

Research paper**Reproduction, production and draftability performance of Kathani cattle under rural management conditions**RL Bhagat^{1*}, PK Singh², MS Tantia², Marimuthu Swaminathan¹ and NL Phadke¹¹BAIF Development Research Foundation, Central Research Station, Urulikanchan, Pune 412 202 (Maharashtra) India²National Bureau of Animal Genetic Resources, Karnal-132 001, (Haryana) India**ABSTRACT**

Data on 6649 Kathani animals from 118 randomly selected villages from Chandrapur, Gadchiroli and Gondia districts of Vidarbha region in Eastern Maharashtra state were used for present study. Information on reproduction and production traits as well as draft-ability of bullocks was collected from the farmers through breed characterization project. For assessing milk production potential of cows, milk was recorded once in a month. Average age at first mating, age at first calving and average calving interval was 42.84±0.05 months, 54.86±0.05 months and 486.85±0.51 days, respectively. Average number of services per conception was 1.48±0.01. Milk production was 0.55±0.01 kg per day with average fat percentage as 4.4 for an average lactation length 237.76±1.82 days. For ploughing of one-acre of land, an average time 8.62±0.05 hours were required and traveled a distance up to 9.32±0.03 km in a day with average 610.64±5.18 kg load.

Keywords: Reproduction, production, draft-ability, Kathani cattle***Corresponding author:** ramchandra.bhagat@baif.org.in**INTRODUCTION**

The State of Maharashtra known from ancient times for its rich livestock genetic resources with six registered cattle breeds (Khillar, Dangi, Deoni, Red Kandhari, Gaolao, Konkan Kapila), two breeds of buffalo (Pandharpuri, Nagpuri), three breeds of goat (Sangamneri, Konkan Kanyal, Berari) and a Deccani breed of Sheep. Kathani cattle is prominent indigenous cattle population in the Vidarbha region and not yet registered as breed. Although, milk production of these cattle is low, their hardy nature, draught capacity, heat tolerance, disease resistance, adaptability to harsh climatic conditions and ability to survive and perform under scarce feed and fodder conditions is admirable and known widely. These animals survives on low nutrition feed and fodder resources available in forests and leftovers of rice and soybean after harvest, which are major crops of the region. In this study, the performance status (production, reproduction and draft-ability) of these cattle in breeding tract under rural management conditions was carried out through data generated under network project on survey, evaluation and characterization.

MATERIALS AND METHODS

Data on total 6649 Kathani animals (For reproduction parameters 2182, production parameters 1289 & draft-ability 2898) were collected from 118 randomly selected villages in Chandrapur, Gadchiroli and Gondia districts of Vidarbha region in Eastern Maharashtra state. The geographical data indicated thriftiness of these animals in varied range of temperature and rainfall ranging from 45°C

and 1308 mm (Gondia district) to 5°C and 1428 mm (Gadchiroli district). Having deep and thick forests in these districts (locally known as Zadipatti districts, an area of forests & trees), 72% area being under Southern Tropical Dry Deciduous Forests, including tree varieties like Sag / Teak (*Tectonagrandis*), Tinsa (*Ougeiniadalbergioides*), Shisham (*Dalbergiasisoo*), Mahua (*Madhuca indica*) and bamboo (*Bambusa vulgaris*). The soil derived from Deccan Trap is Regur or black cotton containing high alumina and carbonate of calcium and magnesium with variable amount of potash, low nitrogen and phosphorus. The cereal crops like rice, sorghum, wheat, maize and kodo (millets) are cultivated and used as staple food; cash crops like cotton and soya beans are also cultivated in region. These animals usually grazed for feeding extensively. The average grazing distance was observed as 7.31±0.04 km with average grazing time of 8.28±0.02 hours in a day. The concentrate offered to animals used Kukus (crushed homemade rice bran) and was fed during growing period of calves, milking and pregnancy period of cows. A common practice of storing leftover meal in a separate vessel locally called 'Dongi' mixed with some quantity of kukus was fed to animals in next day morning especially to working bullocks and milking cows.

The information on female reproduction parameters on age at first mating, age at first calving, number of services per conception, calving interval and life time number of lactations, male reproduction parameters like age at first mounting, age at first mating, production aspects like

Table 1: District-wise mean performance of Kathani animals

SN	Parameters	District			Overall
		Chandrapur	Gadchiroli	Gondia	
Reproduction					
<i>Females</i>					
		N= 646	N= 750	N= 786	N= 2182
1	Age at first mating (Months)	41.67±0.11	41.69±0.08	44.90±0.03	42.84±0.05
2	Age at first calving (Months)	53.73±0.09	53.69±0.08	56.90±0.02	54.86±0.05
3	Service period (days)	204.66±2.03	183.85±1.63	205.00±1.05	203.02±1.08
4	Services per conception	1.52±0.02	1.10±0.01	1.61±0.02	1.48±0.01
5	Calving Interval (days)	473.77±1.59	491.59±0.24	491.96±0.09	486.85±0.51
6	Life time lactations	8.11±0.01	8.43±0.03	8.04±0.01	8.10±0.01
<i>Males</i>					
		N=119	N=95	N=66	N=280
1	Age at first mounting (Mths)	35.96±0.53	36.92±0.21	31.50±0.76	35.84±0.31
2	Age at first mating (Mths)	38.98±0.42	41.79±0.18	36.83±0.47	39.43±0.24
Production parameters					
		N=495	N=460	N=334	N=1289
1	Actually milked by farmers	419	252	174	845
2	Cows not milked	76	208	160	444
3	Average milk per day (Lit.)	1.67±0.07	0.65±0.03	1.25±0.08	0.96±0.03
4	Average lactation length (days)	141.51±2.44	139.02±3.26	165.38±4.27	145.76±1.82
5	Total lactation yield (Lit.)	141.89±5.66	86.81±4.65	196.18±10.86	136.64±4.04
6	Av. dry period (days)	251.15±3.45 (105)	246.27±4.26 (74)	238.35±4.18 (82)	245.75±2.28 (261)
Draftability					
		N=1156	N=1046	N=696	N=2898
1	Time required for ploughing one acre land (hrs)	9.13±0.10	8.13±0.01	8.47±0.11	8.62±0.05
2	Average weight carted (Kg)	738.00±5.34	480.85±9.36	608.70±10.64	610.64±5.18
3	Distance traveled with weight (Km)	9.44±0.04	9.72±0.04	9.19±0.08	9.32±0.03
4	Average working hours / day	7.60±0.01	7.63±0.02	7.52±0.02	7.55±0.01

Figures in parenthesis indicate number of observations

average milk per day, lactation milk yield, lactation length, dry period and draft-ability was collected from farmers through survey. For assessing milk, production potential recording was done once in a month and lactation milk yield was arrived by test day interval method. The data was analyzed using statistical methods suggested by Snedecor and Cochran (1967).

RESULTS AND DISCUSSION

Age at first mating: District-wise mean performance of Kathani animals on production, reproduction and draft-ability traits is given in Table. Average age at first mating in Kathani animals was recorded as 42.84±0.05 months. Satishkumar (1988), Bhosale (2001) and Gokhale et al. (2008) reported lower age at first mating as 37.80±21.84, 37.24±54.78 and 40.92±0.13 months, respectively in Khillar animals. Within districts, less variation was noted and it was highest in Gondia district (44.90±0.03 months), while in Chandrapur and Gadchiroli district it was at par (41.67±0.11 & 41.69±0.08 months, resp.). The lower age at first mating in Gadchiroli and

Chandrapur district might be due to animals having more grazing period resulting males and females together for maximum time, which ultimately leads in natural service. The age at first mating in Deoni cattle, the other breed in Maharashtra state was reported as 36.6±0.52 months by Singh et al., (2006).

Age at first calving: Overall age at first calving averaged 54.86±0.05 months, which was higher to that of Deoni (45.7±0.52 months), Amrithmahal (50.65±0.63 months), Khillar (49.39±0.13, 46.86 months), and indigenous cattle from Chhattisgarh (43.65 months) reported by Singh *et.al.*(2006), Govindaiah *et.al.*(2005), Gokhale et al. (2008) Bhosale (2001), Pundir and Ahlawat (2006) and Prem Chand et al. (2018), respectively. District wise it ranged from 53.69±0.08 months in Gadchiroli to 56.90±0.02 months in Gondia district.

Services per conception: Although, natural service was commonly used for breeding Kathani animals (94.83%) artificial insemination (A.I.) was also adopted by 5.17



per cent cattle owners to breed their animals. On an average 1.48 ± 0.01 services were required to settle the Kathani cows. Bhosale (2001) and Gokhale et al. (2008) reported average 1.50 and 1.43 services per conception for Khillar cows, respectively which was by and large similar to that observed in the present study.

Calving interval: Farmer always prefers an animal having shorter calving interval for better economic gain. In present study, the calving interval averaged 486.85 ± 0.51 days. The district wise variation was from 473.77 ± 1.59 days in Chandrapur to 491.96 ± 0.09 days in Gondia district animals. Lower inter-calving period of 450 days in Khillar cows has been reported by Pundir and Ahlawat (2006) and 462.08 days by Pundir and Sahai (1997), for indigenous cows 15.05 months by Prem Chand et al. (2018), for Deoni cattle it was 447.00 ± 8.0 days (Singh, et al., 2006) and for Amrithmahal cattle 429.9 ± 6.84 days (Govindaiah et al. 2005). The higher calving interval of Kathani animals might be due to suckling period of calves especially males, natural service undertaken on large scale during grazing hours and management of animals so that they would not calve in fodder scarcity period.

Lifetime lactations: The overall average number of calving in Kathani cattle was obtained as 8.10 ± 0.01 with a variation from 8.04 ± 0.01 (Gondia district) to 8.43 ± 0.03 (Gadchiroli district) calving among the districts under study. The average lifetime lactations in Khillar cattle was comparatively less (6.72 ± 0.05) as reported by Gokhale et al. (2008). This variation within districts might be due to feed and management practices in the districts adopted by individual farmer.

Age at first mounting: Average age at first mounting or first ejaculate of the breeding Kathani bull was noted as 35.84 ± 0.31 months. The reports of Gokhale et al. (2008) for Khillar bull was noticed to be much less (24.29 ± 0.12 months) compared with present findings. The lower age of

mounting in Khillar breed bulls might be due to common practice of rearing the bull calves by professional breeder on commercial basis.

Age at first mating: Average age at first mating was observed to be 39.43 ± 0.24 months which was ranged from 36.83 ± 0.47 to 41.79 ± 0.18 months. For Khillar bulls it was recorded as 28.51 ± 0.21 months by Gokhale et al. (2008).

Production performance: Total 1289 cows were enrolled under milk recording. Out of that, 845 cows were actually milked while 444 cows were not milked. Average milk production was observed as 0.55 ± 0.01 kg per day ranging from 0.54 ± 0.00 in Chandrapur to 0.58 ± 0.01 in Gondia district cows excluding milk suckled by calf. Gokhale et al. (2008), Pundir and Ahlawat (2006), Pundir and Sahai (1997) for Khillar cattle, Govindaiah et al. (2005) in Amrithmahal cattle and Prem Chand et al. (2018) in Kosali cattle from Chhattisgarh state indicated higher milk production potential than observed in present findings. Mooventhan et al. (2016) recorded average milk production of local animals as 1.24 kg per day in same state. The average lactation length was noted as 237.76 ± 1.82 days with lactation milk production of 193.07 ± 5.28 kg. The lactation length for Motu cattle (neighboring area breed) noticed to be shorter (5 to 6 months) as reported by Anonymous (2016). However, the findings of Prem Chand et al. (2018) from Chhattisgarh tribal indigenous cattle for lactation length was comparable (7.72 months) to mean lactation length noted in present investigation. The average dry period was noticed as 245.75 ± 2.28 days for 261 cows and ranged from 238.35 ± 4.18 to 251.15 ± 3.45 days.

Draft-ability: 2898 Kathani males were studied for draft-ability purpose. Amongst them, it was noted that 284 males were used for breeding and work both. On an average males were engaged for work 7.55 ± 0.01 hours per day. This work duration was comparable to that of Deoni

(7 to 8 hrs) and Khillar bullocks (7.18 ± 0.02 hrs) as reported by Singh et al. (2006) and Gokhale et al. (2008), respectively. For ploughing of one-acre of land, on an average 8.62 ± 0.05 hours were required, which comparatively was lesser as compared with Khillar bullocks work hours (9.72 ± 0.03) as reported by Gokhale et al. (2008). Kathani bullocks traveled 9.32 ± 0.03 km in a day with a load of 610.64 ± 5.18 kg in a cart. The load carted as well as distance travelled was noticed to be half to that of Khillar bullocks (Gokhale et al. 2008). The differences could be attributed to factors like body weight and height of animals, pace of walking, mechanics of working, method of hitching the implements, type of harness, type of terrain, condition of soil and climate, nature of work, implement efficiency, road conditions etc.

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