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Morphometric characteristics of Pulikulam Cattle breed in a nucleus herd

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Abstract

Morphometric study of Pulikulam cattle breed was undertaken from the nucleus herd of 50 Pulikulam animals of different age groups maintained at Pulikulam Cattle Research Station, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS), India. A total of 4 different age groups were considered for this study. The morphological features of Pulikulam cattle showed that these animals have distinct appearance. Different Morphometric characteristic like wither height, body length, hip width, thurl width and rump width were studied. Pulikulam cattle are relatively smaller in size, the mean wither height for Pulikulam animal at 24-30 months, 36-42 months, 48-54 months and adult bull were 111.67 ± 1.44 cm, 111.07 ± 1.38 cm 112.40 ± 0.74 cm and 121.26 ± 0.84 cm respectively. It is concluded that the variation in the morphometric characteristics in different cattle breeds are due to environmental factors, feeding pattern and other management practices which affects genetic makeup of growth traits of cattle.

Keywords: Body length, morphometric character, native cattle breed, pulikulam cattle, wither height

Introduction

India is an agricultural country and 75% of the Indian population live in rural areas and depend on agriculture and its related enterprises. Due to unsteady monsoon, many of the rural population depend on animal husbandry activities for their regular income. Livestock sector contributes 4.11% of total Indian GDP. As per the 2019 livestock census, India has 192 million cattle. National Bureau of Animal Genetic Resources, India registered 50 Indigenous cattle breeds. Pulikulam Cattle breed is primarily a draught breed, small in size and capable of endurance activities and reared in the southern part of Tamil Nadu, India ^[1]. This breed is locally popular for its vigour and can sustain even under feed and fodder scarcity. Reddish or brownish tinge present in any one or more points in muzzle, eyes, perineum, switch and back of Pulikulam cattle ^[2]. The Pulikulam herd is mainly used for penning in the agriculture field. The Pulikulam bulls are vigorous and difficult to control, so are mainly reared for bull baiting or bull raiding games. The Pulikulam cattle have moderately long face, well developed hump which is short in female and large in male. Horns are long, curved inside with pointed edge. Ears are moderately long. The studies on morphometric measurement of indigenous cattle breeds of India are very scanty. However, morphometric characteristics of Indigenous cattle breeds were studied by some authors ^[3, 4]. In case of Pulikulam cattle breed very minimal work has been documented. Considering aforesaid facts, this study was carried out to determine the morphometric characteristics of Pulikulam cattle breed reared in nucleus herd.

Materials and methods

The study was conducted in Pulikulam Cattle Research Station, Manamadurai a constituent unit of Tamil Nadu Veterinary and Animal Sciences University, Chennai. The morphological measurements were taken from 50 Pulikulam animals being maintained at the station with different age and sex. All the animals are being maintained under similar feeding and management system throughout the year. Green fodder, paddy straw and concentrate feeds are given depending upon the milk yield and body weight. Animals were vaccinated regularly according to prevailing diseases and dewormed depending on parasitic load. All the measurements were taken in daytime, with animal standing on an even surface under natural condition. Morphological traits were recorded in the prescribed format of National Bureau of Animal Genetics Resources (NBAGR, Karnal). Body measurements were measured with the help of the standard metallic tape. Animals are of different age and sex and the number of observations was different for each class.

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The data were analyzed to calculate mean and standard error amongst different physical and morphometric characters as per the standard statistical procedure.

Results and Discussion

Description of different Morphometric measurements of Pulikulam Cattle is given in Table 1

Table 1: Description of different Morphometric measurements of Pulikulam Cattle

Wither height	Vertical distance between the fetlock and the point of wither
Body length	Distance between point of shoulder to pin bone
Hip width	Distance between two hip bones
Thurl width	Distance between hip bone to pin bone
Rump width	distance between the most posterior point of pin bones

Morphological features

Pulikulam Female is predominantly grey colour male is mostly black colour some time grey patches also noticed.

Detailed morphological features of Pulikulam cattle are given in Table 2.

Table 2: Morphological features of Pulikulam Cattle

Body part	Features
Body Colour	Female is predominantly grey colour male is predominantly black colour some time grey patches also noticed
Skin	Soft and pliable
Body	Symmetrical with well developed body and muscles
Forehead	Long and narrow
Horn	Long curved inwards and pointed
Eye balls and eye	Black and white
Ears	Small, pointed
Muzzle	Mainly black in colour
Chest	Narrow for female and wider for male
Legs	Straight, narrow but strong legs
Hump	Well developed for male and short in female
Udder	Small and not well developed mammary gland
Hoof	Black in colour

Wither height

The mean wither height of Pulikulam female animals in respective age groups and sex are given in Table 3. The mean wither height of Pulikulam female animals at 24-30 months, 36-42 months, 48-54 months and adult bull were 111.67±1.44 cm, 111.07±1.38 cm 112.40±0.74 cm and 121.26±0.84 cm respectively. The height at wither of adult male and female Deoni cattle was 134.36±2.03 cm and 122.22±1.23 cm,

respectively [5]. The mean wither height of Kangayam was 139.8 cm for bullock and 124.9cm for cows [6]. The height at wither of adult Red Chittagong cattle female was 107.71cm [7]. Wither height of North Bengal Grey cow was 93.91 cm [8]. The least squares mean of height at wither of Khillar calves for male and female calves were 78.80 ± 0.87 and 77.78 ± 0.87 cm, respectively [16]. The mean height at wither of Jabres cattle of Indonesia was 115.57 cm [17].

Table 3: Morphometric measurements of Pulikulam Cattle for different age groups (cm)

Age group	Wither height	Body length	Hip width	Rump width	Thurl width
24-30 months Female	111.67±1.44	103.33±0.76	30.33±0.58	22.33±0.58	29.49±1.55
36-42 months Female	111.07±1.38	103.36±0.91	30.39±0.25	22.39±0.69	29.71±0.74
48-54 months Female	112.40±0.74	109.40±0.93	30.88±0.28	22.40±0.24	30.78±0.30
Bullock	121.26±0.84	118.26±0.92	33.45±0.25	28.45±0.35	33.67±0.27

Body length

Data on body length of Pulikulam female animals and adult bulls are given in Table 3. The mean body length of Pulikulam female animals at 24-30 months, 36-42 months, 48-54 months and adult bulls were 103.33±0.76 cm, 103.36±0.91 cm 109.40±0.93 cm and 118.26±0.92 cm respectively. The body length of Pulikulam heifer, cow and bullock were 101cm, 114.53cm and 119.17cm respectively [9] which was similar to this finding. The body length of Ongole cattle at 60 months of age was 144.11 cm [10]. The mean body length of Red Chittagong cattle was 114.38 cm which is almost similar to this study [11]. The mean body length of Ponwar cow and bullock were 97.1 cm and 102.5 cm respectively [12]. The mean body length of Deoni cow and bullock were 120.11 cm and 129.59 cm respectively [5] which was lower than the cows reared in the organised herd. The mean body length of Deoni cow in organised herd was 132.2

cm [13]. The body length of Kangayam bullock and cow were 144.9 cm and 131.2 cm respectively [6]. The least squares mean of body length of male and female Khillar calves were 63.49 ± 0.95 and 62.94 ± 0.95 cm, respectively. The body length of Khillar male was higher than female calves [16]. The mean body length of Jabres cattle of Indonesia was 109.73 cm [17].

Hip width

The hip width of Pulikulam female animals was almost similar in all age groups (Table 3). The mean hip width of Pulikulam female animals for the age groups 24-30 months, 36-42 months, 48-54 months and for adult bull were 30.33±0.58 cm, 30.39±0.25 cm, 30.88±0.28 cm and 33.45±0.25 cm respectively. Hip width of Red Chittagong Cattle was 29.58 cm [14] was similar to Pulikulam cattle. At 31-36 month age group it was 26.31 cm and 26.57 cm in 43-

48 months age group. Bangladeshi cattle hip width was 33.21cm in more than 2 years of age group ^[15] which was higher than that for Pulikulam animal.

Rump width

The rump width data of Pulikulam female animals and adult bull in different age group is given in Table 3. The mean rump width for 24-30 months, 36-42 months, 48-54 months in female animals and adult bulls were 22.33±0.58 cm, 22.39±0.69 cm, 22.40±0.24 cm and 28.45±0.35 cm respectively. Mostly rump width is similar among all age group animals. The mean rump width of Jabres cattle of Indonesia was 11.59 cm ^[17].

Thurl width

The measurement of thurl width of Pulikulam female animals and adult bulls in different age group is given in Table 3. The mean thurl width for 24-30 months, 36-42 months, 48-54 months in female animals and adult bulls were 29.49±1.55 cm, 29.71±0.74 cm, 30.78±0.30 cm and 33.67±0.27 cm respectively. Thurl width of Red Chittagong cattle at 25-30 months, 37-42 months and 49-54 months age groups were 26.44cm, 29.60cm and 33.30 cm respectively ^[14]. Thurl width of Bangladeshi native cattle is 30.07 cm at 2years of age which is similar to Pulikulam cattle and Red Chittagong cattle.

Conclusion

Pulikulam cattle are one of the native cattle breed of India mostly reared in southern part of Tamil Nadu. It is draught cattle mainly famous for its vigour. In this study, morphometric measurement of adult Pulikulam cattle was compared to other native cattle breeds of India and Bangladesh. Variation in the morphometric characteristics in different cattle breed are due to environmental factors, feeding pattern and other management practices which affects genetic makeup of growth traits of the cattle.

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