



Indigenous cattle of Tripura- characterisation and performance evaluation

R K PUNDIR¹, S MALIK², P K SINGH³, D SHARMA⁴ and D K SADANA⁵

National Bureau of Animal Genetic Resources, Karnal, Haryana 132 001 India

Received: 5 May 2012; Accepted: 2 June 2014

ABSTRACT

Surveys were conducted in 15 villages of 4 districts of the Tripura state to characterise and evaluate indigenous cattle of Tripura. Cattle owners (100) were interviewed to generate the information on management and performance. Information on different characteristics were generated by recording of different parameters on 364 animals of different age and sex. In the state there were 9.54 lakh cattle available in the year 2007; 8.28% (0.79 lakh) were crossbreds and rest 91.72% (8.75 lakh) indigenous. Cattle were reared for milk (42%), bullock power (12%), both the purposes (46%) and manure (100%). Animals were reared mainly on extensive system of management. Animals were smaller in size with cylindrical type of body. Animals were well built and compact with strong legs. The coat colour varies i.e. brown (46.15%), red (21.16%), black (16.76%) and grey/white (15.93). Biometric parameters indicated that animals were similar to the hill cattle Kumaun region of Uttarakhand. Daily milk yield ranged from 0.5 to 5.0 kg with an average of 1.36 kg. It may be concluded that indigenous cattle in Tripura showed uniformity in physical and morphometric characteristics and contributes significantly in the economy of the state. It was also observed that cows had good potential for milk production in the difficult area. Therefore, there is a urgent need to register this population as a breed and plan genetic improvement programs to improve the productivity of indigenous cows in the Tripura state.

Kew words: Characterization, Evaluation, Performance, Tripura cattle

Tripura is the third smallest state of North-East India. It has an area of 10491.69 Sq. km. Presently, the state had eight districts i.e. West, Khowai, South, Gomti, North, Unakoti and Dhalai. The state influences a monsoonal climate with the well demarcated sub tropical and temperate zones. Tripura state has four distinguishable seasons. The winter prevails from December to February; March and April are the pre monsoon season. The longest season of the state is the monsoon season from May to September. Tripura receives maximum rainfall in June. The state records an average annual rainfall of 2,100 mm. The temperature ranged from 10°C in the winter and 35°C in the summer. Average land holding in the state is 0.58 ha. There is 35% of cropped area irrigated. In the state human population is around 36 lakh with 79% literacy. In the state indigenous cattle, Black Bengal goat and Dome and Mali pigs are the major livestock breeds available. Buffaloes, sheep and equine are very few in number. There is no information available on indigenous cattle of Tripura state in the literature. In the present study an attempt was made to

characterize and evaluate indigenous cattle of the state so that the genetic improvement programs may be planned to improve the productivity, and registration of this population may be initiated.

MATERIALS AND METHODS

Information on various management practices opted by the livestock owners in the state and performance traits were generated by interviewing the farmers using a structured questionnaire from 15 villages of 4 districts of the State i.e. West (7 villages, 36 farmers and 145 animals), South (2 villages, 31 farmers and 98 animals), Gomti (4 villages, 22 farmers and 77 animals) and Dhalai (2 villages, 11 farmers and 44 animals). Farmers (100) were interviewed to know the habitat, status, management, utility and performance of the cattle available. Farmers were interviewed for choice of breed, utility, sale and purchase of animals, animal housing, feeding, breeding, prevalent diseases in the area and performance of the indigenous cattle. Performance traits like birth weight, age at maturity and calving, lactation milk yield, lactation length, dry period, service period, calving interval and draught performance were collected by conversing with the farmers from the surveyed villages. Physical characteristics were recorded on animals of different age and sex during the survey.

Eight different body measurements and physical characteristics were recorded on 364 animals of different

Present address: ^{1,3,5}Principal Scientist (Pundirrk@sify.com, Pksinghmathura@gmail.com, Sadana.dk@gmail.com) National Bureau of Animal Genetic Resources (NBAGR), Karnal.

²Senior Scientist (Sk1mailk@gmail.com), ICAR Research Complex NEH Region, Tripura.

⁴Research Associate (deepak0533@gmail.com), Division of Dairy Economics and Statistics, NDRI, Karnal.

age and sex. The body measurements recorded were body length, height at withers, heart girth, paunch girth, face length, ear length, horn length and tail length without switch. The body measurements data were analyzed by least square maximum likelihood program (Harvey 1990) including age within sex as fixed effects. The survey included 40% male and 60% females animals. Age-wise distribution of animals was up to 3 months 3.57%, 3 to 6 months 4.67%, 6 to 12 months 9.34%, 1–3 years 25% and above 3 years of age 57.42%.

RESULTS AND DISCUSSION

The survey revealed that age of the farmers ranged from 20 to 60 years. Majority of the farmers were above 25 years (79%) of age. Education level ranged from illiterate to graduation and 97% were literate. No beef was consumed. Irrigation facilities were not good and most of the area was rainfed. The annual income of the farmers ranged from Rs 10,000 to 3.0 lakh and around 91% farmers were less than Rs 50,000/year. The contribution from livestock sector in the annual income was around 15%. Family size ranged from 2 to 9 with an average of 6.2. Farmers are getting good income from rubber plant in non cultivated land. In cultivated land they are growing rice and different vegetables. Coconut farming has been replaced by rubber plant. Farmer houses were constructed by mud (62%), tin (26%) and bamboo (12%).

Population and trends: In the state 9.54 lakh cattle were available in the year 2007 (Table 1), which constitute around 0.48% of the total Indian cattle. Among them 8.28% (0.79 lakh) were crossbred and rest 91.72% (8.75 lakh) indigenous. The trends in crossbred, indigenous and total cattle population of the state from the year 1997 to 2003 were negative i.e. –21.92%, –39.92% and –38.19%, respectively. The trends from 2003 to 2007 showed increase in crossbred by 38.59%, indigenous cattle 24.64% and total cattle (25.69%). While, the corresponding trends for the years 1997 to 2007 were positive for crossbred (8.22%)

and negative for indigenous cattle (–24.24%) and total cattle (–22.31%).

Buffalo population also declined from 1997 to 2003 by –22.22% and then remained static from 2003 to 2007. In the state there were no defined cattle and buffalo breeds available.

Earlier there were only 4 districts then those were further bifurcated into 8 districts in the year 2010. District-wise cattle population and milk production in the state are presented in Table 2. The West district had maximum number of indigenous and crossbred cattle among all the 4 districts. The district had 37.39% of indigenous cattle and 56% of crossbred available in Tripura. The reasons for maximum number of cattle in the district may be better feed and fodder resources, better connectivity and better overall development in the district. The state is producing 1.05 lakh metric tonnes of milk with a per capita availability of 79 ml/ person/ day as compared to 262 ml per person at country. The West district contributed around 45% of total milk produced in the state. In the state proportion of different species in milk production was from crossbred cattle 33%, indigenous cattle 63%, buffalo 2% and goat 3% in the year 2009–10. It indicated that indigenous cattle had largest contribution in the state milk production.

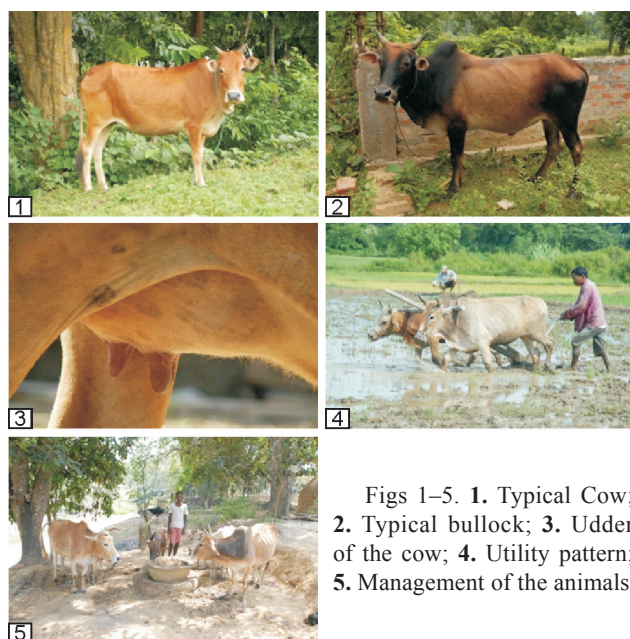
Management practices: Animals were reared mainly on extensive system of management i.e. grazing from morning to evening. In the evening rice straws were provided to the animals with wheat husk. Farmers provided rice boil water to the animals every day. The chaffing of fodder was not observed. None of the farmer was growing green fodder. Grazing and cleaning were by men and women both and children were not engaged in these activities. Feeding and milking were also by men and woman. Most of the animals were farm born. Tieing was only in night by 87% farmers. Animal houses were mostly open and *kachha* in 87% cases and part of owner residence (96%). Drainage of the houses was not proper. Floor of the house was *kachha* in all the cases. Ventilation and shades of tree was available in most

Table 1. Bovine population and trends in Tripura in thousands

	Population			Trends		
	1997	2003	2007	1997–2003	1997–2007	2003–2007
Indigenous cattle	1155	702	875	–39.22	–24.24	26.64
Crossbred cattle	73	57	79	–21.92	8.22	38.59
Total cattle	1228	759	954	–38.19	–22.31	25.69
Buffalo	18	14	14	–22.22	–22.22	-

Table 2. District wise cattle population and milk production in the year 2007 in Tripura

District	Indigenous	Crossbred	Total cattle	Milk production (mt)
West	327189(37.39%)	44454(56.04%)	371643(38.94%)	47796(45.41%)
South	282452(32.27%)	22268(28.07%)	304720(31.92%)	30636(29.11)
North	160997(18.39%)	7034(8.86%)	168031(17.06%)	16104(15.30%)
Dhalai	104431(11.93%)	5561(7.01%)	109992(11.52%)	1069510.16%)
Tripura	875069	79317	954386	105233



Figs 1–5. 1. Typical Cow; 2. Typical bullock; 3. Udder of the cow; 4. Utility pattern; 5. Management of the animals

of the cases. Wall of animal houses were half in all cases. Calves reared mainly through suckling and colostrum feeding was there. Dehorning practice was not adopted. Deworming of animals was there. All the farmers clean their milking pots and udder before milking. Around 43% farmers were using milk for household purposes and around 57% sold the milk. Breeding was natural. Breeding bulls were available in the villages. Vaccinations for HS, FMD and BQ were observed. Good health facilities were available for animals in the state. Animals in utility i.e. ploughing and management of the animals are shown in Figs 4 and 5, respectively.

Physical characteristics: Animals are small in size with cylindrical type of body. Animals were well built and compact with strong legs. The coat colour varied i.e. brown (46.15%), red (21.16%), black (16.76% and grey/white (15.93). Dewlap and hump, head are small; face is short and concave. Ears are small to moderate in length and horizontal in orientation. Neck is short in length and thin. Horns are small, black or gray in colour. Orientation is outward and upward. Hoofs are black; muzzles are brown and black; udder is small, not well developed and milk veins are not prominent. Sizes of fore and rear udder are small (72% and 64%, respectively). Teats are small 5–12 cm long in most of the cases, shape is cylindrical (51%) and sometime funnel (49%). Tips of the teats are either round (68%) or funnel (32%). Naval flap is small (81%). Penis sheath flap is short and tucked up with body. Tail is long up to the hock with black (81%), brown (12%) and white (7%) switch. Temperament is docile in all the cases. Typical cow, bullock and udder of the cow are shown in Figs 1–3, respectively.

Morphometric traits: Means, standard error and number of observation of different biometric traits are given in Table 3. All the morphometric traits from age group 0–3 months, 3–6 months, 6–12 months and 1–3 years did not reveal

significant differences due to sex. The cattle above 3 years were divided into 2 groups i.e. cow and bullocks. The average body length, height at wither, heart girth, paunch girth, horn length, ear length, face length and tail length without switch in cows (136) were 98.09 ± 0.54 cm, 93.39 ± 0.44 cm, 122.05 ± 1.09 cm, 125.14 ± 1.08 cm, 14.37 ± 1.48 cm, 19.47 ± 0.24 cm, 35.30 ± 0.20 cm and 68.63 ± 0.51 cm, respectively. The corresponding estimates in bullocks (73) were 101.17 ± 0.97 cm, 99.95 ± 0.74 cm, 132.83 ± 1.40 cm, 131.41 ± 2.18 cm, 16.77 ± 1.19 cm, 21.12 ± 0.32 cm, 38.30 ± 0.41 cm and 71.83 ± 0.86 cm, respectively. Cows and bullocks differed significantly in body length, height at wither, heart girth, face length and tail length without switch. The estimates of body length, height at wither and heart girth in cows and bullocks were lower than the Sahiwal, Kankrej, Hariana, Red Sindhi and Bargur breeds and within the range as in smaller breeds like Vechur and Punganur (Pundir and Ahlawat 2007) and hill cattle of Kumaun region of Uttarakhand and higher than the hill cattle of Garhwal region (Pundir *et al.* 2013). Similar estimates of face length and horn length and higher for body length, height at wither, heart girth, paunch girth, ear length and tail length without switch were observed in Malnad Gidda cattle (Singh *et al.* 2008). Height at wither had high and significant correlations with heart girth, paunch girth and body length (ranged from 0.803 to 0.889), similar to Uttarakhand cattle. Effects of height at wither on heart and paunch girth were also studied by analysis of variance making different classes of height at wither. It was observed that as height at wither increased heart and paunch girth also increased.

Performance

The birth weight ranged from 10 to 15 kg. The cow and bullock weighed about 110 kg and 142 kg., respectively. The estimates of birth weight and adult body weight were similar to the reports of Singh *et al.* (2008) and Ashok (2000) in Malnad Gidda cattle. The average age at first calving, daily milk yield, lactation length, dry period, service period, calving interval, herd life and number of calving during life time were 44 months (3–5 years), 1.36 ± 0.06 kg (0.5 to 5.0 kg), 145 days (4–8 months), 122 days (3–6 months), 131 days (3–5 months), 424 days (16–36 months), 12–15 years and 8–10 calving, respectively. The estimates of age at first calving, daily milk yield and calving interval were within the range as reported by Singh *et al.* (2004). Higher estimates of daily milk yield were reported by Kumar *et al.* (2000), Singh *et al.* (2004) and Meena *et al.* (2007). The average daily milk yield obtained in the study was slightly higher than the state average (1.14 kg) for indigenous cows in the year 2009–10, but lower than the national average for indigenous cows as 2.14 kg (Anonymous, 2010). It was also higher than the hill cattle of Uttarakhand (Pundir *et al.* 2013). This may be due to fact that the study had more representation from West district, where milk productivity was better than the other districts. The average daily milk yield was lower than the Malnad Gidda cattle (Singh *et al.*

Table 3. Age and sex wise different biometric traits (cm) in indigenous cattle of Tripura

Age (mo.)	Sex	No	Body length	Height at wither	Heart girth	Paunch girth	Ear length	Face length	Tail length without switch	Horn length
0–3 months	M	9	59.44±3.29	66.66±2.59	69.77±5.05	69.53±5.21	13.00±0.97	20.00±1.49	36.00±3.08	-
0–3 months	F	4	58.25±2.56	61.75±1.43	69.00±2.04	65.25±2.56	11.75±0.47	19.27±0.75	33.00±1.41	-
3–6months	M	6	64.16±1.07	69.50±1.23	77.16±1.53	66.16±1.44	14.16±0.60	21.66±0.21	40.00±1.93	-
3–6months	F	11	61.36±1.90	66.00±2.41	75.63±2.75	74.00±3.69	13.27±0.50	21.36±0.89	40.00±2.03	-
6–12months	M	21	70.85±1.86	75.28±1.45	86.42±1.85	87.52±2.35	15.95±0.46	26.90±0.58	46.09±2.13	-
6–12months	F	13	75.07±2.66	77.92±1.55	92.30±2.74	93.84±3.43	16.38±0.67	26.69±0.78	50.92±2.20	-
1–3years	M	35	83.85±1.28	85.57±0.99	106.48±1.96	106.88±2.09	18.28±0.36	31.85±0.53	57.60±1.19	9.47±1.73
1–3years	F	56	84.67±0.92	85.85±0.78	110.12±1.42	109.57±2.40	17.92±0.29	31.00±0.40	58.09±1.03	8.28±1.58
Cow	F	136	98.09*±0.54	93.39*±0.44	122.05*±1.09	125.14±1.08	19.47±0.24	35.30*±0.20	68.63*±0.51	14.37±1.48
Bullock	M	73	101.17±0.97	99.95±0.74	132.83±1.40	131.41±2.18	20.12±0.32	38.30±0.41	71.83±0.86	16.77±1.19

2008). In the study there were 92 cows in milk with 4 different body colours. To study whether coat colour is given any preference for milk production, daily milk yield was analysed according to coat colour by least square analysis. There were no significant differences in daily milk yield due to coat colour. The averages of daily milk yield for black, brown, red and grey/white coat colours were 1.65±0.23 (18) kg, 1.30±0.08 (42) kg, 1.36±0.06 (19) kg and 1.19±0.14 (13) kg, respectively. The distribution of daily milk yield in lactating cows according to milk yield was 0.5 to 1.0 kg, 44.56%, 1.0 to 1.5 kg, 33.70%, 1.5 to 2.0 kg, 17.39% and above 2.0 kg 4.35%. Similar age at first calving and calving interval but lower dry period and service period were observed in Malnad Gidda cattle by Singh *et al.* (2008) as compared to the present study. A pair of bullock may plough about 0.16 ha of land in 3–4 h. The bullock performance was lower than the hill cattle of Uttarakhand (Pundir *et al.* 2013).

It may be concluded that indigenous cattle in Tripura showed uniformity in physical and morphometric characteristics and contributes significantly in the economy of the state. It was observed that cows had good potential for milk production in the difficult climate. There is urgent need to register this population and initiate plan genetic improvement programs to improve the productivity of indigenous cattle of Tripura.

REFERENCES

Anonymous. 2010. *Animal Husbandry Statistics*. Department of

- Animal Husbandry and Dairying, MoA, GOI, New Delhi.
- Ashok C. 2000. 'Characterisation of Malnad Gidda cattle of Karnataka.' M.V.Sc. thesis submitted to the university of agricultural sciences, Bengaluru.
- Harvey W R. 1990. User's guide for LSML-PC-VERSION-2, Mixed model least square maximum likelihood program, Mine graph, Columbus, Ohio, USA.
- Kumar S, Chandre M and Harbola P C. 2000. Livestock farming system- A case study of Kumaun hills. *ENVIS bulletin, Himalyan Ecology and Development* 8 (2).
- Meena H R, Ram H, Singh S K, Mahapatra R K, Sahoo A and Rasool T J. 2007. Animal husbandry practices at high altitude (> 6000 feet) in Kumaun region of Uttarakhand, India. *Livestock Research for Rural Development* 10 (11).
- Pundir R K and Ahlawat S P S. 2007. Indigenous Breeds of Cattle and Buffalo. *Dairy India, Yearbook*. 6th edn, pp 261–71.
- Pundir R K, Singh P K, Neelkant, Sharma D, Singh C V and Prakash B. 2013. Uttara- A new cattle germplasm from Uttarakhand hills. *Indian Journal of Animal Sciences* 83 (1): 51–58.
- Pundir R K, Singh P K, Sharma D, Saini A, Singh C V and Prakash B. 2012. Hill cattle of Pithoragarh of Uttarakhand. *Indian Journal of Animal Sciences* 82: 1591–93.
- Singh P R, Singh M, Verma M L and Jaiswal R S. 2004. Animal husbandry practices in Tarikhet block of Kumaon hill of Uttaranchal. *Indian Journal of Animal Sciences* 74 (9): 997–99.
- Singh P K and Pundir R K, Manjunath V K, Rudresh B H and Govindaiah M G. 2008. Features and status of miniature indigenous germplasm of cattle- Malnad Gidda. *Indian Journal of Animal Sciences* 78 (10): 1123–26.