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Adaptability of grazing Bunaji and Gudali cattle to stall feeding in a tropical university environment

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Abstract

The changing dynamics in feed availability, herder conflicts, and increasing land pressure make a shift from traditional extensive cattle management systems increasingly necessary. This study evaluated the adaptability of grazing cattle to stall feeding at the Teaching and Research Farm, University of Calabar, over seven weeks. Nine White Fulani (Bunaji) and Sokoto Gudali cattle were used in a longitudinal observational cohort design. Animals were fed Napier grass hay supplemented with *Nymphaea lotus* leaf meal (NLLM). Body weight (BW) was recorded weekly, while temperature and relative humidity (RH) were measured daily at 8 am, 11 am, 2 pm, and 5 pm. Temperature-humidity index (THI) was computed. Data were analysed using repeated measures ANOVA and correlation analysis. Body weight increased steadily from 178.74 kg (Week 2) to 199.63 kg (Week 7), indicating positive growth. Ambient temperature declined from 31.89°C (Week 2) to 29.04°C (Week 4), while RH increased from 70.25 % to 80.75 %. The highest THI (84.42) occurred in Week 2, coinciding with the highest temperature and lowest RH, when BW was lowest. Diurnally, peak temperature (33.63°C) and THI (87.27) occurred at 2 pm, significantly higher ($p < 0.05$) than morning values, indicating severe heat stress. Despite declining temperatures at 5 pm, THI remained elevated (83.45) due to high RH, suggesting delayed thermal relief. Correlation analysis showed a strong positive relationship between THI and temperature (r = 0.943). BW had a weak positive relationship with time (r = 0.220), indicating gradual acclimation. BW showed negligible relationships with THI (r = -0.031), temperature (r = −0.074), and RH (r = 0.142), suggesting that moderate heat stress did not impair growth. Overall, cattle gained approximately 20 kg over the study period, likely due to improved nutrition, compensatory growth, and inherent heat tolerance. Nighttime cooling (THI = 78.80 at 8 am) may have supported feed intake and rumination. The results showed that stall feeding supported weight gain and could serve as a viable alternative to extensive systems. However, heat mitigation strategies, such as shade, ventilation, and cooling, should be implemented, particularly between 2 pm and 5 pm, to reduce thermal stress and optimise productivity.

Keywords: Adaptability, cattle, Nympha lotus, stall feeding

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