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Phenotypic characteristics, production and reproduction performance of Deoni cattle in its native tract

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The Deoni, an important dual purpose indigenous breed found in south-eastern part of Maharashtra covering Latur district, northern part of Karnataka i.e. Bidar district, is also distributed in small numbers in the neighbouring districts of Gulbarga in Karnataka; Parbhani, Nanded and Osmanabad in Marathwada region of Maharashtra; and some part of Medak district in Andhra Pradesh. The name of the breed is derived from Deoni taluka of the Latur district. Deoni cattle are hardy and well adapted to their breeding tract constituting an important cattle genetic resource of Maharashtra. In the present study, an attempt was made to envisage physical characteristics, production and reproduction performance in its home tract.

The survey was conducted from December 2009 to November 2011 for phenotypic characterization of Deoni cattle. After discussion with Deoni Breeder's Association, Udgir, district-Latur, data on morphological, morphmetric, production and reproduction performance characteristics were recorded on structured proforma from 166 flocks of 48 villages belonging to 5 taluka (Deoni, Udgir, Chakur, Nilanga and Shrur Anantpal) of Latur District were identified. Stratified 2-stage sampling design was adopted, different villages within taluka were identified which constituted different strata. Animals (551) from all the age groups of both sexes were randomly chosen for morpho-metric measurement, viz. chest girth, body length, height at wither, face length, ear length and horn length. Data of 329 Deoni cattle above 3 years of age of both sexes were recorded for studying various morphological characteristics like colour of coat, skin, muzzle, eyelid, horn, hoof and tail switch, orientation of ear and horn, size of hump, dewlap, naval flap and udder etc. Data on production traits, viz. milk yield, lactation length, fat %, SNF %, and reproduction traits, viz. age at first maturity, age at first calving, service period and calving interval were also recorded. The milk fat percentage was estimated by Gerber's method (Ramasamy *et al.* 1999) and SNF percentage was estimated using Babcock's formula.

Morphological characteristics of Deoni cattle: Deoni cattle have 3 strains on the basis of coat colour variations, viz. *Wannera* (clear white with black colour at the sides of the face), *Shevera* (white body with irregular black spots) and *Balankya* (clear white with black spots on the lower side of the body). This colour variation was observed in both the sexes. The typical morphological characteristics of Deoni cattle are indicative of the distinguished appearance as compared to other cattle breeds of Maharashtra state. Deoni is a medium size animal which resembles the Gir in physical structures to a large extent. The typical morphological characteristics of Deoni animals showed these animals have distinct appearance from other reported breeds of Maharashtra, viz. Dangi (Gokhale 2005), Gaolao (Patil *et al.* 2005), Red Khandari (Pundhir and Singh 2008), and Khillari (Gokhale *et al.* 2009).

The Deoni breed has masculine, broad and slightly convex head with prominent poll (65.96 %) (Table 1). The colour of head is black and white in Wannera and Shevera and completely white in the Balankya strain. The forehead is prominent, broad, slightly bulged, invariably dished and white in all strains. Ears are alert and pendulous unlike Gir breed whereas, the eyes prominent, bright and alert with black eyebrows. The colour of eyelid, muzzle, horn and hoof is black while colour of tail switch is black (36.47%), black and white (32.52%) and white (31.01%), respectively. Horn are present in both sexes of Deoni cattle and shape of horn are either straight (33.74%) or curved (66.26%), medium size, thick emerging from outer angle of polls, going in a markedly inward and upward as well as lateral direction and the tips of horn are blunt in all animals. The hump is massive

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Table 1. Physical characteristics of Deoni breed of cattle

Characteristics	n	%	Characteristics	n	%
1. Strain	329		11. Dewlap	329	
Wannera	154	46.81	Large	75	22.80
Shevera	157	47.72	Medium	211	64.13
Balankya	18	5.12	Small	43	13.07
2. Muzzle	329		12. Navel flap	329	
Black	329	100	Large	39	11.85
3. Eyelids	329		Medium	137	41.64
Black	329	100	Small	153	46.51
4. Poll	329		13. Hoof	329	
Prominent	217	65.96	Black	329	100
Not prominent	112	34.04	14. Hair sheen	329	
5. Horn	329		Glossy	298	90.58
Present	329	100	Dull	31	9.42
6. Horn colour	329		15. Tail switch	329	
Black	329	100	Black	120	36.47
7. Horn shape	329		Black and White	107	32.52
Straight	111	33.74	White	102	31.01
Curved	218	66.26	16. Tail	329	
8. Horn orientation	329		Above hock	4	1.22
Lateral pointing tip	80	24.32	At hock	5	1.52
Inward pointing tip	152	46.20	Below hock	315	95.74
Upward pointing tip	87	26.44	Touching to ground	5	1.52
Other	10	3.04	17. Penis sheath	122	
9. Ear orientation	329		Large	42	34.42
Pendulous	329	100	Medium	70	57.38
10. Hump	329		Small	8	6.56
Large	122	37.08	Absent	2	1.64
Medium	164	49.85			
Small	43	13.07			

Fig 1. Deoni cow and bull.

and well developed in male and small in female. The majority of Deoni cattle have thick, pendulous and muscular with folds dewlap (64.13%), naval flap is medium to large. The 95.74% Deoni cattle are having tail switch below hock with white or black or mix switch. Similar findings were also reported by Singh *et al.* (2002). The body is massive and upstanding with considerable depth and gives an appearance of strength. The chest is deep and wide, well arched ribs, straight back, strong quarter. Neck is short, thick and strong, while legs were long, straight and strong. The skin of these animals is thick and semi tightly attached to the body. The udder is well attached and medium size with squarely placed black teats. The udder is either bowl shaped (90%) or round shaped (9.63%). Fore udder and rear udder were of medium sized. The teats are cylindrical (100%) with round (95.19%) or pointed (4.81%) tips respectively. The cow and bull of the Deoni breed are presented in Figs 1 and 2, respectively.

Morphometric characteristic: The average age of measurement for calves below 1 year age was 7.39±0.43 months of males and 7.37±0.59 months for females. The average age of measurement for young stocks (1 to 3 years age group) were 23.11±0.62 months in males and 24.58±0.66 months in females. The estimates obtained in the present study (Table 2) were higher than those reported in other indigenous breeds like Khillar (Gokhale *et al.* 2009), Dangi (Gokhale 2005) and Red Kandhari (Pundir and Singh 2008) in both age groups.

In adult animals bullocks have higher body measurements than the cattles. The average chest girth, body length, height at wither, horn length, ear length and face length (Table 2). The measurements increased with increase in age and male had more measurement than female in all age groups. Singh *et al.* (2002) reported higher estimate of height at wither and similar estimates for chest girth and body length in Deoni bullock, while lower estimate for chest girth and similar

Table 2. Morphometric parameters of different ages and sexes in Deoni cattle (cm)

Age	Sex	n	Chest girth	Body length	Height at wither	Horn length	Ear length	Face length
Calves (<1 year)	Male	55	122.38±2.30	100.07±1.91	105.24±1.52	6.50±0.53	21.15±0.57	35.85±0.77
	Female	46	116.66±2.61	96.14±2.09	101.16±1.63	6.78±0.18	21.24±0.68	36.89±0.96
Animals 1-3 years	Male	55	155.95±2.30	120.40±1.79	122.10±0.98	9.31±0.52	24.56±0.43	46.76±0.66
	Female	66	143.42±1.62	111.58±1.20	114.79±0.85	8.21±0.52	23.98±0.44	42.53±0.50
Adults animals	Bullocks	122	165.99±1.47	128.04±0.90	129.52±0.85	15.14±0.63	25.61±0.26	49.67±0.36
	Cow	207	159.31±0.86	121.78±0.61	123.08±0.55	16.94±0.52	25.93±0.19	48.11±0.29

Table 3. Production and reproduction characteristics in Deoni cattle

Traits	Number of observations	Mean±SE
Milk yield (kg)	204	910.95±27.62
Lactation length (days)	204	246.12±1.77
Fat %	86	4.20±0.15
SNF %	86	8.43±0.05
Age at first mating (months)	162	35.45±0.30
Age at first calving (months)	160	44.50±0.30
Service period (days)	97	116.04±3.21
Calving interval (days)	85	395.87±3.38

estimates of body length and height at wither in Deoni cattles as compare to present study. Horn length is larger in female as compared to male, this may be due to the practice of sharpening and trimming the horns for beautifying breeding bulls and bullocks especially for cattle festival, which is significant in breeding tract. The ear length in adult animals was similar in both sexes and face length was more in adult male than female.

Production performance: The lactation milk yield and lactation length are given in Table 3. Singh *et al.* (2002) and ICAR Network Project on Deoni cattle (1999) reported lactation milk yield as 864.24±49.56 kg and 868.24±49.56 kg, respectively. However, Thombre *et al.* (2001), Kumar *et al.* (2006) and Das *et al.* (2011) reported lower means for milk yield in Deoni cattle. The lower estimate of lactation length was reported by Kumar *et al*. (2006) and Das *et al.* (2011) than that of present study.

The average fat content in milk of Deoni cattles was 4.20±0.15 % and SNF was 8.43±0.05 % (Table 3). Report of ICAR Network Project on Deoni cattle (1999) and Singh *et al.* (2002) reported higher fat % values in Deoni cattle.

Reproduction performance: The mean for age at first mating was 35.45±0.30 months (Table 3). Higher estimate for age at first conception (36.6 ± 0.54 months) was reported by Singh *et al*. (2002) in Deoni cattle. The mean for age at first calving (AFC) was 44.50±0.30 months. Higher mean value for AFC was recorded by Singh *et al*. (2002) as 45.7±0.52 months, While Das *et al.* (2011) reported lower estimate for AFC as 38.73±0.73 months. The mean value for service period was 116.04±3.21 days. The estimate of service period were lower than the reports of Thombre *et al*. (2001) as 162.32±5.56 days and Singh *et al.* (2002) as 170.0±7.0 days. The overall mean for calving interval was noted as 395.87±3.38 days. Higher mean of calving interval were reported by Das *et al.* (2011) as 447.22±6.64 days. The reduction in service period and calving interval in present study may be due to the awareness amongst Deoni owners for timely heat detection and subsequent service to the cattles.

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

SUMMARY

An attempt was made to envisage physical characteristics, production and reproduction performance of Deoni, a medium size dual purpose indigenous breed of cattle in Maharashtra in its home tract. Chest girth, body length, height at wither, long horn, ear length and face length were measured. The mean values for age at first mating, age at first calving, service period and calving interval were 35.45±0.30 months, 44.50±0.30 months, 116.04±3.21 days and 395.87±3.38 days, respectively.

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