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AGE AT FIRST CALVING EFFECT ON ECONOMIC TRAITS IN DEONI CATTLE OF MAHARASHTRA

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ABSTRACT

In the present study 544 lactations of 145 Deoni females were included. The data was divided into seven groups from G_1 to G_7 on the basis of age at first calving (AFC). Further the effect of AFC on milk yield (MY), service period (SP) and intercalving period (ICP) were studied. The overall (Least Squares Means) LSM for the effect of AFC on MY, SP and ICP in Deoni cattle were reported as 518.229 ± 22.437 kg, 286.572 ± 13.379 days and 566.109 ± 13.639 days, respectively. The effect of AFC on MY of group G_2 and G_3 was seen to be highly significant on other groups. Higher AFC in Deoni cattle lowered down the milk production considerably after G_3 . Whereas, the effect of AFC on SP and ICP was found to be non-significant in Deoni breed of cattle.

INTRODUCTION

Deoni breed of cattle is one of the important dual purpose breed in Marathwada region of Maharashtra State. Deoni cattle by virtue of their phenotype are believed to be developed from local and Gir breed of cattle before 300 years. The home tract of Deoni breed is Udgir, Ahmedpur, Nilanga and Ausa tehsil of Latur district of Maharashtra; adjoining part of Andhra Pradesh, Bidar and Gulbarga districts of Karnataka State. In cattle, mainly the AFC is viewed from economic point of view irrespective of its genetic significance or environmental deviation at producers level. Early AFC is desirable to the farmer and producer. In the present study effect of age at first calving (AFC) on milk yield (MY), service period (SP) and intercalving period (ICP) is evaluated. In the expression of the character AFC, both heredity and environment play their important role.

MATERIAL AND METHODS

The data generated at two farms of Marathwada Agricultural University, Parbhani (M.S.) *viz.* Cattle Cross Breeding Project (CCBP) and Agriculture College Dairy Farm (ACDF) were taken up for the study. The total 145 Deoni females having completed 544 lactations were considered. The information was collected from individual pedigree sheet, milking registers and breeding records. The data accumulated for AFC, MY, SP and ICP characters during the period from 1974 to 1994 were collected and classified in suitable sub-class frequency and subjected for correction. This data was classified into seven age groups as follows:

Age groups	Age in days
1. G_1	Below 1300
2. G_2	1301 to 1450
3. G_3	1451 to 1600
4. G_4	1601 to 1750
5. G_5	1751 to 1900
6. G_6	1901 to 2050
7. G_7	above 2050

The data classified on the basis of AFC along with the corresponding groupwise distribution for MY, SP and ICP were analysed by using Least Square Techniques (Harvey, 1976). Ducan's multiple range test was used to compare the means (Kramer, 1957). The following mathematical model was employed to analyse the data.

$$Y_{ij} = \mu + G_i + e_{ij}$$

Where, Y_{ij} is the record of cow calved during G^{th} group.
μ is population mean common to all observations.

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G_i is the effect of i^{th} group of age at first calving (1.....7)

e_{ij} is the random error assumed to be NID (0, σ^2, e).

RESULTS AND DISCUSSION

The MY, SP and ICP in Deoni cattle observed in this study are presented in Table 1. The overall least squares mean of Deoni cattle for MY, SP and ICP observed as 518.229 ± 22.437 kg (Shelke *et al.*, 1992), 286.572 ± 13.379 days (Deshpande and Singh, 1977) and 566.109 ± 13.639 days (Deshpande and Singh, 1977; Padwal *et al.*,1977) respectively. The trend of MY observed is highest in G_2. The G_2 and G_3 had comparatively higher AFC and higher MY to that of G_1. The trend of SP and ICP observed are lowest in G_6 followed by G_7, G_5, G_2, G_4, G_3 and G_1. The lower AFC increases SP and ICP considerably.

Table 1. Effect of age at first calving on milk yield, service period and intercalving period in Deoni cattle

Sources	Code	LSM ± SE		
		MY (kg)	SP (days)	ICP (days)
Mean		518.229 ± 22.437 (544)	286.572 ± 13.379 (544)	566.109 ± 13.639 (544)
AFC	G_1	416.000^a ± 94.484 (9)	325.799^a ± 56.339 (9)	607.199^a ± 57.433 (9)
	G_2	728.732^b ± 57.544 (35)	287.999^b ± 34.313 (35)	566.399^b ± 34.979 (35)
	G_3	713.249^b ± 51.082 (50)	319.399^a ± 30.459 (50)	599.699^a ± 31.050 (50)
	G_4	409.821^a ± 39.792 (78)	315.178^a ± 23.727 (78)	596.769^a ± 24.188 (78)
	G_5	476.969^a ± 42.657 (72)	269.062^b ± 25.436 (72)	548.093^b ± 25.929 (72)
	G_6	426.280^a ± 46.778 (65)	222.280^b ± 27.893 (65)	499.000^b ± 28.434 (65)
	G_7	456.543^a ± 26.761 (235)	266.285^b ± 15.959 (235)	545.603^b ± 16.266 (235)

Means with similar superscripts are not significantly different from each other.
Figures in parenthesis denotes number of observations.

Effect of AFC on MY, SP and ICP

The highly significant difference among the LSM due to AFC effect for MY in Deoni cattle (Table 1) was observed at the age group of G_2 and G_3 with G_1, G_4, G_5, G_6 and G_7. It has indicated that significantly higher milk yield is due to higher AFC upto G_3 and their after it has no significant effect. Similar trend of results were revealed in the literature for indigenous and crossbred cattle (Chaudhari, and Chaudhari, 1977; Dalal *et al.*, 1991; Kushwaha and Misra, 1969; Shelke *et al.*, 1992). The reports putforth by these authors are indicative of the fact that AFC affects the MY in indigenous breeds of cattle is in close agreement with present findings. The AFC had non-significant effect on SP and ICP (Table 1), but lower AFC increases the SP and ICP. Similar results were also reported earlier (Chaudhary *et al.*, 1977 and Patil, 1983).

CONCLUSIONS

On the basis of the findings given above it is concluded that character AFC contribute significantly in milk production of

Deoni cattle. Higher AFC upto certain age lead to increased MY considerably whereas, there is non significant effect of AFC on SP and ICP, which indicates that SP and ICP are independent of AFC in Deoni breed of cattle.

REFERENCES

Chaudhari, S. and Chaudhary, A.L. (1977). *Indian J. Anim. Sci.* **47**: 773-776.
Chaudhary *et al.* (1977). *Indian J. Dairy Sci.* **30**: 274-278.
Dalal *et al.* (1991). *Indian J. Dairy Sci.* **44**: 401-405.
Deshpande, K.S. and Singh, B.P. (1977). *Indian Vet. J.* **54**: 454-456.
Harvey, W.R. (1976). Least Squares Analysis of Data with unequal sub-class numbers. Agricultural Research Service, United States, Department of Agriculture, Washington, D.C.
Kramer, C.Y. (1957). *Biometrics* **13**: 13-18.
Kushwaha, N.C. and Misra, R.C. (1969). *Indian J. Dairy Sci.* **22**: 81-84.
Padwal *et al.* (1977). *Food Farming Agric.* **8**: 33-35.
Patil, C.Y. (1983). M.Sc. Thesis, M.A.U., Parbhani.
Shelke *et al.* (1992). *Indian J. Dairy Sci.* **45**: 416-418.