

SOME FACTORS INFLUENCING EVALUATION OF FREE JUMPING IN STATIONARY PERFORMANCE TESTS OF STALLIONS

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Abstract

The aim of this study is to evaluate the influence of trial year, age and breed on the results of the marks in loose jumping given to stallions at the Qualification for the Training Establishment, by the Establishment Manager and the Commission during the stationary training of stallions from 2011 to 2016. The study included 74 three- and four-year-old stallions of noble breeds. The study used the notes given during the Qualification for the training establishment and after the final trial (assessment by the Training Establishment Manager (ZT) and the Commission). The year of the trial did not have a significant influence on the marks during the Qualification, the assessment of the ZT Manager and the Commission, nor did the age of the horse. Breed turned out to be a factor determining statistically significant differences only in the assessment of the ZT Manager. A highly significant correlation existed between the assessment during the Qualification and the assessment of the ZT Manager in the final sample, as well as between the assessment of the ZT Manager and the assessment of the Commission.

Keywords: loose jumping, stationary bravery tests, stallions of noble breeds

Introduction

EU and national legal regulations strictly define the way in which animal breeding is carried out, referring, for example, to the principles of keeping herd books and registers, assessing functional and genetic value and approving for reproduction (Martyniuk, 2013). Animals are subjected to performance testing in order to provide data on the level of traits relevant to the breeding objectives pursued. Performance value assessment, being an important selection criterion, a measure of genetic progress and progression in breeding and selection work, is a source of data for estimating breeding value. The main purpose of breeding horses of noble breeds is to improve traits desirable for specific equestrian sports or to obtain versatile horses used in widely understood recreation (Borowska and Koza, 2017). The diversity in the use and selection of breeds of equine breeding animals has resulted in the requirements for performance and genetic evaluation being set individually for each breed (Regulation (EU) 2016/1012 of the European Parliament and of the Council). The performance value assessment of stallions, obligatory for all breeds and types of noble breeds, is carried out in training plants, in field trials, as well as through participation in the so-called alternative trials (competitive horse sport, Young Horse Polish Championships, races for half-bred horses). In Poland, the scheme of bravery tests of noble stallions assumes riding or sled training. Trials are organized as stationed (horses stay in the Training Facility until the official end of the trial) or field (in the form of a few days of evaluation). Stationary horse training lasts one hundred days, while harness training lasts sixty. The objectives pursued by the Training Establishments are to select the best individuals and prepare young horses for further sports careers (Janicki et al., 2015). Breeding programs for horses of noble breeds (Małopolska, Wielkopolska, Polish sport horse) contain a methodology for assessing performance value differentiated depending on the age. An important element of it are loose jumps in the corridor, which is an attempt that has also become an integral part of the championship programs, breeding reviews and auctions (Dudek, 2011). The correctness of the jumps is a product of the work of the back, hind limbs, neck and withers, balance, rhythm and willingness to jump. The following are assessed: caution and the way of approaching the obstacle, the power of the rebound and the speed of the forelegs off the ground, the position of the head, the neck and the log during the jump (baskil), the ability to fold the forelegs and "open the rump" (opening of the hocks), the evenness of the forelegs, the dynamics of the jump, the flexibility of the back and the speed of the return to balance after the jump.

The test shows the natural jumping predispositions of a young horse and enables an initial assessment of its riding performance. Thorén Hellsten et al. (2006), Olsson (2006) and Ducro (2011) found a strong genetic correlation (0.87–0.9) between the results of the assessment of jumping in the corridor and the subsequent results obtained in the discipline of show jumping. Similarly, Gerber Olsson et al. (2000) showed the existence of a correlation of 0.93 between loose jumps and rider jumping results, considering them highly useful for selection purposes. According to Janczarek (2007), the assessment of a young horse's jumping predispositions should be based on the analysis of the way in which it overcomes obstacles during free jumps.

For most breeds of warmblood, the aim of breeding is not only to acquire horses for equestrian sport, but also to continuously improve their aptitude for specific equestrian disciplines (Thorén Hellsten et al., 2006). Analysis of the biomechanics of movement, characteristic kinematic and dynamic parameters, e.g. the point of rebound before an obstacle, during loose jumping of horses belonging to different age groups, can be a valuable source of information on the potential and "talent" of the animal's jumping (Lewczuk et al., 2006; Nascimen- to de Godoi et al., 2014). According to Levchuk and Ducro (2012) and Levchuk (2017), in the group of horses characterised by a predisposition for jumping, for example, there was a greater repeatability of the trait of the height of lifting the forelegs over the obstacle compared to the hindlegs, and a repeatability of the trait of the position of the head in relation to the withers of 0.45 and in relation to the croup of 0.48. Proper activity of the head and neck muscles plays an important role during all stages of the jump. It helps, among other things, to focus the animal's attention before an obstacle and to maintain balance while overcoming it. Also according to Maršálek and others (2010) the degree of flexion of the limbs in individual joints, and above all the elevation of the forelimbs over the obstacle, are the most important data for predicting the potential and ankle predispositions of a young horse.

The aim of the study was to analyze the impact of the year of trial, age and breed on the marks for loose jumping issued during the ZT Qualification, by the ZT Manager and the Commission, as part of stationary stallion training in 2011–2016.

Material and methods

The research material consisted of the results of loose jumping evaluations of 74 three- and four-year-old stallions of Polish and foreign breeding that completed stationary riding trials at the Training Establishments between 2011 and 2016. The analyzed feature were the grades issued by the Manager of ZT and the Commission during the qualification and final trial. The source of the figures for the statistical calculations were materials obtained from the official website of the PZHK (www.pzhk.pl).

The choice of the range of years covered by the research was dictated by the fact that in 2011 changes were introduced in the way the stallions were organized and only stationary sled training was carried out in the 2017–2019 seasons.

The collected data were subjected to statistical analysis to determine the influence of the following factors on the results of stallions for loose jumping:

1. Year of trial (2011, 2012, 2013, 2014, 2015, 2016)
2. Age of stallion (3 and 4 years)
3. Breeds – Polish sport horse (sp), Wielkopolska (wlkp), Małopolska (m), Olden- Burska (old), Holstein (hol), other. The category "other" included single horses of breeds: Dutch warmblood, Belgian warmblood, Trakehner horse. The conformity of the distribution of variables with the normal distribution was verified by the Kolmogorov-Smirnov test (K-S test). To determine the significance of differences between means, nonparametric Kruskal-Wallis and Mann-Whitney U tests for two variables were used. Dependence of the marks obtained during the Qualification and in the final sample was determined using the Spearman correlation coefficient.

Results

The analyses showed no significant differences between the average marks given to stallions during Qualification and the final trial in individual years (Table 1).

Factors influencing the assessment of bulk jumps

Table 1. Average marks for free jumps of 3- and 4-year-old stallions which completed stationary performance tests in training centers in 2011–2016

	Year	N	Średnia Mean	SE	P
Qualifications	2011	14	7,393	0,2927	0,81
	2012	15	7,633	0,1723	
	2013	9	7,222	0,3447	
	2014	14	7,214	0,2552	
	2915	6	7,333	0,2472	
	2016	16	7,406	0,1529	
	Total	74	7,385	0,0974	
Manager of Training Center	2011	14	7,286	0,2658	0,807
	2012	15	7,433	0,1609	
	2013	9	7,333	0,2041	
	2014	14	7,393	0,2412	
	2915	6	7,833	0,2472	
	2016	16	7,531	0,2258	
	Total	74	7,439	0,0937	
Commission	2011	14	6,793	0,1734	0,47
	2012	15	6,847	0,1756	
	2013	9	6,867	0,165	
	2014	14	6,864	0,3156	
	2915	6	7,567	0,3018	
	2016	16	7,144	0,2548	
	Total	74	6,965	0,0999	

The years covered by the study were characterized by a significant variation in the number of horses completing the bravery test. In 2015, only 6 stallions graduated from the Training Facility, while in 2016 the largest group consisted of 16 individuals. The highest scores obtained by stallions were recorded in 2015 and 2016.

The differences between the average marks obtained for loose jumping by individuals of different races were significant in the case of notes issued by the Manager of the Training Facility ($p = 0.044$) and insignificant in the case of the assessment issued by the Commission ($p = 0.075$) and during the Qualification ($p = 0.304$) (Table 2). Horses of the Oldenburg and Holstein breeds were rated the highest by both the Manager of the Training Facility and the Commission.

The average scores of the Wielkopolska stallions obtained from the ZT Manager and during the Qualification were similar and in both cases lower than the overall average. The different opinion of the members of the Commission as to the regularity of jumps in the corridor of representatives of the Wielkopolska breed (wlkp) resulted in the fact that the average rating of stallions of this breed significantly exceeded the overall average. A similar differentiation of the assessment took place in relation to the Małopolska stallions. As a result of the marks obtained from the Commission, the characterising mean was above the average of the sp stallions, while as a result of the marks given by the Manager and during the Qualification, the averages of the Małopolska horses were lower than the overall average.

Stationary riding training of noble stallions is organized primarily for the selection of three-year-olds, but 4-year-old horses can also participate in it. Early determination of suitability accelerates the possibility of using the most valuable individuals in breeding and allows you to focus on the implementation of horses with the greatest predispositions to equestrian sport for training work. There were no significant differences between the average marks given for loose jumping to three- and four-year-old horses by the Manager of the Training Facility, the Committee and during the Qualification (Table 3). The average values were similar in the assessment of the Manager of the ZT and Qualifications, the lower average was the assessment of the Commission. The age difference did not translate into the results of training stallions at the Training Facility.

Factors influencing the assessment of bulk jumps

Table 2. Average marks for free jumps of 3- and 4-year-old stallions of different breeds obtained in stationary performance tests in training centers in 2011–2016

	Breeds	N	Mean	SE	p
Qualifications	sp	31	7,581	0,1705	0,304
	wlkp	5	7,300	0,3742	
	m	16	7,063	0,2135	
	old	9	7,389	0,2003	
	hol	7	7,143	0,1798	
	others	6	7,583	0,3005	
	Total		74	7,385	
Manager of Training Center	sp	31	7,516	0,1475	0,044
	wlkp	5	7,400	0,3674	
	m	16	6,938	0,1700	
	old	9	7,944	0,2422	
	hol	7	7,714	0,3056	
	others	6	7,333	0,2789	
	Total		74	7,439	
Commission	sp	31	6,752	0,1604	0,075
	wlkp	5	7,460	0,4082	
	m	16	6,788	0,1688	
	old	9	7,533	0,1795	
	hol	7	7,343	0,3429	
	others	6	6,833	0,4232	
	Total		74	6,965	

Table 3. Average marks for free jumps of 3- and 4-year-old stallions of different breeds obtained in stationary performance tests in training centers in 2011–2016

	Age	N	Mean	SE	p
Qualifications	3 years old	53	7,368	0,1136	0,85
	4 years old	21	7,429	0,1930	
	Total	74	7,385	0,0974	
Manager of Training Center	3 years old	53	7,443	0,1156	0,304
	4 years old	21	7,429	0,1592	
	Total	74	7,385	0,0974	
Commission	3 years old	53	6,953	0,1277	0,942
	4 years old	21	6,995	0,1458	
	Total	74	7,385	0,0974	

There was a strong correlation between the marks issued for loose jumps by the Manager of ZT and the Commission (Table 4). The calculated correlation coefficients indicate a moderate level of relationship between the amount of marks awarded during the Qualification and the grades of the Manager of the ZT and low with the notes of the Commission.

Table 4. Pearson correlations between stallions' marks for free jumps given during Qualification, by Manager of the Training Center and by the Commission

Evaluation	Qualification	Manager of Training Center	Commission
Qualification	1	0,443	0,276
Manager of Training Center	0,443**	1	0,602**
Commission	0,276	0,602**	1

**Correlation is significant at 0.01 level (2-tailed).

*Correlation is significant at 0.05 level (2-tailed).

Discussion

The low and varied number of horses completing the trials of bravery over the years covered by the study may have resulted from their inadequate organization, changes in the system of evaluating stallions, which further precludes the possibility of comparing the quality of specimens between vintages, and the increase in costs associated with participation in the trial (Kapron, 2001). Small rates of horses in ZT could also be consequences of staffing problems. The presence of qualified personnel to handle and work with animals is a factor significantly influencing the decision to send young stallions to the Training Facility.

Geringer et al. (2006) and Kamieniak et al. (2016) showed a statistically significant effect of the breed on the results obtained by stallions in ZT. According to the authors, horses of foreign breeds are classified the highest in the bravery test, and horses of the breed Polish sport horse (sp) in the domestic population. This result in relation to sp horses seems understandable due to the fact that the purpose of creating the breed was to acquire horses with a predisposition to equestrian sport. Breeding of Małopolska and Wielkopolska breeds until the 80s. The twentieth century was aimed at obtaining animals in the combined, harness-riding type. The significant discrepancy in the assessment of sp horses between the Manager of the Training Facility (result above the general average) and the Commission (below the general average) seems puzzling (Table 2), taking into account that the assessment during both the Qualification and the ZT Manager placed horses of the breed Polish sport horse just behind horses of foreign breeds. Following the Commission's notes, the average of the traits in question for the SP breed reached the lowest values among the

racial groups compared. Sometimes the final result of a valuable stallion is influenced by a worse "form of the day", but the size of the analyzed group excludes the possibility of recognizing the legitimacy of such an argument.

Pietrzak et al. (2000), Janczarek (2006) and Geringer et al. (2006), comparing the utility of representatives of domestic half-bred breeds, found the superiority of Sp stallions over Wielkopolska and Małopolska stallions in terms of predisposition for jumping over obstacles.

According to Kamieniak et al. (2016) and Drewka et al. (2013), the analysis of the results of the bravery tests shows the superiority of the marks obtained by foreign-bred stallions over Polish-bred horses. According to Krzyżanowski (2009), Polish breeding ranks far in the ranking of world sport horse breeding. For many years, the priorities of Polish breeding differed significantly from those of Western Europe. Years ago, when breeding in Poland was conducted in two directions in the state sector, selection was carried out at studs, while in the case of field breeding almost all born individuals were entered in the books, and almost all stallions were recognized. There was a lack of sharp election, consistency and lack of sentiment in breeding (Cuber and Stasiowski, 2011). The lack of a reliable performance assessment system and frequent changes in the methodology of animal evaluation also had a negative impact on the amount of breeding progress in the noble horse population.

The discrepancy in the marks for loose jumping between the moment of Qualification and the final assessment of the Commission may have been the result of a tightening of the evaluation criteria based on the increase in skills and experience acquired by horses during the 100-day training. The emerging discrepancies in the evaluation of stallions may also have resulted from the heterogeneous way of training the members of the judging commission. Each judge assessing young horses should have professional knowledge about the characteristics of the essential features of the jumping technique, the level of requirements adequate to the age of the animal, as well as each object assessment of the viewed passage through the corridor with obstacles without comparing the passages of subsequent individuals. According to Szaszkievicz (2009), judges usually issue notes whose values oscillate around the median range of grades available. According to Levchuk et al. (2004) a debatable issue is the reliability of horse evaluation conditioned by the competence, experience and personal preferences of the members of the animal evaluation commission. The objectivity of the assessment can also be disturbed by private contacts with owners and breeders. According to Janura and Dvořáková (2004), regardless of the level of professional qualifications, the analysis and evaluation of certain horse movement patterns is not possible without the use of specialized

equipment. Also Pietrzak et al. (2006), drawing attention to the imperfection of visual assessment resulting from subjective perception and the inability to perceive important details, emphasize the need to analyze the recorded image of the jumps made, in order to obtain data to objectively determine the individual's predisposition to jump and use this knowledge in the work of training. Comparable results of jumping evaluations in the corridor of 3- and 4-year-old horses may indicate a similar level of training of stallions submitted for qualification to ZT, as well as finishing training. The existence of a strong correlation between the marks issued for loose jumps by the ZT Manager and the Commission confirms the importance of the assessment of the ZT Manager, who, observing horses throughout the training period, has full and objective knowledge about their possibilities.

The assessment issued during the Qualification is the result of the opinion of the ZT Manager, a representative of the PZHK or OZHK/WZHK, at least one of the members of the assessment commission and the ZT veterinarian. According to Czerwińska et al. (2008), the Commission's assessment, unlike that of the Training Centre Manager observing the stallions during the entire preparatory period, concerns only the day of the trial, which, being a source of stress for a young horse, may adversely affect the final result of its assessment. Mental traits translate significantly into the performance of animals both in performance trials and when competing in equestrian sport. The negative impact on the effectiveness of use results from the psychosomatic links between fatigue and fitness and physiological performance (Geringer et al., 2001). Also, according to Sapuła et al. (2005) there are high correlations between the results of bravery tests and the varying levels of nervous excitability affecting the behavior and reactions of horses. A single assessment, as in the case of the Commission, can be subject to a large error of a single observation, so the ability to analyse biomechanics and the knowledge to what extent the training can improve the individual elements to be assessed is an opportunity to increase its objectivity.

Summary

The analysis of how young horses overcome obstacles in the corridor is a tool for breeders to support and facilitate early selection of animals. The assessment of bulk jumping is an important element in the process of determining the performance value and jumping predispositions of warm-blooded stallions undergoing stationary training in Training Establishments. The analysis of the influence of selected factors on the accuracy of the marks for loose jumping given to the stallion during the Qualification, by the Training Facility Manager and the Commission during the bravery tests after the end of the 100-day training in 2011–2016 showed:

- There are no significant differences between the average grades given to stallions during Qualification and the final trial in individual years.
- The existence of statistically significant differences in the assessment of loose jumping of stallions of different breeds made by the Manager of ZT and the absence of significant differences in the assessment of the Commission and during the Qualification. The highest average marks given by the Manager of the Training Facility and the Commission were obtained by horses of foreign breeds – Oldenburg and Holstein.
- No significant impact of the age of the stallions on the amount of marks for loose jumping in the case of assessments of the ZT Manager, the Commission and during the Qualification. The age difference did not significantly affect the level of training of the horses during the 100-day riding training and the result of the final trial.
- A small and varied number of ZT graduating stallions in individual years of trials. The small number of assessed stallions should be considered as an unfavourable phenomenon, which may result in a decrease in the intensity of breeding selection in Poland.

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SUMMARY

The aim of the study was to assess the influence of the test year, age and breed on the results of the grades in free jumping issued to stallions during Qualification for the Training Test, by the Manager of the Training Center and the Judging Committee during the stationary tests of stallions in 2011–2016. The research covered 74 three-year-old and four-year-old stallions of warmblood breeds. The study used the notes issued during the Qualification for the Training Center and after the final test (assessment by the Manager of the Training Center and the Judging Committee). The trial year had no significant effect on the grades during the Qualification, the grades of the Manager of the Training Center and the Judging Committee, nor did the age of the horse. Breed turned out to be a factor determining the statistically significant differences only in the opinion of the Manager of the Training Center. A highly significant correlation occurred between the assessment during the Qualification and the assessment of the Manager of the Training Center in the final test, as well as between the assessment of the Manager of the Training Center and the assessment of the Judging Committee.