



Physical features and performance of unexplored Sanchori cattle population of Rajasthan state

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The cattle population of Rajasthan state (12.12 million), which is about 6.1% of total cattle population of the country (199.08 million), may further be categorized as 43.62% purebreds, 1.01% graded indigenous, 48.64% non-descript indigenous and 6.73% exotic/crossbreds. As per the milk production statistics, Rajasthan is contributing 10.53% (13.95 million tonnes) of the national milk production in 2013 (132.43 million tonne). Average per day per capita milk availability of Rajasthan state during the year 2012 was 539 g, which was about double to the national average of 290 g and ranked at number three after Punjab and Haryana amongst all the states of India (BAHS 2013). The milk produced in Rajasthan is shared by exotic/crossbred cattle, indigenous cattle, buffalo and goats, which are contributing 6.5, 29.3, 51.9 and 12.3%, respectively, to the total milk production of Rajasthan during 2012–13. Indigenous breeds with good milk productivity viz. Sahiwal, Gir, Rathi, Tharparkar and Kankrej are reared in this state besides, the dual purpose breeds like Hariana, Mewati and Malvi and the good quality draught breed i.e. Nagori. More than four-fifth of the milk produced by cattle (about 81.7%) in Rajasthan state is contributed by indigenous cattle breeds and non-descript cows. As per Livestock census 2007, the proportion of non-descript cattle in Rajasthan (48.64%) is well below the national proportion of 69.7%. There are some cattle populations of this state that deserve the status of a breed but have so far been kept under the non-descript category due to lack of any systematic attempt for their survey and characterization. One such population locally known as Sanchori cattle, which was included in the global breed list of livestock (FAO 2007), was explored in its breeding tract so as to characterize it phenotypically by making systematic surveys in its native tract.

The survey was undertaken in 12 villages of three tehsils, viz. Sanchore, Bhinmal and Raniwada of Jalore district of Rajasthan state. During the survey 45 farmers were interviewed to collect information about management and performance of Sanchori cattle by using a predesigned

questionnaire developed for the purpose. Cows (151) and bulls (19) were studied for the physical traits of Sanchori cattle. The morphometric measurements were recorded on 314 animals belonging to different age groups and sexes. Production and reproduction performance traits were obtained by interviewing their owners. Test day random milk recording of 276 cows belonging to different months and order of lactation was carried out in Sanchore and Bhinmal tehsils.

Origin, geographical distribution and native environment of the breed: Sanchori cattle are mainly distributed in Jalore district of Rajasthan state. Jalore district is surrounded by Barmer on the North-West, Sirohi on the South-East, Pali on the North-East and Banaskantha district of Gujarat on the South-Western part of Rajasthan. Therefore, the breeding tract of Sanchori cattle lies between the breeding tracts of Tharparkar and Kankrej breeds of cattle. This population of cattle derives its name from the area of its distribution i.e. Sanchore and adjoining tehsils of Jalore district. The Sanchori cows are having good milk production potential in the hot agro-climate of the area. Since the Sanchori cattle are mainly distributed in three tehsils of Jalore, the population size is a few thousands only. In that area non-descript cattle and Kankrej breed of cattle are also found.

General management practices in rearing of Sanchori cattle: The animals are kept in closed houses made in the 'dhani' separately but adjoining to the farmer's houses during nights only. The roof of the houses was generally thatched but sometimes tin shaded and floor of the houses was *kachcha* type. The walls of the houses were either half or full and made up of thatch or brick. It was also observed that some farmers make a circular thatched fencing instead of walls. Outside the animal houses the shade of tree was invariably available. During day time animals were either left for grazing in nearby agricultural fields or tied in open under tree. Though the drainage system was not constructed in animal houses but sanitation was by and large good. Sanchori breeding bulls of unknown genetic merit were available in village and breeding of cows was through natural mating in about 80% cases (Fig. 1). Few farmers opted the breeding of their cows by Kankrej bulls either

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through natural mating or AI. In the Gaushala and hospitals Kankrej bull semen was available. Animal keepers were aware of signs of oestrus and AI was generally performed 8–12 hours after onset of oestrus. Only one natural mating or 1–3 AIs were required for conception in most of the cases.

The Sanchori animals were sent for grazing for a period of 6–8 h in nearby agricultural fields, if there is no crop. These animals were maintained on stall feeding over and above grazing. During stall feeding, an adult lactating cow was fed with an average of 10.56 kg (5–25 kg) of dry fodder, 4.13 kg (2–12 kg) of green fodder and 4.18 kg (2–6 kg) of concentrate in a day depending on purchasing power of their owner and milk yield. Feeding of milk directly from teats, colostrum feeding is practiced, removal of placenta is natural, de-worming of calves is generally not practiced.

The milk was partially used for family, selling or ghee making. Since the milk market to cooperative dairies are based on fat content of milk, it was noted that the farmers are shifting to buffalo keeping instead of cattle. Livestock keepers were interested for all kind of prophylactic measures suggested by the veterinarians. Prevalence of diseases was reported to be less as compared to exotic or crossbred cattle.

Physical characteristics: The Sanchori animals were strong and active with compact body and deep belly. The predominant coat colour in cows was white (74.17%) but grey (23.17%), red (1.33%) and black (1.33%) were also observed. The predominant coat colours of bull were grey (68.42%) but white (15.79%), black (10.53%) and red

(5.26%) were also noted. The predominant colour of muzzle was found as black both in cows and bulls (96.03% and 89.4%, respectively). The colour of tail switch was also black in majority of cases (93.5%). The horn colour was black in majority of cows but creamy in bulls. The shape of horn was found to be curved in most of the animals. Two types of horn orientations were observed in cows i.e. outward upward inward ending with pointing tips in 73.5% cases and outward upward ending with pointed in 26.5% cases. The orientation of ear of Sanchori cattle was slightly drooping in 75% and horizontal in rest of the cases. The hump of the bull was large (63.16%) but also medium in some cases (36.84%). The hump of cows was medium size in majority of cases (79.47%) but large sized hump (17.88%) and small sized hump (2.65%) were also observed. The size of dewlap was mostly large (86.5%) but sometimes medium (13.5%). Naval flap of Sanchori cows was found to be of medium size (59.6%) but large and small naval flap were also seen in 34.4% and 6% cases. The size of penis sheath was large (68.42%) or medium (31.58%). Udder shape of Sanchori cows was either pendulous (88.64%) or round (11.36%). The shape of the teat was either cylindrical (90.91%) or funnel (9.09%) ending with round (77.27%) or pointed tips (22.73%). The milk veins were mostly prominent indicating good milk production potential in Sanchori cows (Fig. 2).

Morpho-metric measurements: The height at withers, body length, chest girth, paunch girth, horn length, horn

Table 1. Morpho-metric traits of Sanchori cattle

Trait	Cows (N=153)	Bulls/ Bullock (N=14)	Calves (N=107)	Males (1–3 Y)(N=11)	Females (1–3 Y)(N=29)
Body length	129.3±0.65 (6.25%)	137.86±0.68 (6.95%)	82±0.10 (13.67%)	104.82±0.43 (4.55%)	113.72±0.34 (8.77%)
Height at withers	122.95±0.34 (3.37%)	138.57±0.35 (3.51%)	88.13±0.09 (11.47%)	108.18±0.39 (3.98%)	114.90±0.27 (6.94%)
Chest girth	167.03±0.75 (5.56%)	188.7±1.02 (6.49%)	97.91±0.14 (14.76%)	128±0.69 (5.92%)	144.96±0.54 (10.39%)
Paunch girth	183.5±0.97 (6.53%)	199±1.43 (8.61%)	100.07±0.15 (16.42%)	131.18±0.96 (8.05%)	150.93±0.60 (11.05%)
Face length	44.07±0.20 (5.53%)	46.85±0.18 (5.07%)	27.73±0.06 (24.60%)	35.09±0.37 (11.50%)	39.45±0.12 (9.05%)
Ear length	31.66±0.17 (6.74%)	32.5±0.1 (4.31%)	24.28±0.03 (13.44%)	28.27±0.24 (9.37%)	30.10±0.09 (8.89%)
Horn length	32.01±0.60 (22.87%)	42.21±0.73 (24.36%)	—	8.40±0.41 (48.99%)	13.96±0.25 (48.63%)
Horn circumference	22.87±0.28 (14.71%)	21.38±0.20 (11.85%)	—	14±0 (0%)	19.73±0.23 (17.60%)
Tail length	117.94±0.70 (7.27%)	129±0.68 (5.30%)	65.72±0.12 (19.50%)	96.27±0.49 (5.63%)	105.96±0.45 (10.97%)
Tail length without switch	87.95±0.58 (8.14%)	94.6±0.68 (7.14%)	55.66±0.08 (15.96%)	75.45±0.63 (9.15%)	79.93±0.36 (12.53%)

Figures in parentheses indicate coefficient of variation.



Figs 1–2. 1. Sanchori bull; 2. Sanchori cow

circumference, ear length, face length, face width and tail length with and without switch were measured in 314 animal of five age/sex groups. The means along with their standard errors of nine body measurements for all the five groups are presented in Table 1. Pundir *et al.* (2011) estimated the above biometrical parameters of 407 Kankrej cows in Palanpur district of Gujarat and reported lower estimates of body length and chest girth but slightly higher height at withers than that of Sanchori cows obtained in the present study. Higher body length, height at withers and chest girth were reported by Nivsarkar *et al.* (2000) in Tharparkar cattle. The breeding tract of Sanchori cattle is in between the breeding tracts of Kankrej and Tharparkar cattle and the body conformation, as indicated by the biometric traits, of Sanchori lies in between Kankrej and Tharparkar breeds of cattle. The horn length and horn circumference estimated in the present study were higher than Tharparkar cattle (Nivsarkar *et al.* 2000) but lesser than Kankrej cattle (Pundir *et al.* 2011). The face length of Sanchori cows (44.07 cm) were comparable to the Kankrej cows (44.09 cm) reported by Pundir *et al.* (2011). The tail length of Sanchori cows as obtained in the present study was comparable to that of Kankrej cows (Pundir *et al.* 2011). The biometrical parameters of Sanchori cattle recorded in this study clearly indicated that this population is different from Kankrej and Tharparkar breeds of cattle found in adjoining areas of Gujarat and Rajasthan and deserves a status of a separate breed of cattle of Indian origin.

Performance: Age at first calving, lactation length, calving interval, dry period and service period were found in the range of 36–48 months (average 39.5 months), 8–15 months (average 10.16 months), 12–20 months (average 14.4 months), 0.5–10 months (average 4.3 months) and 2–11 months (average 5.44 months), respectively. The age at first calving and calving interval of Sanchori cattle obtained in this study are comparable to that of Tharparkar cattle reported by Taneja (1999). The life span of Sanchori cattle was found as 20–25 years with 12 to 15 lifetime calvings. Test day random milk recording of 276 lactating Sanchori cows in different months and order of lactation was carried out in its breeding tract. The average per day milk yield of the Sanchori cows varied from 3.05 to 16.3 litre with an average of 9.08 litre. Average milk yield in different months and order of lactation have been depicted in Table 2. The milk production of Sanchori cattle is comparable to Tharparkar cattle kept under field condition in the Jaisalmer

Table 2. Month-wise and lactation order-wise daily milk yield of Sanchori cattle

Month/ Order of lactation	Number of observations	Mean±SE (Litres)	Range (Litres)	CV (%)
1	21	9.76±0.57	6.15–14.5	26.74
2	31	10.71±0.39	6.6–16.3	20.02
3	33	10.64±0.30	7.05–15.55	15.99
4	38	9.78±0.33	5.3–12.5	21.02
5	46	9.76±0.32	3.8–13.15	22.34
6	35	8.58±0.40	4.3–14.15	27.66
7	41	7.40±0.28	3.95–11.35	24.27
8	17	6.42±0.69	3.05–14.0	44.57
9	12	6.05±0.50	3.65–8.8	28.93
10	2	5.0±0.40	4.6–5.4	11.31
Lactation-I	46	8.26±0.36	3.05–12.2	29.4
Lactation-II	61	8.52±0.29	4.0–13.8	26.42
Lactation-III	83	8.91±0.27	3.7–14.5	27.88
Lactation-IV	35	9.99±0.38	4.75–14.15	22.60
Lactation-V	35	10.24±0.51	3.95–16.3	29.65
Lactation-VI onwards	16	9.80±0.72	4.05–13.15	29.57
Overall	276	9.08±0.16	3.05–16.3	28.39

district of Rajasthan i.e. 6–12 kg/day (Anonymous 2009) and higher than the wet average of Tharparkar cattle at NDRI, Karnal (5.9 kg) during 2013–14 (Anonymous 2014). The cows in the herd showed good reproductive health and repeat breeding was maximum to the extent of 3%. With the natural mating majority of cows conceived by only one service. However, through AI conception could be achieved by 2–3 inseminations.

The Sanchori animals are well adapted to hot climate in the areas of its breeding tract and perform better than other cattle breeds in that area. The Sanchori animals are contributing significantly in the livelihood of farmers in terms of good milk production and bullocks. The Sanchori animals are more resistant to communicable and parasitic diseases as compared to crossbreds in that area under hot and humid climate. The bullocks of this breed are active and well suited to agricultural operations and transport but due to mechanization of agriculture, the farmers generally sell the bull calves at the age of 1 to 2 years to the persons/businessmen coming from Madhya Pradesh and Gujarat states.

Recommendations: Sanchori cattle population should be included in the recognized list of cattle breeds. Keeping in view the declining population size and good milk production potential, there is a need to take up sustainable measures for the improvement and conservation of this population. A nucleus herd may be established for production of bull calves and studies on the qualities of the Sanchori cattle especially the disease resistance and tolerance to hot and humid climatic conditions may be initiated. Shrinkage in grazing land area and unavailability of adequate drinking water are major constraints which, are adversely affecting the population status of this breed. These problems should be well addressed by the Forest and Animal Husbandry

departments of state government. A Breed Society may also be established for protecting the interest of the owners of this breed.

SUMMARY

The Sanchori cattle, having good milk production potential, are maintained by the farmers of Jalore district of Rajasthan. The population of Sanchori cattle in the breeding tract is expected to be around two thousand only. Sanchori cattle have compact body, deep belly and are strong and active. The cows are generally white or grey in coat colour; the bulls are white or dark grey to black in colour. When compared with neighbouring Kankrej (Gujarat) and Tharparkar (Rajasthan) breeds of cattle, the body measurements viz. body length, height at withers and chest girth of Sanchori cattle are lower than Tharparkar but higher body length and chest girth and slightly lower height at withers as compared to Kankrej cattle. The horn length and horn circumference of Sanchori cattle estimated in the present study were higher than Tharparkar cattle but lesser than Kankrej cattle. The animals are kept in herds with size varying from 2–10 animals under semi-intensive production system and stall feeding. Age at first calving, lactation length, calving interval, dry period and service period of Sanchori cows were found in the range of 36–48 months (average 39.5 months), 8–15 months (average 10.16 months), 12–20 months (average 14.4 months), 0.5–10 months (average 4.3 months) and 2–11 months (average 5.44 months), respectively. The life span of Sanchori cattle was found as 20–25 years with 12 to 15 lifetime calving. Average daily milk yield of Sanchori cows ranged from 3.05 to 16.3 litre with an average of 9.08 litre. This cattle population, although included in the world's cattle breed list of FAO, has not been included in the list of recognized cattle breeds of India. The unique physical features,

biometry and geographical location makes Sanchori cattle population as having distinct identity, therefore, may be registered as a new cattle breed of India. Keeping in view the declining population status of Sanchori cattle, there is a need to take up suitable measures for its genetic improvement and conservation.

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