



A011 Male Reproductive Physiology and Semen Technology

**Evaluation of thermal comfort, physiological and seminal parameters of buffaloes kept in artificial insemination center under tropical climate**

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The study evaluated the variation of thermal comfort indices, physiological parameters and seminal buffalo bulls kept in place of tropical humid climate (Koppen of Af) in Belém-PA. Ten bulls ( $55.0 \pm 8.9$  months;  $701.4 \pm 82.8$  kg) were kept in collective cages in Central Biotechnology of Animal Reproduction (UFPA) from April to August 2013, with free access to the trough and automatic drinking fountain. Inside the sheds three data loggers were installed to monitor the temperature (Ta) and relative humidity (RH). The temperature and humidity index (THI) within the bays (average of the three dataloggers 06h00 to 09h00 12h00 to 15h00) was calculated according to the formula:  $THI=(0,8Ta)+(RH/100)[(Ta-14,4)+46,4]$ . Every 25 days with respiratory rate (RR, mov / min), heart rate (HR, beats / min), rectal temperature (RT, ° C) and calculated the index of thermal comfort Benezra (ICB) were measured according to the formula: during the morning (6:00 a.m. to 9:00 a.m.) and afternoon (12:00 to 15:00). Semen was collected weekly and ejaculates subjected to physical and morphological evaluation. Data were analyzed using the general linear model of SAS software, version 9.3, with mean comparisons performed by Tukey test and correlations calculated the Pearson test. The level of significance was 5%. Ta and RH were averaged  $31.5 \pm 0.8^\circ\text{C}$  and  $81.3 \pm 3.8\%$ , respectively. The average value of THI within bays ranged between 75.9 and 83.4, above recommended for buffaloes. During the months of July and August, the values of RR, HR and ICB showed a significant increase, with  $28.9 \pm 3.3$  and  $27.6 \pm 3.4$  mov / min,  $66.9 \pm 2.6$  and  $65.6 \pm 2.4$  beats / min and  $2.25 \pm 0.15$  and  $2.19 \pm 0.15$  respectively, while the RT was reduced ( $38.1 \pm 0.5$  and  $37.8 \pm 0.7$  ° C, respectively). Regardless of the month, values of RR, HR, RT and ICB showed elevation of the morning to late, but always within the physiological range (Garcia et al., 2011. Brazilian Agricultural Research, v.46, p.1409-1414). The positive correlation between the average THI within the bays and RT (0.63,  $P < 0.001$ ) showed the rise of animal internal temperature due to the increase of Ta. The seminal parameters showed mean  $2.2 \pm 1.4$  mL for volume,  $1322.0 \pm 501.9 \times 10^6$  sperm/mL for sperm concentration,  $68.7 \pm 10.2\%$  for progressive motility,  $67.8 \pm 9.7\%$  for integrity of the plasma membrane,  $5.7 \pm 4.2\%$  for minor defects,  $13.9 \pm 7.0\%$  for major defects and  $19.7 \pm 8.7\%$  for total defects ( $P > 0.05$ ). The average THI within the cages correlated with plasma membrane integrity ( $-0.17$ ,  $P < 0.05$ ), indicating that Ta can have negative impacts on semen. Therefore, despite variations in thermal comfort, the thermoregulatory system enabled quickly offset the caloric gains, saving homeothermy without manifestation of heat stress and maintenance of sperm quality.