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Production performance of different strains of Deoni cattle

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Abstract

A study was carried out to study the production performance of different strains of Deoni cattle, an indigenous dual-purpose cattle breed native to Bidar district of Karnataka and adjacent regions. Data on 184 Deoni cows in 13 villages and Livestock Research & Information Centre (Deoni), Hallikhed (B) in Bidar district of Karnataka state was collected as part of the Field Performance Recording Project. Though differences were non-significant, Balankya strain of Deoni cattle had higher lactation milk yield (1340.77 ± 82.922 kg) and peak yield (6.55 ± 0.308 kg), and Shevera strain had longer lactation length (295.32 ± 6.598 days). The Wannera strain had significantly higher milk fat ($4.653 \pm 0.0414\%$) and SNF ($8.302 \pm 0.0198\%$). The high lactation milk yield figures in the present study indicate significant potential for improvement of the breed.

Keywords: Deoni cattle, strain, Balankya, Wannera, Shevera, morphometric traits

Introduction

Along with agriculture, animal husbandry and dairying continue to be an integral part of human life since the dawn of civilization. These activities have contributed not only to the food basket and draught animal power but also to maintaining ecological balance. The total cattle population of India is 193.46 million, comprising 142.11 million indigenous cattle and 53 descript cattle breeds (NBAGR, 2023) [18]. The Deoni is a dual-purpose medium-sized animal which resembles the Gir in physical structure to a large extent. It is a registered breed of Indian cattle declared by NBAGR having accession number INDIA_CATTLE_1108_DEONI_03005. It is found in three strains based on colour variations viz. Wannera, Balankya and Shevera. Deoni cattle are one of the most important cattle breeds found in most drought prone region of the country (Bukya *et al.*, 2019; Dongre, 2019) [5, 11]. Joshi and Phillips (1953) [13] reported that genetically, the Deoni breed was evolved through the crossbreeding of the Gir cattle of the Kathiawar region of Gujarat with the Dangi breed of Marathwada and local desi cattle of Nizam State from Bidar and Osmanabad. Singh *et al.* (2002) [21] reported three coat colour variations in both the sexes of Deoni cattle viz. Wannera was clear white with black colour at the sides of the face, Balankya was clear white with black spots on the lower side of the body and Shevera was white body with irregular black spots. An evaluation of different production traits of dairy cattle plays a crucial role in judging its economic utility. Generally, in field conditions, for animals with unknown pedigree or devoid of any reliable data, observation of overall phenotypic characters can aid in predicting the probable value of the animal.

Materials and Methods

The present study was carried out under the project "Field Performance Recording (FPR) of Deoni cattle in Bidar District" as part of the Rashtriya Gokul Mission. Under the project 13 villages from 2 talukas (Bhalki and Aurad) of Bidar district were selected. The data of total 184 adult female Deoni cattle (36 Balankya, 88 Shevera and 60 Wannera) were recorded for production performance during 2018-19.

The lactation milk yield was estimated using Test Interval Method (Interpolation Method) approved by the International Committee for Animal Recording (2012) [12]. Milk samples were stirred using an ultrasonic stirrer and then subjected to analysis for fat and SNF by using an electronic milk analyzer (Vector).

Statistical methods

The data collected was analyzed by using SAS software version 9.3 (2010) using General Linear Model (GLM) procedure.

Results and Discussion

The comparison of the production performance of different Deoni cattle strains are given in Table 1.

Lactation milk yield: The overall mean for lactation milk yield of Deoni cattle was found to be 1223.37 ± 36.728 kg. Lower LMY was reported by Shingare *et al.* (2015) [20] (236.43 ± 12.71 kg), Chakravarthi *et al.* (2002) [6] (238.86 ± 76.00 kg), Bhutkar *et al.* (2014) [4] (358.31 ± 27.18 kg), Thombre *et al.* (2001) [23] (518.23 ± 22.44 kg), Kumar *et al.* (2006) [15] (544.06 ± 15.33 kg), Dhumal *et al.* (1993) [10] (605 ± 25.0 kg), Basak *et al.* (2018) [2, 3] (643.08 ± 25.16 kg), Das *et al.* (2011) [7] (779.27 ± 18.31 kg), Deshpande and Singh (1977a) [9] (818.1 and 1041.9 kg at Hingoli and Udgir farms respectively), and Basak and Das (2018) [2, 3] (819.98 ± 16.50 kg) in Deoni cattle. The LMY values obtained in this study are comparable with Singh *et al.* (2002) [21] (868.24 ± 49.56 lit), Patil (2014) [19] (881.35 ± 37.64 kg), Kuralkar *et al.* (2014) [16] (910.95 ± 27.62 kg) and Ambika (2019) [1] (966.08 ± 35.915 kg) in Deoni cattle.

As per the least squares analysis of variance (LSA), there was no significant effect of strain on the lactation milk yield of the cows. Lactation milk yield was highest in Balankya strain (1340.77 ± 82.922 kg) while it was lowest in Wannera strain (1192.78 ± 64.231 kg). Lower values of 973.63 ± 55.18 , 848.44 ± 41.57 and 830.80 ± 40.38 kg were reported by Kuralkar *et al.* (2014) [16] for Balankya, Shevera and Wannera strains, respectively. Slightly lower values of 823.55 ± 79.78 , 1025.62 ± 100.66 and 979.68 ± 77.94 kg were reported by Basak and Das (2018) [2, 3] for Balankya, Shevera and Wannera strains, respectively.

Peak yield: The overall mean for peak yield of Deoni cattle was observed to be 6.05 ± 0.138 kg. It was higher than the findings of Ambika (2019) [1] (5.69 ± 0.176 kg), Deshpande and Singh (1977) (4.48 ± 0.12 kg), Patil (2014) [19] (4.19 ± 0.10 kg), Bhutkar *et al.* (2014) [4] (3.14 ± 0.18 kg), Thorat *et al.* (2016) (2.60 ± 1.00 kg) and Chakravarthi *et al.* (2002) [6] (2.28 ± 0.24 kg). However, it was lower than Shingare *et al.* (2015) [20] (7.12 ± 0.24 kg) and Kakde *et al.* (1980) (6.277 kg) in Deoni cattle. Highest peak yield was observed in Balankya strain (6.55 ± 0.308 kg) while least in Wannera strain (5.68 ± 0.238 kg), though the differences between the strains were not significant.

Lactation length: The least squares means for lactation length (LL) of Deoni cattle under this study was found to be 293.72 ± 4.540 days. Lower LL was reported by Chakravarthi *et al.* (2002) [6] (149.43 ± 33.52 days), Basak *et al.* (2018) [2, 3] (178.24 ± 4.41 days), Kumar *et al.* (2006) [15] (185.79 ± 4.35 days), Das *et al.* (2011) [7] (186.61 ± 3.02 days), Basak and Das (2018) [2, 3] (195.23 ± 2.62 days), Bhutkar *et al.* (2014) [4] (213.90 ± 13.74 days), Shingare *et al.* (2015) [20] ($211.26 \pm$

8.59 days), Thorat *et al.* (2017) (220.21 ± 6.75 days) and Kuralkar *et al.* (2014) [16] (246.12 ± 1.77 days). The values obtained were comparable with Patil (2014) [19] (253.66 ± 2.29 days), Ambika (2019) [1] (259.15 ± 4.883 days), Dhumal *et al.* (1993) [10] (277.0 ± 9.23 days) and Deshpande and Singh (1977) (293.3 ± 2.9 days) in Deoni cattle.

While a longer lactation length was observed in Shevera strain (295.32 ± 6.598 days) and shorter lactation length in Balankya strain (290.72 ± 10.316 days), the differences between the strains were not significant. Lower values of 258.04 ± 16.28 , 244.66 ± 6.43 and 237.98 ± 6.87 days were reported by Kuralkar *et al.* (2014) [16] for Balankya, Shevera and Wannera strains, respectively. Basak and Das (2018) [2, 3] reported lactation length for Balankya, Shevera and Wannera strains of 194.59 ± 10.60 , 222.74 ± 14.09 and 229.51 ± 11.91 days, respectively.

Milk fat: The overall mean for milk fat of Deoni cattle was found to be 4.545 ± 0.0242 percent based on 184 observations. It was higher than the findings of Kuralkar *et al.* (2014) [16] ($4.20 \pm 0.15\%$), Patil (2014) [19] ($4.25 \pm 0.11\%$), Sontakke *et al.* (1978) ($4.29 \pm 0.10\%$), NBAGR (2008) (4.3%) and Singh *et al.* (2002) [21] ($4.30 \pm 0.14\%$). The value obtained was comparable with Ambika (2019) [1] ($4.492 \pm 0.0233\%$) in Deoni cattle.

As per the least squares analysis of variance, strain had a significant effect on the milk fat percentage of the cows. Highest milk fat percentage was observed in Wannera strain ($4.653 \pm 0.0414\%$) while lowest in Shevera strain ($4.480 \pm 0.0342\%$), differences being significant ($p < 0.05$). Lower values of milk fat 4.08 ± 0.60 , 3.90 ± 0.29 and 4.04 ± 0.26 percent were reported by Kuralkar *et al.* (2014) [16] for Balankya, Shevera and Wannera strains, respectively.

Milk Solids Not Fat (SNF): The overall mean for SNF percentage of Deoni cattle was found to be 8.240 ± 0.0117 percent. It was lower than the findings of Kuralkar *et al.* (2014) [16] ($8.43 \pm 0.05\%$), Patil (2014) [19] ($9.02 \pm 0.06\%$) and Sontakke *et al.* (1978) ($9.76 \pm 0.03\%$). The value obtained was in comparable with Ambika (2019) [1] ($8.181 \pm 0.0117\%$) in Deoni cattle. SNF percentage was highest in Wannera strain ($8.302 \pm 0.0198\%$) and lowest in Shevera strain ($8.208 \pm 0.0164\%$), differences being significant ($p < 0.05$). Similar findings of 8.45 ± 0.19 , 8.38 ± 0.09 and 8.28 ± 0.08 percent were reported by Kuralkar *et al.* (2014) [16] for Balankya, Shevera and Wannera strains, respectively.

Table 1: Production performance of different Deoni cattle strains

Parameter	Balankya (n=36)	Shevera (n=88)	Wannera (n=60)	Overall (n=184)
Lactation milk yield (kg)	1340.77 ± 82.922	1196.19 ± 53.037	1192.78 ± 64.231	1223.37 ± 36.728
Peak yield (kg)	6.55 ± 0.308	6.09 ± 0.197	5.68 ± 0.238	6.05 ± 0.138
Lactation length (days)	290.72 ± 10.316	295.32 ± 6.598	293.16 ± 7.990	293.72 ± 4.540
Milk fat (%)	$4.523^{ab} \pm 0.0535$	$4.480^a \pm 0.0342$	$4.653^b \pm 0.0414$	4.545 ± 0.0242
Milk Solids Not Fat (%)	$8.211^a \pm 0.0256$	$8.208^a \pm 0.0164$	$8.302^b \pm 0.0198$	8.24 ± 0.0117

Note: Means within a row having different superscripts differ significantly ($p < 0.05$)

Conclusion

Though differences were non-significant, Balankya strain of Deoni cattle had higher lactation milk yield and peak yield, and Shevera strain had longer lactation length. The Wannera

strain had significantly more milk fat and SNF. The extreme variation in the LMY, PY and LL can be due to various factors. In most recent reports, performance at institutional farms is inferior to that of performance of farmers' herds. This could be due to the constraints in institutional farms like availability of adequate labour and fodder. In comparison, as most Deoni cattle farmers have small herds of 1-2 cattle, they can provide adequate care in terms of management and nutrition. The high lactation milk yield figures in the present study indicate significant potential for improvement of the breed.

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