



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.23

TPI 2022; SP-11(1): 64-67

© 2022 TPI

[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 04-11-2021

Accepted: 06-12-2021

## DS Jadhao

M.Sc. (Animal Husbandry),  
Department of Animal  
Husbandry and Dairy Science,  
College of Agriculture, VNMKV,  
Parbhani, Maharashtra, India

## DV Bainwad

Associate Professor, Department  
of Animal Husbandry and Dairy  
Science, College of Agriculture,  
VNMKV, Parbhani,  
Maharashtra, India

## GB Jadhav

M.Sc. (Animal Husbandry),  
Department of Animal  
Husbandry and Dairy Science,  
College of Agriculture, VNMKV,  
Parbhani, Maharashtra, India

## Corresponding Author

### DS Jadhao

M.Sc. (Animal Husbandry),  
Department of Animal  
Husbandry and Dairy Science,  
College of Agriculture, VNMKV,  
Parbhani, Maharashtra, India

## Studies on reproductive performance of buffaloes maintained at college of agriculture, Parbhani

DS Jadhao, DV Bainwad and GB Jadhav

### Abstract

The reproductive performance of breeding female is probably the single most important factor that is a prerequisite for sustainable dairy production system and influencing the productivity. About 18-40 percent of cattle and buffalo are culled and reach to abattoir mostly due to infertility. Keeping in view such a problem the present study was undertaken to find out the reproductive performance of buffalo. The reproductive characteristics of buffaloes were studied at organized farm, Department of Animal Husbandry and Dairy Science, College of Agriculture, Parbhani, (M.S). The raw data were collected by evaluating the actual records of Murrah (40), Surti (25) and Jaffrabadi (13) buffaloes during the period from the year 2000 to 2020 were compiled from the pedigree sheet, lactation records and breeding records of each individual animal. The overall least square means for age at first calving (AFC), service period (SP) and inter-calving period (ICP), of Murrah, Surti and Jaffrabadi buffaloes was recorded as  $1812.14 \pm 50.99$ ,  $1778.55 \pm 28.26$  and  $1724.60 \pm 35.79$  days;  $238.31 \pm 64.83$ ,  $230.68 \pm 58.64$  and  $183.06 \pm 44.31$  days;  $545.08 \pm 66.15$ ,  $547.18 \pm 57.72$  and  $493.06 \pm 44.31$  days, respectively. From the present study it is concluded that, the winter season is the most favorable season for breeding in all three breeds of buffalo.

**Keywords:** Jaffrabadi, murrah, period, reproductive traits and Surti

### Introduction

Livestock production and management plays an important role in the Indian economy by supplementing the family income, strengthening household and nutritional security. About 20.5 million people depends upon livestock for their livelihood particularly youth and women in principal and subsidiary status (Suthar *et al.*, 2019) [18]. About 20.5 per cent of the total livestock is contributed by buffaloes. In Maharashtra total buffalo population is 5.6 million (20<sup>th</sup> Livestock Census, 2019) [1]. Buffalo is the main plank for the development of dairy industry in India. Murrah buffalo is one of the precious breeds of buffalo in India by virtue of its milking capacity with marvelous potential for further genetic improvement and the Surti and Jaffrabadi buffalo is another most important breeds of buffalo. The buffalo is considered as Sluggish breeder as the reproductive efficiency of buffalo is adversely affected by certain constraints such as late maturity, poor expression of the estrous signs, irregular estrous cycle, silent heat, seasonality in breeding, poor conception rate/early embryonic mortality and prolonged inter-calving interval. Therefore, the present study has been conducted to study the reproductive characteristics and breeding season of buffalo.

### Materials and Methods

**Sources of collection of data:** The data on reproductive traits i.e. Age at first calving (AFC), service period (SP) and inter-calving period (ICP) of Murrah (40), Surti (25) and Jaffrabadi (13) buffaloes where be taken from pedigree sheets, lactation records, and breeding records maintained at the VNMKV buffalo farm, College of Agriculture, parbhani, over period of 20 (2000 to 2020) years were included in the present study.

### Classification of data

#### A) Age at first calving

1) A<sub>1</sub> (Below 1500 days) 2) A<sub>2</sub> (Between 1501-1900 days) 3) A<sub>3</sub> (Above 1900 days)

#### B) Period of calving

1) P<sub>1</sub> (1 June 2000 - 31 May 2005) 2) P<sub>2</sub> (1 June 2005 – 31 May 2010)  
3) P<sub>3</sub> (1 June 2010 – 31 May 2015) 4) P<sub>4</sub> (1 June 2015 – 31 May 2020)

**C) Season of calving**

- 1) S<sub>1</sub> (Monsoon season)
- 2) S<sub>2</sub> (Winter season)
- 3) S<sub>3</sub> (Summer season)

**Reproductive characteristics:** The analysis of data will be carried out by method of Least Square Means Technique as outlines by Harvey (1990) [7]. The following mathematical model will be employed to analyzing the data.

$$Y_{ijk} = \mu + S_i + P_j + e_{ijk}$$

Where,

Y<sub>ijk</sub>- is the record of the buffalo calved during j<sup>th</sup> period and in i<sup>th</sup> season

μ - is the population mean common to all observation

S<sub>i</sub> - is the effect of i<sup>th</sup> season of calving (1...3)

P<sub>j</sub> - is the effect of j<sup>th</sup> period of calving (1...4)

e<sub>ijk</sub> - is the random error assumed to be NID (0, δ<sup>2</sup>, e)

**Results and Discussion**

**Reproductive characteristics**

It is observed from the Table 1 that, the overall least square means for age at first calving of Murrah, Surti and Jaffrabadi buffaloes was 1812.14 ± 50.99, 1778.55 ± 28.26 and 1724.60 ± 35.79 days respectively. The lower LSMs for AFC than the present result for Murrah has been reported by Kumar (2015) [12] and Jamal *et al.*, (2018) [9], the lower LSMs for AFC than the present result for Surti has been reported by Rathod *et al.*, (2018) [15] and the similar results for Jaffrabadi were obtained by Sharma *et al.*, (2016) [17]. A lower or higher AFC reported by various authors in buffalo was due to herd differences and also due to breed of animal, feeding, heat detection and

managerial factors.

It is observed from the Table 1 that, the overall least square means for service period of Murrah, Surti and Jaffrabadi buffaloes was 238.31 ± 64.83, 230.68 ± 58.64 and 183.06 ± 44.31 days respectively. The similar results for Murrah were obtained by Thiruvankadan *et al.*, (2010) [20] and the lower LSMs for SP than the present result for Murrah has been reported by Jakhar *et al.*, (2016) [8], the lower LSMs for SP than the present result for Surti has been reported by Sinha *et al.*, (2020) and the similar results for Jaffrabadi were obtained by Kushwaha *et al.*, (2013) [13] and the slightly higher LSMs for SP than the present result for Jaffrabadi was reported by Kumar *et al.*, (2017) [10]. The important factor for long SP in animal is many heat periods are lost due to unavailability of breeding bull or artificial inseminations facility.

It is also observed from the Table 1 that, the overall least square means for inter-calving period for Murrah, Surti and Jaffrabadi buffaloes was 545.08 ± 65.15, 547.18 ± 52.72 and 493.06 ± 44.31 days respectively. The similar results for Murrah were obtained by Thiruvankadan *et al.*, (2014) [19] and the slightly lower LSMs for ICP than the present result for Murrah has been reported by Charlini and Sinniah (2015) [5], the similar result for average ICP for Surti were reported by Kushwaha *et al.*, (2013) [13] and the slightly lower LSMs for ICP than the present result for Surti has been reported by Rathod *et al.*, (2018) [15], and the similar results for Jaffrabadi were obtained by Chaikhun *et al.*, (2012) [4], the slightly higher LSMs for ICP than the present result for Jaffrabadi was reported by Thiruvankadan *et al.*, (2010) [20]. The fluctuations in the value of ICP is might be due to summer stress, silent heat problems, low conception rates in buffalo and managerial facilities available at farm.

**Table 1:** Least square means and standard error for different reproductive characteristics in Murrah, Surti and Jaffrabadi buffaloes.

Sr. No.	Source of variation	Murrah	Surti	Jaffrabadi
		Overall mean		
		LSM ± SE	LSM ± SE	LSM ± SE
1.	Age at first calving	1812.14 ± 50.99	1778.55 ± 28.26	1724.60 ± 35.79
2.	Service period	238.31 ± 64.83	230.68 ± 58.64	183.06 ± 44.31
3.	Inter-calving period	545.08 ± 66.15	547.18 ± 57.72	493.06 ± 44.31

**Breeding season in Murrah, Surti and Jaffrabadi buffaloes**

It is observed from Table 2 that, in Murrah buffalo maximum number of successful conceptions take place in the month of October (18.59%), November (25.66%), December (19.46%) and January (14.16%). Hence, the maximum successful conceptions were observed in the month of November

(25.66%). Similar result was reported by Das *et al.*, (2015) [6]. It is also observed from Table 3 that, the successful conception rate was highest in winter season (77.88%), followed by summer season (11.51%) and rainy season (10.61%). The similar result was reported by Shah *et al.*, (1988) [16] and Phogat *et al.* (2016) [14].

**Table 2:** Frequency distribution of number successful conceptions in different month of the year in Murrah buffalo (period: 2000 to 2020).

Months	No. of successful conceptions	Percentage of successful conceptions
January	16	14.16
February	7	6.19
March	3	2.65
April	2	1.77
May	1	0.88
June	0	0.00
July	1	0.88
August	3	2.69
September	8	7.07
October	21	18.59
November	29	25.66
December	22	19.46
Total	113	100.00

**Table 3:** Frequency distribution of number successful conceptions in different season of the year in Murrah buffalo.

Season	No. of successful conceptions	Percentage of successful conceptions
Monsoon season	12	10.61
Winter season	88	77.88
Summer season	13	11.51
Total	113	100.00

It is observed from Table 4 that, in Surti buffalo maximum number of successful conceptions take place in the month of October (19.18%), November (17.81%), December (21.92%) and January (12.33%). Hence, the maximum successful conceptions were observed in the month of December

(21.92%). Similar result was reported by Bhave *et al.*, (2016)<sup>[2]</sup>. It is also observed from Table 5 that, the conception rate observed highest in the winter season (71.23%) followed by summer (21.92%) and rainy (6.85%) respectively.

**Table 4:** Frequency distribution of number successful conceptions in different month of the year in Surti buffalo (period: 2000 to 2020).

Months	No. of successful conceptions	Percentage of successful conceptions
January	9	12.33
February	8	10.96
March	4	5.48
April	4	5.48
May	0	0
June	1	1.36
July	0	0
August	0	0
September	4	5.48
October	14	19.18
November	13	17.81
December	16	21.92
Total	73	100.00

**Table 5:** Frequency distribution of number successful conceptions in different season of the year in Surti buffalo.

Season	No. of successful conceptions	Percentage of successful conceptions
Monsoon season	5	6.85
Winter season	52	71.23
Summer season	16	21.92
Total	73	100.00

It is observed from Table 6 that, in Jaffrabadi buffalo maximum number of successful conceptions take place in the month of October (12%), November (32%), December (14%) and January (12%). Hence, the maximum successful conceptions were observed in the month of November (32%). Similar result was reported by Das *et al.*, (2015)<sup>[6]</sup>. It is

observed from table 7 that, the conception rate observed highest in the winter season (70%), followed by rainy (20%) and summer (10%) season, respectively. The similar result was reported by Shah *et al.*, (1988)<sup>[16]</sup> and Phogat *et al.* (2016)<sup>[14]</sup>.

**Table 6:** Frequency distribution of number successful conceptions in different month of the year in Jaffrabadi buffalo (period: 2000 to 2020).

Months	No. of successful conceptions	Percentage of successful conceptions
January	6	12
February	2	4
March	1	2
April	1	2
May	1	2
June	0	0
July	1	2
August	4	8
September	5	10
October	6	12
November	16	32
December	7	14
Total	50	100.00

**Table 7:** Frequency distribution of number successful conceptions in different season of the year in Jaffrabadi buffalo.

Season	No. of successful conceptions	Percentage of successful conceptions
Monsoon season	10	20
Winter season	35	70
Summer season	5	10
Total	50	100.00

## Conclusion

Present study revealed that, the environmental and managerial factors play an important role in reproductive performance of buffalo. The study also indicated that, the maximum successful conceptions were observed during the month of November (25.66%) in Murrah buffalo, December (21.92%) in Surti buffalo and November (32%) in Jaffrabadi buffalo. Hence, it is concluded from the present findings that, the winter season is the most favorable season for breeding in all three breeds of buffaloes.

## Acknowledgement

The authors would like to express sincere thanks to Associate Dean and Principal of VNMKV, College of Agriculture, Parbhani, Head of Department, faculty members of the Department of Animal Husbandry and Dairy Science, College of Agriculture, VNMKV, Parbhani, (M.S.) India, for their valuable suggestions and cooperation during this study.

## References

1. Anonymous. 20<sup>th</sup> livestock census 2019-All India Report. Department of Animal Husbandry and Dairying, Ministry of Agriculture, Government of India, New Delhi, 2019.
2. Bhawe KG, Khadse JR, Gaundare YS, Mangurkar BR. Factors affecting conception rates in AI bred buffaloes in field conditions. *Indian Journal of Animal Sciences*. 2016;86(12):50-53.
3. Boro P, Saharia J, Bharali D, Sharma M, Sonowal M, Brahma J. Productive and reproductive performances of Murrah buffalo cows: A review. *Journal of Entomology and Zoology Studies*. 2020;8(2):290-293.
4. Chaikhun T, Hengtrakunsin R, De Rensis F, Techakumphu M, Suadsong S. Reproductive and dairy performances of Thai swamp buffaloes under intensive farm management. *The Thai Journal of Veterinary Medicine*. 2012;42(1):81.
5. Charlini BC, Sinniah J. Performance of Murrah, Surti, Nili-Ravi buffaloes and their crosses in the intermediate zone of Sri Lanka. *Development*. 2015;27(3):1-17.
6. Dash S, Chakravarty AK, Sah V, Jamuna V, Behera R, Kashyap N, *et al.* Influence of temperature and humidity on pregnancy rate of Murrah buffaloes under subtropical climate. *Asian-Australasian journal of animal sciences*. 2015;28(7):943.
7. Harvey WR. Mixed model least square's and maximum likelihood computer program, PC-2 version, Ohio, USA, 1990.
8. Jakhar VIKRAM, Vinayak AK, Singh KP. Genetic evaluation of performance attributes in Murrah buffaloes. *Haryana Veterinarian*. 2016;55(1):66-69.
9. Jamal I, Mehla RK, Yousuf S, Naik MA, Japeth KP. Effect of non-genetic factors on various reproduction traits in Murrah buffaloes. *Indian journal of dairy science*. 2018;71(2):193-197.
10. Kumar M, Ratwan P, Patil CS, Vohra V. Influence of environmental factors on performance traits in Murrah buffaloes: A Review. *Journal of Veterinary Science and Technology*. 2017;6(1):6-16.
11. Kumar M, Ratwan P, Patil CS, Vohra V. Influence of environmental factors on performance traits in Murrah buffaloes: A Review. *Journal of Veterinary Science and Technology*. 2017;6(1):6-16.
12. Kumar V. Factors Affecting Performance of Indian Murrah Buffalo: A Review. *Journal of Buffalo Science*. 2015;4(1):21.
13. Kushwaha BP, Singh S, Das N, Maity SB, Singh KK, Jayasankar J. Production and reproductive performance of Bhadawari buffaloes in Uttar Pradesh, India. *Journal of Buffalo Science*. 2013;2(2):72-77.
14. Phogat JB, Pandey AK, Singh I. Seasonality in buffalo's reproduction. *International Journal of Plant, Animal and Environmental Sciences*. 2016;6(2):46-54.
15. Rathod AS, Vaidya MS, Ali SS. Genetic Studies of productive and reproductive attributes of surti buffalo in Maharashtra. *International Journal of Livestock Research*. 2018;8(18):309-314.
16. Shah SNH. Comparative studies of seasonal influence on breeding behaviour and conception rate of dairy buffalo and zebu cattle. In *Proceedings of 11th Congress on Animal Reproduction and Artificial Insemination*. 1988;3:538.
17. Sharma HA, Gajbhiye PU, Ahlawat AR, Ramani AL, Dongre VB. Influence of environmental factors on age at first calving in Jaffrabadi buffaloes. *Journal of Livestock Science*. 2016;7:256-259.
18. Suthar B, Bansal R, Gamit P. An overview of livestock sector in India. *Ind. J Pure App. Biosci*. 2019;7(5):265-271.
19. Thiruvankadan AK, Panneerselvam S, Murali N, Selvam S, Saravanakumar VR. Milk production and reproduction performance of Murrah buffaloes of Tamil Nadu, India. *Buffalo Bulletin*. 2014;33(3):291-300.
20. Thiruvankadan AK, Panneerselvam S, Rajendran R, Murali N. Analysis on the productive and reproductive traits of Murrah buffalo cows maintained in the coastal region of India. *Applied animal husbandry and rural development*. 2010;3(1):1-5.