THEME 4 | GENETICS, GENOMICS, ANIMAL BREEDING AND REPRODUCTION

Peak yield and peak time in Girolando cattle using nonlinear models

Darlene S. Daltro[1], Juliana D. Machado*[1], Alessandro, P. Haiduck[1], Elisandra L. Kern[1],
Marcos Vinicius G. B. Silva[2], João C. C. Panetto[2], José Bracinni Neto[1], Jaime A. Cobuci[1]

[1]Universidade Federal do Rio Grande do Sul, Porto Alegre/RS; [2]EMBRAPA Gado de leite,
Juiz de Fora/MG.

*Graduation student – julianadm@yahoo.com

Girolando breed is responsible for most of the milk yield in Brazil. Nevertheless few studies have addressed the lactation curve of cows from different genetic groups of this breed. Due to the its importance in the national panorama, it is important to verify the characteristics of the lactation curve such as the peak yield (PY) and the peak time (PT), because they can be used as guide for the farmers in their food program and cow's management techniques. The objective of this study is to evaluate PY and PT of cows from three different genetic groups of the Girolando breed using non-linear models of Wilmink (WIL) and Wood (WD). Data of first parity of 7,934 Girolando cows from Minas Gerais State were used. Cows with genetic composition of 1/2 Holstein (H): 1/2 Gir (G), 5/8 H: 3/8 G e 1/4 H: 3/4 G will be named as 1/2 HG, 5/8 HG and 1/4 HG, respectively. The values for PY and PT were estimated by non-linear models of WIL and WD using Gauss-Newton method in the NLIN procedure of the Statistical Analysis Software. The estimated values for PY and PT between the genetic groups were significantly different ($p < 0.05$). For PY, 1/2 HG group stood out with 21.26 (WD) and 20.46 kg of milk yield (WIL), followed by 1/4 HG, with 18.88 (WD) and 18.13 kg (WIL), and 5/8 HG, with 18.05 (WD) and 17.65 kg (WIL). For PT, the estimated values were 128 (WD) and 49 days (WIL), 134 (WD) and 56 days (WIL), and 107 (WD) and 82 days (WIL) for groups 1/2 HG, 4 HG and 5/8 HG, respectively. The highest PT values estimated by WD were in the 1/4 HG group, but for WIL the 5/8 HG group was higher. For PY, the standard error obtained by WIL (-3.703) was lower than that estimated by WD (-6.596), indicating a better quality in the adjustment. For PT, the standard error was lower when using WD (-26,683) compared to WIL (-28,289). Overall, WD model presented lower quality of fit than that by WIL in the PT estimation, because the means were overestimated. The 1/2 HG group presented higher PY and lower PT when adjusted for WIL. An opposite result was observed for 5/8 HG, while 1/4 HG remained intermediate in both traits. In WD model, 5/8 HG remained with lower PY and PT, however, 1/2 HG and 1/4 HG groups alternated in larger and intermediate PY and intermediate and higher PT, respectively. Both models can be used independently of the Girolando's breed composition for PY. Nevertheless, the same was not observed for PT.

Keywords: dairy cattle, lactation, models, peak yield, peak time