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Physical characteristics of desi cattle in its home tract of Jharkhand

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Abstract
Animal husbandry, agriculture and allied activities have been the core livelihood for majority of the rural people since time immemorial. It provides productive employment, especially self-employment and the most valuable supplementary income to a vast majority of rural households, majority of who are small and marginal farmers and landless labourers. Livestock provide increased economic stability to the poor masses. They act as cash buffer in case of small stock and as captive reserve in case of larger stock. Livestock provide quality animal protein to human population in the form of milk, eggs, meat and value-added products. They provide draught power for agricultural operations, organic manure for agriculture and raw materials like skin, hides, blood, bone, hoof, horn, etc. for various industries. The present study was carried out on local non-descript cattle native to Ranchi district of Jharkhand. Three villages from each block were randomly selected. All the animals under study were Desi cattle reared by the local population in the study areas. A total 90 Household rearing Desi cattle of different age group were selected and interviewed. Data related to physical production, management practices like housing, feeding, economics and major constraints of Desi cattle rearing will be collected. To describe the Physical Characteristics (such as – Coat colour, Skin Colour, Muzzle Colour, Eyelid Colour, Hoof Colour, Switch Colour) including body conformation (such as - Hump size, Ear size, Face length) of the Desi cattle of Ranchi district of Jharkhand. To evaluate the body measurements like chest Girth, Body length and height at wither of the Desi cattle of Jharkhand.
To report about the productive performances such as daily average, milk yield, peak milk yield and lactation length of the Desi cattle of Angara, Bero and Mandar block of Ranchi district of Jharkhand.

Keywords: Coat colour, skin colour, muzzle colour, eyelid colour, hoof colour, switch colour

1. Introduction
They allow participants such as producers, feed lot operators, meat packers, importers and exporters, to deal with the price risks associated with the sale or purchase of livestock and meat products. In the case of speculators, they provide them with tools to capitalize on potential profit opportunities in the livestock markets. According to Livestock Census 2019 total cattle Population of India is about 192.49 million out of which Desi cattle accounts for about 56.2 million. In Jharkhand total cattle population is 11.2 million and8.36 million. Desi cattle are well known for tropical adaptability and disease Resistance. They can thrive & produce well with low feed consumption and minimal health care. Over the years, intensification of animal husbandry and widespread introduction of exotic breeds has completely altered the animal genetic resource scenario. There is perceptible increase in a limited number of specialized breeds, while several indigenous livestock have suffered decline and degeneration over the years. The body size of Desi cattle varies from medium to large, skin-loose to tight, usually horned, body weight ranging from (300-550kg) humped or hump less and usually docile (Banerjee,1991) [1]. The Desi Cattle of Indian Sub-continent were mainly classified into six groups on the basis of physical characters (Olver, 1938). The classification was made group-wise in the manner: Group - I, Group - II, Group - III, Group - IV, Group - V and Group - VI (Joshi & Phillips, 1953). The most important characters of Desi Cattle is their higher heat tolerance and tick resistance power (Parmer *et al*., 2000) and their less susceptibility to a variety of bacterial and viral diseases. Milk Production in India has increased from 22 million tonne in 1970 to 210 million tonne in 2020-21, which shows a growth of 950 percent during last 50 years. As a result, the per capita availability of milk in India is 427 grams/day (2020-21) as compared to average world per capita availability of 229 gram/day.

Desi cattle accounts for about 142.11 million in India (Livestock sensus 2019) and in Jharkhand accounts 5.20 million

2. Material and Methods

The present study was carried out on local non-descript cattle native to Ranchi district of Jharkhand. Three villages from each block were randomly selected. All the animals under study were Desi cattle reared by the local population in the study areas. A total 90 Household rearing Desi cattle of different age group were selected and interviewed.

Data related to physical production, reproductive performance, management practices like housing, feeding, economics and major constraints of Desi cattle rearing will be collected. To describe the Physical Characteristics (such as – Coat colour, Skin Colour, Muzzle Colour, Eyelid Colour, Hoof Colour, Switch Colour) including body conformation (such as - Hump size, Ear size, Face length) of the Desi cattle of Ranchi district of Jharkhand. To evaluate the body measurements like chest Girth, Body length and height at wither of the Desi cattle of Jharkhand.

3. Results

3.1 Physical Characteristics

3.1.1 Coat colour

Coat colour of Desi cattle were observed by visual observation in all the three blocks (Angara, Bero and Mandar) of Ranchi district. In Angara block most of the cattle were observed to be white (80%) followed by black (10%), grey (5.55%) and brown (4.44%) Coat colour.

In Bero block coat colour of cattle was observed to be white (77.77%) followed by grey (8.88%), brown (7.77%) and black (5.55%).Similarly, in Mandar block the coat colour pattern was observed to be white (83.33%),black (7.77%),grey (4.44%) and brown (4.44%).However, overall body coat colour were observed to be white (80.37%),black (7.77%), grey (6.29%) and brown (5.55%).

Present study reveals that the white coat colour is predominant Desi cattle population whereas brown coat is least in number (table 1).

Table 1: Coat colour of Desi cattle of three blocks of Ranchi district

Block	White	Black	Brown	Grey
Angara	76 (80%)	10 (10%)	4 (4.44%)	5 (5.55%)
Bero	88 (77.77%)	6 (5.55%)	9 (7.77%)	10 (8.88%)
Mandar	88 (83.33%)	8 (7.77%)	5 (4.44%)	5 (4.44%)
Overall	252 (80.37%)	25 (7.77%)	17 (5.55%)	20 (6.29%)

Figure In parentheses indicate percentage of coat colour

3.1.2 Muzzle Colour

Muzzle colour of Desi cattle were observed by visual observation in all the three blocks (Angara, Bero and Mandar) at Ranchi district. In Angara block most of the cattles were observed to be black (87.77%) followed by grey (12.22%).In Bero block muzzle colour was observed to be black (91.11%) followed by grey (8.88%). Similarly, in Mandar block the muzzle colour pattern was observed to be black (96.66%) and grey (3.33%).However overall muzzle colour were observed to be black (91.85%) and grey(8.15%).Present study reveals that the black muzzle colour is predominant Desi cattle population whereas grey muzzle colour is least in number.The detailed observations are mentioned in (table 2).

Table 2: Muzzle colour of Desi cattle of three blocks of Ranchi district

Block	Black	Grey
Angara	83 (87.77%)	12 (12.22%)
Bero	103 (91.11%)	10 (8.88%)
Mandar	102 (96.66%)	4 (3.33%)
Overall	288 (91.85%)	26 (8.15%)

Figure In parentheses indicate percentage of muzzle colour

3.1.3 Eyelid colour

The colour of the eyelids in cattle of Desi population in all the three blocks under study (Angara, Bero and mandar) of Ranchi district of Jharkhand were observed to be black only (Table 3).

Table 3: Eyelid colour of Desi cattle of three blocks of Ranchi district

Block	Black colour
Angara	95 (100%)
Bero	113 (100%)
Mandar	106 (100%)
Overall	314 (100%)

Figure In parentheses indicate percentage of eyelid colour

3.1.4 Hoof Colour

Hoof colour of Desi cattle were observed by visual observation in all the three blocks (Angara, Bero and Mandar) at Ranchi district. In Angara block most of the cattle were observed to be black (75.55%) followed by grey (24.44%).

In Bero block Hoof colour was observed to be black (82.22%) followed by grey (17.77%). Similarly, in Mandar block the Hoof colour pattern was observed to be black (72.22%) and grey (27.77%).However overall hoof colour were observed to be black (76.66%) and grey (23.33%).

Present study reveals that the black Hoof colour is predominant Desi cattle population whereas grey Hoof colour is least in number (table 4.).

Table 4: Hoof Colour of Desi cattle of three blocks of Ranchi district

Block	Black	Grey
Angara	72 (75.55%)	23 (24.44%)
Bero	91 (82.22%)	22 (17.77%)
Mandar	77 (72.22%)	29 (27.77%)
Overall	241 (76.66%)	73 (23.33%)

Figure In parentheses indicate percentage of hoof colour

3.1.5 Switch Colour

Switch colour of Desi cattle were observed by visual observation in all the three blocks (Angara, Bero and Mandar) of Ranchi district. In Angara block most of the cattles were observed to be black switch (80%) followed by brown (15.55%) and white (4.44%). In Bero block switch colour was observed to be black (77.77%) followed by brown (14.445%) and white (7.77%). Similarly, in Mandar block the switch colour pattern was observed to be black (83.33%) brown (12.22%) and white (4.44%).However overall switch colour were observed to be black (80.37%), brown (14.07%) and white (5.55%). Present study reveals that the black switch colour is predominant Desi cattle population whereas white switches is less in number.The detailed observations are mentioned in table (5.).

Table 5: Switch colour of Desi cattle of three blocks of Ranchi district

Blocks	Black	Brown	White
Angara	76 (80%)	15 (15.55%)	4 (4.44%)
Bero	88 (77.77%)	16 (14.44%)	9 (7.77%)
Mandar	88 (83.33%)	13 (12.22%)	5 (4.44%)
Overall	252 (80.37%)	44 (14.07%)	18 (5.55%)

Figure In parentheses indicate percentage of switch colour

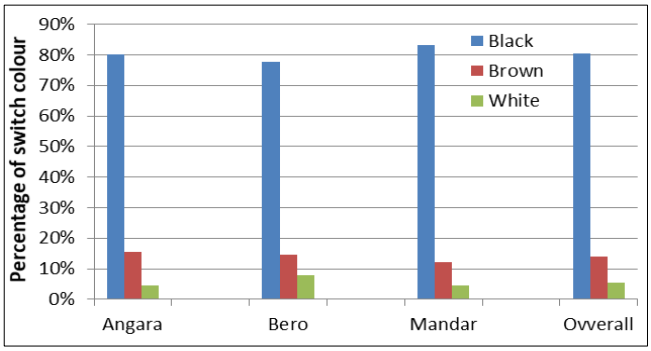

Fig 1: Switch colour of Desi cattle of three blocks of Ranchi district

3.1.6 Horn orientation

Horn orientationof Desi cattle were observed by visual observation in all the three blocks (Angara, Bero and Mandar) of Ranchi district. In Angara block most of the cattles were observed to be Upward (86.66%) followed by Inward (11.95%) and Outward (1.11%). In Bero block horn orientation was observed to be Upward (90%) followed by Inward (6.66%), and Outward (2.22%). Similarly, in Mandar block the horn orientation pattern was observed to be Upward (84.44%) Inward (12.21%) and Outward (3.33%).However overall horn orientation were observed to be Upward (87.03%), Inward (10.36%) and Outward (2.59%). Present study reveals that the upward horn orientationis predominant in Desi cattle population of Ranchi district whereas Outwardhorn orientation is least in number (table 6.).

Table 6: Horn Orientation of Desi cattle of three blocks of Ranchi district

Blocks	Outward	Upward	Inward
Angara	1 (1.11%)	56 (86.66%)	8 (11.95%)
Bero	3 (3.33%)	69 (90%)	5 (6.66%)
Mandar	2 (3.33%)	64 (84.44%)	9 (12.21%)
Overall	6 (2.59%)	189 (87.03%)	23 (10.36%)

Figure In parentheses indicate percentage of horn orientation

3.2.1 Morphometric characters

3.2.1.1 Ear length

Ear length (in cm) of desi cattle where measured at different age groups in three blocks (Angara, Bero and Mandar) under study. Overall ear length were observed to be 9.36, 11.13, 13.50, 14.85, 16.07, 18.50 and 20.87 cm at birth, 3 month, 6 month, 9 month, 12 month, 18 month and more than 18 month (adults) of age respectively.

No definite patterns in significance were observed among groups during most of the periods under study (table no. 7). However slightly longer ear length was observed in cattle of Angara block.

Table 7: Ear length of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	9.70 ± 0.50^{b} (30)	9.15 ± 0.30^{a} (36)	9.24 ± 0.50^{ab} (31)	9.36 ± 0.40 (97)
3 month	11.70 ± 0.82^{b} (30)	10.06 ± 0.42^{a} (36)	11.64 ± 0.82^{b} (31)	11.13 ± 0.67 (97)
6 month	13.57 ± 0.78 (30)	13.55 ± 0.78 (36)	13.38 ± 0.45^{N} (31)	13.50 ± 0.63 (97)
9 month	15.18 ± 1.25^{b} (30)	14.74 ± 1.25^{a} (36)	14.64 ± 0.27^{a} (31)	14.85 ± 1.02 (97)
12 month	16.79 ± 0.93^{b} (30)	16.14 ± 0.93^{b} (36)	15.28 ± 0.41^{a} (31)	16.07 ± 0.76 (217)
18 month	18.82 ± 0.83 (65)	18.46 ± 0.83 (77)	18.23 ± 0.34^{N} (75)	18.50 ± 0.68 (217)
>18 month (adult)	21.98 ± 1.04^{b} (65)	$20.44\pm.04^{a}$ (77)	20.18 ± 0.37^{a} (75)	20.87 ± 0.84 (217)

Fig in parentheses indicate number of observation * $P<0.05$, ** $P<0.01$

3.2.2 Face length

Face length (in cm) of Desi cattle where measured at different age groups in three blocks under study. Overall face length were observed to be 16.20, 21.29,24.45,28.20, 30.04,35.03 and 39.44 cm at birth, 3 month, 6 month, 9 month, 12 month, 18 month and more than 18 month(adults) of age respectively in table (8). Significantly higher face length were observed in Angara block at 12 and 18 month of age. However, no definite patterns in significance were observed among groups during most of the periods under study.

Table 8: Face length of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	16.38 ± 0.63 (30)	15.87 ± 0.72 (36)	16.35 ± 0.62 (31)	16.20 ± 0.50 (97)
3 month	21.71 ± 1.29 (30)	20.77 ± 0.51 (36)	21.39 ± 1.21 (31)	21.29 ± 0.99 (97)
6 month	24.88 ± 1.25 (30)	23.85 ± 0.78 (36)	24.63 ± 1.29 (31)	24.45 ± 1.06 (97)
9 month	28.58 ± 1.52 (30)	27.63 ± 0.27 (36)	28.38 ± 1.54 (31)	28.20 ± 1.26 (97)
12 month	30.85 ± 1.14^{b} (30)	29.71 ± 1.04^{a} (36)	29.56 ± 0.10^{a} (31)	30.04 ± 0.85 (97)
18 month	35.47 ± 0.70^{b} (65)	35.26 ± 0.90^{ab} (77)	34.36 ± 0.31^{a} (75)	35.03 ± 0.74 (217)
>18 month (adult)	40.19 ± 1.63 (65)	39.11 ± 1.23 (77)	39.11 ± 1.74 (75)	39.44 ± 1.33 (217)

Fig in parentheses indicate number of observation * $P<0.05$, ** $P<0.01$

3.2.3 Hump length

Hump length (in cm) of desi cattle where measured at different age groups in three blocks (Angara, Bero and Mandar) under study. No significant difference in hump length were observed at most of the periods under study. However significantly higher hump length at 18 month and more than 18 month of age were observed in Angara block followed by Bero and Mandar block. Overall hump length were observed to be 3.41,4.71, 5.12,5.8,6.03,8.46 and 9.52 cm at birth, 3 month, 6 month, 9 month, 12 month, 18 month and more than 18 month (adults) of age respectively (table 9).

Table 9: Hump length of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	3.52±0.39 (30)	3.22±0.20 (36)	3.49±0.39 (31)	3.41±0.32 (97)
3 month	4.80±0.75 (30)	4.75±0.75 (36)	4.57±0.37 (31)	4.71±0.61 (97)
6 month	5.16±0.69 (30)	5.13±0.69 (36)	5.06±0.42 (31)	5.12±0.56 (97)
9 month	5.90±0.47 (30)	5.73±0.30 (36)	5.81±0.47 (31)	5.8±0.38 (97)
12 month	6.05±0.51 (30)	6.03±0.51 (36)	6.00±0.15 (31)	6.03±0.41 (97)
18 month	8.79±0.46^{ab} (65)	8.40±0.46^{b} (77)	8.2±0.20^{a} (75)	8.46±0.38 (217)
>18 month (adult)	10.15±0.79^{ab} (65)	9.16±0.31^{a} (77)	9.27±0.79^{b} (75)	9.52±0.64 (217)

Fig in parentheses indicate number of observation * P<0.05, ** P<0.01

3.2.4 Paunch Girth

Paunch Girth (in cm) of desi cattle where measured at different age groups in all three blocks (Angara, Bero and Mandar) under study. Overall punch girth were observed to be 54.19,69.71,81.51,84.18,102.21,135.40 and 140.64 cm at birth, 3 month, 6 month, 9 months, 12 months, 18 months and more than 18 month (adults) of age respectively (table 10).

Significantly higher paunch girth was observed in Angara block followed by Bero and Mandar. However no definite pattern in significance was observed among groups during most of the periods under study.

Table 10: Paunch girth of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	54.86±0.86 ^{a} (30)	54.29±0.86 ^{a} (36)	53.41±0.08 ^{b} (31)	54.19±0.70 (97)
3 month	69.87±2.15 (30)	69.67±2.64 (36)	69.60±0.42 (31)	69.71±2.64 (97)
6 month	82.52±1.90 (30)	81.27±1.90 (36)	80.76±0.51 (31)	81.51±1.55 (97)
9 month	85.38±1.77^{b} (30)	82.84±0.10^{a} (36)	84.32±1.77^{ab} (31)	84.18±1.44 (97)
12 month	103.05±2.74 (30)	101.28±0.33 (36)	102.31±2.74 (31)	102.21±2.23 (97)
18 month	135.75±1.04 (30)	135.02±0.21 (77)	135.42±1.04 (75)	135.40±0.85 (217)
> 18 month (adult)	141.01±1.81 (30)	140.25±0.34 (77)	140.65±1.81 (75)	140.64±1.48 (217)

Fig in parentheses indicate number of observation * P<0.05, ** P<0.01

3.2.5 Heart Girth

Heart Girth (in cm) of desi cattle were measured at different age groups in three blocks (Angara, Bero and Mandar) under study. Overall heart girth were observed to be 52.51,68.13,81.09 93.01,100.29,133.82 and 138.19 cm at birth, 3 month, 6 month, 9 months, 12 months,18 months and more than 18 month(adults) of age respectively (table 11).

No significant difference was observed among groups during most of the periods under study. However slightly more heart girth were observed belongs to Angara block.

Table 11: Heart girth of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	52.85±0.99 (30)	52.66±0.79 (36)	52.01±0.41 (31)	52.51±0.81 (97)
3 month	69.60±2.77 (30)	66.86±0.73 (36)	67.92±2.75 (31)	68.13±2.26 (97)
6 month	81.47±1.51 (30)	81.28±1.51 (36)	80.51±0.28 (31)	81.09±1.24 (97)
9 month	83.98±2.23 (30)	81.91±0.31 (36)	83.13±2.13 (31)	83.01±1.82 (97)
12 month	101.10±2.16 (30)	99.19±0.23 (36)	100.57±2.06 (31)	100.29±1.68 (97)
18 month	134.55±0.94^{b} (65)	133.39±0.16^{a} (77)	133.52±0.94^{a} (75)	133.82±0.76 (217)
> 18 month (adult)	139.06±2.63 (65)	138.18±.43 (77)	137.32±0.42 (75)	138.19±1.99 (217)

Fig in parentheses indicate number of observation * P<0.05, ** P<0.01

3.2.6 Body length

Body length (in cm) of desi cattle were measured at different age groups in three blocks (Angara, Bero and Mandar) under study. Overall Body length were observed to be 40.98,66.68,71.71,79.50,85.35,96.18 and 102.21 cm at birth, 3 month, 6 month, 9 months, 12 months, 18 months and more than 18 month(adults) of age respectively (table 12).

No significant difference were observed among groups during most of the periods under study. However slightly longer body length were observed to Angara block.

Table 12: Body length of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	41.03±1.04 (30)	40.95±0.67 (36)	40.95±1.04 (31)	40.98±0.85 (97)
3 month	67.1±1.62 (30)	66.11±0.31 (36)	66.84±1.62 (31)	66.68±1.32 (97)
6 month	72.94±1.98 (30)	71.19±1.98 (36)	71.00±0.27 (31)	71.71±1.61 (97)
9 month	79.98±1.27 (30)	79.09±0.03 (36)	79.43±1.27 (31)	79.50±1.03 (97)
12 month	86.08±3.21 (30)	85.88±3.21 (36)	84.09±0.07 (31)	85.35±2.62 (97)
18 month	96.30±0.84 (65)	96.16±0.84 (77)	96.10±0.14 (75)	96.18±0.69 (217)
> 18 month (adult)	102.95±1.56^{ab} (65)	101.25±0.20^{a} (77)	102.44±1.56^{b} (75)	102.21±1.27 (217)

Fig in parentheses indicate number of observation * P<0.05, ** P<0.01

3.2.7 Tail length

Tail length (in cm) of Desi cattle where measured at different age groups in three blocks (Angara, Bero and Mandar) under study. Overall tail length were observed to be

26.43,39.18,51.73,56.65,65.72,69.77 and 78.45 cm at birth,3 month, 6 month, 9 months, 12 months,18 months and more than 18 month (adults) of age respectively in table (13).

No significant difference was observed among groups during most of the periods under study. However slightly longer tail length were observed belongs to Angara block.

Table 13: Tail length of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	27.52±1.22 [b] (30)	25.47±0.09 [a] (36)	26.30±1.22 [a] (31)	26.43±1.00 (97)
3 month	40.79±1.66 (30)	37.50±0.43 (36)	39.25±1.68 (31)	39.18±1.35 (97)
6 month	52.59±1.72 (30)	51.39±1.72 (36)	51.21±0.21 (31)	51.73±1.41 (97)
9 month	57.17±1.82 (30)	56.55±1.82 (36)	56.24±0.35 (31)	56.65±1.49 (97)
12 month	66.34±2.88 (30)	65.48±2.88 (36)	65.35±0.41 (31)	65.72±2.35 (97)
18 month	65.63±1.95 (65)	64.52±1.25 (77)	64.16±0.37 (75)	64.77±1.59 (217)
> 18 month (adult)	79.59±4.26 (65)	78.56±4.56 (77)	77.21±0.53 (75)	78.45±3.47 (217)

Fig in parentheses indicate number of observation * *P*<0.05, ** *P*<0.01

3.2.8 Height at withers

Height at wither (in cm) of desi cattle where measured at different age groups in three blocks (Angara, Bero and Mandar) under study. Overall height at wither were observed to be 51.48,69.22,81.67,87.74,94.97,108.88 and 114.11 cm at birth, 3 month, 6 month, 9 month, 12 month, 18 month and more than 18 month(adults) of age respectively (table 14).

No significant difference was observed among groups during most of the periods under study. However slightly higher height at wither were observed belongs to Angara block.

Table 14: Height at wither of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
At birth	52.12±1.09 [b] (30)	51.40±1.12 [ab] (36)	50.93±0.23 [a] (31)	51.48±0.89 (97)
3 month	70.22±1.45 (30)	68.15±0.42 (36)	69.29±1.45 (31)	69.22±1.18 (97)
6 month	81.93±1.57 (30)	81.91±1.57 (36)	81.16±0.31 (31)	81.67±1.28 (97)
9 month	85.46±2.39 (30)	84.16±0.25 (36)	84.58±2.93 (31)	84.74±2.39 (97)
12 month	90.11±1.78 [b] (30)	90.07±1.78 [ab] (36)	89.73±2.26 [a] (31)	89.97±1.45 (97)
18 month	109.44±3.11 (65)	108.79±3.11 (77)	108.42±0.08 (75)	108.88±2.54 (217)
> 18 month (adult)	115.25±3.12 (65)	113.27±0.51 (77)	113.80±3.12 (75)	114.11±2.55 (217)

Fig in parentheses indicate number of observation * *P*<0.05, ** *P*<0.01

3.2.9 Horn length and Horn girth

Horn length and Horn girth (in cm) of desi cattle where measured at 18 month of age and more than 18 month of age (adult) in three blocks (Angara, Bero and Mandar) under study. Overall Horn length and girth were observed to be 9.87 cm and 8.09 cm respectively at 18 month and at more than 18 month of age (adults) were 12.03 and 10.03 cm. respectively (table 15).

Significantly, higher horn length and horn girth were observed for Angara block followed by Mandar and Bero.

Table 15: Horn length and horn girth of Desi cattle of three blocks of Ranchi district

Parameters	Angara	Bero	Mandar	Overall
18 month (Horn length)	10.54±1.10 (134)	9.59±1.10 (154)	9.48±0.32 (168)	9.87±0.90 (456)
18 month (adult) (Horn girth)	8.76±0.83 [b] (134)	7.64 ±0.50 [a] (154)	7.89±0.83 [a] (168)	8.09±0.67 (456)
> 18 month (adult) (Horn length)	12.78±1.08 [b] (134)	11.08±0.36 [a] (154)	12.22±1.08 [b] (168)	12.03±0.88 (456)
> 18 month (adult) (Horn girth)	10.40±0.64 [b] (134)	9.65±0.28 [a] (154)	10.04±0.64 [ab] (168)	10.03±0.52 (456)

Fig in parentheses indicate number of observation * *P*<0.05, ** *P*<0.01

4. Summary

4.1 Physical Characteristics

Coat color of majority of cattle under study was observed to be white (80.37%) followed by Black, Grey and Brown. Muzzle (91.85%), Eyelid (100%), hoof (76.66%) and Switch color (80.37%) was observed to be black in majority cases. Horn orientation was observed to be U shaped (87.03%) in most of the cases under study.

4.2 Morphometric Characteristics

1. Ear length, Face length, Hump length, paunch girth, heart girth, body length, tail length, height at withers, horn length and horn girth were observed during different stages of growth.
2. No significant difference was observed for most of the traits under study among cattle of different blocks. Overall data for adult cattle was found to be Ear length (20.87±0.84 cm), Face length (39.44±1.33 cm), Hump length (9.52±0.64 cm), paunch girth(140.64±1.48 cm), heart girth(138.19±1.99 cm), body length (102.21±1.27cm), tail length (78.45±3.47cm), height at withers(114.11±2.55 cm), horn length (12.03±0.88 cm) and horn girth (10.03±0.52 cm).
3. No Significant difference in body weight between males and females was observed. Most of the animals under study were reared Extensive system of housing followed by Semi-intensive system of housing.
4. Flooring materials in most of the sheds were used to be kaccha.
5. Most of the farmers kept their animals in separate enclosures and rest of the animals were kept where farmers lived themselves. Most of the Animals in different blocks under study were maintained on dry fodder and green grasses. Approximately 32% of animals were observed to be vaccinated for FMD vaccine only.
6. All the animals under study were observed to be bred by natural mating/breeding.

5. Conclusion

1. Indigenous cattle of Jharkhand have peculiar physical characteristics *viz*. small in size and less in height. conservation and improvement of this germplasm should be taken up immediately.
2. Indigenous cattle of Jharkhand serve livelihood of small and marginal rural farmers as even the cows are utilized for various agricultural practices. They can be kept easily at very low maintenance and input cost.

6. References

1. Banerjee GC. A Text Book of Animal Husbandry. 7th edition. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, Calcutta. India, 1991, 90-101.
2. Basu SB, Bhatnagar DS, Taneja VK. Indian J Anim. Sci. (Cited in Characterisation and Description of Tharparkar Breed, National Bureau of Animal Genetic Resources, Karnal, India. pp. 3)*. 1982;52:279-283.
3. Bhat PN, Sharma BS, Garg RC. Indian J Anim. Sci. (Cited in Characterisation and Description of Tharparkar Breed. National Bureau of Animal Genetic Resources, Karnal, India. pp. 3)*. 1980;50:542-547.
4. Bhatnagar DS, Sharma RC, Gurnani M, Sundaresan D. The Kamal Sahiwal and Red Sindhi Cows, National Dairy Research Institute, Karnal, India, 1979.
5. Bhusan S. Productive, reproductive and draft traits of Hariana cattle and their comparison with cross bred and other zebu cattle. The Indian Cow. 2005 Oct-Dec, 28-31.
6. Bindu Madhuri S, Suman CL. Reproduction and production performance of two breeds crosses in cattle. Indian Veterinary Journal. 2008;85(10):1051-1053.
7. Bindu Madhuri S, Suman CL, Pandey HS. Reproduction and production performance of three-breeds crosses in cattle. Indian Journal of Animal Research. 2009;43(1):267-271
8. Das D. Performance of indigenous and crossbred cattle under the agro-climatic condition of Assam, India. Proceedings, VI 11 World Conference on Animal Production. 1988) 502. Finnish Animal Breeding Associations; Helsinki; Finland, 1988.
9. Dahiya SP, Kumari V. Conservation and development of indigenous cattle: A socio-economic appraisal. The Indian Cow, 2011 27Jan-March, 17-22.
10. Dairy India. Fifth Edition. Ed. P. R. Gupta, New Delhi, 1997.
11. Das NG. Statistical method in commerce, accountancy and economics (part - I). M. Das & Co., Calcutta, 1989, 120.
12. Desai RN, Dutt M. Relationship between physical character and milk yield in Hariana cattle, Indian Vet. J. 1963;40:266-72.
13. Deshpande KS, Deshpande AP, Raj Kumar SR. Genetic studies on lactation yield of Jersey cows. Livestock Advisor. 1995;20(3):25-27.
14. Dutt M, Singh BP. Some Phenotypic aspects of butter fat yield of Hariana cattle. Indian Vet. J. 1971;48:153-159.
15. Dangi PS, Singh R, Pundir RK, Singh A, Chaudhary C, Verma NK. Study of various performance traits in Rathi cattle. Indian Journal of Animal Research. 2013;47(4):321-326.
16. Das M, Baruah DK, Buragohain SC, Borgohain A. Economic traits of crossbred and indigenous cattle of Assam. Indian Veterinary Journal. 2012;89(9):88-89.
17. Dash SK, Rao PK, Mohanty RC. Genetic studies of Binjharpuri cattle of undivided Cuttack district of Odisha. Journal of Research, Orissa University of Agriculture and Technology. 2010;28(1&2):32-37.
18. Dash SK, Sethi BP. Cattle genetic resources of Orissa – Motu. Orissa Livestock Resources Development Society (OLRDS) and Orissa University of Agriculture and Technology, Bhubaneswar, 2007.
19. Dash SK, Sethi BP, Rao PK, Prakash B. Evaluation and cytogenetic profiling of Binjharpuri cattle of India in its native tract. Journal of Livestock Biodiversity. 2010;2(2):59-63.
20. Dash SK, Sethi BP, Rao PK. Evaluation of Binjharpuri cattle of India in the nativetract. International Journal Livestock Production. 2013;4(7):102-105.
21. Deepika, Salar RK. Genetic Diversity and Relationship among Ghumusari, Binjharpuri and Hariana Breeds Using Microsatellite Markers. Indian Journal of Dairy Science. 2013;66(4):294-302.
22. Devasahayam M, Mecarty SD. Increased milk yield from Sahiwal - Friesian cross breed cattle using a two milking management system between 2002-2005.The Indian Cow, 2010 April-June, 41-50.
23. Dhal BK, Patro BN, Rao PK, Panda P. Khariar cattle-An indigenous germplasm of Nuapada in the undivided Kalahandi district of Orissa. Indian Journal of Animal Science. 2007;77(9):889-893
24. Dhara KC, Ray N, Sinha R. Factors affecting production of F1 crossbred dairy cattle in West Bengal. http://www.lrrd.org.Livestock Research for Rural Development.18 (4) EFSA Panel on Dietetic Products Nutrition and Allergies. NDA Journal. 2006;7(9):1210.
25. FAO (Food and agriculture Organisation of the United Nations). The technology of traditional milk products in developing countries. FAO Animal Production and Health Paper. 1999;85:333
26. Falconer DS, Mackay TFC. Introduction to Quantitative Genetics, Fourth Edition. Pearson Education Limited, 2009.
27. Ganapathi P, Kumar V, Rajesh NV. Production and reproduction performance of endangered Bargur cattle under the field conditions of Tamil Nadu. International Journal of Food, Agriculture and Veterinary Science. 2013;3(1):207-209.
28. Ganapathi P, Rajendran R, Subbramaniam A, Meenakshisundaram S. Bargur cattle-characterization and management practice. Indian Veterinary Journal. 2013;90(11):9-10.
29. Gaur GK, Kaushik SN, Garg RC. Ongole cattle status in India. Animal Genetic Resources Information. 2002;32:27-34.
30. Gaur GK, Singh A, Singh PK, Pundir RK. Morphometric characteristics and present status of Ponwar cattle breed in India. Animal Genetic Resource Information. 2004;34:17-25.
31. Government of India Ministry of Agriculture Department of Animal Husbandry, Dairying & Fisheries,19th Livestock Census-2012. All India Report.
32. Johar KS, Taylor CM. Variation in lactation yield of Tharparkar, Hariana and Malvi cows. Indian Vet. J. 1971;50:1099-1102.
33. Joshi BK, Singh A, Gandhi RS. Performance evaluation conservation and improvement of Sahiwal cattle in India. Animal Genetic Resources Infonnation, No. 2001;31:43-54. III

34. Joshi RK. Study of some production traits in Rathi cattle and their crosses. M. V. Sc. Thesis. Rajasthan Agricultural University, Bikaner, 1989.
35. Haldar A, Prasad J, Dattagupta R. Birth weight of crossbred calves in sub-tropical region of Uttar Pradesh. Indian Journal of Animal Health. 2002;41(2):118-122.
36. Hussain J, Roychoudhury R, Mili DC. Production performance of dairy cows under field condition of Assam. Indian Journal of field Veterinarians. 2011;6(3):63-64.
37. Khan HM, Kachwaha RN. Lifetime Performance of Rathi Cattle at an organized farm. Indian Journal of Animal Research. 2008;42(3):186-190.
38. Katiyar SS, Singh C, Katiyar MP. Effect of parity of some productive and reproductive traits in Sahiwal cattle (80S indicus), Indian J Anim. Reprod. 1993;14:30-31.
39. Khan UN, Olsson A, Philipsson J. Sahiwal 8reed Development in Pakistan. Animal Production and Rural Development. Proceedings of the 6th A.A.A.P. Animal Science Congress. (Edited by Bunyavejchewin, P.; Sangdid, S. and Hangsanot, K.). 1992;1:171-178.
40. Khanna MC, Bhatnagar DS. Age at first calving, expected producing ability and breeding efficiency in Sahiwal and their Brown Swiss crosses. Indian J heredity. 1986;18:11-17.
41. Koul GL. Age at first calving, Calving intervals and their relations with milk yield in Hariana cattle. Indian J. Dairy Sci. 1987;40:169-173.
42. Khirari BP, Bharambe VY, Burte RG. Physical and morphological characterization of non descript cattle in Ratnagiri district of Kokan region of India. Livestock Research International. 2014;2(1):16-18.
43. Kumar A, Singh U, Singh RP, Khanna AS. Genetic and non genetic variability in selective value of Hariana cows. Indian Journal of Animal Science. 2009a;79(4):388-391
44. Kumar A, Singh U, Mehera ML, Mathew S. Performance of crossbred cattle under field condition. Indian Veterinary Journal. 2009b;86(1):40-43.
45. Kumar D, Verma SB, Singh SR, Mandal KG, Pandey PR. Effect of non genetic factors on dry period and age at first calving in Haryana and its crosses. Indian Journal of Animal Health. 2005;44(2):99-102.
46. Kumar P, Bhusan B, Sharma A. Hariana: An important dual purpose breed of India. The Indian Cow. 2007a, July-Sept, 34-37.
47. Kumar P, Bhusan B, Sharma A. Cattle genetic resources of India and their conservation. The Indian Cow. 2007b, July-Sept, 45-49.
48. Kumari V, Dahiya SP. Conservation and development of indigenous, 2011.