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Existing housing management practices followed by dairy farmers in Hadoti region of Rajasthan

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Abstract
The study was conducted on the status of housing management practices followed by the dairy farmers in Hadoti region of Rajasthan. The data were collected from randomly selected 225 dairy animal owners through well-structured and pre-tested interview schedule. The study revealed that majority of respondents (60.44%) kept their animals in *pucca* houses, whereas 37.33 per cent kept in *kuccha* type of house. Majority (81.33%) of dairy shed attached to farmer's dwelling. About 49.33% of respondents provided long axis of the dairy animal shed in East-West followed by North-South (40%). Majority (86.22%) of respondents provided a single line of housing system followed by (8.44%) tail to tail system and minority of farmers (5.33%) provided head to head system of housing. Majority (82.22%) of the respondents provided adequate lighting whereas. About 87.11% of respondents provide protection to animals against extreme weather. Majority (53.77%) of respondents maintained medium cleanliness of sheds followed by poor (19.11%), good (18.22%) and only 5.55% maintain excellent cleanliness of sheds. About 80.89% of respondents provided *kuccha* floor followed by 19.11% *pucca* (cement concrete) floor. 74.22% of houses with proper wall facilities followed by no wall (25.78%). About 53.78% of respondents provided thatched roof followed by galvanized iron/Asbestos sheets roof (18.22%), cement roof (17.78%) and no roof (17.33%) for their animal's house. About 50.67% of animal's house had no drainage system. Majority (48.89%) of the respondents had distant manure pit followed by (36.89%) adjacent and 14.22% not practiced of manure pit in the study area.

Keywords: Housing management, hadoti, dairy farmers, management practices, respondents

Introduction
The livestock sector has emerged as a vital sector for ensuring a more inclusive and sustainable agriculture system. Good manage mental practices are future of the livestock industry. Proper management plays an important role in the development of the dairy sector of the country (Khan *et al*. 2007) [9]. 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) [5]. The housing management of animals forms the very backbone of any livestock production system. 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. It has been observed that very little attention is given to proper and scientific recommended housing management practices and there is a great need for baseline studies to identify the farmers rearing practices in terms of dairy animals. Hence, the present study was purposely carried out with the target to gather information in terms of housing management practices followed by the dairy owners in Hadoti region of Rajasthan.

Materials and Methods
Information pertaining to farmer's adoption pattern regarding housing practices for dairy animals was collected from three districts in Hadoti region of Rajasthan namely Kota, Bundi and Baran. Three blocks from each district, five villages from each blocks and five dairy farmers from each village were randomly selected for study, thus a total of 225 dairy farmers (75x3) were selected. The selected respondents were interviewed personally with the help of a well-structured and pre-tested interview schedule.

Results and Discussion

The results obtained on the different parameters of housing of animals in the survey area from 225 farmers are summarized in the following sub heads and detailed information are showed in Table 1.

Type of Housing

It was observed that 62.66, 58.67 and 60 percent of respondents provided *pucca* shelters for dairy animals in Kota, Bundi and Baran district, respectively. About 34.67, 37.33 and 40 percent provided *kuccha* type of housing in Kota, Bundi and Baran, respectively. Whereas minority 2.67, 4 and 0 percent of respondents not provided any type of shelters for their animals in Kota, Bundi and Baran, respectively. Overall, it was observed that majority of respondents provided the *pucca* type of housing (60.44%) followed by *kuccha* shelter (37.33%) and only 2.22% of respondents did not provide housing for dairy animals in the study area. The results are in agreement with finding of Pilaniya *et al*. (2018) [1] in study onrural dairy animal owners of sabar dairy milk shed in Gujarat.

Location shed

Study revealed that 73.33, 81.33 and 85.33 percent of respondents had dairy animal shed attached to human dwellings in Kota, Bundi and Baran, respectively. About 22.67, 18.67 and 14.67 percent of respondents had dairy animal shed separate from their dwellings in Kota, Bundi and Baran, respectively. Overall majority (81.33%) of dairy farmers had dairy animal shed attached to their dwelling followed by separate from human dwelling (18.67%) in the study area.The findings are in close conformity with the earlier reports of Choudhary *et al*. (2017) [3] and contrary to findings of Gupta *et al.* (2008) [5] who reported that 86.00 per cent of house hold provide separate stall outside the human dwelling in Rajasthan.

Direction of Shed

It was observed that 53.33, 49.33 and 45.33 percent of respondents provided long axis of dairy animal shed in East-West direction in Kota, Bundi and Baran, respectively. About 41.33, 38.67 and 40 percent of respondents provide long axis of dairy animal shed in North-South direction in Kota, Bundi and Baran, respectively. Whereas 5.33, 12 and 14.67 percent of farmers did not follow any direction of the shed in Kota, Bundi and Baran, respectively. Overall, 49.33% of respondents provided long axis of the dairy animal shed in East-West followed by North-South (40%) and having no direction (10.67%) of sheds in the study area. The present finding are in accordance with the results reported by Kumar *et al.* (2011) [7] and dissonance with the findings of Sinha *et al*. (2009) [6], they reported that 48.89% animal houses were in east-west direction but majority of animal houses in (51.11%) were in north-south direction in Uttar Pradesh.

System of Housing

It was found that 89.33,82.67 and 86.67percent of respondents provided a single line of housing system for dairy animals in Kota, Bundi and Baran, respectively. About 6.67, 10.67and 8 percent of respondents provided tail to tail housing systems in Kota, Bundi and Baran, respectively. About 4, 6.67and 5.33 percent of respondents provided head to head system of housing in Kota, Bundi and Baran districts, respectively. Overall majority (86.22%) of respondents provided a single line of housing system followed by (8.44%) tail to tail system of housing and minority of farmers (5.33%) provided head to head system of housing for dairy animals in the study area. These findings are agreement with the findings of Ahiwar *et al.* (2009) [2] and Sabapara *et al*. (2015) [8], they reported that majority of the respondents had single row housing system in their respective study area.

Size of House

It was observed that 29.33, 18.67 and 30.67 percent of respondents had not optimum sized animal houses in Kota, Bundi and Baran, respectively. Whereas 70.67, 81.33 and 69.33 percent respondents had optimum size of animal houses in Kota, Bundi and Baran district, respectively. Overall, 73.78% of respondents provided optimum sized of houses for animals followed by 26.22% provide not optimum size of a house in the study area. Similar findings were reported by Kumar *et al*. (2011) [7] in Tehri Garhwal district of Uttarakhand.

Floor space available

It was found that 26.67, 21.33 and 29.33 percent of respondents provided inadequate floor space in Kota, Bundi and Baran respectively. Whereas 73.33, 78.67 and 70.67 percent of respondents provided adequate floor space in Kota, Bundi and Baran, respectively. Overall, 74.22 and 25.78 percent of dairy farmers provided adequate and inadequate floor space in dairy sheds, respectively in the study area. Similar finding were also reported by Patel *et al*. (2018) and Kumar *et al*. (2011) [7].

Lighting

It was found that adequate lighting was provided by 80, 84 and 82.67 percent of respondents in Kota, Bundi andBaran, respectively. About 20, 16 and 17.33 percent of respondents provided inadequate lighting in Kota, Bundi and Baran, respectively. Overall majority (82.22%) of the respondents provided adequate lighting followed 17.78% provided inadequate lighting in the study area. Similar findings were also reported by Patel *et al*. (2018) [4] in Valsad district of Gujarat.

Ventilation

It was observed that 17.33, 10.67 and 22.67 percent of respondents provided poor ventilation in Kota, Bundi and Baran, respectively. Whereas 82.67, 89.33 and 77.33 percent of respondents provided good ventilation in Kota, Bundi and Baran, respectively. Overall, it was observed that a majority percent of respondents (83.11%) provided good ventilation followed by poor ventilation (16.89%) in animal houses in the study area. Similar finding were also reported by Choudhary *et al*. (2017) [3] in Udaipur district of Rajasthan

Provision& practice to protect animal from extreme weather

It was observed that provision and practice to protect the animal from extreme weather was provided by 84, 86.67 and 90.67 percent of respondents in Kota, Bundi and Baran, respectively. Whereas 16, 13.33 and 9.33 percent of respondents did not provide the provision and practice to protect the animal from extreme weather in Kota, Bundi and Baran, respectively. Overall higher number (87.11%) of

respondents provided protection to animals against extreme weather and only 12.89% of members did not follow any practice to protect the animals. The result are in agreement with the findings of Sabapara *et al*. (2010) [10].

Cleanliness of Sheds

Animal sheds observed that 5.33, 4 and 7.33 percent of respondents maintained excellent cleanliness of shed in Kota, Bundi and Baran, respectively. About 26.67, 13.33 and 14.67 percent of respondents maintained good cleanliness of shed in Kota, Bundi and Baran district, respectively. 54.67, 61.33 and 45.33 percent of respondents maintained medium cleanliness of shed in Kota, Bundi and Baran district, respectively. Whereas 13.33, 21.33 and 22.67 percent of respondents maintained poor cleanliness of sheds in Kota, Bundi and Baran, respectively. Overall, it was found that majority of respondents (53.77%) maintained medium cleanliness of sheds followed by poor (19.11%), good (18.22%) and 5.55% maintain excellent cleanliness of sheds in the study area. These findings are in agreement with the findings of Sharma and Singh, (2003) [13] and Sikha Yadav, (2018) [14].

Type of Floor

Pucca type of floor in animal houses was observed with 18.67, 13.33 and 25.33 percent of respondents in Kota, Bundi and Baran, respectively. Earthen type of flooring was observed with 81.33, 86.67 and 74.67 percent of respondents in Kota, Bundi and Baran, respectively. Overall, it was observed that majority (80.89%) of respondents provided *kuccha* floor followed by (19.11%) *pucca* (cement concrete) floor in animal houses in the study area. The present findings are in line with the findings of Singh *et al*. (2007) in Rajasthan they observed that most of the animal owners had *kuchcha* floor.

Slope in Floor

It was found that 4 and 2.67 percent of respondents provided slope of the floor towards the back in Kota and Baran districts, whereas 96, 100 and 97.33 percent of respondents did not provide any slope on the floor. Overall majority (97.78%) of respondents provided no slope followed by (2.22%) slope of the floor towards the back in animal houses in the study area. Present findings are in conformity with the results of Choudhary *et al*. (2017) [3].

Wall of House

Full wall of cattle shed was observed in 73.33, 78.67 and 70.67 percent of respondents in Kota, Bundi and Baran, respectively. No walls were observed in 26.67, 21.33 and 29.33 percent of respondents sheds in Kota, Bundi and Baran, respectively. Overall majority (74.22%) of respondents provided wall followed by no wall (25.78%) in the study area. Present results are in accordance to the results of Sinha *et al*. (2009) [6].

Type of Roof

No roof was found in animal houses 5.33, 8 and 9.33 percent of respondents in Kota, Bundi and Baran, respectively. Cement roof was observed that 13.33, 17.33 and 22.67 percent of respondents animal houses in Kota, Bundi and Baran, respectively. Galvanized iron sheet/Asbestos sheet roof was observed that 22.67, 13.33 and 14.67 percent of respondents in Kota, Bundi and Baran, respectively. Thatched roof was found in animal houses with 54.67, 61.33 and 45.33 percent of respondents in Kota, Bundi and Baran, respectively. Overall, 53.78% of respondents provided thatched roof followed by followed by galvanized iron/Asbestos sheets roof (18.22%), cement roof (17.78%) and no roof (17.33%) as a roofing material in the study area. Similar findings were also reported by Varaprasad *et al*. (2013) [11].

Type of Manger

It was found that *kuccha* type of manger was provided by 34.67, 41.33 and 34.67 percent of respondents in Kota, Bundi and Baran, respectively. About 41.33, 36 and 46.67 percent of respondents provided *pucca* type manger in Kota, Bundi and Baran, respectively. Whereas 16, 8 and 9.33 percent of respondents provided wooden assisted temporary manger in Kota, Bundi and Baran, respectively. 8, 14.67 and 9.33 percent of respondents did not provide mangers in the Kota, Bundi and Baran district, respectively. Overall majority of respondents provided *pucca* manger (41.33%) followed by *kuccha* manger (36.89%), and wooden assisted temporary manger (21.78%) in the study area. The findings are in close conformity with the earlier reports of Pilaniya *et al.* (2018) [1].

Provision of Drainage System

It was observed that 49.33, 50.67 and 48 percent of respondents followed a *pucca* drainage system in Kota, Bundi and Baran, respectively. Whereas soaked at earthen floor drainage system was seen with 50.67, 49.33 and 52 percent of respondents in Kota, Bundi and Baran, respectively. Overall majority (50.67%) of respondents provided soaked at the earthen floor drainage system followed by (49.33%) *pucca* drainage in the study area. The result is conformity to finding of Sabapara *et al.* (2015) [8]. They reported 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

Location of Manure Pit

It was found that the location of manure pit was adjacent to the dairy sheds with 34.67, 41.33 and 34.67 percent of respondents in Kota, Bundi and Baran, respectively. Whereas the distant location of manure pit was maintained by 50.67, 42.67 and 53.33 percent of respondents in Kota, Bundi and Baran, respectively. No manure pit was used by 14.67, 16 and 12 percent of respondents in Kota, Bundi and Baran, respectively. Overall majority (48.89%) of the respondents had distant manure pit followed by (36.89%) adjacent and 14.22%not practiced of manure pit in the study area. Present findings are in conformity with the results of Choudhary *et al*. (2017) [3].

Table 1: Housing management practices of Dairy farmers in Kota, Bundi and Baran districts of Rajasthan (n=225).

S. No	Particulars	Unit	Kota	Bundi	Baran	Overall
		%	(75)	(75)	(75)	(225)
1.	**Type of Housing**					
(a)	No shelter	%	2.67 (2)	4 (3)	0 (0)	2.22 (5)

(b)	Kutcha	%	34.67 (26)	37.33 (28)	40 (30)	37.33 (84)
(c)	Pucca	%	62.66 (47)	58.67 (44)	60 (45)	60.44 (136)
2.	**Location shed**					
(a)	Attached to human Dwelling	%	73.33 (58)	81.33 (61)	85.33 (64)	81.33 (183)
(b)	Separate from human Dwelling	%	22.67 (17)	18.67 (14)	14.67 (11)	18.67 (42)
3.	**Direction of shed**					
(a)	East-West	%	53.33 (40)	49.33 (37)	45.33 (34)	49.33 (111)
(b)	North-South	%	41.33 (31	38.67 (29)	40 (30)	40 (90)
(c)	No direction	%	5.33 (4)	12 (9)	14.67 (11)	10.67 (24)
4.	**System of housing**					
(a)	Single line	%	89.33 (67)	82.67 (62)	86.67 (65)	86.22 (194)
(b)	Head to head	%	4 (3)	6.67 (5)	5.33 (4)	5.33 (12)
(C)	Tail to tail	%	6.67 (5)	10.67 (8)	8 (6)	8.44 (19)
5.	**Size of house**					
(a)	Optimum	%	29.33 (22)	18.67 (14)	30.67 (23)	26.22 (59)
(b)	Not optimum	%	70.67 (53)	81.33 (61)	69.33 (52)	73.78 (166)
6.	**Floor Space available**					
(a)	Adequate	%	26.67 (20)	21.33 (16)	29.33 (22)	25.78 (58)
(b)	In adequate	%	73.33 (55)	78.67 (59)	70.67 (53	74.22 (167)
7.	Light	%				
(a)	Adequate	%	80(60)	84(63)	82.67(62)	82.22(185)
(b)	In adequate	%	20(15)	16(12)	17.33(13)	17.78(40)
8.	Ventilation	%				
(a)	Poor	%	17.33(13)	10.67(8)	22.67(17)	16.89(38)
(b)	Good	%	82.67(62)	89.33(67)	77.33(58)	83.11(187)
9.	**Provision & practice to protect animal from extreme weather**					
(a)	Yes	%	84(63)	86.67(65)	90.67(68)	87.11(196)
(b)	No	%	16(12)	13.33(10)	9.33(7)	12.89(29)
10.	**Cleanliness of Shed**					
(a)	Excellent	%	5.33(4)	4(3)	7.33(13)	5.55(20)
(b)	Good	%	26.67(20)	13.33(10)	14.67(11)	18.22(41)
(c)	Medium	%	54.67(41)	61.33(46)	45.33(34)	53.77(91)
(d)	Poor	%	13.33(10)	21.33(16)	22.67(17)	19.11(43)
11.	**Type of floor**					
(a)	Pucca (cement concrete)	%	18.67(14)	13.33(10)	25.33(19)	19.11(43)
(b)	Pacca	%	81.33(61)	86.67(65)	74.67(56)	80.89(182)
12.	Slope of Floor	%				
(a)	Yes	%	4(3)	0(0)	2.67(2)	2.22(5)
(b)	No	%	96(72)	100(75)	97.33(73)	97.78(120)
13.	**Wall of house**					
(a)	Yes	%	73.33(55)	78.67(59)	70.67(53	74.22(167)
(b)	No	%	26.67(20)	21.33(16)	29.33(22)	25.78(58)
14.	**Type of roof**					
(a)	No roof	%	5.33(4)	8(6)	9.33(7)	7.55(17)
(b)	Cement roof	%	13.33(10)	17.33(13)	22.67(17)	17.78(40)
(c)	Galvanized iron/ Asbestos sheets roof	%	26.67(20)	13.33(10)	14.67(11)	18.22(41)
(d)	Thatched roof	%	54.67(41)	61.33(46)	45.33(34)	53.78(121)
15.	**Type of manger**					
(a)	Kutcha	%	34.67 (26)	41.33 (31)	34.67 (26)	36.89 (83)
(b)	Pacca	%	41.33 (31)	36 (27)	46.67 (35)	41.33 (93)
(c)	Wooden assisted Temporary	%	16 (12)	8 (6)	9.33 (7)	11.11 (25)
(d)	No manger	%	8 (6)	14.67 (11)	9.33 (7)	10.67 (24)
16.	**Provision of drainage system**					
(a)	Pucca drain	%	49.33 (37)	50.67 (38)	48 (36)	49.33 (111)
(b)	Soaked at earthen floor	%	50.67 (38)	49.33 (37)	52 (39)	50.67 (114)
17.	**Location of manure pit**					
(a)	Adjacent	%	34.67 (26)	41.33 (31)	34.67 (26)	36.89 (83)
(b)	Distant	%	50.67 (38)	42.67 (32)	53.33 (40)	48.89 (110)
(c)	No manure pit	%	14.67 (11)	16 (12)	12 (9)	14.22 (32)

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