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Breeding management practices adopted by buffalo owners in Vindhya region of Madhya Pradesh

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Abstract

The present study was designed to acquire information about the existing breeding management practices adopted by buffalo owners in Vindhya region of Madhya Pradesh. The data were collected manually through face-to-face interviews, and then analyzed using frequency and percentage analysis. In the current investigation about 67.92% of the respondents preferred the artificial insemination technique for their buffaloes, whereas only 32.08% of respondents in the current study used the natural service of breeding method. It was observed that majority (75.00%) of the respondents told that A.I. service for dairy buffaloes available in his willing whereas 25.00% of the respondents did not get A.I. service in his/her willing in the study area. It was also found that 57.08% of the respondents were dependent on the veterinary hospital for A.I., whereas 42.92% of the respondents dependent on other for A.I. About 59.16% of respondents had adopted single insemination per successful conception, whereas 24.58% and 16.25% of the respondents adopted more than two and two insemination per successful conception, respectively. Perusal of data revealed that only 29.17% respondents possessed the knowledge of time of insemination between 60 to 90 days whereas, 70.83% respondents had breeding of dairy buffaloes >90 days after calving. About 40.00% of respondents allowed their female buffalo for breeding through A.I. or N.S. at mid heat period and only 36.25 and 23.75% respondents allowed their buffaloes at late and early heat period, respectively. Majority respondents (59.58%) dependent on qualified veterinarian followed by 23.33% and 17.08% dependent on own judgments and A.I. workers, respectively and 74.58% of respondents did not taken any help from veterinarian during parturition, whereas only 25.41% of the respondents had taken help from veterinarian during parturition.

Keywords: Buffaloes, breeding, management, respondents and Vindhya

Introduction

Livestock is holds significant importance to a nation's social progress and prosperity. Rural Indians depend on it for their livelihood, making it even more crucial. Over 73% of Indian households own livestock. The rural populace of India heavily relies on it for their livelihood, hence amplifying its significance. A significant majority of families in India, possess livestock of their own. One of the main sources of productive work in rural India is the grazing, feeding, and milking of cows and buffaloes (Ahirwar *et al.*, 2010) ^[1]. The Indian dairy industry has achieved remarkable development over the past three decades, with milk production increasing at an unprecedented rate. India has become the world's foremost producer of milk (DAHD, 2017) ^[2].

The buffalo is an integral part of Indian dairy production. It is India's primary source of milk, flesh, and draught power. Large-scale dairy farms frequently raise buffalo for the purpose of domestic milk production (Sastry, 2003) ^[3]. The buffalo species exhibits considerable potential for enhancing food security and promoting sustainable development in the 21st century, primarily because to its significant role within the traditional agricultural framework of India. The buffalo has played a key role in sustaining the rural economy. It is the primary ingredient in the manufacturing of butter and ghee. In addition, buffalo is considered more useful due to its higher fat content in milk and greater ability to utilize agricultural byproducts (Sharma *et*

al., 2009) [4]. Due to the higher quantities of protein, fat, lactose, minerals, and vitamins in buffalo milk than in cows, buffalo milk products have a better nutritional value than cows' milk. As with other ruminant foods, buffalo milk and its derivatives may be an excellent source of conjugated linoleic acid for humans (Frank *et al.*, 2012) [5].

India holds the greatest livestock population on the planet. The production potential of livestock is contingent on the management practices employed. It is important to comprehend the livestock management practices employed by farmers within a given region in order to assess the merits and drawbacks of the rearing system and to develop appropriate policy interventions. Additionally, it plays a significant role in the economy by serving as a means to augment family income and generate productive work within the rural sector. Healthcare management practices, such as the implementation of vaccination and deworming protocols, play a crucial role in safeguarding the well-being of animals, hence enhancing their overall output. Livestock production in animal husbandry boosts rural and national economies. The entire profitability of dairying is impacted by accurate heat detection, prompt insemination, and pregnancy diagnosis in dairy animals (Prajapati *et al.*, 2015) [6].

Due to a lack of detailed information on extant breeding practices adopted for various categories of livestock, the policy planner has been unable to devote adequate consideration to these crucial aspects of livestock production. A robust database is essential for effective administration. The goal should be to gather and connect all the information that is accessible. Limited attempts have been documented in the literature to comprehensively investigate the livestock management practises in rural regions. Hence, the present study was purposely carried out with the aim to gather information regarding the existing breeding management practices adopted by buffalo owners in Vindhya region of Madhya Pradesh.

Materials and Methods

The present study was conducted in Vindhya region of Madhya Pradesh during 2020-21. The Vindhya region of Madhya Pradesh state comprises of four districts namely Rewa, Satana, Sidhi and Singrauli. Three tehsils viz. Teonther, Jawa and Hanumana from Rewa district, Nagod, Maihar and Raghuraj Nagar from Satna district, Sihawal, Gopdbanas and Majhauri from Sidhi district and Chitrangi, Deosar and Waidhan from Singrauli district were selected

randomly from each identified district. From each selected tehsil, two villages were randomly chosen using simple lottery method. After the selection of the villages, a preliminary survey was conducted in the selected villages to know the total number of farmers practicing dairy farming. Among these selected villages, 10 buffalo owners as respondents were chosen randomly from each selected villages. Thus the total respondents of the study were 240 dairy farmers. The study employed an exploratory research design and a multistage random sampling approach to choose participants. Initially, a pilot test was conducted to refine the interview schedule for farmers to collect data on buffalo breeding management practices. Informal and pleasant early-morning visits to farmers' homes and fields were used to collect data. The acquired data was analyzed to determine frequency and percentage.

Breeding management practices

Breeding method practice

The breeding method practiced in female buffalo followed by the respondents of different districts of Vindhya region are presented in Table 1. The entire respondent under study followed the only 32.08% natural service breeding method for their buffaloes while surprisingly 67.92% of the respondents found in the favour of artificial insemination technique. The lack of natural service might be due to keeping of bull had expensive for small and marginal farmers.

The district wise present study investigation revealed that majority 66.67%, 56.67%, 70.00% and 78.33% of respondents used scientific method of artificial insemination (A.I.) for breeding their dairy buffaloes, whereas 33.33%, 43.33%, 30.00% and 21.67% of respondents were using known or unknown pedigree bull for natural service in Rewa, Satna, Sidhi and Singrauli district respectively (Table 1).

A greater proportion of A.I. may be attributable to the existence of excellent infrastructure facilities for the preservation and timely delivery of A.I. services with satisfactory results by A.I. employees in rural areas. These findings are in line with the results of Chowdhary *et al.* (2006) [7], Modi and Patel (2010) [8], Kumar *et al.* (2019) [9]. However, the results are contrary to the findings of Malik *et al.* (2005) [10], Kushwaha *et al.* (2007) [11], Rathore and Kachwaha (2009) [12], Rathore *et al.* (2010) [13], Kumar and Mishra (2011) [14], Kumar *et al.* (2011) [15] and Dar *et al.* (2017) [16].

Table 1: Breeding method practice in buffaloes

| Practice | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|--------------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Bull | 20 | 33.33 | 26 | 43.33 | 18 | 30.00 | 13 | 21.67 | 77 | 32.08 |
| Through A.I. | 40 | 66.67 | 34 | 56.67 | 42 | 70.00 | 47 | 78.33 | 163 | 67.92 |

(N and% indicate the number and percentage of respondents, respectively)

A.I. service available in his willing

It was observed that majority (75.00%) of the respondents told that A.I. service for dairy buffaloes available in his willing whereas 25.00% of the respondents did not get A.I. service in his/ her willing in the study area. The district wise present results showed that majority 68.33%, 70.00%, 83.33%

and 78.33% of respondents told that A.I. service for dairy buffaloes available in his willing whereas 31.67%, 30.00%, 16.67% and 21.67% of the respondents did not get A.I. service in his/ her willing in. in Rewa, Satna, Sidhi and Singrauli districts, respectively (Table 2).

Table 2: Artificial Insemination service for dairy buffaloes available in his willing

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|----------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Yes | 41 | 68.33 | 42 | 70.00 | 50 | 83.33 | 47 | 78.33 | 180 | 75.00 |

| | | | | | | | | | | |
|----|----|-------|----|-------|----|-------|----|-------|----|-------|
| No | 19 | 31.67 | 18 | 30.00 | 10 | 16.67 | 13 | 21.67 | 60 | 25.00 |
|----|----|-------|----|-------|----|-------|----|-------|----|-------|

(N and% indicate the number and percentage of respondents, respectively)

Agency that provide A.I.

It was found that 57.08% of the respondents were dependent on the Veterinary Hospital for A.I., whereas 42.92% of the respondents dependent on other for A.I. The district wise present results showed that majority 55.00%, 50.00%, 66.67%

and 66.67% of respondents dependent on the Veterinary Hospital for A.I., whereas 45.00%, 50.00%, 33.33% and 33.33% of the respondents dependent on other for A.I. in Rewa, Satna, Sidhi and Singrauli districts, respectively (Table 3).

Table 3: Agency that provide artificial insemination to the dairy buffaloes

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|---------------------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Veterinary Hospital | 33 | 55.00 | 30 | 50.00 | 40 | 66.67 | 40 | 66.67 | 137 | 57.08 |
| Others | 27 | 45.00 | 30 | 50.00 | 20 | 33.33 | 20 | 33.33 | 103 | 42.92 |

(N and% indicate the number and percentage of respondents, respectively)

Number of insemination per successful conception

It was revealed that 59.16% of respondents had adopted single insemination per successful conception, whereas 24.58% and 16.25% of the respondents adopted more than two and two insemination per successful conception, respectively. In regards to the number of insemination required per successful conception in buffaloes in the district wise present study investigation, majority 50.00%, 65.00%, 65.00% and 58.33%

of respondents adopted single insemination per successful conception, whereas 20.00%, 16.67%, 1.67% and 25.00% of the respondents adopted two insemination per successful conception and 30.00%, 18.33%, 33.33% and 16.67% of respondents adopted more than two insemination per successful conception in Rewa, Satna, Sidhi and Singrauli districts, respectively (Table 4).

Table 4: Number of insemination per successful conception for dairy buffaloes

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|---------------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| One | 30 | 50.00 | 39 | 65.00 | 39 | 65.00 | 35 | 58.33 | 142 | 59.17 |
| Two | 12 | 20.00 | 10 | 16.67 | 1 | 1.67 | 15 | 25.00 | 39 | 16.25 |
| More than two | 18 | 30.00 | 11 | 18.33 | 20 | 33.33 | 10 | 16.67 | 59 | 24.58 |

(N and% indicate the number and percentage of respondents, respectively)

Breeding after calving of buffaloes

Perusal of data revealed that only 29.17% respondents possessed the knowledge of time of insemination between 60 to 90 days whereas, 70.83% respondents had breeding of dairy buffaloes >90 days after calving and 3.00% did not know. The district wise present study investigation has been found to be the majority about 66.67%, 70.00%, 71.67% and 75.00% of respondents breed their buffaloes after 90 days after calving, followed by 33.33%, 30.00%, 28.33% and 25.00% of the respondents breed within 60-90 days after calving and none of them breed within 45-60 days after calving in Rewa, Satna, Sidhi and Singrauli districts, respectively (Table 5).

Studies show that people have a high degree of knowledge about the most valuable economic characteristic of dairy buffalo. Therefore, it is very obvious from the emerging findings of various breeding practices followed by buffalo keepers in the research area that the majority of the respondents were following the suggested breeding practices. This finding is in agreement with the observations of Chowdhary *et al.* (2006) [7], Gupta *et al.* (2008) [17], Sabapara *et al.* (2010) [18] and Khadda *et al.* (2017) [19]. However, lesser number of respondents followed this practice as reported by Shirsat *et al.* (1994) [20], Jagdale *et al.* (2000) [21] and Malik *et al.* (2005) [10].

Table 5: Breeding after calving of dairy buffaloes

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|------------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| 45-60 days | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 00 | 00 |
| 60-90 days | 20 | 33.33 | 18 | 30.00 | 17 | 28.33 | 15 | 25.00 | 70 | 29.17 |
| >90 days | 40 | 66.67 | 42 | 70.00 | 43 | 71.67 | 45 | 75.00 | 170 | 70.83 |

(N and% indicate the number and percentage of respondents, respectively)

Insemination after heat detection

The study revealed that 40.00% of respondents allowed their female buffalo for breeding through A.I. or N.S. at mid heat period and only 36.25% and 23.75% respondents allowed their buffaloes at late and early heat period, respectively. This is a good practice adopted by respondents to serve their buffaloes in between 12-18 hrs from onset of estrus for better results of conception. This practice was widely accepted by respondents which might be due to extension work done by V.O. and A.I. workers in study area.

The district wise present study investigation indicated that about 5.00%, 25.00%, 65.00% and 0.00% of respondents

allowed their female buffaloes for breeding through A.I. or N.S. at early heat period, whereas 71.67%, 53.33%, 0.00% and 35.00% of respondents allowed their buffaloes mid heat period and 23.33%, 21.67%, 35.00% and 65.00% of respondents allowed their buffaloes late heat period in Rewa, Satna, Sidhi and Singrauli district respectively (Table 6).

This is a good practice adopted by farmers to serve their buffaloes in between 12-18 hrs from onset of estrus for better conception rate. The widespread acceptance of this practise among farmers may be attributed to the extension efforts carried out by A.I. employees in rural areas. The results are in accordance with the results of Chowdhary *et al.* (2006) [7],

Gupta *et al.* (2008) ^[17], Rathore and Kachwaha (2009) ^[12], Rathore *et al.* (2010) ^[13], Sabapara *et al.* (2010) ^[18] and Hole (2016) ^[22], Manohar *et al.* (2014) ^[23], Rangamma *et al.* (2016)

^[24] and Pata *et al.* (2019) ^[25] reported that most of the respondents followed AM-PM rule for insemination of buffaloes.

Table 6: Insemination or mating of dairy buffaloes after heat detection

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|------------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Early Heat | 3 | 5.00 | 15 | 25.00 | 31 | 51.66 | 8 | 13.33 | 57 | 23.75 |
| Mid Heat | 35 | 58.33 | 30 | 50.00 | 10 | 16.66 | 21 | 35.00 | 96 | 40.00 |
| Late Heat | 14 | 23.33 | 13 | 21.67 | 21 | 35.00 | 39 | 65.00 | 87 | 36.25 |

(N and% indicate the number and percentage of respondents, respectively)

Pregnancy diagnosis

The result of pregnancy diagnosis practices followed by the respondents under study area presented in Table 7. The results indicated that the highest proportion of dairy farmers about 59.58% dependent on qualified veterinarian followed by 23.33% and 17.08% dependent on own judgments and A.I. workers, respectively.

The district wise present study investigation reported that majority about 58.33%, 66.67%, 66.67% and 46.67% of respondents dependent on the Veterinary Hospital for breeding after calving, whereas 25.00%, 3.33%, 20.00% and

20.00% of the respondents dependent on A.I. workers and 16.67%, 30.00%, 13.33% and 33.33% of the respondents dependent own judgments for breeding after calving in Rewa, Satna, Sidhi and Singrauli district respectively (Table 7).

The present results of pregnancy diagnosis are more as compared to observe by Yadav *et al.* (2009) ^[26] and Sabapara *et al.* (2016) ^[27] who reported that most cases of pregnancy diagnosis were done by veterinarians. However, Contrary to the present findings by Jagdale *et al.* (2000) ^[21] and Gupta *et al.* (2008) ^[17], who reported that the most of the diagnosis were done by A.I. workers

Table 7: Pregnancy diagnosis of dairy buffaloes

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|------------------------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Own judgments | 10 | 16.67 | 18 | 30.00 | 8 | 13.33 | 20 | 33.33 | 56 | 23.34 |
| Qualified veterinarian | 35 | 58.33 | 40 | 66.67 | 40 | 66.67 | 28 | 46.67 | 143 | 59.58 |
| A.I. workers | 15 | 25.00 | 2 | 3.33 | 12 | 20.00 | 12 | 20.00 | 41 | 17.08 |

(N and% indicate the number and percentage of respondents, respectively)

Contribution of veterinarian during parturition

The result of help taken from veterinarians during parturition followed by the respondents under study area presented in Table 8. The results indicated that the majority of respondents (74.58%) did not taken any help from veterinarian during parturition, whereas only 25.41% of the respondents had taken help from veterinarian during parturition. The district

wise results of present investigation showed that majority 88.33%, 83.33%, 60.00% and 66.67% of respondents did not taken any help from veterinarian during parturition, whereas 11.67%, 16.67%, 40.00% and 33.33% of the respondents had taken help from veterinarian during parturition in Rewa, Satna, Sidhi and Singrauli district respectively (Table 8).

Table 8: Contribution of veterinarian during parturition in dairy buffaloes

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|----------|------|-------|-------|-------|-------|-------|-----------|-------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Yes | 7 | 11.67 | 10 | 16.67 | 24 | 40.00 | 20 | 33.33 | 61 | 25.42 |
| No | 53 | 88.33 | 50 | 83.33 | 36 | 60.00 | 40 | 66.67 | 179 | 74.58 |

(N and% indicate the number and percentage of respondents, respectively)

Maintenance of breeding record

It was observed that In Vindhya region about 7.08% of the respondents kept the breeding records of their dairy buffaloes, whereas 92.91% of the respondents did not follow this practice has been presented in Table 9. The district wise results of present investigation showed that majority 95.00%, 98.33%, 78.33% and 100.00% of respondents did not kept the

breeding records of their dairy buffaloes, whereas 5.00%, 1.67%, 21.67% and 0.00% of the respondents had kept the breeding records of their dairy buffaloes in Rewa, Satna, Sidhi and Singrauli district respectively (Table 9). Present findings are encouraging than the results of Kumar *et al.* (2011) ^[15], Kumar *et al.* (2014) ^[28] and Kumar *et al.* (2019) ^[9].

Table 9: Maintenance of breeding record of dairy buffaloes

| Category | Rewa | | Satna | | Sidhi | | Singrauli | | Overall | |
|----------|------|-------|-------|-------|-------|-------|-----------|--------|---------|-------|
| | N | % | N | % | N | % | N | % | N | % |
| Yes | 3 | 5.00 | 1 | 1.67 | 13 | 21.67 | 0 | 0.00 | 17 | 7.08 |
| No | 57 | 95.00 | 59 | 98.33 | 47 | 78.33 | 60 | 100.00 | 223 | 92.92 |

(N and% indicate the number and percentage of respondents, respectively)

Conclusion

In order to improve the productivity of buffalo in the study region, it is recommended that an artificial insemination centre be established at the village Panchayat level. This

centre would facilitate regular insemination procedures. Additionally, it is advised that purebred proven sires be distributed to buffalo keepers residing in remote villages. The conservation of purebred buffalo should be prioritized, and

buffalo keepers should be incentivized through subsidies or remuneration. Furthermore, existing artificial insemination facilities should be reinforced to ensure the provision of improved services.

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