INDIGENOUS ZEBU CATTLE OF SRI LANKA: PHENOTYPIC CHARACTERISTICS, GROWTH PERFORMANCES AND REPRODUCTIVE PATTERN OF THE FEMALE

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ABSTRACT

Cattle and buffalo farming in Sri Lanka forms a major component of the livestock sector and its contribution to the Gross Domestic Product is in the range of 1 to 2%. Indigenous Zebu cattle comprise 65% of the national cattle population of 1.7 million. The objectives of this study were to assess the phenotypic and reproductive characteristics of indigenous cattle at three locations in the dry zone: Anamaduwa, Bandagiriya and Kandalama.

The colour of the animals was either mono (brown predominating, 25.8%) or mixed (brown or black with white predominating, 26%). In mature animals, the average body measurements were: *a).* body weight 187.1 ± 24.0 kg; *b).* body length 128.4 ± 8.5 cm; *c).* height at withers, hip and pinbones 101.1 ± 4.2 cm, 107.3 ± 4.6 cm and 93.6 ± 4 cm, respectively; *d).* body widths at hip, thurls and pinbones 33.6 ± 2.1 cm, 33.5 ± 2.0 cm and 18.3 ± 1.1 cm, respectively; *e).* body depth at chine and loin 53.4 ± 3.2 cm and 48.6 ± 3.6 cm, respectively; *f).* body circumferences at chest, last rib and loin 129.3 ± 6 cm, 162.5 ± 10.1 cm and 128.2 ± 9.2 cm, respectively; *g).* depth of dewlap 10.8 ± 2.8 cm; *h).* length and width of face 39.7 ± 1.6 cm and 15 ± 1.4 cm, respectively and *i).* length and width of ears 18.1 ± 1.7 cm and 8.5 ± 1.2 cm, respectively. Both polled and horned animals were found and in horned animals, the average length of horns was 9.3 ± 0.3 cm. Horns were found to be straight or curved and their directions highly varied.

Calvings showed a strong seasonality with 65% occurring from October to January. It was highly correlated with the rainfall (r=0.85). The average calving interval was 342 ± 39.4 days. The average birth weight was 15.8 ± 2.5 kg. The average prepubertal growth rate

was 106.7 ± 207.5 grams/day. Growth rates varied with the month of the year ($P<0.05$) and were positively correlated with the monthly rainfall ($r=0.24$).

The average age at puberty was 874 ± 85 days. Prior to the first oestrous cycle, 41.5% of animals showed a small plasma progesterone elevation. The age at first observed oestrus was 926 ± 119 days and 78% of heifers conceived at the first oestrus. The mean ages at first conception and calving were 963 ± 143 days and 1241 ± 143 days, respectively. The average gestation length was 279 ± 3 days and cows were found to have longer gestation lengths than heifers ($P<0.05$).

The postpartum uterine involution was completed by 20 ± 2 days and the first palpable corpus luteum was detected at 36 ± 16 days. The mean length of cervix was 3.1 ± 0.3 cm and the mean external diameters of uterine body, horns and cervix were 2.1 ± 0.3 cm, 1.5 ± 0.1 cm, and 2.2 ± 0.4 cm, respectively. The dimensions of the left and right ovaries were 1.3 x 1.0 x 0.8 and 1.4 x 1.2 x 0.9 cm, respectively.

At Anamaduwa, Bandagiriya and Kandalama, the interval from calving *a).* to first elevation of plasma progesterone concentrations above 0.5 ng/ml was 53 ± 44, 84 ± 48 and 62 ± 29 days, *b).* to first observed oestrus was 65 ± 90, 83 ± 48 and 69 ± 30 days and *c).* to conception was 52 ± 57, 87 ± 52 and 73 ± 41 days, respectively. In 23.4% of animals, the first ovulation was preceded by a small short term elevation of plasma progesterone and 90.5% of cows conceived at the first postpartum oestrus.

Following hormonal induction of oestrus with progesterone implant, height and width of vulval lips gradually increased to reach the maximum at 48 to 84 hours post implant

removal (PIR) and returned to normal size by 132 to 168 hours PIR. The vaginal temperature was low in the morning and high in the evening ($P<0.05$). Vulval swelling and reddening and vaginal discharge appeared first at 12 hours PIR, reached the maximum intensity by 48 to 96 hours PIR and disappeared by 192 hours PIR.

Behavioural changes of oestrus shown by more than 10% of the animals were sniffing the vulval region or urine of other animals, head butting, and licking and rubbing each other and these were first observed by 12 hours PIR. Riding behaviour, raising the tail-head and standing to be mounted appeared first at 24 hours PIR. The number of animals showing behavioural changes gradually increased to a maximum between 48 and 84 hours PIR and declined gradually thereafter. Oestrus was expressed strongly in 51% of the animals, moderately in 27%, poorly in 15% and absent in 7%. The average lengths of luteal phases of the induced and natural oestrous cycles were 15 ± 3 days and 14 ± 3 days, respectively. The mean length of the oestrous cycle was found to be 20 ± 2 days.

In conclusion, Lankan indigenous Zebu cattle are phenotypically very heterogeneous. They are small at birth, grow slowly, reach sexual maturity around 30 months and give the first calf by 42 months. They were found to be very fertile with an early resumption of postpartum ovarian activity and high calving rates. Fertility is affected by suckling and seasonal availability of pasture.