

Repeatabilities of jumping parameters of KWPN stallions on the second step of selection

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Material and methods

Data were collected during the second step of the KWPN stallion selection. In total 53 horses taking part in the second selection of KWPN stallions for jumping directed horses were filmed. Horses performed 353 jumps through the final vertical and oxer obstacles (heights 90-130cm) in the free jumping line. Data collection was done from the audience place – press sector. The linear measurements were achieved by treating the current height of the obstacle as a scale (100%), the temporal measurements were achieved by calculations of frames of the film (25 frames per second). Linear and temporal variables were calculated from the selected frames manually by MultiScan program and Motion DV Studio. The definitions of measured parameters are presented in the table 1. The repeatabilities were calculated using procedure Mixed from the SAS program calculated from the model with the random effect of the horse and fixed effects of the obstacle (different heights of verticals and oxers) and successive number of the jump.

Results

The repeatabilities of temporal parameters were 0.27 for landing time and 0.42 for taking off time. The repeatabilities for linear measurements of taking off and landing was 0.46 and 0.53 respectively. The lowest values were achieved for lifting of hind legs (0.4). Higher values were calculated for front legs and reached 0.5. The repeatabilities for elevation of bascule points were above 0.5 and the position of the head 0.4. The effect of the obstacle was statistically significant for all parameters, that was not observed for the effect of the successive number of the jump. Received repeatabilities even calculated on the basis of relative measurements are comparable with repeatabilities based on the absolute measurements. Repeatabilities received for lifting of legs were higher in this study. That could be the effect of breed observed as well as the effect of different state of training.

Table 1 Definitions of parameters

Parameter	Definition
Time to bascule	time from the last hind limbs full contact to the bascule frame
Time after bascule	time from the bascule frame to the first full contact of front limbs
Time total	time of taking off and landing after adding time of bascule
Taking off	distance between the last full contact of hind limb to the first stand of the obstacle
Landing	distance between the first full contact of the front limb to the second stand of the obstacle
Lifting of FL	height of the lowest point of the front left limb above the obstacle highest pole
Lifting of FR	height of the lowest point of the front right limb above the obstacle highest pole
Lifting of HL	height of the lowest point of the hind left limb above the obstacle highest pole
Lifting of HR	height of the lowest point of the hind right limb above the obstacle highest pole
Elevation of croup	height between the highest point of the croup measured on the bascule frame and the highest point of the pole of the obstacle
Elevation of withers	height between the highest point of the withers measured on the bascule frame and the highest point of the pole of the obstacle
Elevation of head	height between the highest point of the head measured on the bascule frame and the highest point of the pole of the obstacle
Position of head	angle of the position of the head on the bascule frame measured as the angle between "the line of nose" and the line perpendicular to the ground

Table 2 Repeatability of jumping parameters for KWPN stallions 2004 (jumping directed)

Parameter	Repeatability
Time to bascule	0.42
Time after bascule	0.27
Time total	0.42
Taking off	0.53
Landing	0.46
Lifting of FL	0.52
Lifting of FH	0.53
Lifting of HL	0.38
Lifting of HR	0.39
Elevation of croup	0.52
Elevation of withers	0.52
Elevation of head	0.54
Position of head	0.43

