# GENETIC PERFORMANCE OF HOLSTEIN BULLS FOR MILK YIELD IN DIFFERENT TEMPERATURE GRADIENTS

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The aim of the present study was to verify the genetic performance of the most representative bulls in Holstein dairy cattle in state of Paraná, according to the changes of temperature gradients. Therefore, we used data from the Paraná Holstein Breeders Association of 57,957 primiparous females, to detect the 20 main bulls used in the last 15 years, for milk yield at 305 days. The contemporaneous group (CG) formation was based on grouping the animals born on the same farm and year, in which CG with less than three observations and animals with an age at calving less than 18 or more than 48 months were excluded from the data file. The genetic values' estimation was realized by the restricted maximum likelihood estimation (REML) method, with animal model, utilizing the PEST software, considered the regional average temperature, computed by the National Institute Meteorology (INMET). The mean annual temperatures varied between 18ºC in the state's south region and 22ºC in the north region, where such animals' genetic values were estimated to such change of the temperature range. Posteriorly, a genetic values subset was formed with the 20 most representative bulls, through the statistic software SAS 9.3 applying linear regression, in order to observe the transient genetic behavior due to the environmental gradient changes. The average milk yield at 305 days of the daughters of the 20 bulls was 9,609.39 kg, evidencing the genetic superiority of the most important sires utilized in Paraná State. We observed a significant decrease in genetic potential of the 20 sires with increasing temperature. We highlight the decrease until 380 kg of milk yield in the genetic value for one bull in comparison to the gradient 18ºC and 22ºC. The re-ranking of the sires according to the temperature increase was specific, with a more evident transition only to one of the bulls and not altering the classification of the other bulls. This fact demonstrates that, although increasing the temperature influence the genetic potential for milk production, this is not enough to cause an impactful re-ranking of the main bulls in Holstein cattle, facilitating the selection in Paraná State.

**Keywords:** dairy cattle, genetic evaluation, genotype by environment interaction.