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Studies on body measurement of Kathani cattle in Goregaon Tahsil of Gondia district

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Abstract
The primary data pertaining to phenotypic appearance breed characteristics and biometric measurements of Kathani cattle were collected from 10 villages in Goregaon Tahsil of Gondia district, by interviewing the cattle owners with help of questionnaires and measurement of 200 Kathani cattle belonging to age group up to 1 year, 1 to 2 year, 2 to 3 years and above 3 years.
The population of female was higher in all age groups. The Kathani cattle were of small size, light built and having compact body. Body coat colour were mostly white colour and muzzle, hoof, eyelid and tail switch were mostly black and horn colour was grey. The horns were medium and curved like shape and orientation of horn was outward and upward. The ears have horizontal orientation. The forehead was medium with straight profile. The body characteristics such as hump as well as dewlap were medium in size and navel flap was small in size. The udder was mostly in bowl shape, teat shape was mostly cylindrical shape and milk vein was small in size. The average body weight in Kathani cattle for different age group were found to be 43.26±1.03 (up to 1 year), 71.10±1.85 (1 to 2 year), 112.97±3.04 (2 to 3 year) and 215.96±2.92 (above 3 year) kg, respectively. In biometric measurement average length of neck was 41.90±0.35 cm, chest girth was 142.86±1.24cm, body length was 113.10±0.60 cm, length of tail was 76.00±1.80 cm and height at wither was 115.04±0.72 cm. The lactation performance of average lactational milk yield was obtained to be 520.61±21.59 kg, with average lactation period as 153.21±1.81 days and lactational milk yield per day was 2.95±0.17 kg.

Keywords: Kathani, phenotypic, body characteristics, chest girth, length of neck

Introduction
Indian cattle population is an integral part of the agriculture. Thus, the cattle occupy central position and are basis of the Indian rural livelihood security. The cattle biodiversity in India constitutes 41 well defined breeds of cattle, 13 breeds of buffaloes, 28 breeds of goat and 42 breeds of sheep (Anonymous, 2018) [2]. India ranks first among the world's milk producing nations since 1998 and has the largest bovine population in the world.
The geographical data indicated thriftiness of Kathani cattle 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), respectively. Having deep and thick forest in these districts (locally known as zadipatti districts-an area of forest and trees), 72 per cent area being under southern tropical dry deciduous forest, including tree varieties like Sag, Halda, Tinsa, Shisham, Mahua, Bamboo, and Teak and 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. Major rivers are Wainganga, Wardha, Gadhvi and Kathani flowing through these districts. The cereal crop like rice, sorghum, wheat, maize, and kodo (millet) are cultivated and used as staple food Cash crops like cotton and soybean are also found cultivated (Kulkarni, *et al*., 2013) [6].
There are some threats to livestock diversity like, genetic dilution due to a crossbreeding with exotic breeds especially in indigenous cattle, sheep, pig and poultry. Loss of superior germplasm attributed to uncontrolled breeding and migration. Increased mechanization lowering the demand for draft animal power. Continuous/declining populations of some breeds. Changing production system lending to intensive monoculture. Gap between demand and supply of fodder and grasses for livestock under prevailing production system. Higher human population pressure on land and other natural resources. Shrinking grazing areas in forests or revenue lands. Increased pollution and degradation of environment due to higher degree of urbanization. Species competition for food and space for small holder. Changing rural-agricultural based social systems, habitat erosion and loss of grazing land emerging

diseases and disasters are another reasons for livestock diversity erosion, changing markets and changes in consumer demand (Gandhi and Sharma, 2016).

Material and Methods

The data on body measurement of Kathani cattle were used for present investigation from village Goregaon, Soni, Kalimati, Tedha, Chopa, Mundipar, Hirapur, Tumkheda, Hirdamali, and Pandhari of Goregaon tahsil of Gondia district. Body measurements were taken by direct measurement of different body parts of 200 Kathani cattle belonging to different age group in their native tract. The data was categorized in the following age groups.

The data was categorized in the following age groups.

Sr. No.	Group	Age between (years)
1	A	Up to 1
2	B	1 – 2
3	C	2 – 3
4	D	3 year and above (Adult female)

Body measurements

1. Chest girth

Chest girth was recorded by measuring as minimum circumference around barrel ventrally behind elbow and dorsally behind point of withers.

2. Body length

Body length was the horizontal distance from the point of shoulder to the pin bone of same side.

3. Height at wither

Height at wither was taken as the vertical distance from highest point over the wither to the ground. While measuring, the animal was made to stand on level ground.

4. Length of tail

The tail length was measured from base to the tip of the tail.

5. Length of neck

It is the upper most line of neck and it starts the head crest to hump and measured accordingly.

Result and Discussion

Body measurements

Chest girth, body length, height at wither, tail length and neck length of the animals are the indicator of body growth and production capacity of animal. The frequency distribution of body measurements.

1. Chest girth

The mean values of chest girth along with standard error of Kathani cattle according to different age group are presented in Table 1.

It is presented that in the age group of up to 1 year, average chest girth was found to be 95.18±1.49 cm followed by 1 to 2 years as 112.96±1.27, 2 to 3 years age group as 119.78±1.02 cm. The chest girth was progressively increased with the age. Average chest girth of cattle of the age group in above 3 years was found to be 142.86±1.24cm.

Table 1: The mean value of chest girth of Kathani cattle (cm)

Sr. No.	Age group (year)	No. of animals	Chest girth (cm)		Average ± S.E.	S.D.
			Max	Min		
1	up to 1 year	50	108	71	95.18±1.49	10.57
2	1 to 2 years	50	118	84	112.96±1.27	9.01
3	2 to 3 years	50	126	106	119.78±1.02	7.25
4	Above 3 years	50	165	130	142.86±1.24	8.78

The present trends on chest girth are similar with result of Kunghadkar (2017) [7] she reported chest girth of young calve (up to 1 year) was found to be 90.99±1.04 cm and in mature cattle (above 3 years) it was found to be 149.95±1.52 cm in Kathani cattle in Chamorshi tahsil of Gadchiroli district. Rannaware (2016) [12] who observed chest girth of young calve (up to 1 year) was found to be 95.18±1.49 cm and in mature cattle (above 3 years) it was found to be 142.86±1.24 cm in Kathani cattle in Armori tahsil of Gadchiroli district. Yadav (2008) [16] who observed chest girth of calves as 75.78±0.96 and above 3 years adult females as 152.24±1.05 cm in Deoni cattle. Pundir *et al*. (2007) [10] observed chest girth as 142.0±1.1 cm in Kenkatha breed in its native tract. Nivsarkar *et al*. (2000) [8] reported that the average chest girth as 173 cm in Gaolao cattle.

2. Body Length

The mean values of length of body along with standard error of Kathani cattle according to different age group are presented in Table 2.

In the age group up to 1 year the body length observed to be 76.14±1.09 cm followed by 1 to 2 years as 81.16±1.13, 2 to 3 years age group as 93.03±1.17 cm. The body length progressively increased. In the age group of above 3 years (adult female), length of body was observed to be 113.10±0.60 cm.

Table 2: The mean values of body length of Kathani cattle (cm)

Sr. No.	Age group (year)	No. of animals	Body length (cm)		Average ± S.E.	S.D.
			Max	Min		
1	up to 1 year	50	86	60	76.14±1.09	7.73
2	1 to 2 years	50	89	64	81.16±1.13	7.99
3	2 to 3 years	50	101	70	93.03±1.17	8.33
4	Above 3 years	50	117	101	113.10±0.60	4.25

The present finding is closely agreement with Kunghadkar (2017) [7] observed average body length up to 1 year was 74.61±1.01 and above 3-year adult cow was 112.80 ±0.68 cm of Kathani cattle. Pundir *et al.* (2015) [13] who observed average body length was 101.14+0.46 cm of three different indigenous cattle populations from north east states of India.

Kulkarni *et al*. (2013) [6] who observed body length up to 1 year was 87.66±1.60 and above 3 year adult cow was 113.19±0.70 cm in Kathani cattle of Vidarbha region in Maharashtra state. Nivsarkar *et al*. (2000) [8] reported that the average body length as 125 cm in Gaolao cattle.

3. Height at wither

The group wise mean height at wither along with S.E. of Kathani cattle according to different age group are presented in Table 3.

Data presented in Table 3 that average height at wither in the age group of up to 1 year was 84.31±0.79 cm. As the age advances, the wither height of cattle also increased. In above 3 years (adult female) group of cattle, wither height was increased up to 115.04±0.72 cm.

Table 3: The mean values of height at wither of Kathani cattle (cm)

Sr. No.	Age group (year)	No. of animals	Height at withers (cm)		Average ± S.E.	S.D.
			Max	Min		
1	up to 1 year	50	92	73	84.31±0.79	5.62
2	1 to 2 years	50	94	75	85.62±0.82	5.80
3	2 to 3 years	50	104	79	93.68±1.10	7.79
4	Above 3 years	50	123	105	115.04±0.72	5.15

The present trends on height at withers are similar with results of Kunghadkar (2017) [7] who observed height at wither of adult cow as 113.18±1.16 cm in Kathani cattle. Kulkarni *et al*. (2013) [6] who observed height at wither of adult cow as 105.77±0.79 cm in Kathani cattle of Vidarbha region in Maharashtra state. Similar result was also reported by Singh *et al*. (2012) who observed height at wither of below 1 year age group as 68.98±1.54 cm and adult cow as 112.27±0.79 cm in Pulikulam cattle of Tamil Nadu, Pundir *et al*. (2009) [11] observed the height at wither as up to 1 year animal as 80.50±2.05 cm and adult cow as 108.36±0.80 cm in Bargur cattle.

4. Length of tail

Table 4: The mean value of tail length of Kathani cattle (cm)

Sr. No.	Age group (year)	No. of animals	Tail length (cm)		Average ± S.E.	S.D.
			Max	Min		
1	up to 1 year	50	54	36	44.82±0.76	5.39
2	1 to 2 years	50	65	40	50.95±0.91	6.45
3	2 to 3 years	50	80	54	73.03±0.91	6.46
4	Above 3 years	50	95	56	76.00±1.80	12.74

It was indicated in Table 4 that the tail of Kathani cattle was short as compared to other cattle. At the age of up to 1 year, the average tail length was 44.82±0.76 cm. While, with increasing the age the tail length, slightly increased up to adult stage. In above 3 years (adult female) age animal, length of tail was found to be 76.00±1.80 cm.

The tail length reported by Kunghadkar (2017) [7] who recorded that length of tail was 74.80±1.93 cm in Kathani cattle. Rannaware (2016) [12] who recorded that length of tail was 70.26±1.36 cm in Kathani cattle. Kulkarni *et al*. (2013) [6] who observed length of tail as 68.82±0.66 cm in Kathani cattle of Vidarbha region in Maharashtra state. Similar result was found by Tolenkhomba *et al*. (2012) [15] who recorded the tail length in local cow of Manipur was 75.50 ± 0.55 cm. Pundir *et al*. (2009) [11] who observed the length of tail in up to 1 year age as 44.50±2.17 cm and adult female as 62.42±1.33 cm in Bargur cattle and Pundir *et al*. (2007) [10] observed the length of tail as 76.1±1.02 cm in Kenkatha breed in its native tract.

5. Length of neck

Table 5: The mean value of neck length of Kathani cattle (cm)

Sr. No.	Age group (year)	No. of animals	Neck length (cm)		Average ± S.E	S.D.
			Max	Min		
1	up to 1 year	50	34	22	28.24±0.57	4.08
2	1 to 2 years	50	36	26	31.73±0.46	3.31
3	2 to 3 years	50	42	33	38.68±0.42	3.02
4	Above 3 years	50	45	37	41.9±0.35	2.59

The data indicated in Table 5 showed that average length of neck of age group up to 1 year was 28.24±0.57 cm. The length of neck was increase progressively with increasing in age. Average neck length of cattle of age group 1 to 2 years was 31.73±0.46 cm, 2 to 3 years was 38.68±0.42 and 41.9±0.35 at above 3 years age group (adult female).

The present trends of study are in agreement with the result reported by Kunghadkar (2017) [7] who recorded that length of neck was 42.93±0.42 cm in Kathani cattle. Tolenkhomba *et al.* (2012) [15] analysed that the average neck length was 29.95 ± 0.21 cm in local cow of Manipur. Kayastha *et al.* (2010) [4] noticed neck length in indigenous cattle of Assam was 32.705 ± 0.166 cm.

Conclusions

The Kathani cattle is mainly confined to Goregoan tahasil of Gondia district are small size, light built and having compact body and suited for working in muddy paddy field in the deep forest. The importance of Kathani cattle lies in their drought power capacity, heat tolerance, disease resistance, adoptability to harsh agro-climatic condition and ability to survive and perform under scarce feed and fodder. The

lactation performance of Kathani cattle is not satisfactory and can be considered as drought purpose having higher biological potential for improvement in production. By adopting selective breeding, scientific feeding and management, the performance can be increased under field condition. This work will be useful in future for recognition of Kathani cattle.

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