



Relationship between the magnitude of the inbreeding coefficient and milk traits in Holstein and Jersey dairy bull semen used in Brazil

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ABSTRACT. Artificial insemination has been used to improve production in Brazilian dairy cattle; however, this can lead to problems due to increased inbreeding. To evaluate the effect of the magnitude of inbreeding coefficients on predicted transmitting abilities (PTAs) for milk traits of Holstein and Jersey breeds, data on 392 Holstein and 92 Jersey sires used in Brazil were tabulated. The second-degree polynomial equations and points of maximum or minimal response were estimated to establish the regression equation of the variables as a function of the inbreeding coefficients. The mean inbreeding coefficient of the Holstein bulls was 5.10%; this did not significantly affect the PTA

for percent milk fat, protein percentage and protein ($P = 0.479$, 0.058 and 0.087 , respectively). However, the PTAs for milk yield and fat decreased significantly after reaching inbreeding coefficients of 6.43 ($P = 0.034$) and 5.75 ($P = 0.007$), respectively. The mean inbreeding coefficient of Jersey bulls was 6.45% ; the PTAs for milk yield, fat and protein, in pounds, decreased significantly after reaching inbreeding coefficients of 15.04 , 9.83 and 12.82% ($P < 0.001$, $P = 0.002$, and $P = 0.001$, respectively). The linear regression was only significant for fat and protein percentages in the Jersey breed ($P = 0.002$ and $P = 0.005$, respectively). The PTAs of Holstein sires were more affected by smaller magnitudes of inbreeding coefficients than those of Jersey sires. It is necessary to monitor the inbreeding coefficients of sires used for artificial insemination in breeding schemes in Brazil, since the low genetic variability of the available sires may lead to reduced production.

Key words: Artificial insemination; Dairy cows; Genetic improvement; Progeny testing; Semen