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A004 Physiology of Reproduction in Male and Semen Technology

Assessment of scrotal termography and semen quality in buffalo bulls (*Bubalus bubalis*) raised under humid tropical environment

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This study aimed assessing the surface temperatures of orbital area and scrotum of buffalo bulls using infrared thermography, monitoring the sperm quality over time and correlating surface temperatures to thermal comfort indexes. The experiment was conducted in humid tropical climate region, from April to August 2013, with maximum daily average of 31.5 ± 0,8°C, and relative humidity of 81.3 ± 3.8%. Ten water buffalo bulls (Bubalus bubalis, n=10) were maintained in an artificial insemination station (Cebran/UFPA, Castanhal-PA) and were evaluated each 25 days (morning: 6:00-9:00; afternoon: 12:00-15:00). Rectal temperature (RT, °C) was assessed using thermometry and surface temperatures of orbital area (ORB, °C) and scrotum (SCR, °C) were evaluated by infrared thermography. Semen was evaluated for volume, concentration, turbulence, vigor, progressive motility, sperm morphology and plasma membrane integrity, with eosin-nigrosine. Climatic data were continuously monitored and the Temperature and Humidity Index (THI) and the Index of Comfort of Benezra (ICB) were calculated. Variables with non-normal distribution were transformed to logarithmic scale. Analysis of variance was performed by the GLM SAS, version 9.3 (SAS, 2011). It was considered in the model shift (morning and afternoon) and month effects (April to August). For mean comparisons between shifts used F test and for multiple comparison of average monthly was adopted Tukey test. Correlations were calculated using Pearson test. In all analyzes was adopted $P<0.05$. The ICB ranged from 1.96 to 2.25 and significant differences were observed for shifts and over the months ($P<0.05$). The averages of surface temperatures were RT=38.2±0.5°C, ORB=36.1±0.8°C, SCR=33.3±1.1°C, which exhibited significantly differences for shifts and over the months ($P<0.05$). The gross motility and the sperm vigor were significantly different ($P<0.05$), and a quality decrease during the warmer months and higher THI was detected. The total sperm defects ranged from 17.6±6.2% and 21.2±8.2%, but no significant difference was observed ($P>0.05$). The THI showed positive correlations with ORB (0.72) and ESC (0.41) ($P<0.0001$), while the ICB was positively correlated with ESC (0.25; $P<0.0001$). Negative and significant correlation was found between ITU and sperm plasma membrane integrity (-0.17; $P<0.05$). Therefore, the surface temperatures of buffalo bulls and their semen quality are associated to temperature and humidity changes and suffer interference from climatic variations, justifying the management approaches to provide thermal comfort to animals in order to increase the semen quality.

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