

Genetic parameters for hair characteristics and vaginal temperature in a multibreed Brahman-Angus herd under hot humid conditions.

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Thermal stress in hot humid conditions limits cattle production. The objectives for this study were to estimate genetic parameters for short hair length, average hair length, long hair length, vaginal temperature under low temperature humidity index (THI) conditions and vaginal temperature under high THI conditions. In 2017, vaginal temperature was measured every 5 minutes over a 5 day period using an iButton temperature measuring device implanted in a blank CIDR in 113 heifers from the University of Florida multibreed herd (ranging from 100% Angus to 100% Brahman). Ambient environmental conditions monitored using HOBO data loggers were used to calculate the THI. Hair samples were also collected from the heifers at the time of CIDR insertion and measured for length using ImageJ software. Restricted maximum likelihood procedures were used to estimate genetic and phenotypic covariances from multivariate animal models using the WOMBAT program. Estimates for heritability for short hair length, average hair length, long hair length, vaginal temperature under low THI conditions and vaginal temperature under high THI conditions were 0.50, 0.50, 0.50, 0.25 and 0.10, respectively. Genetic correlations were greater than 0.90 for all relationships among the three hair traits. Genetic correlation between the average hair measurements and vaginal temperatures under high THI and low THI were 0.16 and 0.17, respectively. The short and long hair measurements had similar genetic correlations with the temperature traits. The genetic correlation between vaginal temperature at low THI and high THI was found to be 0.68, indicating that genetic selection for vaginal temperature at either THI will also improve thermoregulation at the other THI despite the difference in estimated heritabilities.