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The effect of age on results obtained by mares during stationary and field performance tests conducted in Poland in the years 2001-2010

Wplyv wieku na wyniki osiągane przez klacze podczas stacjonarnych i polowych prób dzielności w polsce w latach 2001-2010

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Abstract

The study encompassed a population of noble mares, assessed in Poland during performance tests. The statistical analysis pertained to results obtained by warmblood mares within a period of 10 years. Performance tests were conducted in II systems: field and stationary. The analysis encompassed 1490 mares, each of which participated in at least one performance test.
The conducted study revealed statistically significant differences between average results obtained by 2-3 year-old mares and 4-year-olds only in the free jumping and rideability categories – in favor of 4-year-old mares. No statistically significant differences were noted between average scores for: walk, trot and gallop. The study did not reveal the impact of age on final scores for warmblood mares for the following traits during performance tests: walk, trot and gallop. Age did impact the results of: free jumping and rideability. The authors believe that the horses' natural gait (its movements since infancy) is determined genetically and does not depend on age or length of training.

Keywords: Stationary and Field Performance Tests Conducted for Mares, effect of age, walk, trot, gallop, free jumping, rideability.

Streszczenie

Badaniami objęto populację klaczy ras szlachetnych, ocenionych podczas wierzchowych prób dzielności na terenie Polski. Analizie statystycznej poddano wyniki uzyskane przez klacze gorącokrwiste na przestrzeni 10 lat. Próby dzielności przeprowadzono w II systemach: polowym i stacjonarnym. Łącznie rozpatrywano wyniki 1490 ocenionych klaczy, które uczestniczyły przynajmniej w jednej próbie dzielności. W badaniach różnica statystyczna pomiędzy średnimi wynikami uzyskanymi przez klacze 2-3letnie i 4-letnie, była istotna tylko dla cech skoki luzem i jezdność, na korzyść klaczy 4-letnichNie odnotowano różnic statystycznych miedzy średnimi notami za cechy stęp, kłus i galop a wiekiem klaczy. Nie stwierdzono

wpływu wieku na noty końcowe jakie uzyskały klacze ras gorącokrwistych za cechy: stęp, kłus i galop, podczas oceny na próbie dzielności. Wiek wpłynął na wyniki za skoki luzem i jezdność. Zdaniem autorów chody naturalne jakimi porusza się koń od najmłodszych lat są uwarunkowane genetycznie i niezależne od wieku zwierzęcia oraz długości trwania treningu.

Słowa kluczowe: Stacjonarne i Polowe Próby Dzielności Klaczy, wpływ wieku, stęp, kłus, galop, skoki luzem, jezdność

Detailed Abstract

Konie poddawane są ocenie prawidłowego pokroju i wartości użytkowej podczas próby polowej i stacjonarnej (Jończyk 2002). Wyniki z prób dzielności są wskazówką przy wyborze klaczy do dalszej hodowli, dają możliwość porównania przyszłych matek między sobą (www.hanoverian.org.au). Określenie predyspozycji sportowych klaczy pozwala na selekcję względem dyscyplin hipicznych (dresaż, skoki przez przeszkody). Badaniami objęto populację klaczy ras szlachetnych, ocenionych podczas wierzchowych prób dzielności na terenie Polski. Analizie statystycznej poddano wyniki uzyskane przez klacze gorącokrwiste na przestrzeni 10 lat. Próby dzielności przeprowadzono w II systemach: polowym i stacjonarnym. Łącznie rozpatrywano wyniki 1490 ocenionych klaczy, które uczestniczyły przynajmniej w jednej próbie dzielności.
Klacze stanowiły własność stadnin państwowych oraz osób prywatnych, pochodziły zarówno z hodowli polskiej, jak i zagranicznej. Zgodnie z wymogami PZHK klaczom 5-letnim i starszym wynik końcowy pomniejszono o 5%, ze względu na zaawansowane stadium rozwoju fizycznego oraz poziom wytrenowania. Klacze najmłodsze (2 i 3 letnie) osiągały średnio niższe wyniki niż klacze 4 letnie dla wszystkich badanych cech użytkowych
Celem pracy jest określenie wpływu wieku na noty końcowe uzyskiwane przez klacze ras gorącokrwistych podczas wierzchowych prób dzielności.

Introduction

During stationary and field performance tests, horses undergo evaluation of proper conduct and utility value (Jończyk 2002). Performance test results are an indicator when choosing a mare for further breeding, and enable a comparison of future mothers [www.hanoverian.org.au]. Determining mares' riding predispositions allows for a selection of most suitable equestrian disciplines (dressage, show jumping). Similar problems were also addressed by Halo et al. (2009), Mlyneková et al. (2008); Hollý et al. (2009), Halo et al. (2008)
The analysis pertained to the impact of mares' age on parameters evaluated during performance tests conducted in Poland. The analysis encompassed scores pertaining to individual traits in order to assess mares' utility value. In accordance with the Polish Horse Breeders Association's guidelines, the results of mares aged 5 years and older were decreased by 5%, due to an advanced stage of physical development and level of training. Research revealed that decreasing final scores had an impact on results and mares' comparison levels (Barry et. al. 2002; 2002a). This pertains to both stationary and field performance tests.

Breeding plans in Poland should be based on a comprehensive assessment and selection of foals, stallions and mares during performance tests conducted before the selection of individual animals for equestrian sports (Budzyński et. al.1997). Witkowski (2006) suggests that – as is done in the West – the selection of Polish horses should be conducted in steps, depending on the animals' age, commencing from an evaluation (description) of animals in three periods: nursing foals, horses aged 1-2, in the case of which selection criteria are determined based on: type, conduct, gait, pedigree, height, development, health and temperament. The last step is an evaluation of breeding value and the elaboration of selection indexes through an analysis of equestrian performance, the performance of offspring and collateral kin. Selection steps should be linked with horses' age and their readiness to work, as well as breeding utility (www.pzhk.pl), Mlyneková et al. (2010), Halo et al. 2009, Mlyneková et al. (2009).

The aim of the study was to determine the manner in which age impacts final scores obtained by warmblood mares during performance tests.

Material and Methods

The study encompassed a population of noble mares, assessed in Poland during performance tests. The statistical analysis pertained to results obtained by warmblood mares within a period of 10 years. Performance tests were conducted in II systems: field and stationary. The analysis encompassed 1490 mares, each of which participated in at least one performance test.

The mares were the property of state-owned stud farms and of private individuals, and were bred both in Poland and abroad. The number of mares in each analyzed year varied: 43 mares in 2001 and 292 in 2008. Starting in 2008, the minimal age of mares taking part in performance tests was 33 months, and maximum age was 5 years (as determined by the Polish Horse Breeders Association). In previous years the age limit was 30 months and up, which is why the collected data includes mares above 5 years of age. The presence of 2-year-old mares in the analyzed population was linked with the Polish Horse Breeders Association's regulations, in accordance with which foals born in the 4^{th} quarter are to be included in the following (subsequent) age-group in order to minimize differences between foals. The year of birth included in the documentation revealed 42 mares qualified as 2-year-olds. However, they fulfilled performance test conditions as they were 33 (in previous years: 30) months old.

Ten age groups were distinguished based on year of birth – ranging from 2-year-old mares to 11-year old mares. The number of animals comprising each group was not the same – mares were grouped into three age intervals:

- mares 2 and 3 years of age
- 4-year-old mares
- mares 5 years of age and older .

In accordance with the Polish Horse Breeders Association's regulations, in order to even out the chances for all animals, mares 5 years of age and older were subtracted 5% due to a higher physical development stage and training level. This pertains to both field and stationary performance tests.

The analysis of the studied population was conducted using Statistica 9PL [Stanisz 1998] software. Results contain the percentage of mares assessed in stationary and field performance tests. Minimal and maximum scores were shown, as well as mathematical averages (MA) and standard deviation (SD) in the studied population

with classification into type of test (stationary and field) as well as in age groups for the following traits: free jumping, walk, trot, gallop and rideability. Statistical differences between average values of scores obtained by the horses within each trait were conducted using the Kruskal-Wallis test. The study determined the relationship between age and utility traits and their statistical significance for the entire studied population. Spearman's rank correlation coefficient was used to calculate correlation.

Results and Discussion

Breeding and genetic resource protection programs for noble horse breeds (Greater Poland, Lesser Poland and Half-Blood) postulate that only 3 and 4 year old mares participate in performance tests (Krupiński 2004). Bagniewski (2008) holds a similar opinion; according to Bagniewski only pares 3 years of age and older should qualify for performance tests; many mares under 3 years of age appeared worn-out from training during assessment. Byszewski (2009) noticed that most 3 year-old mares participating in performance tests appear foal-like and are not yet stable in their movements. During tests these mares are compared to 4-year-old mares which are somatically mature and have often worked in saddle for nearly a year, gaining experience. Byszewski (2009) believes that the difference in general development in the case of 3 and 4-year-old mares is substantial. Research results show the highest scores are obtained by 4-year-old mares, which might indicate their higher level of development and training (Drewka 2012). The fact that number of mares younger than 3 years of age participating in performance tests decreases on an annual basis is a good sign. These young mares – as a result of a shorter preparation period – cannot display their full mobility and utility potential during tests.
According to Krzyżanowski (2009), the younger the animal, the greater the error in its assessment during performance tests, as too many environmental factors impact its future equestrian career.

Table 1. A characteristic of the studied population according to age

Mares' age	Number of mares in the field performance tests	Number of mares in the stationary performance tests	Total	% Population
2-3 year	284	434	718	48,2%
4 year	267	180	447	30%
5 and above year	249	76	325	21,8%
total assessed mares	800	690	1490	100%
mathematical averages age	4,2 **	3,5 **	3,9	-
minimal	2,0	2,0	-	-
maximum	11	10	-	-

** differences significant at $p \leq 0,01$

The smallest age group among the studied mares was composed of horses five years of age and older; they composed 21.8% of the population. The largest group was composed of 2-3 year-olds (48.2% of the entire population). The average age for the entire population was a little under 4 years of age. This age was higher in the case of field tests (a little over 4), in comparison with mares participating in stationary tests (3.5 years of age) – the difference was highly significant statistically (Table 1). The span between average score values for stationary tests in comparison with field tests was 1.83 points (Table 2). The difference was statistically significant for $p \leq 0.05$. After taking into consideration the 5% decrease in final scores for mares 5 years of age and older, higher average scores were noted for mares participating in field and stationary tests. This difference amounted to 1.46 points, and – as before – the difference was statistically significant.

Table 2. Results obtained by mares during field and stationary performance tests for shared traits

Statistical characteristic	Correction for age	Field Tests	Stationary Tests	Total
n	1	800	690	1490
	2	800	690	1490
mathematical averages	1	35,84 **	34,02 **	35,00
	2	35,29 **	33,83 **	34,62
standard deviation	1	3,85	3,23	3,69
	2	3,92	3,27	3,71
minimal	1	16,0	23,8	16,0
	2	15,2	23,5	15,2
maximum	1	49,0	44,0	49,0
	2	47,5	44,0	47,5

** differences significant at $p \leq 0,01$
* differences significant at $p \leq 0,05$
1 -total note before correction
2 - after correction - after deduction of 5% of the total marks mares 5 years and older

The youngest mares (2 and 3 years of age) obtained lower scores on average than 4-year-olds for all studied utility traits. The lowest scores were noted for mares 5 years of age and older, as an effect of subtracting 5% from their scores (Drewka 2012). Performance tests should be compared for mares in the same or similar age groups. No statistically significant differences were noted between average scores for: walk, trot and gallop. The study did not confirm the hypothesis that age impacts final scores of individual gaits in the assessed population.
A comparison of results obtained by mares 5 years of age and older without subtracting the 5% and with the 5% subtracted from final scores revealed a

statistically significant difference both for field and stationary tests, in favor of the first group. According to the authors, subtracting 5% has its practical justifications, as it evens out the chances during both field and stationary performance tests for younger mares (2,3 and 4 years of age), as older mares (5 years of age and older) are more experienced.

A positive correlation was noted between age and the results of free jumping and rideability; it was statistically significant for $p \leq 0.05$ (Table 3). No statistically significant interdependencies were noted in the case of basic gaits and age (Drewka 2012).

Table 3. Interdependence between mares' age and utility traits

Lp.	Trait	R
1	free jumping	0,055*
2	walk	0,024
3	trot	0,034
4	galop	0,002
5	rideability	0,062*

* differences significant at $p \leq 0,05$

The highest average scores for free jumping were obtained by 4-year-old mares (7.32), followed by 5-year-old mares (7.23) and 2-3 year-olds (7.19). According to the authors, this indicates that experience impacts final scores in the case of older animals (Drewka 2012).

A statistically significant difference was noted for $p \leq 0.05$ in the case of free jumping, between the 2-3 year old mares and 4 year-olds (Table 4).

Table 4. Results for free jumping in the analyzed age groups

Mares' age	N	Mathematical averages	Standard deviation	Minimal	Maximum
2-3 year	718	7,19*	0,918	4,0	10,0
4 year	447	7,32*	0,996	4,0	10,0
5 and above year	325	7,23	1,144	3,0	10,0

* differences significant at $p \leq 0,05$

Marchwicki (2011) states that in the case of younger horses, lower technical correctness in the free jumping category does not rule out an animal's chances for a career in sports. Weinberg [2002] indicates that young animals do not present themselves adequately during tests, but work very well with a rider. Klimke (2011) believes that assessing horses not quite 3 years of age, which have just been trained to saddle, for potential equestrian results is a mistake. The path from basic training to success is long – and requires patience and planned training Janczarek (2007) and Lewczuk et. al. (2004) indicate that early free juming predisposition assessments are

based on how an animal overtakes obstacles. Skulicz (1992) indicates that by eliminating the impact of training with a rider it would be possible to obtain a full view of potentially talented animals. A correctly performed jump should be ergonomic and dynamic (Deul 1995). The jump cannot be forced, the horse must be relaxed, and an animal with jump predispositions should overtake obstacles by bending its neck in a characteristic arch.

An assessment of mares in free jumping is fully justified and highly desirable by breeders. The validity of the point system used in performance tests for the free jumping category has been widely discussed in literature. Świdzińska (1982) states that there is a correlation between foals' jumping scores and their subsequent equestrian category. Szadyn (2006) indicates that features testifying that a horse has a talent for jumping can be noticed at an early age. Lewczuk et. al. (2001) indicates that a method for forecasting jumping ability is observing free jumps of young animals.

According to Wiszowaty (2004), a horse's assessment in the free jumping category is the best initial indicator of its genetic predispositions to obstacle jumping competitions. The trainers at Verden's Royal State Stud verified horses' predispositions to obstacle jumping and dressage as early as 90 years ago. A young horse illustrated its natural abilities during free jumping. During an assessment of free jumping conducted during performance tests, the same combination of obstacles is used for all mares – regardless of age and type of test.

Comparable results were noted for all age groups in the walk category within the studied population (Table 5). No statistically significant differences were noted in any of the age groups.

Table 5. Results for walk in the analyzed age groups

Mares' age	**N**	**Mathematical averages**	**Standard deviation**	**Minimal**	**Maximum**
2-3 year	718	6,90	0,769	4,5	9,0
4 year	447	6,94	0,802	4,0	9,7
5 and above year	325	6,89	0,968	3,0	10,0

Older mares (4 and 5 years of age and older) obtained higher average scores for trotting when compared with 2-3 year-old mares (Table 6).

Table 6. Results for trot in the analyzed age groups

Mares' age	**N**	**Mathematical averages**	**Standard deviation**	**Minimal**	**Maximum**
2-3 year	718	6,99	0,843	4,2	9,5
4 year	447	7,05	0,852	4,5	9,3
5 and above year	325	7,03	0,991	3,5	10,0

In the gallop category, the highest scores were obtained by 2-3 year-old mares, while mares 5 years of age and older obtained slightly lower scores (Table 7). No statistically significant differences were noted between average scores and age in the gallop category.

Table 7. Results for gallop in the analyzed age groups

Mares' age	N	Mathematical averages	Standard deviation	Minimal	Maximum
2-3 year	718	6,97	0,785	4,0	9,5
4 year	447	7,03	0,837	4,0	10,0
5 and above year	325	6,93	0,981	3,0	9,3

The study showed statistical differences for average scores in the rideability category between 2-3 year-old mares and 4-year-olds (Table 8). The highest scores for this trait were obtained by 4-year-old mares (Drewka 2012).

Table 8. Results for rideability in the analyzed age groups

Mares' age	N	Mathematical averages	Standard deviation	Minimal	Maximum
2-3 year	718	6,78 *	1,244	0,5	10,0
4 year	447	6,93 *	1,271	2,0	10,0
5 and above year	325	6,89	1,375	2,0	10,0

* differences significant at $p \leq 0,05$

Byszewski (2009) states that the difference in development between a 3 and 4-year-old horse is greater than that between a 4 and 5-year-old horse. Mares 5 years of age and older are often assessed right after giving birth – their physical condition is thus poorer and they receive poorer scores despite greater training experience. Average score values for the analyzed traits (free jumping, walking, trotting, gallop and rideability), without factoring in age (and without results obtained by mares 5 years of age and older), were obtained in field performance tests.
The conducted study revealed statistically significant differences between average results obtained by 2-3 year-old mares and 4-year-olds only in the free jumping and rideability categories – in favor of 4-year-old mares. A study conducted by Drewka (2008) also revealed higher final scores for 4-year-old mares. According to Byszewski (2009), performance tests should encompass solely mares 3 and 4 years of age – and the 5% decrease in results should be implemented in the case of 4 year old mares due to differences in somatic and behavioral development and training levels.

Conclusions

The study did not reveal the impact of age on final scores for warmblood mares for the following traits during performance tests: walk, trot and gallop. Age did impact the results of: free jumping and rideability. The authors believe that the horses' natural gait (its movements since infancy) is determined genetically and does not depend on age or length of training. Rideability, on the other hand, as well as free jumping, require planned work during training sessions with a rider. Dispersion of scores in the case of free jumping and rideability between 2-3 year-old mares and 4-year-old mares suggest differences in development.

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