

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

INFRARED MEASUREMENTS, PHYSIOLOGICAL RESPONSES AND HEAT PRODUCTION IN JERSEY HEIFERS

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Infrared thermography is a precise and noninvasive tool to measure the body surface temperature, and so heat stress. The traditional methods to measure the heat production in animals can be invasive and vary. There isn't a methodology specifying the best way to collect data with the thermographic camera. Therefore, the aim of this work was to evaluate the use of infrared thermography to measure heat production of Jersey heifers in different hours and days of evaluation. The experiment was conducted at UFGD, Dourados, MS, Brazil. Eight Jersey heifers allocated in pens, semi-covered, with natural ventilation were used to assess the thermographic images and physiological parameters. Data were collected during 5 days (Day 1, Day 2, Day 3, Day 4, Day 5), in different hours (Hour 1 = 6:00; 7:30; 9:00; 10:30; 12:00; Hour 2 = 12:00; 13:30; 15:30; 16:30; 18:00.). Environmental parameters were measured, by a thermohygrometer, to determine the Temperature and Humidity Index (THI). The mean temperature and relative air humidity were 29.23°C and 55.55%, respectively. Rectal temperature was obtained using a digital thermometer. Respiratory rate was determined by flank observation, it was counted the movements for 15 seconds and then multiplied by four so that the result could be expressed in movements min⁻¹. Heart rate was measured using a stethoscope, counting for 15 seconds, also multiplied by four to express the unity in beats min⁻¹. The IRT (Infrared temperatures) were obtained by using a Thermal Imager (Testo 880®) infrared camera in the following regions: head, left eye, left ear, nose, left shoulder area. The THI varied between 66.26 to 86.28, considering that the animals were under heat stress in some periods. Rectal temperature showed medium correlation with the IRT parameters and heart rate. Respiratory frequency had no correlation with the other parameters. IRT parameters presented a high correlation between themselves (head, eye, ear, nose, and shoulder). Day influences heart rate, respiratory frequency and IRT temperatures ($P < 0.0001$). Respiratory frequency is the only affected by the time of measurement (hour) ($P < 0.0001$). All the parameters measured had an effect of interaction (day x hour) ($P < 0.0001$), except for the respiratory frequency. The results show that respiratory frequency requires three days of measurement, one day for heart rate, and two days for any IRT temperature (head, eye, nose or shoulder). In conclusion, the time and number of days measured are important and can influence the results.

Keywords: cows, ambience, thermography, methodology, bioclimatology

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