

COMPARISON OF THERMOREGULATORY MECHANISMS IN HEAT SENSITIVE AND TOLERANT BREEDS OF *BOS TAURUS* CATTLE

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Two *Bos taurus* breeds with known differences in heat tolerance were tested under controlled conditions to evaluate heat tolerance. Romosinuano (**RO**) is a tropically adapted breed. Nine Angus (304 ± 7 Kg BW; **AG**) and nine RO (285 ± 7.5 Kg BW) steers from USDA-ARS, Brooksville, Florida were transported to the Brody Environmental Center at the University of Missouri. Steers were housed for 14 days at thermoneutrality (21C; **TN**) before 14 days of cyclic heat stress (**HS**; 26C night; 36C day). Rectal temperature and respiration rate were measured six times daily. Sweat rates at shaved sites were recorded on specific days. Blood samples were taken once a week. The RO maintained a lower respiration rate (20 bpm), sweat rate ($6 \text{ g/m}^2/\text{h}$), and rectal temperature (0.5C) than AG throughout TN. Both breeds increased sweat rate, respiration rate, and rectal temperature during HS, with AG retaining the higher levels. There were breed differences for serum prolactin, leptin, creatinine, and cholesterol, with AG being higher than RO. Serum leptin increased for both breeds with HS. Although there were no breed differences at TN, AG steers exhibited HS-induced increases in prolactin, creatinine, and cholesterol. However, these measures for RO were unaffected by HS. The present study has identified additional physiological and endocrine markers that may aide in the identification of *Bos taurus* sensitivity to heat. The reasons for these changes during heat stress remain to be determined.