

Factors Affecting Lactation Performance of Deoni Cattle

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ABSTRACT

The research was conducted on 78 lactation records of 78 Deoni cows over three years to analyze the effect of non-genetic factors on lactation performance traits. Data of lactation records were analyzed to determine the effect of age, parity, a period of calving and season of calving on lactation traits, viz., lactation milk yield (LMY), peak milk yield (PMY), lactation length (LL) and persistency of lactation. The findings revealed that age group and parity had a significant ($p \leq 0.05$) effect on lactation milk yield, but not the period of calving and season of calving. Further, only the parity had a significant ($P \leq 0.05$) effect on peak milk yield of Deoni cattle but not the age group, period of calving, and season of calving. The other two traits, namely lactation length, and persistence was not influenced significantly by any the non-genetic factors evaluated in Deoni cattle.

Keyword: Deoni, Lactation performance, Period of calving, Parity, Season of calving, Age.

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INTRODUCTION

As per 20th Livestock Census of 2019, the total livestock population in India is 535.78 million. Karnataka is the 9th largest state in cattle and buffalo population in India, accounting for 29 million and contributes 4.70 % of the country's total population (GOI, 2019). In view of the increasing population and diversified food requirement, enhancing milk production for future years would be very challenging. Among different cattle breeds reared in India, Deoni is one of the important dual-purpose cattle breeds of the erstwhile Nizam State, comprising parts of Maharashtra, Karnataka and Telangana states. Deoni bullocks are suitable for heavy cultivation and carting works (Suryawamshi *et al.*, 2000). They are also good milk yielders, even up to 10 liters per day under village conditions (NBAGR, 2008). However, the range of lactation milk yield is reported to be 293.3±76.0 kg to 868.24±49.56 kg, indicating a large variation among the population and great scope for improvement (Dongre *et al.*, 2017). Some researchers assessed the regional priorities for sustainable milk production in Karnataka and recommended upgrading non-descript stock with native cattle breeds like Deoni, which have much higher production potential. Although some of the studies have reported the performance of Deoni cattle in field conditions, the present study was undertaken to analyze the factors affecting the lactation performance of Deoni cattle maintained in institutional farms.

MATERIALS AND METHODS

The study was carried out to analyze the effect of non-genetic factors on lactation performance traits like lactation milk yield (LMY), peak milk yield (PMY), lactation length (LL) and persistency of lactation in Deoni cattle at Livestock

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Research & Information Centre (Deoni) in Bidar district. Data pertaining to 78 lactation records over 3 years period (2015 to 2018) of 78 Deoni cows from this center were collected and organized to study the effect of age, parity, a period of calving, and season of calving on production traits. Five levels of age groups (3-5, 5-7, 7-9, 9-11, and >11 years) were coded, and six parties (1 to 6) were analyzed. The study also covered three periods, viz., period 1 (July 15-Jun 16), period 2 (July 16-Jun 17), and period 3 (July 17-Jun 18) and three seasons, viz., rainy (Jul-Oct), winter (Nov-Feb) and summer (Mar-Jun). Statistical analysis was done using SAS software version 9.3 (2010) using the General Linear Model (GLM) procedure.

RESULTS AND DISCUSSION

The overall lactation performance of 78 Deoni cows studied over three years period revealed the mean lactation milk yield of 1297.99 ± 54.41 kg, peak milk yield 6.19 ± 0.147 kg, lactation length of 291.68 ± 6.789 days and persistency of lactation as 207.68 ± 5.105 days.

Lactation Milk Yield

Table 1 depicts that lactation milk yield (LMY) was significantly ($p \leq 0.05$) affected by the age group and parity, but the period of calving and season of calving had no significant influence on it. Further, the cattle of 9-11 years age group showed significantly ($p \leq 0.05$) higher LMY when compared with animals of 5-6 years and 3-5 years age groups, but it was statistically similar to that of 7-9 years and >11 years of age groups. With regards to parity, LMY was significantly ($p \leq 0.05$) higher at fourth parity when compared to first parity. Still, it was statistically at par with LMY of second, third, fifth, and sixth parity. This might be due to the fact that, as parity and age advances, cow's body weight and size increase, which in turn helps in producing more milk than younger/small cows. This also might be due to better udder development that comes with repeated pregnancies as well as the full development of udder tissues. Also, multiparous cows reach their peak in early lactation than first parity cows by consuming more feed and water, leading to longer persistency period than

that of the first calving. Our observations corroborate with the reports of Wondifraw *et al.* (2013), Anarase *et al.* (2015), and Kuralkar *et al.* (2015), who reported the highest LMY in fifth and second parity, respectively. The season of calving and period of calving did not have any significant effect on LMY. These results were in contradiction with Bhutkar *et al.* (2014), Anarase *et al.* (2015), Basak and Das (2018), and Basak *et al.* (2018). They reported a significant effect of the period of calving and season of calving on LMY.

Peak Milk Yield (PMY)

Peak milk yield was significantly ($p \leq 0.05$) influenced by parity, but was not affected by age, period of calving and season of calving. The PMY was significantly ($p \leq 0.05$) higher during first, sixth and second parity in ascending order as compared to fourth and fifth parity, while that of third parity was statistically at par with all other parties.

Lactation Length (LL)

Lactation length did not reveal the significant influence of different traits like age group, parity, and period of calving. However, a season of calving had significantly ($p \leq 0.05$) influenced the LL. The rainy season showed significantly higher LL when compared to summer season, and it was intermediate during the winter season. These results were in agreement with Anarase *et al.* (2015), who reported a

Table 1: Lactation milk yield, Peak milk yield, Lactation length and persistency as affected by age groups, parity, a period of calving and season of calving in Deoni cows

Sources/ Factors	N	Lactation Performance			
		LMY (Kg)	PMY (Kg)	LL (Days)	Persistency
Age group (Years)					
3-5	8	1095.68 ^a ± 150.875	5.62 ± 0.445	271.00 ± 20.943	194.05 ± 15.588
5-6	24	1121.80 ^a ± 87.107	5.82 ± 0.257	276.33 ± 12.091	194.10 ± 9.000
7-9	20	1350.48 ^{ab} ± 95.421	6.53 ± 0.281	291.70 ± 13.245	207.92 ± 9.859
9-11	10	1669.39 ^b ± 134.946	6.93 ± 0.398	318.70 ± 18.732	234.17 ± 13.942
> 11	16	1365.67 ^{ab} ± 106.684	6.13 ± 0.315	308.12 ± 14.800	217.97 ± 11.022
Parity					
1	17	1054.15 ^a ± 101.330	5.60 ^a ± 0.352	267.47 ± 14.173	188.08 ± 10.479
2	18	1191.65 ^{ab} ± 98.475	6.00 ^a ± 0.342	284.00 ± 13.774	200.20 ± 10.184
3	14	1211.40 ^{ab} ± 111.660	4.58 ^{ab} ± 0.38	282.00 ± 15.618	199.07 ± 11.548
4	9	1650.87 ^b ± 139.265	3.11 ^b ± 0.484	327.88 ± 19.479	234.27 ± 14.403
5	6	1559.55 ^{ab} ± 170.564	3.12 ^b ± 0.593	316.16 ± 23.857	236.36 ± 17.640
≥ 6	14	1478.40 ^{ab} ± 111.660	5.94 ^a ± 0.388	306.85 ± 15.618	220.29 ± 11.548
Period of calving					
Jul 15-Jun 16	31	1325.78 ± 80.756	6.41 ± 0.233	291.90 ± 10.758	207.17 ± 10.758
Jul 16-Jun 17	24	1206.60 ± 91.781	6.16 ± 0.264	278.95 ± 12.226	192.98 ± 12.226
Jul 17-Jun 18	23	1378.10 ± 93.755	5.91 ± 0.270	304.65 ± 12.489	223.69 ± 12.489
Season of calving					
Rainy	23	1351.95 ± 92.727	6.60 ± 0.265	311.30 ^a ± 11.94	202.73 ± 9.184
Winter	26	1413.99 ± 87.213	6.23 ± 0.250	302.65 ^{ab} ± 11.2	224.14 ± 8.638
Summer	29	1151.18 ± 82.579	5.82 ± 0.236	266.27 ^b ± 10.63	196.83 ± 8.179

n = Number of observation / lactation records

Means with no common superscript within the column differ significantly ($p \leq 0.05$) for a factor.



significant effect of season of calving on LL. In contrast, Basak and Das (2018) and Kuralkar *et al.* (2015) did not find it's a significant effect on LL.

Persistence

The study revealed that age group, parity, a period of calving, and season of calving did not have any significant influence on the persistence. These results were in agreement with those of Chaudhry *et al.* (2000) in Nili-Ravi buffaloes.

CONCLUSION

The study revealed that non-genetic factors, particularly the age and parity, have a significant effect on production parameters of Deoni cattle, but not the period or season of calving. Further, the high variation in the milk production of Deoni cattle is also indicative of further scope for improvement in the trait through selective breeding.

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