Correlation study between PTAs for milk production traits and type in Holstein bulls with genetic evaluation available in Brazil

Diego de C. Cucco[1]*, Elvis Ticiani[1], Alsiane Capelesso[2], Marcio P. Soares[3], Leila de G. Gaya[4]

[1]Department of Animal Science, Santa Catarina State University, Chapecó-SC, Brazil;
[2]Department of Animal Science, Federal University of Santa Maria, Santa Maria-RS, Brazil;
[3]Federal Institute of Education, Science and Technology of Santa Catarina, Araquari-SC, Brazil;
[4] Department of Biosystems Engineering, Federal University of São João Del-Rei, São João Del-Rei-MG, Brazil
*diego.cucco@udesc.br

In Brazil great focus on the selection of dairy cattle is given for milk production traits. However, it is necessary to assess this association with other traits, as well as, analyzing how they behave when the selection is made. The knowledge of the correlations between these traits enables us to develop appropriate breeding plans for genetic improvement. In this context, the aim of this study was to estimate the correlation coefficient between the PTAs (Predicted Transmitting Ability) of milk production traits and type in Holstein bulls with genetic evaluation available for commercialization by semen suppliers companies in Brazil. Records of 385 Holstein bulls offer in Brazil until the year 2008 were located on the company's websites. The genetic evaluations of these bulls to the traits described in the study were located and tabulated from the Dairy Bulls website (http://www.dairybulls.com). Statistical analysis of the correlation between PTAs of production traits (milk yield in pounds and fat and protein percentage) and type or linear traits (stature, strength, body depth, dairy form, rump angle, thurl width, rear legs side view, rear legs rear view, foot angle, feet and legs, rear udder height, rear udder width, udder cleft, udder depth, and front / rear teat placement) were performed by correlation analysis using the software Minitab® (Minitab version 14, 2004, State College, PA) using the Tukey test, considering 5% of significance level. It was observed that the traits of milk production in pounds has a low positive correlation with linear traits like: body depth (r = 0.02), dairy form (r = 0.26), rump angle (r = 0.13), posterior leg (r = 0.04), foot angle (r = 0.07), udder height (r = 0.05), udder width (r = 0.19), front teat placement (r = 0.08) and rear teat placement (r = 0.20) and negative correlations of low magnitude when analyzed strength (r = -0.03), rump width (r = -0.09), lateral legs (r = -0.08), udder cleft (r = -0.03), udder depth (r = -0.32) and score for feet and legs (r = -0.19), no significant correlation was observed with stature. To linear traits correlated with the protein and fat concentration in milk, it was positive only for udder depth in both milk components (r = 0.02 and r = 0.10 for protein and fat respectively). Though, the correlation of protein and fat concentration behaved antagonistically, being negative to protein and positive to fat in the traits: strength, body depth, rump angle, thurl width and score for feet and legs, with the low correlation coefficients presented in the range r = -0.09 to 0.08. Low negative correlation was observed for both milk components (protein and fat) with stature (r = -0.02 and -0.01), dairy form (r = -0.22 and -0.07), foot angle (r = -0.03 and -0.12), udder height (r = -0.20 to -0.01), udder width (r = -0.24 and -0.11) and udder cleft (r = -0.08 and -0.03). The low correlation observed in this bulls between production traits and type, allow us to conclude that we can select to type without affecting the production and milk quality. This factor is favorable because the selection to type may contribute to longevity of cows in the herd, with fewer discards due to problems with locomotion, udder, among others.

Keywords: bull proofs, milk production, selection