

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

Wpływ rasy klaczy gorącokrwistych na wyniki osiągnięte podczas stacjonarnych i polowych prób dzielności w Polsce w latach 2001-2010

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Abstract

The aim of the research was to determine the effect of breed on results obtained by warmblood mares during stationary and field performance tests. Research encompassed results obtained by 1490 mares participating in stationary and field performance tests in Poland in the years 2001-2010. The population was comprised of 17 breeds. Name abbreviations are displayed in Table 1.

As a result of significant differences in the number of individual animals comprising each breed and in order to maintain the comparability of results, the entire population was divided into four breed groups: Half-Blood, Greater Poland, Lesser Poland and foreign breeds. Minimal and maximum score ranges were shown, as well as mathematical averages (MA) and standard deviation (SD) in the studied population. Statistical differences between average utility point values obtained by the horse breeds were analyzed using the Kruskal-Wallis test.

Keywords: performance tests horse, race horses, noble traits of riding horses

Streszczenie

Celem badań jest określenie wpływu rasy na wyniki uzyskiwane przez klacze ras gorącokrwistych podczas stacjonarnej i polowej próby dzielności. Badaniemi objęto wyniki uzyskane przez 1490 klaczy uczestniczących w polowych i stacjonarnych próbach dzielności w Polsce w latach 2001-2010. W strukturze badanej populacji oceniono 17 ras koni. Z uwagi na duże zróżnicowanie liczbowe osobników w poszczególnych rasach, w celu zachowania porównywalności wyników, w dalszych badaniach dokonano podziału całej populacji na cztery grupy rasowe: sp, wkp, m i rasy zagraniczne. Wyznaczono rozrzut wartości dla badanych cech (min – max), średnią arytmetyczną (\bar{x}) oraz odchylenie standardowe (Sd). Różnice statystyczne między średnimi wartościami wyników punktowych uzyskanymi przez badane rasy koni w obrębie cech wykonano testem Kruskala – Wallisa.

Słowa kluczowe: próby dzielności klacz, rasy koni szlachetnych, cechy użytkowe koni wierzchowych

Detailed Abstract

Ocena cech użytkowych klaczy jest jednym z podstawowych mierników postępu w hodowli koni gorącokrwistych. Budowa ciała koni różnych ras wywiera zasadniczy wpływ na poziom predyspozycji skokowych (Okarska i wsp. 1988). Cuber (2009) twierdzi, że w dzisiejszych czasach hodowlę koni sportowych determinuje określony cel działania. To właśnie sport określa wymagania stawiane koniom wierzchowym a hodowla stara się je wypełnić. Celem staje się dostarczenie koni sportowych predysponowanych do określonej dyscypliny wyselekcjonowanych spośród wybitnych ras.

Badaniami objęto wyniki uzyskane przez 1490 klaczy uczestniczących w polowych i stacjonarnych próbach dzielności w Polsce w latach 2001-2010. W strukturze badanej populacji oceniono 17 ras koni. Z uwagi na duże zróżnicowanie liczbowe osobników w poszczególnych rasach, w celu zachowania porównywalności wyników, w dalszych badaniach dokonano podziału całej populacji na cztery grupy rasowe: sp, wlkp, m i rasy zagraniczne.

Charakterystyki statystycznej badanej populacji dokonano z wykorzystaniem programu Statistica 9PL (Sanisz 1998). Wyznaczono rozrzut wartości dla badanych cech (min – max), średnią arytmetyczną (\bar{x}) oraz odchylenie standardowe (Sd). Różnice statystyczne między średnimi wartościami wyników punktowych uzyskanymi przez badane rasy koni w obrębie cech wykonano testem Kruskala –Wallisa.

W badaniach własnych wykazano, że rasy koni zagranicznych otrzymały najwyższe noty. W przeprowadzonej analizie wykazano istotne różnice statystyczne między rasami m, wlkp i sp a rasami zagranicznymi.

W badaniach własnych spośród wyników klaczy z hodowli krajowej najwyższą średnią otrzymały konie rasy szlachetnej półkrwi (sp), na drugiej pozycji konie wielkopolskie i na trzeciej konie małopolskie.

Celem badań jest określenie wpływu rasy na wyniki uzyskiwane przez klacze ras gorącokrwistych podczas stacjonarnej i polowej próby dzielności.

Introduction

An assessment of mares' utility traits is a basic indicator of progress when breeding warmblood horses. An animal's body type largely impacts jumping predispositions (Okarska et al. 1988). Cuber (2009) believes that nowadays, breeding horses used in sports is determined by a predefined objective. Sportsmanship determines the requirements set for horses and a breeder strives to fulfill them. The objective is to breed sport horses with predispositions for a particular discipline; animals selected among exceeding breeds. Piłkuła et al. (2006) analyzed the percentage of breeds in individual disciplines. He was able to determine that obstacle jumping and dressage were dominated by Half-Blood breeds, whilst Lesser Poland horses dominated in the case of eventing (Wszechstronny Konkurs Konia Wierzchowego). Similar problems were also addressed by Halo et al (2011a), Halo et al. (2011b), Mlynková et al. (2013).

Contemporary breeding and utility of warmblood breeds places great emphasis on how animals behave with a rider. Control and utility assessment of horses is a difficult undertaking (Kaproń 1996). An assessment of utility value encompasses breed, sex and age, as well as conduct, performance test scores and assessment of breeding value [Polish Journal of Laws 1999]; Halo et al. 2008, Mlyneková et al (2008), Mlyneková et al (2010). The aim of the research was to determine the effect of breed on results obtained by warmblood mares during stationary and field performance tests.

Material and Methods

Research encompassed results obtained by 1490 mares participating in stationary and field performance tests in Poland in the years 2001-2010. The population was comprised of 17 breeds. Name abbreviations are displayed in Table1:

Table.1 Horse breeds participating in performance tests and their abbreviations

| Lp. | Rasa | Skrót |
|-----|---------------------------------------|-------------------|
| 1. | polski koń szlachetny półkrwi | Sp |
| 2. | Wielkopolska | Wlkp |
| 3. | Małopolska | M |
| 4. | Bawarska | Baw |
| 5. | Hanowerska | Han |
| 6. | Saksońska | Saks |
| 7. | Trakeńska | Trak |
| 8. | Oldenburska | Old |
| 9. | holenderski koń gorącokrwisty | KWPN |
| 10. | pełna krew angielska | Xx |
| 11. | belgijski koń gorącokrwisty | BWP |
| 12. | Westfalska | Westf |
| 13. | Holsztyńska | Hol |
| 14. | Meklemburska | Mekl |
| 15. | wielkopolska pochodzenie trakeńskiego | wlkp / poch. Trak |
| 16. | Angloarabska | Xo |

As a result of significant differences in the number of individual animals comprising each breed and in order to maintain the comparability of results, the entire population was divided into four breed groups: Half-Blood, Greater Poland, Lesser Poland and foreign breeds. Stanisław (1998) indicates that smaller groups (according to the authors: those comprised of fewer than 15 animals; fewer than 30 animals according to other researchers), are not analyzed statistically, as there is a risk of error. The analysis of the studied population was conducted using Statistica 9PL (Stanisław 1998) software. Minimal and maximum score ranges were shown, as well as mathematical averages (MA) and standard deviation (SD) in the studied population. Statistical differences between average utility point values obtained by the horse breeds were analyzed using the Kruskal-Wallis test.

Results and discussion

Three horse breeds were dominant in the described population: Polish Half-Blood Horse (SP), the Greater Poland breed (WLKP) and the Lesser Poland breed (M). The population of the Polish Half-Blood Horse was comprised of 671 mares – 45.0% of the entire population. 520 mares comprised the Greater Poland breed (35.0%), and 162 comprised the Lesser Poland breed (10.8%). The foreign breeds included 92 mares (6.1%).

Table 2. Statistical characteristic of the free jumping within the studied horse breeds

| lp | The breed mares | N | Mathematical averages | Standard deviation | Min | Max | Statistical differences |
|----|-----------------|-----|-----------------------|--------------------|-----|------|-------------------------|
| 1. | Sp | 671 | 7,29 | 0,988 | 3,0 | 10,0 | 1-3,4** |
| 2. | wlkp | 527 | 7,11 | 1,017 | 4,0 | 9,8 | 2-3,4** |
| 3. | M | 200 | 7,07 | 0,794 | 5,0 | 9,0 | 3-4** |
| 4. | foreign | 92 | 7,92 | 1,011 | 5,2 | 10,0 | |

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

The author's research revealed that the highest scores for free jumping (Table 2) were obtained by foreign breeds (7.92 points), second place was obtained by Polish Half-Blood breeds (average of 7.29 points). Statistically significant differences were revealed between average scores ($p \leq 0.01$) in the case of foreign and domestic breeds, as well as between Polish Half-Blood and Lesser Poland breeds. No statistically significant differences were noted only between Half-Blood and Greater Poland breeds (Table 2).

Table 3. Statistical characteristic of the walk trait within the studied horse breeds

| Lp. | The breed mares | N | Mathematical averages | Standard deviation | Min | Max | Statistical differences |
|-----|-----------------|-----|-----------------------|--------------------|-----|------|-------------------------|
| 1. | Sp | 671 | 6,90 | 0,815 | 4,3 | 9,0 | 1-3,4** |
| 2. | wlkp | 527 | 6,90 | 0,828 | 3,0 | 9,0 | 2-3*, 2-4** |
| 3. | M | 200 | 6,78 | 0,776 | 4,7 | 9,2 | 3-4** |
| 4. | foreign | 92 | 7,34 | 0,873 | 5,5 | 10,0 | |

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

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

The analysis for the walk trait (Table 3) revealed that the highest average scores were obtained by foreign breeds (7.34 points), while the lowest (6.78) by Lesser Poland mares. Statistically significant differences were noted between foreign and domestic (Half-Blood, Greater Poland and Lesser Poland) breeds. In the case of Greater Poland and Lesser Poland breeds, the statistical differences were at the level of $p \leq 0.05$.

Table 4. Statistical characteristic of the trot within the studied horse breeds

| Lp. | The breed mares | N | Mathematical averages | Standard deviation | Min | Max | Statistical differences |
|-----|-----------------|-----|-----------------------|--------------------|-----|------|-----------------------------|
| 1. | Sp | 671 | 7,06 | 0,876 | 4,0 | 10,0 | 1-3,4** 2-3,4** 3-4** |
| 2. | wlcp | 527 | 6,98 | 0,885 | 3,5 | 9,5 | |
| 3. | M | 200 | 6,77 | 0,823 | 4,5 | 8,7 | |
| 4. | foreign | 92 | 7,52 | 0,774 | 6,0 | 10,0 | |

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

The highest average scores for trot (Table 4) were obtained by foreign mares (7.52 points), while the lowest by Lesser Poland horses; their average score was 6.77. The averages for the trot trait contained statistically significant differences for $p \leq 0.01$ in the case of foreign and domestic (Lesser Poland, Greater Poland and Half-Blood) breeds, as well as between Half-Blood and Lesser Poland and Greater Poland and Lesser Poland breeds.

Table 5. Statistical characteristic of the gallop within the studied horse breeds

| Lp. | The breed mares | N | Mathematical averages | Standard deviation | Min | Max | Statistical differences |
|-----|-----------------|-----|-----------------------|--------------------|-----|------|-----------------------------|
| 1. | sp | 671 | 7,00 | 0,846 | 4,0 | 9,3 | 1-3,4** 2-3,4** 3-4** |
| 2. | wlcp | 527 | 6,93 | 0,825 | 3,0 | 9,5 | |
| 3. | m | 200 | 6,78 | 0,818 | 4,3 | 8,8 | |
| 4. | foreign | 92 | 7,58 | 0,768 | 6,0 | 10,0 | |

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

The highest average scores for gallop (Table 5) were obtained by foreign mares (7.58 points), while the lowest – from 6.78 points to 7.06 points – for, respectively: Lesser Poland horses, Greater Poland Horses and Half-Blood horses. Statistically significant differences were noted between domestic and foreign breeds for $p \leq 0.01$. No statistically significant difference was noted only in the case of the Greater Poland breed and Half-Blood breeds for the given trait.

Table 6. Statistical characteristic of the rideability within the studied horse breeds

| Lp. | The breed mares | N | Mathematical averages | Standard deviation | Min | Max | Statistical differences |
|-----|-----------------|-----|-----------------------|--------------------|-----|------|-------------------------|
| 1. | sp | 671 | 6,86 | 1,224 | 0,5 | 10,0 | 1-4** 2-4** 3-4** |
| 2. | wlcp | 527 | 6,79 | 1,304 | 2,0 | 10,0 | |
| 3. | m | 200 | 6,63 | 1,420 | 1,0 | 9,0 | |
| 4. | foreign | 92 | 7,60 | 0,962 | 6,0 | 10,0 | |

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

The highest average scores for rideability (Table 6) were obtained by foreign mares (7.60 points), while the lowest – from 6.63 points to 6.86 points – for, respectively: Lesser Poland horses, Greater Poland Horses and Half-Blood horses. Statistically significant differences were noted between domestic and foreign breeds for $p \leq 0.01$. The author's research indicated that foreign breeds obtained the lowest scores. The same conclusions were reached by Geringer et. al. [2004]. The analysis indicated statistically significant differences between Lesser Poland, Greater Poland, Half-Blood breeds and foreign breeds. Pietrzak et. al. [2002] also stated that domestic mares obtain higher scores in the walk and gallop categories, which indicates inadequate assumptions during selection of movement parameters in breeding in Poland. Łojka [1997] and Piśkuła [1997] observed higher scores for individual gaits in the case of foreign breeds, compared with domestic breeds. Borowska [2011] indicated that basic parameters in most assessed traits, evaluated during performance tests, were the highest in the case of foreign breeds, and especially Koninklijk Warmblood Paard Nederland, which showed an aptitude towards, inter alia, jumping. According to Stachurska et. al. [2006], it is necessary to utilize German stallions in Poland in order to improve jumping and movement predispositions in domestic horses.

The author's research revealed that amongst the results obtained by domestic breeds, the highest averages were obtained by Half-Blood horses, while second place was held by the Greater Poland breed, third by the Lesser Poland breed. According to Łojka (2003), Half-Blood horses are excellent for breeding animals used for sportsmanship and are characterized by harmonious conduct.

Janczarek (2006) and Geringer et al. (2006) noticed the significant impact of breed on utility, and the highest values were noted in the case of Half-Blood horses. An analysis of the author's research also indicated the impact of breed on individual traits, including: free jumping, walk, trot, gallop and rideability.

Pietrzak et al. (2000) noticed that the combined assessment of the basic gaits of the studied horses revealed statistically significant differences between the breeds. The highest average values were obtained by Greater Poland breeds. This breed also had the best body type. Research conducted by Łojka (1996) indicated the equestrian universality of Greater Poland horses, which obtained comparable results in each riding competition. Koter and Łukaszewicz (2002) also concluded that – unlike traits linked with conduct – breed had an impact on most utility traits.

Conclusions

The author's research indicated a clear difference between scores for individual utility traits assessed during performance tests among domestic breeds and foreign breeds.

Polish half-blood mares obtained higher scores for studied utility traits which allowed for the conclusion that they have the best predispositions as horses used for sportsmanship among domestic breeds.

Greater Poland mares displayed similar scores for all evaluated traits, indicating that they are a versatile breed.

Research showed that breed has an impact on scores obtained during stationary and field tests, and, as a result, on the utility scores obtained by individual animals and their usability when breeding animals for particular sporting events.

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