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Existing Housing Management Practices Followed by Rural Dairy Animal Owners in Sabar Dairy Milk Shed of Gujarat, India

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A B S T R A C T

The study on status of housing practices followed by the dairy owners in Gujarat was conducted in Sabarkantha districts. The data were collected from randomly selected 150 dairy animal owners through personal interview using pre-tested structured schedule from three clusters (Ider, Prantij and Himmatnagar) was selected at randomly. The study revealed that majority of respondents (52.66%) provided of the respondents kept their animals in *pucca* houses, whereas 36.66 per cent kept in *kuccha* type house of which 48.66 per cent animal sheds were nearby their dwellings. About 39.33 per cent of respondents had *pucca* floor in an animal shed. About 39.33 per cent of respondents had single roof shed. The roof made by galvanized iron sheet (50.00%) was prevalent in the study area. The majority (76.00%) of the respondents prepared wall of the shed from brick and lime/cement. 100 per cent respondents provided manger to their animal and a large number of respondents had *pucca* manger (68.00%). 68.66 per cent of the respondents had constructed water trough in an animal shed. The majority (64.00%) of dairy animal owners used bedding material for the pregnant animal. Mostly 70.00 per cent respondents had a proper light provision in an animal shed, *pucca* drainage facility for urine drain (42.00%) and 70.66% respondents were aware of protecting their animals against inclement weather/climatic conditions.

Introduction

Livestock rearing is an integral part of agriculture in India as well as in many developing countries since centuries. The Indian dairy industry has made a remarkable progress in the last three decades with unprecedented growth in milk production. Cattle and buffalo play a major role in the Indian economy by producing milk which is the largest agricultural commodity in India. Gujarat is a very important state in milk production and marketing in India on a co-operative dairy system basis. This credit was achieved owing to the development of a wide network of a co-operative dairy system based on Anand pattern. Gujarat has around 5.23 per cent of cattle and 9.55 per cent of buffalo population of the country (Anonymous, 2014b). It contributed around 10.3 million

tonnes (7.80 per cent) of milk to the total milk pool of India and per capita, milk availability was 476 gm/day during the year 2012-13 (Anonymous, 2014a).

Production potential of livestock depends mostly on the management practices under which they are reared and these practices vary significantly across various agro ecological regions due to many factors. Understanding of livestock management practices followed by farmers in a region is necessary to identify the strengths and weaknesses of the rearing systems and to formulate suitable intervention policies (Gupta *et al.*, 2008). Each component of management practices interacts either independently or in combination to affect the productivity of the livestock. Almost all the farmers did not keep their animals at a single place throughout the year or even for a whole day and night. Provision of proper housing facilities to the animals not only reduces the energy wastage in maintaining thermo neutral zone but also provides good hygienic conditions, reduces the incidence of diseases, protects them from predators and provides better working conditions to the farmers. Therefore it is imperative to ascertain the scientific housing management practices of dairy animals followed by dairy animal owners under village conditions so that need-based extension programmed may be launched to make them aware to increase their knowledge and the adoption of scientific housing management practices for dairy animals.

Materials and Methods

In the present study information was collected by arrangement of field survey from Sabarkantha district of North Gujarat. Sabarkantha district possesses 8 Talukas out of which 3 Clusters (Ider, Prantij and Himmatnagar) were randomly selected. From each selected clusters 5 villages having functional primary milk producer's co-operative societies were selected at randomly. Ten dairy animal owners from each village were randomly selected making a total of 150 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 study area.

The selected farmers were interviewed and the desired information was collected regarding housing management practices adopted by them for dairy animals with the help of pre-designed and pre-tested questionnaire. To analyze the collected information, several basis statistical tools and methods were used. The following statistical treatments were used for interpretation of data. Tentatively it has been planned to apply frequency distribution, percentage and chi-square test. The following formula was used to calculate chi-square value. Therefore, significance among the different classes will be tested with chi-squares test (Snedecor and Cochran, 1994).

$$\chi^2 = \sum = \left[\frac{(O-E)2}{E} \right]$$

Where,

O = Observed Frequencies in each animal group.

E = Expected Frequencies in each animal group.

Results and Discussion

The findings indicated that majority (52.66%) of the respondents kept their animals in *pucca* housing system, whereas 36.34 per cent of the respondents provided *kuccha* type of houses and 10.66 per cent respondents had an open type of housing to their dairy animals. The results are highly significant ($P<0.01$). In

Himmatnagar clusters (64.00%) of respondents kept their animals in *pucca* housing system followed by Prantij (62.00%) clusters also followed *pucca* housing system and in Ider clusters 48.00 per cent respondents followed *kuccha* housing system. The study was in contradiction to findings of Bainwad *et al.,* (2007) observed that 77.50 per cent of the respondents provided *kuccha* shed and only 22.50 per cent provided *pucca* sheds. Ahiwar *et al.,* (2009) also observed in rural areas significantly higher number (59.33%) of farmers having mud houses and in urban areas 68.00 per cent of farmers had *pucca* houses.

It was observed that 27.34, 48.66 and 24.00 per cent of the respondents kept their animals attached to a human dwelling, nearby their dwelling house and in the field of farmers, respectively. Most of the respondents preferred to keep their animals in close proximity of house so that they can observe them more frequently. The findings of present study were in agreement with findings of Gupta *et al.,* (2008) reported that 86.00 per cent of households provided separate stall within or outside the human dwelling and 13.90 per cent, were unable to provide separate housing facility to their bovines. It was found that half (49.34%) of the respondents followed head to head system of animal housing, tail to tail (29.34%) and single row type of housing system (21.34%), respectively. The results are significant ($P<0.05$). These findings are not at par with the findings of Ahiwar *et al.,* (2009) and Sabapara *et al.,* (2015). Former reported that majority (87.67%) of the respondents in the area of the study had single row.

The results was observed that 39.36 per cent respondents had *pucca* (cement and concrete) floor in their dairy animal shed, while earthen floors (31.33%), brick paved (13.34%), rubber mat with concrete floor (13.34%) and stone paved (2.66%), respectively. It is generally found that *pucca* floor was found to be better than *kuccha* floor for animals to keep them free from worm problems and also from the hygienic point of view in the study area. The respondents following *kuccha* floors showed unawareness about these problems. They believe *pucca* floors are cheap and comfortable to animals. The finding of present study were in agreement with findings of Modi (2003) in Sabarkantha district of North Gujarat who found that most (82.00%) of the animal houses had *pucca* floors. These findings are contradictory to the earlier reports of Bainwad *et al.,* (2007), Sabapara *et al.,* (2010a), Varaprasad *et al.,* (2013) and kishore *et al.,* (2013).

It was observed that majority (58.00%) of the respondents used galvanized iron sheet type roof, while 34.00, 11.34 and 4.66 per cent of respondents used asbestos sheet, thatch roofing the shed and no roof/tree shed, respectively in the study area. These finding are in agreement with Sabapara *et al.,* (2015) observed that 33.67, 31.33, 22.33 and 12.67 per cent of respondents used asbestos sheets, thatched materials, galvanized iron sheets and tiles as roofing material in their animals sheds, respectively. The present study is in contradiction to findings of Divekar and Saiyed (2010) revealed that majority (94.00%) of Gir owners did not provide any roofing to their animals and kept them in open or under the tree shade while, 6.00 per cent owners used asbestos or galvanized sheets as roofing materials for their animal sheds. The data regarding the features of roof revealed that 39.33 per cent of the respondents possessed single slope type of roof in the study area. These findings are in agreement with that of Garg *et al.,* (2005) and Kumar *et al.,* (2006). Their results were very similar to each other wherein 58.50 per cent of the respondents had single slope roof of shed followed by flat (32.50%) and double slope (9.00%) roof of shed (Table 1).

Table.1 Distribution of the dairy animal owners according to housing practices

(n=150)

Particulars		Clusters			Total	χ^2 Value
		Ider	Prantij	Himmatnagar		
1. Type of housing	a. Open	10 (20.00%)	5 (10.00%)	1 (2.00%)	16 (10.66%)	**16.599****
	b. *Kuccha*	24 (48.00%)	14 (28.00%)	17 (34.00%)	55 (36.34%)	
	c. *Pucca*	16 (32.00%)	31 (62.00%)	32 (64.00%)	79 (52.66%)	
2. Location of shed	a. Attached to human dwelling	13 (26.00%)	11 (22.00%)	17 (34.00%)	41 (27.34%)	**3.7243**
	b. Nearby their dwelling	26 (52.00%)	23 (46.00%)	24 (48.00%)	73 (48.66%)	
	c. At the field of farmers	11 (22.00%)	16 (32.00%)	9 (18.00%)	36 (24.00%)	
3. System of housing	a. Single row	13 (26.00%)	4 (8.00%)	15 (30.00%)	32 (21.34%)	**18.392***
	b. Head to head	28 (56.00%)	21 (42.00%)	25 (50.00%)	74 (49.34%)	
	c. Tail to tail	9 (18.00%)	25 (50.00%)	10 (20.00%)	44 (29.34%)	
4. Type of floor	a. Pucca (cement concrete)	22 (44.00%)	14 (28.00%)	23 (46.00%)	59 (39.33%)	**16.80**
	b. Earthen floor	12 (24.00%)	19 (38.00%)	16 (32.00%)	47 (31.33%)	
	c. Brick paved	11 (22.00%)	5 (10.00%)	4 (8.00%)	20 (13.34%)	
	d. Stone paved	1 (2.00%)	1 (2.00%)	2 (4.00%)	4 (2.66%)	
	e. Rubber mat with concrete floor	4 (8.00%)	11 (22.00%)	5 (10.00%)	20 (13.34%)	
5. Type of roof	a. No roof/ Tree sheds	4 (8.00%)	3 (6.00%)	0 (00.00%)	7 (4.66%)	**5.4413**
	b. Asbestos sheet roof	15 (30.00%)	16 (32.00%)	20 (40.00%)	51 (34.00%)	
	c. Galvanized iron sheet roof	24 (48.00%)	25 (50.00%)	26 (52.00%)	75 (58.00%)	
	d. Thatched roof	7 (14.00%)	6 (12.00%)	4 (8.00%)	17 (11.33%)	
6. Features of roof of shed	a. Flat	18 (36.00%)	15 (30.00%)	24 (48.00%)	57 (38.00%)	**5.8446**
	b. Single slope	17 (34.00%)	24 (48.00%)	18 (36.00%)	59 (39.33%)	
	c. Double	15	11	8	34	

	slope	(30.00%)	(22.00%)	(16.00%)	(22.66%)	
7. Materials used in walls	a. Thatch	5 (10.00%)	2 (4.00%)	1 (2.00%)	8 (5.33%)	**9.4371**
	b. Brick and lime/cement	40 (80.00%)	34 (68.00%)	40 (80.00%)	114 (76.00%)	
	c. Brick in mud	5 (10.00%)	13 (26.00%)	9 (18.00%)	27 (18.00%)	
	d. Wooden	0 (00.00%)	1 (2.00%)	0 (00.00%)	1 (0.66%)	
8. Type of pillar/pole	a. Wooden	8 (16.00%)	8 (16.00%)	2 (4.00%)	18 (12.00%)	**9.44**
	b. Iron	26 (52.00%)	18 (36.00%)	31 (62.00%)	75 (50.00%)	
	c. Cemented	16 (32.00%)	24 (48.00%)	17 (34.00%)	57 (38.00%)	
9. Provision of manger	a. Yes	50 (100%)	50 (100%)	50 (100%)	150 (100%)	-
	b. No	0 (00.00%)	0 (00.00%)	0 (00.00%)	0 (00.00%)	
10. Type of manger	a. Wooden assisted temporary	6 (12.00%)	4 (8.00%)	3 (6.00%)	13 (8.66%)	**2.0063**
	b. Pucca manger	31 (62.00%)	34 (68.00%)	37 (47.00%)	102 (68.00%)	
	c. Flexible cement pipe manger	13 (26.00%)	12 (26.00%)	10 (20.00%)	35 (23.34%)	
11. Provision of water trough in shed	a. Yes	36 (72.00%)	35 (70.00%)	32 (64.00%)	103 (68.66%)	**0.8056**
	b. No	14 (28.00%)	15 (30.00%)	18 (36.00%)	47 (31.34%)	
12. Provision of bedding material for pregnant animal	a. Yes	35 (70.00%)	29 (58.00%)	32 (64.00%)	96 (64.00%)	**1.5625**
	b. No	15 (30.00%)	21 (42.00%)	18 (36.00%)	54 (36.00%)	
13. Provision of adequate light in animal shed	a. Yes	34 (68.00%)	36 (72.00%)	35 (70.00%)	105 (70.00%)	**0.1905**
	b. No	16 (32.00%)	14 (28.00%)	15 (30.00%)	45 (30.00%)	
14. Provision of urine drain	a. Pucca drain	18 (36.00%)	23 (46.00%)	22 (44.00%)	63 (42.00%)	**1.1494**
	b. Soaked at earthen floor	32 (64.00%)	27 (54.00%)	28 (56.00%)	87 (58.00%)	
15. Provision and practice to protect animal from extreme weather	a. Yes	40 (80.00%)	33 (66.00%)	33 (66.00%)	106 (70.66%)	**3.1518**
	b. No	10 (20.00%)	17 (34.00%)	17 (34.00%)	44 (29.34%)	

%= Per cent, * Significant at 5% level (P<0.05) ** Significant at 1% level (P<0.01)

The result observed that 76.00 per cent respondents was used Brick and lime/cement material for construction of the walls in the animal shed. Whereas, brick in mud (18.00%), thatch material (5.34%) and wooden type wall (0.66%) respectively in the study area. The choice of materials for the construction might have been depended on economic condition of the farmer, level of intensification and locally available materials and strength of house required. The results are contrary to the study of Sinha *et al.,* (2009) and Kumar and Mishra (2011a) stated that majority of the animal houses had full walls in their study area because of prolonged cooler period. The 31.00 per cent of the respondents used brick and cement walls, 22.0 and 1.33 per cent of the respondents used thatch and brick in mud for the sheds, respectively. The present findings are in agreement with finding of Rathore *et al.,* (2010a). They reported that 51.75 per cent of the respondents used brick and lime and 44.75 per cent used brick in mud to construct the walls of the animal houses.

The result found that half (50.00%) of the respondents was used iron type poles, while used cemented poles to support the roof (38.00%) and only 12.0 per cent of the respondents used wooden poles to support the roof. The reason behind the use of the iron pole is fact that cemented/RCC poles are more robust and durable than the wooden poles. The findings are in contradiction of findings of Divekar and Saiyed (2010) where in the majority (50.33 per cent) of the respondents used cemented/RCC poles, while, 49. 67 per cent used wooden poles to support the roofs.

The results revealed that 100 per cent respondents provided manger to their animals, but these findings are not in agreement with the findings of Sabapara *et al.,* (2015). The outcome of their study was that 66.00 per cent of the respondents provided manger to their animals, while 34.00 per cent did not provide any type of manger to their animals. Modi (2003) stated that 75.00 per cent of the farmers had mangers for their animals. This is indicative of progress made from 75.00 to 100 per cent.

The present study revealed that most of the respondents had *pucca* manger (68.00%), flexible cement pipe manger (23.34%) and wooden manger (8.66%) for the feeding of animals. This might be due to the awareness of dairy farmers regarding prevention of wastage of feeds and fodder. Sinha *et al.,* (2009) reported that majority of feeding mangers were *kuccha* in rural areas. Sabapara *et al.,* (2015) observed that 33.33 per cent of the respondents had *pucca* type of manger while, 25.33 and 7.33 per cent had wooden assisted manger and *kuccha* type manger of varying size and shape.

The results observed that majority (68.66%) of respondents provided water trough in animal shed and 31.34 per cent of respondents provided water facility near animal shed in the study area. The results are not in agreement to the results of the study of Fogya (2017) revealed that only 14.00 per cent of the respondents provided water trough in animal shed and 86.00 per cent of the respondents did not provide water trough in animal shed. The results revealed that 64.00 per cent respondents was used some bedding material for pregnant animals and didn't use any bedding material for pregnant animals (36.00%) in the study area. The present findings are closely similar to the earlier findings of Sinha *et al.,* (2009) reported that in rural areas, 73.30 per cent farmers were using sugarcane leaves and 13.30 per cent were using straw as bedding material. Fogya (2017) also found that 50.00 per cent of the respondents provided bedding material to pregnant cows.

The results observed that 70.00 per cent respondents was had provision of adequate light in animal shed in the study area. The similar findings were reported by Ahirwar *et al.,* (2009) and Sabapara *et al.,* (2015) in both the studies 89.00 per cent of the respondents had provision of sufficient light in the animal houses. Contrary to the present study, Rathore *et al.,* (2010a) reported that very low i.e. about 18.33 per cent of respondents provided sufficient light in the animal houses of high altitude Kumaon Himalaya and Churu district of Rajasthan, respectively.

Only 42.00 per cent of animal sheds had provision of *pucca* drainage facility of urine while, remaining (58.00%) had no drainage facility but urine soaked in earthen floor of animal sheds. This resulted in dampness and unsanitary conditions. It was observed that some farmers practiced changing soil bedding or location of animals frequently. The result is similar to that of Sabapara *et al.,* (2015) revealed that 36.33 per cent of the animal sheds had provision of *pucca* drainage facility for urine while, remaining 63.67 per cent had no drainage facility. However the results are different from the findings reported by Modi (2003) stated that 82.0 per cent of respondents provided *pucca* drains.

Findings of the present study indicated that majority (70.66%) of the respondents adopted some kind of measures to protect the animals from extreme weather/climatic conditions, while 29.33 per cent of the respondents did not follow this practice. It might be due to the awareness of the dairy farmers regarding ill effects of the extreme weather conditions on health and production of the dairy animals.

The results are lower to that of Sabapara *et al.,* (2015) revealed that majority (58.33%) of the respondents of Surat district adopted some kind of measures to protect the animals from extreme weather conditions, while 41.67 per cent of the respondents did not follow this practice. Contrary to the present findings Rathore and Kachwaha (2009) reported 9.25 per cent of the buffalo owners used electric fan/water cooler in buffalo sheds during the hot period. It can be concluded that majority (52.66%) of the respondents kept their animals in *pucca* housing system and 36.34 per cent of the respondents provided *kuccha* type of houses. The results are highly significant ($P<0.01$). In case of animal sheds were nearby their dwellings (48.66%), *pucca* floor in animal sheds (39.33%) and 39.33 per cent of respondents had single roof shed. The roof made by galvanized iron sheet (50.00%) was prevalent and prepared wall of the shed from brick and lime/cement (76.00%). 100 per cent respondents provided manger to their animal, *pucca* manger (68.00%), constructed water trough in an animal shed (68.66%), used bedding material for the pregnant animal (64.00%), adequate light provision in an animal shed (70.00%), *pucca* drainage facility for urine drain (42.00%) and majority (70.66%) of the respondents were aware of protecting their animals against extreme weather/climatic conditions in the study area.

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