



## TICK RESISTANCE AND HEAT TOLERANCE IN CATTLE. II. RECTAL TEMPERATURE AND RESPIRATORY FREQUENCY<sup>1</sup>

### RESISTÊNCIA AO CARRAPATO E TOLERÂNCIA AO CALOR EM BOVINOS. II. TEMPERATURA RETAL E FREQUENCIA RESPIRATÓRIA

CECÍLIA JOSÉ VERÍSSIMO<sup>2</sup>, LUCIANDRA MACEDO DE TOLEDO<sup>2</sup>, FERNANDA FERREIRA PESSOA<sup>3</sup>, SELMA MARQUES D'AGOSTINO<sup>3</sup>, LUCIANA MORITA KATIKI<sup>2</sup>, ISABEL KINNEY FERREIRA DE MIRANDA SANTOS<sup>4</sup>

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<sup>2</sup>Instituto de Zootecnia (IZ), Agência Paulista de Tecnologia dos Agronegócios (APTA), Secretaria de Agricultura e Abastecimento do Estado de São Paulo (SAA), Rua Heitor Penteado, 56, Centro, CEP 13460-000, Nova Odessa, SP, Brasil. E-mail: [cjverissimo@iz.sp.gov.br](mailto:cjverissimo@iz.sp.gov.br)

<sup>3</sup>Pós-Graduação em Produção Animal Sustentável, IZ, APTA, SAA, Nova Odessa, SP, Brasil.

<sup>4</sup>Departamento de Bioquímica e Imunologia, Faculdade de Medicina de Ribeirão Preto (FMRP), Universidade de São Paulo (USP), Ribeirão Preto, SP, Brasil.

The heat and *Rhipicephalus microplus* tick infestation are limiting factors to the livestock production in the tropics. Therefore, in a tropical sustainable livestock, cattle should be tick resistant and heat tolerant. The relationship between the *Rhipicephalus (Boophilus) microplus* tick infestation and heat characteristics like rectal temperature and respiratory frequency was studied in 6 Nellore and 4 Holstein, seven-month-old steers. They were submitted to an artificial infestation (a.i.) with 10,000 larvae (Holstein) and 20,000 larvae (Nellore) of *Rhipicephalus (Boophilus) microplus* tick in 16/Apr/2011. Females ticks bigger than 4.0 mm were counted in the left side from day 19 to 27 after the artificial infestation. The infestation rate was calculated by summing and multiplying by two the number of ticks counted, assuming that females are half of infesting larvae (5,000 for Holstein and 10,000 for Nellore). In days 20, 23 and 24 after the infestation, the 10 bigger females ticks found in whole animal were weighed and put in a chamber (27 °C and 80% RH), weighing the egg mass of each female fourteen days after. The rectal temperature (RT, measured by a digital thermometer in the animal's rectum) and respiratory frequency (RF, respiratory movements per minute) were measured on days 14/Apr (2 days before the a.i.) and on day 05/May (19 days after the a.i.). The RT and RF were measured in the morning and in the afternoon, after they had been exposed to noon sun. The experimental design was a non-probability sample restricted to the 10 available animals. Analyses of variance for the random variables RT and RF to evaluate the effects of period of day, date and breed were performed using the SPSS 12.0. The RF was greater in the afternoon ( $64.82 \pm 2.44$  mov/min *versus*  $38.42 \pm 2.44$  mov/min in the morning,  $P < 0.001$ ) and did not varied between dates; Nellore cattle had lower RF ( $41.50 \pm 2.20$  mov/min) than Holstein ( $61.75 \pm 2.70$  mov/min,  $P < 0.001$ ). About RT, breed hasn't a significant effect, the RT was lower in the morning ( $38.95 \pm 0.11$  °C,  $P < 0.001$ ) than in the afternoon ( $39.80 \pm 0.11$  °C) and on April (before infestation) the RT was higher ( $39.64 \pm 0.11$  °C,  $P < 0.01$ ) than that observed on May ( $39.09 \pm 0.11$  °C). On April, infestation rate, tick weight and egg mass weight were positive correlated with RF ( $r = 0.698$ ,  $r = 0.777$  and  $r = 0.825$ , respectively,  $P < 0.05$ , Pearson correlation), and on May, tick weight and egg mass weight were positive correlated with RF ( $r = 0.683$ ,  $r = 0.811$ , respectively,  $P < 0.05$ ). The positive and significant correlations found were probably due to the higher RF of the Holsteins in heat conditions and its greater susceptibility, leading to higher reproductive indices of the ticks. The amount of larvae put on the artificial infestation did not raise the animal's temperature because on day 19, the final parasitic life cycle of the tick, the temperature was lower than that observed before the infestation. Holsteins were less heat tolerant and more susceptible to tick.

Key words: Holstein, Nellore, *Rhipicephalus microplus*.