

MANAGEMENT AND HOUSING OF DAIRY DEMONSTRATION FARMS IN ANAND DISTRICT

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ABSTRACT

The study was conducted in Anand district of Gujarat with the objectives to study to know management of animal and housing practices followed by dairy demonstration farm(DDF) owners. Herd strength of DDF was ranging 31 to 99 animals and wet dry ratio was 76:24. Herd average and wet average of DDF farm was 10.72 and 14.08 litre, respectively. The average parity of animal was observed in between 3.2 to 4.58. All DDF were having some level of mechanisation in their farm for efficient management of herd. The various systems of housing on DDF were loose housing (16 per cent), tail to tail (41.7per cent), head to head (16.7per cent) and single line (25 per cent). Most of sheds were in East- West direction (75 per cent). It was observed that all farmer provide improved housing facility to animal like pucca floor with adequate average floor space of 45.16 sq. ft and back word slope of floor; sufficient light, good natural ventilation by constructing wall of house half, regular cleaning of shed with pucca drainage system, firm houses using brick and cement material in construction and adequate manger space for feeding.

Keywords : management, housing, dairy demonstration farms

INTRODUCTION

As per the 18th livestock census, India has about 199.07 and 105 million cattle and buffalo population respectively which, contributes to around 14% and 56% of the world cattle and buffalo population, respectively. Milk production in India grew at a compound annual growth rate of 3.77 % in the last decade and reached a volume of 121.5 million tonnes milk in the year 2010-11 (GOI, 2011). Gujarat is an important state in milk production and marketing in India on co-operative dairy system. It contributed around 8.84 million tonnes (7.85%) of milk to the total milk pool of India and per capita milk availability was 418 g / day during 2009-10 (GOI, 2011).

Gujarat Cooperative Milk Marketing Federation Ltd. (GCMMF) is India's largest food product marketing organisation with annual turnover (2011-12) of US\$ 2.5 billion. Its daily milk procurement is approx 13 million litre (peak period) per day from 16,117 village milk cooperative societies, 17 member unions covering 24 districts, and 3.18 million milk producer members. Amul dairy had established about 176 Dairy Demonstration Farms (DDF) spread over 8 talukas covering 62 villages. These DDFs serve as production hubs for Amul dairy producing 43587 lit of milk per day.

Production potential of livestock depends mostly on the genetic makeup animal and 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 policy (Gupta *et al.*, 2008).

OBJECTIVE

To study the management and housing of dairy demonstration farms in Anand district.

METHODOLOGY

The study was conducted to know management and housing of DDF farms. Twelve dairy farms having more than or equal to 25 dairy cows and completed minimum one year of operation were included in study. Respondents (dairy farm owner) were interviewed and the desired information was collected in the questionnaire (schedule). A questionnaire had been designed to study the various management practices under which dairy animal are reared. The collected data was tabulated and subjected to statistical methods to draw meaningful inferences.

RESULTS AND DISCUSSION

Productivity of animals and profitability of farms depending on management and housing of animals. Understanding of livestock management practices followed by the farmers is crucial to identify the strengths and weakness of the animal rearing system so that appropriate

intervention policies can be devised in order to have optimum production from the animals and more benefits to the farmers. General management practices of dairy animal on dairy demonstration farm completing more than one year of operation were studied and presented in Table No. 1.

Table 1 : Management of dairy demonstration farms

n=12

Sr. No.	Farm No.	No. of animal at start	Present strength	Percentage increase (%)	No. of milking cow	No. of dry cow	Wet Avg.	Herd Avg.	Wet and dry ratio	Avg. lactation No.	Level of mechanisation			
											Chaff cutter	Milking machine	Auto-matic water	BMC
1	Farm No.1	50	83	66	50	15	14.49	11.15	77 : 23	4.53	Yes	Yes	Yes	Yes
2	Farm No.2	20	31	55	21	4	14.42	12.12	84 : 16	3.6	Yes	Yes	Yes	No
3	Farm No.3	25	38	52	23	7	14.73	11.3	77 : 23	3.6	Yes	Yes	Yes	No
4	Farm No.4	20	29	45	21	4	13.14	11.04	84 : 16	3.6	Yes	Yes	Yes	No
5	Farm No.5	50	99	98	54	25	15.43	10.55	68 : 32	4.54	Yes	Yes	Yes	No
6	Farm No.6	25	57	128	36	10	13.73	10.75	78 : 22	4.58	Yes	Yes	Yes	No
7	Farm No.7	25	38	52	24	6	13.57	10.86	80 : 20	3.23	Yes	Yes	No	No
8	Farm No.8	20	33	65	20	5	14.05	11.24	80 : 20	4.4	Yes	Yes	Yes	No
9	Farm No.9	20	37	85	24	7	13.2	10.22	77 : 23	4.5	Yes	Yes	No	No
10	Farm No.10	20	33	65	18	7	13.65	9.83	72 : 28	3.2	Yes	No	No	No
11	Farm No.11	20	34	70	20	5	12.55	10.04	80 : 20	3.2	Yes	No	No	No
12	Farm No.12	20	31	55	15	10	16.06	9.64	60 : 40	3.2	Yes	No	No	No
13	Avg. value	26.3	45.3	69.7	27.2	8.8	14.08	10.72	76:24	3.84	100 %	75 %	58.33%	8.33%

The farms were started with initial strength of 20 to 50 animals and after one year it is reached up to 31 to 99 animals. There was average 69.66 per cent increase in strength of dairy animal. This increase in strength of dairy animals indicates better management and development of DDF, it indicates better profit and growth in dairy business.

Wet and dry ratio is indication of per cent of animal in milking and dry. More the animal in milk throughout the year better will be the profitability of enterprises. In present study the average No. animal in milk and dry were ranging from 15-50 to 4-25, respectively with wet dry ratio of farm ranging from 60:40 to 84:16. The study of all farms indicate that average wet dry ratio of 76:24 which is close to optimum wet dry ratio of 75:25 for better management and optimum profitability farm. Similar wet dry ratio were reported in

crossbred cow maintain at Livestock Research Station, Anand Agricultural University, Anand where it was 78.2: 21.8 (Anonymous 2013).

Herd average of DDF was ranging from 9.64 to 12.12 lit with average 10.72 lit. Whereas wet average was ranging from 12.55 to 15.43 lit with average 14.08 lit. Results are related with the result reported by Anonymous (2013) where the wet average and dry average reported at LRS farm Anand for crossbred cow was 10.77 and 8.39 lit.

In the present study all DDF owner were having dairy animal of different lactation (parity). The average parity of farm animal was ranging from 3.2 to 4.58 with an average parity of 3.84. It is well established that dairy cows produce maximum during 3 to 5 parity. It indicated that all DDF owner rear animal of the same parity for their optimum profit. Sahu

et al., (2011) reported the similar finding that majority (78 percent) of commercial dairy farmer prefer their animals to be in between first to fifth lactation as this is most productive age of animal.

Effective management of farm depends on the level of mechanisation of dairy farm. It was found that DDF owner having some kind of mechanisation on their farm. All DDF owners were having Motor operated chaff cutter for chafing of fodder and 75 per cent of farms were having milking machine for milking of their animal. Automatic water supply system was installed by 58.33 per cent (7) of farms. Only one

(8.33 per cent) of farm was with Bulk milk cooler (BMC) facility for storage of large quantity of milk.

Provision of proper housing facilities to the animals not only reduces the energy wastage in maintaining thermo neutral zone but also provides good hygienic condition, reduces the incidence of diseases, protects animals from predators and provides better working condition to the farmers. The various housing management practices followed by dairy demonstration farm owners in the study are presented in Table No. 2 and 3.

Table 2 : Housing management of dairy demonstration farms

n = 12

Sr. No.	Particulars	Type	Percent (No.)
1	Type of Housing	Close	100 (12)
		Open	0.00 (0)
2	Location of shed	Attached to human dwelling	41.7 (5)
		At the field of farmer	33.3 (4)
		Nearby their dwelling	25.0 (3)
3	Direction of house	East-West	75.0 (9)
		North-South	25.0 (3)
4	System of housing	Tail to tail	41.7 (5)
		Head to head	16.7 (2)
		Single line	25.0 (3)
		loose	16.7 (2)
5	Avg. floor Space available / animal	Adequate (≥ 40 sq. ft)	91.7 (11)
		In adequate (< 40 sq. ft.)	8.3 (1)
6	Light	Adequate	91.7 (11)
		In adequate	8.3 (1)
7	Natural ventilation	Good	75.0 (9)
		Fairly good	100 (12)
		Poor	0.00 (0)
8	Provision & practice to Protect animal from extreme weather	Yes	100 (12)
		No	0.00 (0)
9	Cleanliness of house	Clean	91.7 (11)
		Dirty	8.3 (1)
10	Type of floor	Pucca (cement concrete)	91.7 (11)
		Stone paved	8.3 (1)
		Brick paved	0.00 (0)
		Muddy	0.00 (0)
		Earthen floor	0.00 (0)
11	Slope in floor	Towards back	91.7 (11)
		No slope	8.3 (1)
		Towards front	0.00 (0)

Table 3 : Housing management of dairy demonstration farms

n = 12

Sr. No.	Particulars	Type	Percent (No.)
12	Type of pillar/ pole	Cemented/brick	58.3 (7)
		Iron	41.7 (5)
		Wooden	0.00 (0)
13	Materials used in walls	Brick and cement	100 (12)
		Brick and lime	0.00 (0)
		Brick in mud	0.00 (0)
		Thatch	0.00 (0)
14	Wall of house	Half	100 (12)
		Full	0.00 (0)
		No wall	0.00 (0)
15	Type of roof	Asbestos sheets roof	41.7 (5)
		Galvanized iron sheets roof	58.3 (7)
		Thatched roof	0.00 (0)
		No roof	0.00 (0)
16	Slope of roof	Double slope	83.3 (10)
		Single slope	16.7 (2)
		Flat	0.00 (0)
17	Manger space allowed to animal	Adequate	91.7 (11)
		Inadequate	8.3 (1)
18	Provision of drainage system	Pucca drain	91.7 (11)
		Soaked at earthen floor	8.3 (1)
19	Bedding material used on the floor in winter season	Straw	0.00 (0)
		No bedding	100 (12)
20	Location of manure pit	Distant	50.0 (6)
		Adjacent	50.0 (6)
		No	0.00 (0)

It was observed that all DDF owners (100 per cent) provided close type of housing. This was general practice followed by all DDF owners to provide closed type of housing to animal for efficient management and maximum returns from dairy farming. Shrivastava and Promila (1983), Sharma (1996) and Sabapara *et al.*, (2010a) were also found that majority of respondents were provided close type of housing to their animal.

Management of farm is greatly influenced by location. For effective management of farm location should be close to human housing or on their agricultural field. The study of all DDF indicated that 41.7 per cent (5) shed were attached to human dwelling. While, 33 per cent (4) sheds were present at farmer field. Only 25 per cent (3) farms were present away from their dwellings. Similarly, location of farm attached to human dwelling were reported by Rathore

et al., (2009), Sinha *et al.*, (2009), Rathore *et al.*, (2010) and Sabapara *et al.*, (2010a). The animal house nearby the human dwelling or attached to human dwelling provides good management, market availability and easy transport of milk.

Direction of house is important in hot humid climate to reduce heat stress on animal during summer season, to maintain good sanitation and increase production of dairy animal. 75 per cent (nine) of farmer construct animal houses such that length of shed is oriented in East-West direction while 25 per cent (3) of the animal shed were having length of shed in North-South orientation. Similar finding was reported by Sinha *et al.*, (2009) that majority (53 per cent) of respondents were constructed their animal houses in East-West direction.

Majority of the dairy farmer 41.7 per cent (five farms) in the study followed tail to tail system of housing.

About 25 per cent (three farms) followed single line system of animal housing, while loose house system and head to head system of housing was followed by 16.7 per cent (two farms). More number of double row system of housing might be due to the limited availability of land and larger herd size hence, farmers utilized the available land more efficiently by constructing double row houses. Findings of this study were in conflict with the findings of Deoras *et al.*, (2004) and Ahirwar *et al.*, (2010) where majority of respondents followed the single row system of housing.

The floor space per animal on DDF farms ranging from 36 to 70 sq. ft. with average floor space per animal was 45.16 sq. ft. In study it was observed that Adequate (≥ 40 sq ft/animal) floor space/animal was provided by 91.7 per cent (eleven farms) respondents, whereas 8.3 per cent (one farm) respondent there was inadequate standing floor space/animal

Findings of this study were in agreement with the findings of Deoras *et al.*, (2004) who found that 93 per cent of respondents provide adequate standing floor space to animals. Sinha *et al.*, (2009) also found that 74.4 per cent of respondents in the rural and 86.7 per cent in urban area of Bareilly district of Uttar Pradesh had adequate floor space in their animal houses. Adequate standing floor space provides comfort to animal and reduces stress, which help in increase in production of milk.

Provision of adequate light was observed in eleven DDF farms. It was found that about 91.7 per cent farmers had provision of sufficient light i.e. no dark area inside shed during day time and 12 hrs light in the animal shed, while it was not sufficient in the 8.3 per cent sheds. Similar findings were reported by Deoras *et al.*, (2004) about 93 per cent respondents provide sufficient light. Ahirwar *et al.*, (2010) observed that in the animal houses of 75.50 and 86 per cent of the respondents had provision of adequate light in the rural and urban areas, respectively. Provision of sufficient light inside shed is useful for efficient working of labour in shed.

Good natural ventilation was provided by nine DDF owners. It was observed that around 75 per cent of respondents had provision of good natural ventilation by constructing house in such way that half of wall was constructed and half kept open, which provide continuous flow of air in animal shed. Provision of natural ventilation was fairly good by 25 per cent of respondents in their animal shed. Findings of this study were in agreement of the findings of Pawar *et al.*, (2006), Bainwad *et al.*, (2007) and Sinha *et al.*, (2009). They reported that maximum number of respondent provide good to fairly good type of natural ventilation.

All (100 per cent) of the respondents of DDF adopted

some kind of measures to protect the animals from extreme weather conditions. They were providing curtains around shed during winter season and fans, fogger and in hot days of summer. They were having awareness regarding ill effects of the extreme weather conditions on health and production of animals. Bhardwaj (1999) also reported that most of farmer protects their animal against inclement weather condition.

Proper cleanliness in animal houses was maintained by eleven DDF owners and only one DDF farm it was Dirty. It was found that majority (91.7 per cent) of the DDF owners have clean animal shed and 8.3 per cent respondents have dirty animal shed. It might be due to the fact that animal houses were having more pucca type floor hence cleaning of shed was easier. Bainwad *et al.*, (2007) and Meena *et al.*, (2008) in their respective studies observed that more than 90 per cent of respondents were keeping the animal houses clean.

Perusal of data revealed that majority of the respondents (91.7 per cent) had pucca type of floor to their animal house while, 8.3 per cent respondents had stone paved floor. Pucca type of flooring in shed was helpful in maintaining cleanliness in shed. Patel *et al.*, (2005), Chowdhary *et al.*, (2006), Sabapara *et al.*, (2010a) and Singh *et al.*, (2007) in their respective study area observed that majority of animal houses were having kuchcha type floor.

Eleven DDF owners were provided proper slope in floor towards backward. It was observed that 91.7 per cent farmers had slope in floor towards back in the animal shed while, 8.3 per cent of the respondents had no slope in floor of their animal shed. Sinha *et al.*, (2009) observed that 65.6 per cent of the respondents in the urban areas had floor slope towards back in their animal shed. Rathore *et al.*, (2010) reported that regarding slope in floor about half (51.50 per cent) of respondents had floor slope towards back in their cattle shed.

Sheds were constructed using cemented and brick type of pillar in seven DDF while, five DDF were having iron type of pillar. It was observed that the majority (58.3 per cent) of the respondents used cemented and brick type poles while, 41.7 per cent of the respondents used iron poles to support the roof. It might be due to the fact that cemented poles are more robust and durable than the wooden poles. Divekar and Saiyed (2009) reported that 50.33 per cent of respondent used cemented type of pole.

It was found that all 100 per cent of the respondents used brick and cements to construction of wall in the animal house. No respondents used thatch, brick in mud and brick & lime for the same purpose. They provide firm house to protect animal from any calamity.

All the DDF farms were having constructed half wall in their animal houses. It might be due to the fact that it provides better ventilation and also less expenditure.

Microclimate inside the shed is greatly influenced by type of roof material Galvanised iron sheet roof were provided by seven DDF owner in their animal shed. while five shed roof were of asbestos sheet roof. It revealed that around 58.3 per cent and 41.7 per cent of the respondents used galvanized iron sheets and asbestos sheets as roofing material for their animal shed respectively. A variety of results were found regarding roofing material. Rathore *et al.*, (2010) observed that 70.50 per cent of the respondents used thatch material for roof of cattle shed while; Sabapara *et al.*, (2010a) reported that 94 per cent respondents used earthen plates with thatched roof material for their animal shed. Prevailing climatic conditions and economic status of the farmer might have played a significant role in the selection of roofing materials.

Ten DDF owners were providing double slope roof in animal shed and two animals shed were with single slope type roof. It was observed that majority of the respondents 83.3 per cent possessed double slope type of roof while 16.7 per cent of the respondents possessed single slope type roof in their animal shed. It might be due to that they follow double row housing system.

Manger space provided per animal was adequate in eleven dairy farms, while only in one farm it was inadequate. From the results it was evident that 91.7 per cent of the respondents provide adequate manger space (length more than or equal to 1.2 m) per animal while, 8.3 per cent of respondents provide inadequate manger space (length less than 1.2 m) per animal. DDF owners provide adequate manger space required per animal to supply the sufficient quantity of feed to cow which, improves animal comfort and help in increase milk production. Similar findings were reported by Rathore *et al.*, (2009) that 34.25 per cent of the respondents had pucca and optimum size of manger.

Proper drainage system helps to maintain cleanness of shed. It was observed that pucca drainage system was on eleven dairy farms while, only one farm was without any drainage system. This indicates 91.7 per cent respondents have pucca drainage facility while remaining 8.3 per cent of the respondents have no drainage facility in their animal houses. Most of DDF owner provide pucca drainage system to keep animal shed clean, hygienic and reduces chances of disease. Similar findings were reported by Modi (2003) and Deoras *et al.*, (2004), they found that about 82 per cent and 52.87 per cent of the respondents had pucca drainage facility in their animal houses, respectively.

It was observed that no DDF owners provide bedding material to their animals in winter in Anand district of Gujarat, whereas Meena *et al.*, (2008) reported 91.66 per cent of the respondents at high altitude of kumaon Himalaya provided bedding material to their animals in the winter while, Rathore *et al.*, (2010) reported that in Churu district of Rajasthan 66 per cent of the respondents used bedding material during winter season. Inconsistency in result might be due to the fact that during winter season mercury level of Anand district doesn't fall much as compared to the northern part of the country they only provide covering to animal shed from outside.

Half (50 per cent) of the DDF under the study have manure pit adjacent to their animal houses while and half (50 per cent) of the respondents have manure pit away from the animal house. It might be due to the fact that close vicinity of manure pit to the animal house helped them in easy disposal of the manure and also less time consuming, but still it is better to have manure pit away from the animal houses. Similar findings were reported by Sinha *et al.*, (2009), Tiwari *et al.*, (2009), Parma *et al.*, (2016), Thorat *et al.*, (2016) and Vinaya *et al.* (2017).

CONCLUSION

Studies on management and housing of DDF Farms in Anand District showed an increase of 69.66 per cent over year. It indicates better management and housing facilities. Majority of DDF are well managed and having good production and profitability.

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