



ISSN: 2456-2912

VET 2024; SP-9 (1): 402-407

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www.veterinarypaper.com

Received: 01-10-2023

Accepted: 06-11-2023

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Study on the role of human resources in housing and milking practices in relationship to herd size of cattle in Alwar district of Rajasthan

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Abstract

The current investigation has been performed in Rajasthan's Alwar district. There were two tehsils Tijara and Rajgarh and 5 villages from every tehsil have been chosen at random. A total of 180 cow breeders were chosen for the study, with each town having eighteen cattle breeders. Chi-Square analysis was used to examine how herd size linked statistically with existing housing and milking management techniques and human resources' role in cattle management procedures was recorded on a percent basis. Regarding the housing management practices 57.78 percent of the respondents kept their animals near dwelling house. In cattle shed, only 32.22 percent of respondents had slope in the floor. Roof made by asbestos materials were prevalent in the study area (43.89%). Wall of shed was prepared from bricks and lime cement material by 73.89 percent of the respondents followed by that prepared from thatch (23.33%). The respondents (80.56%) had Pucca manger to feed their animals. Out of total respondents 37.22 percent of the respondents had constructed water trough in animal shed. The practice of providing bedding material in animal shed was followed by 62.22 percent of total respondents. Result indicated that 46.67 percent of the respondents segregate their cattle before calving and 67.78 percent provided bedding material to pregnant cattle. Out of total respondents, 21.67 percent had light provision in animal shed. The practice of washing of hind quarters of their cattle after the drop of placenta was followed by 96.67 percent of the respondents. Regarding milking management practices result indicated that 92.52 percent of the respondents followed knuckling method of milking. Result shows that 55.56 percent of the respondents use to change milker. It was found that 73.33 percent of the respondents used clean water for cleaning of milking utensils while 26.67 percent of the respondents used ash and water for cleaning of milking utensils. Results indicated that 60.00 percent of the respondents offer concentrate and feed if the cattle do not let down milk after the death of calf while 40.00 percent of the respondents followed teat manipulation if the cattle do not let down milk after the death of calf.

Keywords: Alwar, herd size, housing, human resources, milking

Introduction

Livestock sector is an important source of income for rural people in India. Livestock development has a strong positive effect on rural employment and poverty reduction (Kumar *et al.*, 2019; Mordia *et al.*, 2019) [10, 13]. There is a considerable percentage of agricultural draft power that comes from livestock. According to the recent 20th Livestock Census 2019, this is an increase of 0.8 percent over the previous census. In the country, the total number of cattle was 192.49 million in 2019. Cattle comprise around 36% of the total livestock. In Rajasthan, Animal Husbandry has a vital place in the economic development of the state as it contributes about 8 percent of the state GDP (Livestock Census, 2019) [11]. Market oriented milk production was observed as economically most sustainable for the farmers (Baral *et al.*, 2020) [1]. The rise in per capita income, urbanisation, as well as lifestyle changes, women's participation in the labour force, changes in taste along with desire, are all major factors contributing to the expansion of livestock-based goods (Chanoria and Kumar, 2019) [3]. Due to a lack of detailed information regarding the involvement of human resources and marketing practices in the Alwar district of Rajasthan; Policymakers have not been able to

devote sufficient attention to such critical areas of cattle production due to time and resource constraints. Thus, this is essential for obtaining first-hand information on the current participation of human resources, housing and milking practices being followed by the cattle keepers in Rajasthan's Alwar district. With the increase in number of milch animals, milk production will increase leading to higher household income from dairy. Further it was expected that herd size may positively influence the income level by increasing the production level (Feroze *et al.*, 2011) [5].

Materials and Methods

This research has been performed in 2 chosen tehsils, Rajgarh and Tijara of the Alwar district of Rajasthan. Further, Five villages from each selected tehsil *viz.* Rajgarh (Digwara, Palwa, Kandoli, Thana and Karoth) and Tijara (Tijara, Palpur, Ibrahimpur, Raikhera and Rambasjhonpri) were recognized. A total of 18 respondents have been chosen at random from every village. As a result, a total of 180 people from 10 villages across two tehsils in the district participated in the survey. Each respondent has been interviewed one-on-one according to a predetermined interview schedule, and the information was gathered this way. There was a cattle owners' list in chosen villages compiled by the village Patwari and Sarpanch, and the criteria used to pick from all classes were separated into three groups based on herd sizes: large, medium, and small.

Based on the cattle's herds size, respondents have been classified. The adult cattle units have been counted as pregnant, dry, milch cattle whereas bull is considered as one adult unit. The calf along with the heifer have been expected as 0.25 and 0.5 adult units, respectively as well as respondents have been categorized as Medium (1.6 to 4.5 units), Large (above 4.5 units), as well as small (up to 1.5 units) group. Chi-Square (χ^2) analysis was used to examine how herd size linked statistically with existing housing and milking management techniques, and human resources' role in cattle management procedures was recorded on a percent basis Snedecor and Cochran

Results and Discussion

1. Housing practices

The findings obtained from 180 respondents on the various housing aspects of cattle in the study are summarized in the following subheadings and detailed information is given in Table 1.

1.1 Type of housing

The results indicated that the effect of cattle herd size on type of housing was non-significant ($\chi^2=3.156$). Overall (91.11%) of cattle rearer had opted conventional housing and (8.89%) adopted loose animal housing. Conventional housing was highly adopted by medium-sized herd house holds 97.68 percent while loose housing by small herd owners 11.58 percent.

1.2 Location of shed

The results indicated that there was a non-significant association between location of shed and herd size ($\chi^2=5.755$). The results showed that (57.78%) of cattle rearers house their animals near the dwelling house, followed by housing inside the dwelling house (23.33%) and housing separately from the dwelling house (18.89%). It was found that 60 percent small herd owners housed their animals near the dwelling house followed by medium herd owners

(55.81%) and large herd owners (54.77%). The findings of present study about location of animals had are close conformity with the earlier reports of Rathore *et al.* (2010) [15].

1.3 Type of floor

All the respondents had kutchha floor in their animal houses. The findings of type of floor are in close conformity with the earlier reports of Sabapara *et al.* (2010) [16], Singh *et al.* 2018 [17] and Narsimha *et al.* (2019) [14].

1.4 Slope in floor

The results indicated that the effect of cattle herd size on slope in floor was non-significant ($\chi^2=2.488$). 32.22 percent of the respondents had adopted the practice of giving slope in floor of animal houses while 67.78 percent had not adopted his practice. The findings regarding slope in floor are close conformity with Kumar *et al.* (2006) [9].

1.5 Drainage channel/pit

The association between herd size and practice of drainage channel/pit in animal housing was non-significant ($\chi^2=2.787$). Results indicated that 16.67 percent of respondents had drainage channel/pit for animal houses while 83.33 percent were not having drainage channel/pit. The findings regarding drainage channel/pit are close conformity with Kumar *et al.* (2006) [9].

1.6 Feature of roof shed

There was non-significant association between herd size and feature of roof shed used for animal houses ($\chi^2=3.596$). Out of total respondents, 73.89 percent respondents had single slope of their animal houses and 26.11 percent had flat roof of their animal houses. Results revealed that 83.33 percent of large herd owners had single slope roof shed animal houses and 31.58 percent small herd owners had flat roof animal houses.

1.7 Roof material

There was non-significant association between herd size and roof material ($\chi^2=8.77$). 43.89 percent of total respondents used asbestos as roof material, followed by 29.45 percent of total respondents who used thatch as roof material, 13.33 percent of total respondents who used stone slab as roof material and 13.33 percent of total respondents who used tin shed for making roof of animal houses. It was found that 55.81 percent of medium herd owners, 50.00 percent of total large herd owners and 35.79 percent of total small herd owners used asbestos as roof material for their animal houses.

1.8 Wall material

The results indicated that the effect of cattle herd size on wall material was non-significant ($\chi^2 = 3.206$). Out of the total respondents, 73.89% used bricks and lime cement, 23.33% used thatch as wall material of animal houses and 2.78% used bricks in mud as wall material.

1.9 Manger feeding

All the respondents of all herd sizes followed the method of manger feeding. The present findings about type of manger feeding were same as reported by Garg, *et al.* (2005) [6].

1.10 Type of manger

The results indicated that the effect of cattle herd size on type of manger was non-significant ($\chi^2=4.206$). 80.56 percent of the total respondents had *pucca* manger to feed their animals,

while 19.44 percent had wooden manger. The findings showed that (75.79%) of small herd owners, (90.70%) of medium herd owners and (80.96%) of large herd owner shad *pucca* mangers for animal feeding.

1.1 Ventilation

All the respondents of all herd size had optimum ventilation in their animal houses.

1.2 Water trough In shed

The results indicated that the effect of cattle herd size on water trough in shed was non-significant ($\chi^2=3.791$). Out of the total, (37.22%) of respondents had water troughs in their animal shed, while (62.78%) of respondents had not water troughs in their animal shed.

1.3 Bedding material in winter

The results indicated that there was highly significant association between bedding material in winter and herd size ($\chi^2=26.583$). The practice of providing bedding material in animal shed was followed by 62.22 percent of total respondents while 37.78 percent had not adopted this practice. 73.69 percent of small owners had adopted this practice while 69.77% of medium herd and 28.57% large herd owners had followed adopted practice of providing bedding material in winter. The present findings regarding use of bedding material in winter are similar with the earlier findings of Sabapara *et al.* (2010) [16], Sinha *et al.* (2009) [18] and Singh *et al.* (2018) [17].

1.4 Segregate cattle before calving

The results indicated that the effect of cattle herd size on practice of segregation of cattle before calving was non-

significant ($\chi^2=6.911$). Out of total respondents, 46.67 percent had adopted this practice of segregation of cattle before calving while 53.33 percent had not adopted it. Results indicated that 64.29 percent of large herd owners had adopted this practice followed by small herd owners (42.10%) and medium herd owners (39.53%).

1.5 Bedding material to pregnant cattle

The results indicated that the effect of cattle herd size on practice of bedding material to pregnant cattle was non-significant ($\chi^2=5.383$). The study revealed that 67.78 percent of the total respondent shad provision of providing bedding material to pregnant cattle while 32.22% had not adopted this practice. It was found that 80.96% of large herd owners had adopted this practice followed by medium herd owners (69.77%) and small herd owners (61.05%).

1.6 Light provision in animal shed

There was non-significant association between herd size and light provision in animal shed ($\chi^2=0.333$). Out of total respondents, 21.67 percent had light provision in animal shed while 78.33 percent had no light provision in their animal shed.

1.7 Wash hind quarters after drop of placenta

The results indicated that there was a non-significant association between practice of washing hind quarters after drop of placenta and herd size ($\chi^2=3.657$). Out of total respondents, 96.67 percent respondents had adopted it and 3.33 percent had not adopted this practice. The results indicated that 98.95 percent of small herd owners had adopted this practice followed by medium herd owners (95.34%) and large herd owners (92.86%).

Table 1: Housing practices in cattle

S. No.	Practices	Small Herd	Medium Herd	Large Herd	Overall	χ^2 value
1	Type of housing					
A	Conventional	84 (88.42)	42 (97.68)	38 (90.48)	164 (91.11)	3.156
B	Loose	11 (11.58)	1 (2.32)	4 (9.52)	16 (8.89)	
2	Location of shed					
A	Inside dwelling house	26 (27.37)	8 (18.60)	8 (19.04)	42 (23.33)	5.755
B	Near dwelling house	57 (60.00)	24 (55.81)	23 (54.77)	104 (57.78)	
C	Separate from Dwelling house	12 (12.63)	11 (25.59)	11 (26.19)	34 (18.89)	
3	Type of floor					
A	Kutchha	95 (100)	43 (100)	42 (100)	180 (100)	NA
B	<i>Pucca</i>	0 (0)	0 (0)	0 (0)	0 (0)	
4	Slope in floor					
A	Yes	27 (28.42)	18 (41.87)	13 (30.96)	58 (32.22)	2.488
B	No	68 (71.58)	25 (58.13)	29 (69.04)	122 (67.78)	
5	Drainage channel/pit					
A	Yes	20 (21.05)	5 (11.62)	5 (11.91)	30 (16.67)	2.787
B	No	75 (78.95)	38 (88.38)	37 (88.09)	150 (83.33)	
6	Feature of roof shed					
A	Flat	30 (31.58)	10 (23.26)	7 (16.67)	47 (26.11)	3.596
B	Single slope	65 (68.42)	33 (76.74)	35 (83.33)	133 (73.89)	
C	Double slope	0 (0)	0 (0)	0 (0)	0 (0)	
7	Roof material					
A	Thatch	34 (35.79)	7 (16.28)	12 (28.58)	53 (29.45)	8.77
B	Asbestos	34 (35.79)	24 (55.81)	21 (50.00)	79 (43.89)	
C	Stone slab	14 (14.73)	7 (16.28)	3 (7.14)	24 (13.33)	
D	Tin shed	13 (13.69)	5 (11.63)	6 (14.28)	24 (13.33)	
E	Any other	0 (0)	0 (0)	0 (0)	0 (0)	
8	Wall material					
A	Thatch	26 (27.37)	6 (13.96)	10 (23.80)	42 (23.33)	3.206
B	Bricks & lime Cement	66 (69.48)	36 (83.72)	31 (73.80)	133 (73.89)	

C	Bricks in mud	3 (3.15)	1 (2.32)	1 (2.4)	5 (2.78)	
9	Manger feeding					
A	Yes	95 (100)	43 (100)	42 (100)	180 (100)	NA
B	No	0 (0)	0 (0)	0 (0)	0 (0)	
10	Type of manger					
A	Kutchra	0 (0)	0 (0)	0 (0)	0 (0)	4.206
B	Pucca	72 (75.79)	39 (90.70)	34 (80.96)	145 (80.56)	
C	Wooden	23 (24.21)	4 (9.30)	8 (19.04)	35 (19.44)	
11	Ventilation					
A	Low	0 (0)	0 (0)	0 (0)	0 (0)	NA
B	Optimum	95 (100)	43 (100)	42 (100)	180 (100)	
C	Excess	0 (0)	0 (0)	0 (0)	0 (0)	
12	Water trough in shed					
A	Yes	30 (31.58)	21 (48.83)	16 (38.10)	67 (37.22)	3.791
B	No	65 (68.42)	22 (51.17)	26 (61.90)	113 (62.78)	
13	Bedding material in winter					
A	Yes	70 (73.69)	30 (69.77)	12 (28.57)	112 (62.22)	26.583**
B	No	25 (26.31)	13 (30.23)	30 (71.43)	68 (37.78)	
14	Segregate cattle before calving					
A	Yes	40 (42.10)	17 (39.53)	27 (64.29)	84 (46.67)	6.911
B	No	55 (57.90)	26 (60.47)	15 (35.71)	96 (53.33)	
15	Bedding material to pregnant cattle					
A	Yes	58 (61.05)	30 (69.77)	34 (80.96)	122 (67.78)	5.383
B	No	37 (38.95)	13 (30.23)	8 (19.04)	58 (32.22)	
16	Light provision in animal shed					
A	Yes	19 (20.00)	10 (23.26)	10 (23.80)	39 (21.67)	0.333
B	No	76 (80.00)	33 (76.74)	32 (76.20)	141 (78.33)	
17	Wash hind quarters after placenta drop					
A	Yes	94 (98.95)	41 (95.34)	39 (92.86)	174 (96.67)	3.657
B	No	1 (1.05)#	2 (4.66)	3 (7.14)	6 (3.33)	

*Significant ($p < 0.05$), **Significant ($p < 0.01$), NA= Not applicable, Milking practices

The results obtained from 180 respondents on the different milking practices of cattle in the study are summarized in the sub headings below and detailed information is given in Table 2.

1.8 Method of milking

The results indicated that the effect of cattle herd size on method of milking was non-significant ($\chi^2=0.601$). The results indicated that 92.22 percent of respondents had adopted practice of knuckling as a method of milking while 7.78 percent had adopted stripping as milking method in the study area. Full hand milking method was adopted by none of the cattle rearers studied. The results of present study regarding milking method are almost similar with the earlier findings of Garg *et al.* (2005) [6] and Rathore *et al.* (2010) [15], Manohar *et al.* (2013) [12] and Tewari *et al.* (2016) [20].

1.9 Stripping at the end of milking

The results indicated that all the 180 respondents had adopted the practice of stripping at the end of milking in the study area. The results regarding stripping at the end of milking are almost similar to the findings of Kumar and Mishra (2011) [8].

1.10 Place of milking

The results indicated that all the 180 respondents had adopted the practice of milking at the same place in the study area. The present finding of place of milking are similar to the results of reports of Garg *et al.* (2005) [6].

1.11 Frequency of milking

The results indicated that all the 180 respondents had adopted the practice of milking twice a day in the study area. The findings of frequency of milking are similar to the reports of Garg *et al.* (2005) [6], Bashir and Kumar (2013) [2] and Tewari *et al.* (2016) [20].

1.12 Time and milking interval

It was found that all the 180 cattle rearers milk their cattle at around 6.30 O'clock and at an interval of 12 hours.

1.13 Clean teat and udder before milking

The results revealed that all the 180 respondents had adopted the practice of cleaning teat and udder before milking in the study area. All the respondents cleaned udder and teats before milking. These results are in agreement with the earlier findings of Garg *et al.* (2005) [6], Gupta *et al.* (2008) [7], Rathore *et al.* (2010) [15], Bashir and Kumar (2013) [2] and Chaudhary *et al.* (2013) [4].

1.14 Wash hand before milking

The results revealed that all the 180 respondents had adopted the practice of wash hand before milking in the study area. These result are in agreement with the earlier findings of Garg *et al.* (2005) [6], Gupta *et al.* (2008) [7], Rathore *et al.* (2010) [15], Bashir and Kumar (2013) [2] and Chaudhary *et al.* (2013) [4].

1.15 Change milker

There was non-significant association between herd size and changing milker ($\chi^2=1.251$). Out of total respondents, 55.56 percent of total respondents change milker while 44.44% of total respondent's donot adopt the practice of changing milker.

1.16 Cleaning of milking utensils

There was non-significant association between herd size and cleaning of milking utensils ($\chi^2=0.11$). Out of total respondents, 73.33 percent of total respondents used clean water for washing milking utensils while 26.67 percent used ash and water for washing milking utensils. The findings

regarding cleaning of milking utensil were agreement with Kumar *et al.* (2006) [9].

1.17Drying off practice

All the 180 respondents had adopted the practice of drying off their cattle in the study area.

1.18Wipe to clean udder

None of the cattle rearers in the study are a had adopted practice of cleaning udder after milking. The findings regarding wipe to clean udder agreement with the earlier findings of Kumar and Mishra (2011) [8].

1.19 Suckling of calf: The study revealed that 100 percent of the respondents allowed calf to suckled am both before and after milking. The findings of calf allowed to

suckle are almost similar to the reports of Garg *et al.* (2005) [6] and Choudhary *et al.* (2013) [4].

1.20Milk let down practice after death of calf

There was non-significant association between herd size and milk let down practice after death of calf ($\chi^2=6.123$).The results indicated that 60.00 percent of total respondents had adopted the method offering concentrate and feed to dam after death of calf for let down of milk while by 40.00 percent who used teat manipulation method.

1.21Dry hand milking

None of the respondents had adopted the practice of dry hand milking in the study area. The findings of dry hand milking are similar to Manohar *et al.* (2013) [12].

Table 2: Milking practices in cattle

S. No.	Practices	Small Herd	Medium Herd	Large Herd	Overall	χ^2 value
1.	Method of milking					
a.	Full hand milking	0 (0)	0 (0)	0 (0)	0 (0)	0.601
b.	Knuckling	89 (93.70)	39 (90.70)	38 (90.50)	166 (92.22)	
c.	Stripping	6 (6.30)	4 (9.30)	4 (9.50)	14 (7.78)	
2.	Stripping at the end of milking					
a.	Yes	95 (100)	43 (100)	42 (100)	180 (100)	NA
b.	No	0 (0)	0 (0)	0 (0)	0 (0)	
3.	Place of milking					
a.	Milking at the Same place	95 (100)	43 (100)	42 (100)	180 (100)	NA
b.	At a different and dry place	0 (0)	0 (0)	0 (0)	0 (0)	
4.	Time and milking interval					
a.	6.30 o'clock and 12 hours	95 (100)	43 (100)	42 (100)	180 (100)	NA
5.	Clean teat and udder before milking					
a.	Yes	95 (100)	43 (100)	42 (100)	180 (100)	NA
b.	No	0 (0)	0 (0)	0 (0)	0 (0)	
6.	Wash hand before milking					
a.	Yes	95 (100)	43 (100)	42 (100)	180 (100)	NA
b.	No	0 (0)	0 (0)	0 (0)	0 (0)	
7.	Change milker					
a.	Yes	50 (52.60)	27 (62.80)	23 (54.80)	100 (55.56)	1.251
b.	No	45 (47.40)	16 (37.20)	19 (45.20)	80 (44.44)	
8.	Cleaning of milking utensils with					
a.	Clean water	70 (73.70)	32 (74.40)	30 (71.40)	132 (73.33)	0.11
b.	As hand water	25 (26.30)	11 (25.60)	12 (28.60)	48 (26.67)	
c.	Clean ingagent and water	0 (0)	0 (0)	0 (0)	0 (0)	
9.	Drying off practice					
a.	Yes	95 (100)	43 (100)	42 (100)	180 (100)	NA
b.	No	0 (0)	0 (0)	0 (0)	0 (0)	
10.	Wipe to clean udder					
a.	Yes	0 (0)	0 (0)	0 (0)	0 (0)	NA
b.	No	95 (100)	43 (100)	42 (100)	180 (100)	
11.	Calf allowed to suckle					
a.	Before milking	0 (0)	0 (0)	0 (0)	0 (0)	NA
b.	After milking	0 (0)	0 (0)	0 (0)	0 (0)	
c.	Both times	95 (100)	42 (100)	43 (100)	180 (100)	
12.	Milk let down practice after death of calf					
a.	Offer Conc. and Feed	63 (63.30)	19 (44.19)	26 (61.90)	108 (60)	6.123
b.	Teat manipulation	32 (37.60)	24 (55.81)	16 (38.10)	72 (40)	
13.	Dry hand milking					
a.	Yes	0 (0)	0 (0)	0 (0)	0 (0)	NA
b.	No	95 (100)	43 (100)	42 (100)	180 (100)	

*Significant (p<0.05). **Significant (p<0.01) NA = Not applicable

Conclusions

It was concluded that women played a major role in feeding, cleaning, milking, care of young stock, care of sick animals, protection against external parasites, service mating insemination, deworming whereas, men played major role in

practices like sale of animal and sale of milk and minor role in other management practices. Housing management is an important factor because housing helps to facilitate scientific nutrition, careful control of pathogens, better treatment and management, as well as the prevention of adverse climatic

conditions for animals, and maintains the thermo-neutral zone where animals are most productive.

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