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## Study on the role of human resources in feeding practices and breeding 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 feeding and breeding management techniques and human resources' role in cattle management procedures was recorded on a percent basis. The study show that 93.33 percent follow practice of chaffing of dry fodder. Home prepared concentrate mixture was given by 63.89 percent of the respondents in the study area. Out of total respondents, 70.00 percent respondents followed procedure of soaking for pre-treatment of concentrate mixture. Only 31.67 and 16.67 percent of the respondents followed practice of fed common salt and mineral mixture, respectively. Preparation of silage was not practiced by all the cattle keepers. The result shows that concentrate mixture was fed to lactating cattle by 52.78 percent of the respondents both at milking time and mixed with fodder. Out of total respondents, 88.89 percent of respondents fed concentrate to advance pregnant cattle. The results indicated that 37.78 percent of total respondents offer concentrate feed to young calf, while 55.55 percent fed concentrate mixture to heifers. The results indicated that 53.89 percent respondents adopted natural service as breeding method while 46.11 percent of respondents had adopted artificial insemination as breeding method in the study area. The study shows that 78.33 percent respondents get their cattle inseminated/served at mid heat stage. The result shows that 71.67 percent of the respondents was practiced pregnancy diagnosis of cattle. Practice of treatment of anoestrus by veterinarian was followed by 80.56 percent of the respondents.

**Keywords:** Alwar, artificial insemination, breeding, feeding practices, herd size, human resources

### 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) [9, 13]. There is a considerable percentage of agricultural draft power that comes from livestock. According to the recent 20<sup>th</sup> Livestock Census 2019 [10], 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) [10]. Market oriented milk production was observed as economically most sustainable for the farmers (Baral *et al*, 2020) [2]. The rise in per capita income, urbanization, 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) [4]. 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, feeding and breeding practices being followed by the cattle

keepers in Rajasthan's Alwar district. Various studies have been conducted regarding the effect of herd size over the improved dairy management practices by many workers who observed that herd size had a positive association with adoption of improved dairy management practices like breeding, feeding, disease control (Arora *et al.*, 2006) [1].

## 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 ( $\chi^2$ ) analysis was used to examine how herd size linked statistically with existing marketing management techniques, and human resources' role in cattle management procedures was recorded on a percent basis Snedecor and Cochran

## Results and Discussion

### 1. Feeding practices

The results obtained on different feeding practices of cattle in study area from 180 respondents are summarized in the following sub-heads and detailed information is provided in Table 1. The overall health and reproductive performance of animals is governed by the feeding of the animals.

#### 1.1 Feeding of animals

In the study area, all respondents conducted stall feeding. The findings of feeding of animal are almost similar to Sabapara *et al.* (2016) [15] who observed that majority of respondents followed stall feeding system.

#### 1.2 Grazing site

Grazing practiced was not adopted in the study area. The present finding of grazing site are contrary to report of Malik *et al.* (2005) [11].

#### 1.3 Type of dry fodder

The results indicated that there was a non-significant association between type of dry fodder for animals and herd size ( $\chi^2=2.128$ ). The findings showed that (45.00%) of the total respondents provide maize, jowar and dry grass as dry fodder to their animals followed by (36.67%) of respondents using jowar and dry grass and (18.33%) of respondents using maize and dry grass as dry fodder.

#### 1.4 Chaffing of dry fodder

The association between practice of chaffing of dry fodder and herd size was found to be non-significant ( $\chi^2=2.779$ ). 93.33 percent follow practice of chaffing of dry fodder and

6.67 percent had not adopted this practice.

#### 1.5 Chopping of green fodder

There was non-significant association between herd size and practice of chopping of green fodder used for animal houses ( $\chi^2=1.714$ ). Out of total respondents, 86.67 percent follow practice of chopping of green fodder and 13.33 percent had not adopted this practice.

#### 1.6 Cultivation of green fodder

The results indicated that there was a non-significant association between practice of cultivation of green fodder and herd size ( $\chi^2=2.038$ ). The result reveals that (86.11%) of the total respondents cultivated green fodder and (13.89%) did not cultivate green fodder for their animal. The findings regarding cultivation of green fodder and its feeding are similar to Garg *et al.* (2005) [5] and Sinha *et al.* (2009) [17].

#### 1.7 Type of concentrate mixture

The results indicated that there was a non-significant association between type of concentrate mixture and herd size (37.541). The result showed that 63.89 percent of total respondents used home prepared concentrate mixture for their cattle and 36.11 percent using readymade mixture for their cattle.

#### 1.8 Pre-treatment of concentrate mixture

The results indicated that there was a non-significant association between pre-treatment of concentrate mixture and herd size ( $\chi^2=4.632$ ). Out of total respondents, 70.00 percent respondents followed procedure of soaking for pre-treatment of concentrate mixture while 30 percent adopted soaking and boiling as pre-treatment procedure of concentrate mixture. The findings about the home prepared concentrate mixture and pre-treatment of concentrate mixture with soaking are almost similar to Rathore *et al.* (2010) [14].

#### 1.9 Feeding of common salt

The association between herd size and feeding of common salt was non-significant ( $\chi^2=5.723$ ). The result revealed that 31.67 percent of total respondents fed common salt to their livestock while 68.33 percent had not adopted this practice. The findings of present study about feeding of common salt are close conformity with the earlier report of Manohar *et al.* (2014) [12].

#### 1.10 Feeding of mineral mixture

The results indicated that there was a significant association between feeding of mineral mixture to cattle and herd size ( $\chi^2=8.387$ ). The result revealed that 16.67 percent of total respondents offered mineral mixture to their cattle while 83.33 percent had not adopted this practice. The findings of present study about feeding of mineral mixture are close conformity with the earlier report of Manohar *et al.* (2014) [12].

#### 1.11 Preparation silage

The practice of preparation of silage was not followed by all the cattle farmers of study area. The findings of preparation of hay and silage are similar to the results of Sinha *et al.* (2009) [17], Kishore *et al.* (2013) [7] and Manohar *et al.* (2014) [12].

#### 1.12 Time of concentrate feeding

The association between herd size and time of concentrate feeding was found to be highly significant ( $\chi^2=9.271$ ). The study shows that 47.22 percent of total cattle rearers offer

concentrate feed to their cattle at the time of milking while 52.78 percent offer concentrate both at milking time and mixed with fodder.

**1.13 Concentrate feeding of advance pregnant cattle**

The results indicated that there was a significant association between concentrate feeding of advance pregnant cattle and herd size ( $\chi^2= 6.016$ ). Out of total respondents, 88.89 percent of respondents fed concentrate to advance pregnant cattle while 11.11 percent had not adopted this practice. The results indicated that 92.63 percent of total small herd owners fed concentrate to advance pregnant cattle followed by medium herd owners (90.69%) and small herd owners (78.58%). The findings of concentrate feeding to pregnant cattle recorded are in agreement with the early reports of Kumar *et al.* (2006) [8],

Manohar *et al.* (2014) [12] and Sabapara *et al.* (2016) [15].

**1.14 Concentrate feeding of young calf**

There was non-significant association between herd size and concentrate feeding of young calf ( $\chi^2 = 3.920$ ). The results indicated that 37.78 percent of total respondents offer concentrate feed to young calf while 62.22 percent do not adopt this practice.

**1.15 Concentrate feeding of heifer**

There was highly significant association between herd size and concentrate feeding of heifer ( $\chi^2=47.837$ ).The result revealed that 55.55 percent of the respondents offered concentrate feed to heifer while 44.45 percent had not adopted this practice.

**Table 1: Feeding practices in cattle**

| S. No.     | Practices   | Small herd | Medium Herd | Large herd | Overall    | $\chi^2$ value |
|------------|---|------------|-------------|------------|------------|----------------|
| <b>1.</b>  | <b>Feeding of animals</b>                             |            |             |            |            |                |
| A.         | Stall feeding   | 95(100)    | 43(100)     | 42(100)    | 180(100)   | NA             |
| B.         | Grazing   | 0(0))      | 0(0)        | 0(0)       | 0(0)       |                |
| C.         | Both  | 0(0)       | 0(0)        | 0(0))      | 0(0)       |                |
| <b>2.</b>  | <b>Grazing site</b>                                   |            |             |            |            |                |
| A.         | Common pasture land                                   | 0(0)       | 0(0)        | 0(0)       | 0(0)       | NA             |
| B.         | Harvested /fallow land                                | 0(0)       | 0(0)        | 0(0)       | 0(0)       |                |
| C.         | Own pastureland                                       | 0(0)       | 0(0)        | 0(0)       | 0(0)       |                |
| D.         | No grazing  | 95(100)    | 43(100)     | 42(100)    | 180(100)   |                |
| <b>3.</b>  | <b>Type of dry fodder</b>                             |            |             |            |            |                |
| A.         | Maize + dry grass                                     | 19(20.00)  | 9(20.94)    | 5(11.91)   | 33(18.33)  | 2.128          |
| B.         | Maize + dry grass +jowar                              | 44(46.31)  | 17(39.53)   | 20(47.61)  | 81(45.00)  |                |
| C.         | Jowar + dry grass                                     | 32(33.69)  | 17(39.53)   | 17(40.48)  | 66(36.67)  |                |
| <b>4.</b>  | <b>Chaffing of dry fodder</b>                         |            |             |            |            |                |
| A.         | Yes   | 91(95.79)  | 40(93.02)   | 37(88.10)  | 168(93.33) | 2.779          |
| B.         | No  | 4(4.21)    | 3(6.98)     | 5(11.90)   | 12(6.67)   |                |
| <b>5.</b>  | <b>Chopping of green fodder</b>                       |            |             |            |            |                |
| A.         | Yes   | 85(89.48)  | 35(81.4)    | 36(85.71)  | 156(86.67) | 1.714          |
| B.         | No  | 10(10.52)  | 8(18.60)    | 6(14.29)   | 24(13.33)  |                |
| <b>6.</b>  | <b>Cultivation of green fodder</b>                    |            |             |            |            |                |
| A.         | Yes   | 85(89.48)  | 36(83.72)   | 34(38.09)  | 155(86.11) | 2.038          |
| B.         | No  | 10(10.52)  | 7(16.28)    | 8(19.04)   | 25(13.89)  |                |
| <b>7.</b>  | <b>Type of concentrate mixture</b>                    |            |             |            |            |                |
| A.         | Home prepared   | 41(43.16)  | 38(88.38)   | 36(85.71)  | 115(63.89) | 37.541         |
| B.         | Ready made  | 54(56.84)  | 5(11.62)    | 6(14.29)   | 65(36.11)  |                |
| C.         | Mixture of home prepared and readymade                | 0(0)       | 0(0)        | 0(0)       | 0(0)       |                |
| <b>8.</b>  | <b>Pre-treatment of concentrate mixture</b>           |            |             |            |            |                |
| A.         | Soaking   | 73(76.84)  | 26(60.47)   | 27(64.29)  | 126(70.00) | 4.632          |
| B.         | Soaking and boiling                                   | 22(23.16)  | 17(39.53)   | 15(35.71)  | 54(30.00)  |                |
| <b>9.</b>  | <b>Feeding of common salt</b>                         |            |             |            |            |                |
| A.         | Yes   | 34(35.79)  | 16(37.20)   | 7(16.67)   | 57(31.67)  | 5.723          |
| B.         | No  | 61(64.21)  | 27(62.8)    | 35(83.33)  | 123(68.33) |                |
| <b>10.</b> | <b>Feeding of Mineral mixture</b>                     |            |             |            |            |                |
| A.         | Yes   | 9(9.48)    | 9(20.94)    | 12(28.58)  | 30(16.67)  | 8.387*         |
| B.         | No  | 86(90.52)  | 34(79.06)   | 30(71.42)  | 150(83.33) |                |
| <b>11.</b> | <b>Preparation of silage</b>                          |            |             |            |            |                |
| a.         | Yes   | 0(0)       | 0(0)        | 0(0)       | 0(0)       | NA             |
| b.         | No  | 95(100)    | 43(100)     | 42(100)    | 180(100)   |                |
| <b>12.</b> | <b>Time of concentrate feeding</b>                    |            |             |            |            |                |
| a.         | At milking time                                       | 39(41.05)  | 29(67.44)   | 17(40.48)  | 85(47.22)  | 9.271**        |
| b.         | Both at milking time and mixed with fodder            | 56(58.95)  | 14(32.56)   | 25(59.52)  | 95(52.78)  |                |
| <b>13.</b> | <b>Concentrate feeding of advance pregnant cattle</b> |            |             |            |            |                |
| a.         | Yes   | 88(92.63)  | 39(90.69)   | 33(78.58)  | 160(88.89) | 6.016*         |
| b.         | No  | 7(7.37)    | 4(9.31)     | 9(21.42)   | 20(11.11)  |                |
| <b>14.</b> | <b>Concentrate feeding of young calf</b>              |            |             |            |            |                |
| a.         | Yes   | 30(31.58)  | 21(48.84)   | 17(40.48)  | 68(37.78)  | 3.920          |
| b.         | No  | 65(68.42)  | 22(51.16)   | 25(59.52)  | 112(62.22) |                |
| <b>15.</b> | <b>Concentrate feeding of heifer</b>                  |            |             |            |            |                |
| a.         | Yes   | 33(34.74)  | 42(97.68)   | 25(59.52)  | 100(55.55) | 47.837**       |
| b.         | No  | 62(65.26)  | 1(2.32)     | 17(40.48)  | 80(44.45)  |                |

\*Significant (p<0.05). \*\* Highly significant (p<0.01), NA = Not applicable

## 2. Breeding practices

The findings obtained from 180 respondents on the different breeding practices of cattle in the study area are summarized in the subheadings below and detailed information is given in Table 2.

### 2.1 Method of breeding

There was non-significant association between herd size and breeding method ( $\chi^2=1.594$ ). The results indicated that 53.89 percent respondents adopted natural service as breeding method while 46.11 percent of respondents had adopted artificial insemination as breeding method in the study area. The present results of method of breeding are in accordance with the results observed by Arora *et al.* (2006) [1].

### 2.2 Type of breeding bull

The results indicated that there was a highly significant association between type of breeding bull and herd size ( $\chi^2=56.256$ ). Out of total respondents, 22.22 percent of total respondents used pure breed sire and 77.78 of total respondents who used non descriptive cattle as breeding bull in the study area. Regarding type of breeding bulls the findings are in similar to the findings of Yadav *et al.* (2009) [19].

### 2.3 Heat detection

The results indicated that there was a non-significant association between heat detection of cattle and herd size ( $\chi^2=2.305$ ). Out of total respondents, 87.78 percent of respondents detect heat of cattle while 12.22 percent had not adopted this practice. Regarding heat detection the results

obtained are almost similar as observed by Bidwe *et al.* (2009) [3].

### 2.4 Time of insemination/natural service

The results indicated that there was a non-significant association between time of insemination/natural service and herd size ( $\chi^2 = 3.104$ ). The study shows that 78.33 percent respondents get their cattle inseminated/served at mid heat stage followed by 17.22 percent respondents who get their cattle inseminated/served at early heat stage and 4.45 percent respondents who get their cattle inseminated/served at late heat stage in the study area. Regarding Time of insemination/natural service the results obtained are agreement with the early reports of Gupta *et al.* (2008) [6].

### 2.5 Pregnancy diagnosis

There was a significant association between herd size and pregnancy diagnosis ( $\chi^2= 7.363$ ). The results indicated that 71.67 percent of total respondents adopt practice of pregnancy diagnosis of cattle while 28.33 percent had not adopted this practice. Regarding pregnancy diagnosis, the results obtained are agreement with the early reports of Gupta *et al.* (2008) [6].

### 2.6 Treatment of anoestrous

There was non-significant association between herd size and treatment of anoestrous ( $\chi^2=1.162$ ). The results indicated that 80.56 percent of the respondents had adopted the practice of getting treatment of anoestrous cattle while 19.44 percent had not adopted this practice. Regarding the treatment of anoestrus the present findings are in contrast to the findings of Singh *et al.* (2009) [16].

Table 2: Breeding practices in cattle

| S. No.    | Practices                                    | Small Herd | Medium Herd | Large Herd | Overall    | $\chi^2$ value |
|-----------|--|------------|-------------|------------|------------|----------------|
| <b>1.</b> | <b>Method of breeding</b>                    |            |             |            |            |                |
| A.        | Natural                                      | 47(49.47)  | 25(58.13)   | 25(59.52)  | 97(53.89)  | 1.594          |
| B.        | A. I.  | 48(50.52)  | 18(41.87)   | 17(40.48)  | 83(46.11)  |                |
| <b>2.</b> | <b>Type of breeding bull</b>                 |            |             |            |            |                |
| A.        | Pure breed                                   | 8(8.42)    | 5(11.62)    | 27(64.29)  | 40(22.22)  | 56.256**       |
| B.        | Non descriptive                              | 87(91.58)  | 38(88.38)   | 15(35.71)  | 140(77.78) |                |
| <b>3.</b> | <b>Heat detection</b>                        |            |             |            |            |                |
| A.        | Yes  | 86(90.52)  | 35(81.40)   | 37(88.09)  | 158(87.78) | 2.305          |
| B.        | No   | 9(9.48)    | 8(18.60)    | 5(11.90)   | 22(12.22)  |                |
| <b>4.</b> | <b>Time of insemination /Natural service</b> |            |             |            |            |                |
| A.        | Early heat                                   | 17(17.9)   | 8(18.60)    | 6(14.29)   | 31(17.22)  | 3.104          |
| B.        | Mid heat                                     | 73(76.84)  | 35(81.4)    | 33(78.57)  | 141(78.33) |                |
| C.        | Late heat                                    | 5(5.26)    | 0(3.75)     | 3(7.14)    | 8(4.45)    |                |
| <b>5.</b> | <b>Pregnancy diagnosis</b>                   |            |             |            |            |                |
| A.        | Yes  | 60(63.16)  | 34(79.07)   | 35(83.33)  | 129(71.67) | 7.363*         |
| B.        | No   | 35(36.84)  | 9(20.93)    | 7(16.67)   | 51(28.33)  |                |
| <b>6.</b> | <b>Treatment of anoestrous</b>               |            |             |            |            |                |
| A.        | Yes  | 74(77.90)  | 35(81.40)   | 36(85.71)  | 145(80.56) | 1.162          |
| B.        | No   | 21(22.10)  | 8(18.60)    | 6(14.29)   | 35(19.44)  |                |

\*Significant ( $p<0.05$ ). \*\* Highly significant( $p<0.01$ ),NA= not applicable

## Conclusions

It was concluded that 53.89 percent of respondents follow natural methods of breeding and do not rely over artificial insemination. Concentrate feeding of advance pregnant animals was practiced by 88.89 percent but very few of them had storage facility of feed and fodder during scarcity. Conservation of pure bred cattle should be taken on a priority basis by subsidies or remuneration to motivate cattle keepers. Where ever there are A. I facilities, the availability of better services should be improved. The role of breeding is very crucial, not only to improve the growth of the livestock

sector but also to generate sufficient seed stocks of improved germplasm to sustain the growth of livestock products.

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