

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

## GENOTYPE BY ENVIRONMENT INTERACTION BY GENETIC CORRELATION FOR MILK FAT YIELD IN HOLSTEIN CATTLE

Raphael Patrick MOREIRA\*<sup>1</sup>, Rafaela MARTINS<sup>1</sup>, Henrique Alberto MULIM<sup>1</sup>, Essamai Brizola LAGOS<sup>1</sup>, Renata de Moraes FARIA<sup>1</sup>, Altair Antonio VALLOTO<sup>2</sup>, Luis Fernando Batista PINTO<sup>3</sup>, Victor Breno PEDROSA<sup>1</sup>

\*corresponding author: raphaelmoreira@zootecnista.com.br

<sup>1</sup>Universidade Estadual de Ponta Grossa, Ponta Grossa, Paraná, Brasil

<sup>2</sup>Associação Paranaense de Criadores de Bovinos da Raça Holandesa, Curitiba, Paraná, Brasil

<sup>3</sup>Universidade Federal da Bahia, Salvador, Bahia, Brasil

In recent years, milk fat production has been gaining importance in the dairy sector due to the fact that it is related to the yield of milk products. As this is a polygenic trait, it can suffer significantly with effect called genotype x environment interaction. In this case, different environmental conditions can affect the expression of the genotype, causing mainly alteration in the genetic value of the animals. Therefore, data of 57,986 primiparous cows, with lactation information from 1990 to 2015 and relationship matrix of 106,848 animals, was used to estimate the correlation for the mentioned trait between three different environments. The dataset utilized belongs to the Associação Paranaense de Criadores de Bovinos da Raça Holandesa – APCBRH and was divided according to three climatic classification of the Paraná state, being R1) mesothermic climate moist and super humid, R2) mesothermic climate without dry season, R3) mesothermic climate with dry season. The effects included in the model were the fixed effects of contemporary group (herd and birth year), calving age as linear covariate and the additive genetic random effect. It was considered the animal model, using the REML method, to estimate the genetic correlation, applying the software VCE 6.0. The means of milk fat yield were 295.61 kg ( $\pm$  72.84 kg), 278.31 kg ( $\pm$  71.30 kg) and 242.34 kg ( $\pm$  71.36 kg) for regions 1, 2 and 3, respectively. The genetic correlation for the regions was 0.93 between R1 and R2, 0.94 between R1 and R3 and 0.99 between R2 and R3. These values of correlations do not indicate the genotype environment interaction, because according to previous studies described in the literature, genetic correlations less than 0.80 indicate their existence. These three regions are localized in the same latitude range ( $-30^{\circ}$  to  $-20^{\circ}$ ), which contributed to the fact that climatic differences were not significant enough to cause alteration in gene expression. Thus, as the genetic correlations for milk fat production were close to one, we affirm the non-existence of the interaction genotype environment in Holstein Cattle between the different climatic regions of Paraná.

**Keywords:** breeding value, dairy cattle, gene plasticity, genetic parameters, subtropical climate

**Acknowledgments:** To CAPES, CNPq and Fundação Araucária for the funds provided.

Promoção e Realização:



Apoio Institucional:



Organização:

