et al.* (2007b).

The present study indicated that adoption of scientific housing and feeding management practices was poor in survey area. Majority of animal houses were *kaccha* type and had *kaccha* (87%) floor, used earthen plates with thatched (94%) for roofing material supported on wooden poles

(85.5%). *Pucca* drainage facility of urine was found in only 6% of animal shed. Only 36% of tribal farmers provided manger. Not a single farmer practiced silage making. Only 1% of the farmer provided chaffed green/dry fodder to their animals. Mineral supplements were provided by only 30.5% of farmers and only 18% respondents provided extra salt to their milch animals. There are few aspects where they followed management practices properly to certain extent but most of the housing and feeding practices needs to be improved a lot in this tribal area.

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