Genetic trends for performance and functionality in specialized breeding programs of riding horses

K. F. Stock[1], A. Hahn[2], I. Workel[2], W. Schulze-Schleppinghoff[2]*

[1]IT Solutions for Animal Production (vit), Heinrich-Schroeder-Weg 1, 27283 Verden (Aller), Germany, [2]Oldenburger Pferdezuchtverband e.V., Grafenhorststrasse 5, 49377 Vechta, Germany

Specialization of studbooks on either dressage or show-jumping is a way to increase breeding progress in sport horses. Distinct breeding goals and programs facilitate decision making and allow identifying developments which may relate to strong focus on particular aspects of performance. Knowledge about correlated selection responses can importantly contribute to responsible und sustainable breeding management if a wider range of performance related and functional conformation traits are considered. The aim of this study was to determine patterns of genetic trends in specialized breeding programs for dressage (D) and show jumping (J) referring to the active mare populations of the Oldenburg studbooks (> 7,700 mares). Results from routine genetic evaluations 2021 for sport traits reflecting competition performance in D and J and for 46 linear conformation and performance traits were used. Genetic trends were determined considering mares with own performance and/or at least two progeny with phenotypic data for respective traits, resulting in sample sizes of up to 2,363 mares in the analyses. Across analyzed subsets, 88-95% of the mares were born in 2000-2016. Reference was for all traits made to relative breeding values (RBV) standardized to a mean of 100 and a genetic standard deviation of 20. Substantial genetic improvement of 12-15 points for the target sport traits over the study were found within the respective specialized mare populations. These developments were paralleled with discipline-specific significant changes of RBV for most of the linear gait and jumping traits ($P < 0.001$). Largest increases of >10 points were determined for freedom of shoulders and impulsion in trot (D) and for take-off power and jumping ability (J). Genetic trends for functional conformation traits indicated significant development towards larger frame, longer legs, shorter back and lower set tail in D and towards larger frame and lighter caliber in J. Analyses did not reveal distinct genetic trends for traits relating to correctness of limbs or functional aspects which would indicate the need for particular attention in the breeding program.