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Effect of the Summer Stress on Growing Cross-Bred (Kankrej x Jersey) and Kankrej Cattle

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To assess the effect of the summer stress on growing Kankrej x Jersey cross-bred males and pure-bred Kankrej heifers, a study was undertaken at the Veterinary College, Gujarat Agricultural University, Anand Campus Anand, from March 28, 1978 to June 28, 1978.

A completely randomised design was employed. The two treatments were—(T_1) providing shelter and (T_2) providing no shelter whatsoever. Each treatment had six cross-bred males and six pure-bred Kannkrej heifers.

During the period of study the mean maximum, mean minimum and mean ambient temperatures in open were 38.70° C, 23.82° C and 32.35° C respectively.

Cross-breds had lower heat tolerance than the Zebus according to the indices of Mullick (0.84 and 0.88), Benezra (2.22 and 1.51) and Thomas (1.60 and 1.29). The treatments significantly affected the respiration rate and pulse rate of the protected (39.79 and 80.22) and exposed (44.05 and 82.33) cross-bred males. Their rectal temperature however was not affected significantly.

The average daily body weight gain of the protected and exposed cross-bred males and Kankrej heifers was 760 and 661 g and 609 and 421 g respectively. The average dry matter intake per kg body weight gain of the four respective groups was 7.26 8.72 kg; 12.29 and 18.44 kg respectively. These two attributes were significantly affected by treatments.

The average daily total dry matter consumption by the sheltered and exposed cross-bred males and Kankrej heifers was 3.07 and 3.05 kg; and 2.36 and 2.25 kg per 100 kg body weight respectively. The same from the pasture grass hay for the respective groups was 1.66 and 1.60 kg; and 1.32 and 1.20 kg respectively. The differences however in both the cases were significant in case of Zebu animals only. This showed that providing shelter to cross-breds had no material advantage in this respect. All the experimental animals, irrespective of the breed groups and the treatments, had significantly higher consumption of pasture grass hay during night time than during the day time.

The mean daily water ingestion per 100 kg body weight of the protected and exposed cross-bred males and Kankrej heifers was 11.82 and 15.53 litres; and 9.34 and 10.83 litres respectively. It was significantly affected by treatments.

The protein bound iodine values of the protected and exposed cross-bred males and Kankrej heifers (5.54 and 4.96; and 5.90 and 5.15 kg per 100 ml respectively) were significantly affected by treatments. This shows that Basal Metabolic rate decreasd when no shelter was provided. The haemoglobin and total serum protein content were not significantly affected by treatments.

Ambient temperature and vapour pressure were the only climatic elements principally related with the different attributes studied.

The salient conclusions were—

(1) For climatic physiological studies under field conditions, observations on climatic elements can be taken either in the open or in the shed without losing precision.

(2) Kankrej animals are more heat tolerant than the Kankrej x Jersey half breds. Mullick's heat tolerance index is better indicator of the ability of the animals to gain weight under summer stress as compared to that of Benezra and Thomas.

(3) **Providing shelter increases the feed intake** efficiency of feed utilization and growth rate of the cross-breds and the Kankrej animals, beneficial effect being more marked in case of Kankrej animals.

(4) Cross-bred animals kept exposed, need to be provided with more drinking water.

(5) Sheltering has a significant effect on the protein bound iodine content of the blood of both the breed groups.

(6) Ambient temperature and vapour pressure markedly affect the physiological responses, rate of feed intake and growth rate of the animals.