



Productive and reproductive performances of Deoni cattle under intensive management system

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Deoni, a medium size dual purpose indigenous breed, heavier than the local cattle of native tract, is generally found in northern part of Karnataka i.e. Bidar district and south eastern part of Maharashtra covering Latur district. This breed is also distributed in small numbers in the neighboring districts of Gulberga in Karnataka, Parbhani, Nanded, Osmanabad districts of Maharashtra and some parts of Medak district in Andhra Pradesh. The home tract is mainly hilly with an average altitude of 480 to 705 m above mean sea level. The minimum ambient temperature in the home tract ranges from 9° C to 26° C and the maximum ambient temperature from 29° C to 44° C. The average annual rainfall in these areas varies from 736 to 919 mm. Based on the morphological characters, the animals are classified into 3 types i.e. Balankya (pure white), Waghya (white and black spots on the body) and Wannera (animals with complete white body and black face). This breed is hardy and well adapted for tropical draught prone areas.

Results from ICAR Net-work project revealed that there were good animals yielding more than 10 kg per day under village conditions. However, no concerted efforts were made to improve and conserve this breed leading to fast depletion in their numbers. Hence, efforts were made by NDRI, SRS, Bengaluru to establish a herd with 160 (including cows, heifers, young stock and bulls) procured from its home tract with the objectives of improvement of the breed and dissemination of improved germplasm among farmers to its home tract.

Data on various production and reproduction traits of 428 lactation records of 228 Deoni animals maintained at NDRI, SRS herd during 2002 to 2008 were analyzed to investigate the productive and reproductive performances of Deoni cattle under organized herd. During 2002, the animals were introduced in farm from its native tracts. These animals were

maintained under loose housing system and standard management practices. For six months in a year the animals were fed *ad lib.* green fodder, while during dry season (Jan-June) the animals were fed straw and small quantities of green fodders. In both the periods, the concentrate was fed as per NRC Standards (2001). The parameters studied under this study include birth weight, weight at first calving, lactation milk yield, lactation length, dry period and calving interval and mortality rate. The records of abnormal lactations were excluded from the study. For statistical analysis, least-squares analysis of variance (Harvey 1990) was applied.

The mean birth weight and weight at age at first calving (AFC) in Deoni females were recorded as 20.81±0.21 (n, 140) and 223.64±3.59 (n, 101) kg, respectively. The body weights at birth in various indigenous breeds of cattle, viz. Umbalchery (Anonymous 2008b), Dangi (Anonymous 2008c), Gaolao (Anonymous 2008d) and Gir (Anonymous 2008c), were 14.2, 16.84, 18.23 and 20.77 kg, respectively. The body weight at first calving in Gaolao and Dangi were 220.42 and 253.69 kg, respectively (Anonymous 2008d and Anonymous 2008c).

The mean AFC of 196 Deoni animals were recorded to be 38.73±0.73 months. In a previous study on this breed, a higher mean AFC (1533 days) was reported by Deshpande and Singh (1977a) and 46 months by Singh *et al.* (2002). In Ongole cattle, the average AFC varied from 860 days (Clay Center 1993) to 1200 days (Martinez 1991), whereas, in Sahiwal cattle it was from 879±9.0 (Bhatnagar and Sharma 1976) and 1567.64±20.06 days (Kuralkar 1996). Gaur *et al.* (2003) calculated the mean AFC in Gir cattle as 1534 days. Galina and Arthur (1989) summarized number of studies in Sahiwal, Gir, milking Zebu, Nellore, Hariana, Tharparkar and reported average age at first calving was 40.8, 48.0, 33.1, 43.9, 48.0, and 43.2 months, respectively. In general, AFC in zebu cattle is much higher compared to their exotic or crossbred counterparts which is largely attributed to lack of selection for their traits from generation to generation.

The overall mean lactation milk yield (LMY) over first 5 lactations was noted to be 779.27±18.31 kg with a lactation

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Table 1. Overall mortality rates (%) of Deoni cattle

Year	Male (age in months)					Female (age in months)					Total strength	Overall mortality (%)
	0-1	>1-3	>3-6	>6-12	>12	0-1	>1-3	>3-6	>6-12	>12		
2002	-	-	0.46	-	-	0.46	-	-	-	1.40	214	2.33
2003	0.38	0.38	-	-	-	-	0.76	-	-	1.14	261	2.68
2004	-	0.32	0.32	-	-	0.32	-	-	0.32	0.98	306	2.28
2005	-	-	0.33	0.33	-	0.33	-	-	-	0.33	300	1.33
2006	-	-	-	0.55	0.55	-	-	-	-	0.55	360	1.66
2007	0.24	-	-	0.49	0.98	-	-	-	-	0.49	408	2.45
2008	-	-	0.94	-	0.47	-	0.47	0.47	-	1.41	212	3.77
Overall											294	2.170

length of 186.61 ± 3.02 days. The lactation yield of first 5 lactations were 715.87 ± 32.11 , 858.79 ± 32.72 , 824.99 ± 40.47 , 719.41 ± 43.82 , and 776.41 ± 75.09 kg with corresponding lactation length of 189.43 ± 5.03 , 189.13 ± 5.49 , 185.50 ± 6.97 , 169.40 ± 8.36 , and 187.61 ± 15.00 days. Previous studies on Deoni cattle reported lower lactation milk yield ranging from 238.86 ± 22.44 kg (Kalyana Chakravarthy *et al.* 2002) to 518.23 ± 22.44 kg (Thombre *et al.* 2001). The report of Kishan Kumar *et al.* (2006) was comparatively higher mean LMY (540.06 ± 15.53 kg) with a range from 502.00 ± 46.25 to 589.96 ± 45.58 kg in fifth and fourth lactations, respectively. In the same study, the overall mean lactation length was reported as 185.79 ± 4.35 days with a range of 170.67 ± 14.18 to 194.15 ± 11.88 days in fifth and fourth lactations, respectively.

In an investigation on Deoni cattle, Deshpande and Singh (1977b) reported a mean first lactation yield of 942.7 ± 16.6 kg. Similarly, results of ICAR Network Project on Deoni cattle (1999) indicated a mean LMY of 864.24 ± 49.56 kg. In the present study there was a significant increase ($P < 0.05$) in LMY from first parity to second parity. However, Kishan Kumar *et al.* (2006) and Dhumal *et al.* (1993) did not find any statistically significant difference of parity effect on milk yield in their studies. Analysis of variance in present study indicated that there was no significant effect of parity on lactation length in Deoni cattle which is in agreement with the findings of Kishan Kumar *et al.* (2006) and Dhumal *et al.* (1993). The results on lactation yield and parity must be viewed with caution as the data pertains to both purchased and farm bred females.

Calving interval and dry period are mostly dependant on the management or environment of the herd but have greater bearing on the economics of a dairy unit. In this study, the dry period over 5 lactations were recorded as 273.55 ± 13.51 , 248.95 ± 13.82 , 255.53 ± 14.45 , 241.22 ± 15.17 , and 204.54 ± 19.76 days, respectively with an over all average of 256.87 ± 7.34 days. However, Deshpande and Singh (1977c) reported lower dry period of 177.0 ± 4.2 days in Deoni cattle maintained at Government farm in Maharashtra. The average dry period was 188 days in Ongole cattle (Clay Center 1993)

and 192 days in Sahiwal cattle (Khan 1992). The longer dry period in the present study is attributed to the wide variation of records of purchased animals used for the study.

The mean calving interval of Deoni animals as recorded over five consecutive lactations were 468.11 ± 12.19 , 443.13 ± 12.19 , 432.67 ± 13.82 , 422.11 ± 13.13 , and 405.15 ± 15.90 days, respectively. The overall mean calving interval was noted to be 447.22 ± 6.64 days which was similar (447 days) as reported by Singh *et al.* (2002). However, the higher mean calving interval of 466 days in Deoni cattle (Deshpande and Singh 1977d) and 456 days in Ongole cattle (Khan 1992) were also reported. The present study revealed that the season had no significant effect on calving pattern of Deoni cattle. In a study conducted on 294 calvings in cattle, season had significant effect on calving (Singh 1980). Escobar *et al.* (1972) depicted the highest incidence of calving in late winter, whereas, in the study of Oliveira *et al.* (1975), 60% of the calvings were in the spring and early summer (rainy season), provided that adequate nutrition is available (Gauthier and Thimonier 1984).

The overall mortality rate in Deoni cattle was recorded as 2.17% (Table 1) which was lower than the earlier report of 3.63% in Gir cattle (Gaur *et al.* 2003). In different studies conducted in indigenous breeds of cattle, viz. Tharparkar, Sahiwal and Red Sindhi, the mortality rates among birth to 6 months of age group were recorded as 19.5, 16.3, and 15.8% in males and 17.9, 14.2, and 13.2% in females, respectively (Anonymous 1980). In these 3 breeds mortality rates in 6 to 12 months of age group were reported as 6.0, 3.0, and 1.6% in males and 3.5, 1.5, and 1.2% in females, respectively.

From the present investigation it is clear that this breed has good productive and reproductive potentiality which can further be improved over a period time through proper selection and management.

SUMMARY

Data analyzed on productive and reproductive performances under present investigation in Deoni cattle depicted that the mean birth weight and weight at AFC were 20.81 ± 0.21 (n, 140) and 223.64 ± 3.59 (n, 101) kg,

respectively. The AFC calculated in this study was 38.73 ± 0.73 months. The overall mean lactation milk yield based on first 5 lactations was 779.27 ± 18.31 kg with an average lactation length of 186.31 ± 3.02 days. The present study also revealed that there was a significant increase in milk yield in second lactation than first lactation. The overall dry period and calving interval were 256.87 ± 7.34 and 447.22 ± 6.64 days, respectively. The overall mortality rate in Deoni cattle recorded was 2.17%. In view of reasonably better productive and reproductive performances in the present investigation than earlier studies there is a scope for further genetic improvement of the present Deoni herd.

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