

Genetic parameters of summarizing performance traits for evaluating selection approaches for dressage and show jumping sport performance in riding horses

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Successful breeding of sport horses requires breeding programs that meet the challenge of late availability of information on target traits and support early identification and selection of breeding animals. Routines for data collection and analyses of indicator traits are supposed to indicate those mares and stallions with highest probabilities of producing offspring that (1) start a career in sport and (2) perform successfully in competitions up to advanced level. The aim of this study was to determine genetic parameters for summarizing performance traits reflecting these target measures, so allowing to validate criteria currently used to support selection decisions and mating planning. Data of 24,827 mares born 2000-2015 were considered including all active broodmares of the Oldenburg studbooks (OL, OS) plus dams of OL / OS registered foals. Age restrictions ensured coverage with key figures from dressage (D) and show jumping (J) competitions, i.e. total numbers of progeny and their highest levels achieved. Summarizing performance traits were derived per discipline: proportion of progeny with data on highest level achieved in sport (pPS_D, pPS_J), maximal highest level achieved by the progeny (PHEK_D, PHEK_J). Genetic parameters were estimated uni- and multivariately in linear animal models, with results from routine linear descriptions of foals and adult horses providing the data on indicator traits. Linear gait traits for walk, trot and canter (N=12) were analyzed for D, and linear traits for canter and jumping (N=12) were analyzed for J. Heritability estimates for the summarizing performance traits were similar for D and J, ranging from 0.044 to 0.068 (SE \leq 0.02). Moderately positive genetic correlations of 0.4-0.6 (SE < 0.2) with the directly sport related traits were found for both D (7 gait traits) and J (8 jumping traits). Results indicate the high value of genetic evaluation for linear traits as selection tool in breeding programs for sport horses.