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**Factors affecting performance test results
in half-bred mares**

Czynniki wpływające na wyniki prób dzielności klaczy półkrwi

Summary. The aim of the study was to assess the influence of different factors on the results of performance tests in half-breed mares. Assessment of usability value is one of the most important criteria of breeding selection in modern half-bred horses. Conditions of such tests are not uniform: apart from the genetic influence and breeding conditions, the final result of individual attempts is also determined by a series of other factors such as the test location. The present paper includes the results of stationary performance tests of 751 mares between 2007 and 2010. The following traits were assessed: character, temperament, training usability, loose jumping, walk, trot, canter and rideability. A gradual increase in the mean value of the final test scores was observed: in 2007 the mean was $\bar{x} = 56.40$ pts and in 2010 it was $\bar{x} = 57.24$ pts. The final result was also determined by such factors as the breeder and breed of the mares. Half-bred mares obtained the highest number of pts for character ($\bar{x} = 8.30$ pts) and training usability ($\bar{x} = 6.93$ pts); they also obtained the highest total ($\bar{x} = 56.85$); differences between the means are statistically significant.

Key words: mares, performance test, environmental factors

INTRODUCTION

Assessment of usability value is one of the most important criteria of breeding selection in modern half-bred horses. The assessment of male material, obligatory for all types and breeds, is conducted in specialist units, namely training facilities for young stallions, and performance test programs are gradually modified. They are treated as a tool, which allows for an early evaluation of genetic potential in reproducers, i.e. information important for later selection decisions, and provides data for genetic evaluation of young horses and their parents [Lewczuk 2008, Posta *et al.* 2010]. Another important goal is to use the tests as means of finding equine sporting talents [Thoren Hellsten *et al.* 2006]. The leading Western European breeding facilities have been focus-

ing on the assessment of mare usability value for years. In Polish breeding programs, the assessment of mare usability value is not obligatory. However, as a result of the activities of the Polish Horse Breeders Association, the Ministry of Agriculture and Rural Development accepted changes introduced into the breeding programs. Starting from 1 January 2014, mares of the following breeds: the Polish Half-Bred, the Wielkopolski and the Malopolski, which are to be listed in the register will have to pass performance tests reports that nowadays the impact of such tests on proper selection of mares is commonly acknowledged. Bagniewski [2005] claims that the Polish Horse Breeders Association should implement national uniform rules of placing notes on positive results of performance tests of mares in their breeding documentation. It is high time that such tests in compliance with breeding programs – be obligatory since breeding based only on usability value of stallions does not result in a complete breeding progress. As the above publication shows, mare usability value assessment is immensely important and, as many authors emphasise, comprises an integral selection criterion in contemporary horse breeding.

MATERIALS AND METHODS

The test material comprised 751 mares subjected to stationary performance tests between 2007 and 2010. The following traits were assessed: character, temperament, training usability, loose jumping, walk, trot, canter and rideability. Statistical analyses were conducted by means of the SAS v. 9.2 (2011) statistical package. MEANS-SAS v. 9.2. (2011) procedure was used to calculate the basic statistical parameters. Phenotype correlation coefficients were determined by means of the CORR-SAS v. 9.2. (2011) procedure. The significance of experimental factors (test year, test location, age, breed and breeder of mares) was determined with multivariate analysis using the GLM-SAS v. 9.2. (2011) procedure. Detailed comparison of the means for the items was conducted using Duncan's new multiple range test.

RESULTS AND DISCUSSION

Between 2007 and 2011, 751 mares were subjected to the stationary performance test (Tab. 1). The highest mean score given to the mares participating in the tests was ($\bar{x} = 8.13$ pts) for character and the lowest score was ($\bar{x} = 6.59$ pts) for rideability ($\bar{x} = 6.59$ pts).

The highest variability was observed in the evaluation of walk, trot and canter (from 0.00 pts to 9.17 pts). Mean scores for particular traits (Tab. 2) including the year of conducting the stationary performance test (Tab. 2) are diverse and in many cases highly statistically significant.

Statistically significant differences were observed in the evaluation of walk, trot and canter. The highest scores were given for trot ($\bar{x} = 7.04$ pts) and canter ($\bar{x} = 7.00$ pts) in mares participating in the stationary performance tests in 2007. A gradual increase of the final scores in the tests can be observed: in 2007 the mean was $\bar{x} = 56.40$ pts, and in 2010 $\bar{x} = 57.24$ pts.

Table 1. Number of mares (n), minimum (Min) and maximum (Max) means and standard deviation (SD) for traits analysed in 2007–2010 years (total)
 Tabela 1. Liczba klaczy (n) minimum (Min) i maksimum (Max), średnia i odchylenie standardowe (SD) dla analizowanych cech w roku 2007–2010 (ogółem)

Traits Cechy	n	Min	Max	\bar{x}	SD
Charakter (pts) Character (pkt)	751	4.50	10.00	8.13	0.95
Temperament (pts) Temperament (pkt)	751	5.00	10.00	7.43	0.82
Trainability (pts) Przydatność do treningu (pkt)	751	4.00	10.00	6.82	1.16
Free jump (pts) Skoki wolne (pkt)	751	1.17	9.00	7.02	0.85
Walk (pts) Stęp (pkt)	751	0.00	9.00	6.72	0.83
Trot (pts) Kłus (pkt)	751	0.00	9.17	6.83	0.92
Gallop (pts) Galop (pkt)	751	0.00	9.00	6.79	0.88
Rideability (pts) Jezdność (pkt)	751	1.00	10.00	6.59	1.33
Total (pts) Razem (pkt)	751	29.33	69.83	56.32	4.94

Mean scores of particular traits including the location of conducted tests are diverse (Tab. 3). The differences are statistically significant and highly significant. The best score was obtained by mares in the TC Doruchów training facility (total of 59.43 pts). The lowest total score was given to three mares undergoing tests in the TC Ciechocinek training facility ($\bar{x} = 57.03$ pts). The highest mean score for character ($\bar{x} = 8.44$ pts) was given to mares undergoing tests in the TS Biały Bor training facility. Character of mares undergoing performance tests in the TS Włocławek training facility ($\bar{x} = 8.34$ pts) and the TC Ciechocinek training facility ($\bar{x} = 8.25$ pts) was also marked high (Tab. 3).

However, these mares were given the lowest scores for trot: TC Ciechocinek ($\bar{x} = 6.35$ pts) and TC Włocławek ($\bar{x} = 6.39$ pts). The age of mares does not significantly affect the results of stationary performance test. The differences between mean values for particular traits are statistically insignificant in most cases.

Table 2. Number of mares (n), means and standard deviation (SD) for traits analysed taking into account of year
 Tabela 2. Liczba klaczy (n), średnia i odchylenie standardowe (SD) dla analizowanych cech z uwzględnieniem roku

Traits Cechy	Year – Rok											
	2007			2008			2009			2010		
	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD
Charakter (pts) Character (pkt)	160	8.21 ^a	0.97	217	8.21 ^b	1.03	182	8.07	0.97	192	8.03 ^{ab}	0.81
Temperament (pts) Temperament (pkt)	160	7.38	0.78	217	7.45	0.72	182	7.35 ^a	0.84	192	7.53 ^a	0.93
Trainability (pts) Przydatność (pkt)	160	6.64 ^{Aa}	0.93	217	6.73 ^B	1.23	182	6.83 ^{Ca}	1.17	192	7.07 ^{ABC}	1.20
Free jumping (pts) Skoki luzem (pkt)	160	7.02	0.93	217	6.90 ^A	0.88	182	7.03	0.74	192	7.14 ^A	0.84
Walk (pts) Stęp (pkt)	160	6.82 ^A	0.76	217	6.52 ^{ABC}	0.98	182	6.70 ^{BD}	0.69	192	6.88 ^{CD}	0.78
Trot (pts) Kłus (pkt)	160	7.04 ^{ABa}	0.78	217	6.63 ^{ACb}	1.09	182	6.80 ^{Bb}	0.79	192	6.90 ^{Ca}	0.90
Gallop (pts) Galop (pkt)	160	7.00 ^{AB}	0.75	217	6.59 ^{ACa}	1.07	182	6.73 ^{BDa}	0.73	192	6.90 ^{CD}	0.82
Rideability (pts) Jezdność (pkt)	160	6.30 ^{ABa}	1.47	217	6.52 ^{abc}	1.13	182	6.73 ^{Ab}	1.17	192	6.79 ^{Be}	1.51
Total (pts) Razem (pkt)	160	56.40 ^{AB}	4.75	217	55.53 ^{ACD}	4.94	182	56.23 ^{CE}	4.82	192	57.24 ^{BDE}	5.07

a, b... – values in the same rows with different letters differ significantly at $P \leq 0.05$

a, b... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,05$

A, B... – values in the same rows with different letters differ significantly at $P \leq 0.01$

A, B... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,01$

Table 3. Number of mares (n), means and standard deviation (SD) for traits analysed into account of Training Center

Tabela 3. Liczba klaczy (n), średnia i odchylenie standardowe (SD) dla analizowanych cech z uwzględnieniem zakładu treningowego

Traits Cechy	Training Center Zakład treningowy														
	Biały Bór			Bogusławice			Ciechocinek			Doruchów			Włocławek		
	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD
Character (pts) Charakter (pkt)	329	8.44 ^{AB}	0.91	223	7.63 ^{ACD}	0.95	77	8.25 ^{CE}	0.79	55	7.84 ^{BEF}	0.50	67	8.34 ^{DF}	0.87
Temperament (pts) Temperament (pkt)	329	7.13 ^{ABCD}	0.64	223	7.39 ^{ADEFG}	0.88	77	8.01 ^{BEa}	0.58	55	8.05 ^{CFb}	0.80	67	7.84 ^{DCab}	0.86
Trainability (pts) Przydatność (pkt)	329	6.35 ^{ABC}	0.89	223	6.55 ^{DEF}	1.06	77	7.81 ^{Ada}	0.89	55	8.06 ^{BEa}	0.96	67	7.88 ^{CF}	0.93
Free jumping (pts) Skoki luzem (pkt)	329	6.95	0.87	223	7.06	0.69	77	6.96	1.07	55	7.25	0.84	67	7.13	0.95
Walk (pts) Step (pkt)	329	6.70 ^a	0.78	223	6.81 ^{AB}	0.73	77	6.56 ^{AC}	1.20	55	6.89 ^{CDa}	0.84	67	6.55 ^{BD}	0.77
Trot (pts) Klus (pkt)	329	6.98 ^{AB}	0.89	223	6.88 ^{CD}	0.79	77	6.35 ^{ACE}	1.30	55	6.84 ^{EF}	0.80	67	6.39 ^{BDF}	0.78
Gallop (pts) Galop (pkt)	329	6.88 ^{AB}	0.77	223	6.83 ^{CD}	0.80	77	6.41 ^{ACE}	1.36	55	6.95 ^{EF}	0.83	67	6.50 ^{BDF}	0.81
Rideability (pts) Jezdność (pkt)	329	6.34 ^{AB}	1.17	223	6.57 ^{CD}	1.53	77	6.68 ^{Ea}	0.91	55	7.55 ^{ACEF}	1.59	67	7.00 ^{BDFa}	1.07
Total (pts) Razem (pkt)	329	55.78 ^{ABC}	4.32	223	55.73 ^{DEF}	5.26	77	57.03 ^{AD} G	5.33	55	59.43 ^{BEGH}	5.33	67	57.63 ^{CFH}	4.75

a, b... – values in the same rows with different letters differ significantly at $P \leq 0.05$ a, b... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,05$ A, B... – values in the same rows with different letters differ significantly at $P \leq 0.01$ A, B... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,01$

Statistically significant differences were observed in the evaluation of character, lowest scores for that feature were obtained in 4-year-old mares ($\bar{x} = 8.10$ pts), while highest scores were given to mares older than 5 ($\bar{x} = 8.58$ pts) (Tab. 4).

Statistically significant differences were also observed in mean scores for rideability. The results of tests including the breed of the mare are also diverse (Tab. 5). Scores for character ($\bar{x} = 7.65$ pts), temperament ($\bar{x} = 7.37$ pts) and usability ($\bar{x} = 6.53$ pts) are worst in the mares of the Malopolska breed. The difference between mean scores is statistically significant. Half-bred mares received best scores for character ($\bar{x} = 8.30$ pts) and usability for training ($\bar{x} = 6.93$ pts). These mares also obtained the highest total scores ($\bar{x} = 56.85$); differences between mean values are statistically significant. The influence of the breeder on the mean values of evaluated traits is important (Tab. 6). The

biggest differences were observed between the mean values of scores for movement. Mean score for trot and canter for mares bred in the Wielkopolska stables was the highest and amounted to $\bar{x} = 7.24$ pts and $\bar{x} = 7.07$ pts, and for mares of individual breeders, it was the lowest amounting to $\bar{x} = 6.70$ pts. Lower scores for jumping and the walks were obtained by mares of individual breeders and the difference was statistically significant. The mares from the Wielkopolska stables obtained the highest scores for walks (walk $\bar{x} = 6.82$ pts, trot $\bar{x} = 7.24$ pts, canter $\bar{x} = 7.07$ pts). The highest final score was given to the group of mares born in the Wielkopolska stables. The difference between the final mean scores including, the groups of mares, is highly statistically significant. The correlation coefficients between the evaluated traits were calculated (Tab. 7). The highest and very statistically significant correlations were observed between trot and canter ($r_p = 0.8608$) as well as walk, trot and canter. Very highly statistically significant correlations were observed between usability for training ($r_p = 0.6947$) and the total number of pts as well as canter and the total number of pts ($r_p = 0.6690$). There is a strong, statistically significant correlation between free jumping and particular walks, from $r_p = 0.3145$ to $r = 0.3774$. Posta *et al.* [2010] founded positive genetic correlations between movements and free jumping.

Table 4. Number of mares (n), means and standard deviation (SD) for traits analysed into account of age of mares

Tabela 4. Liczba klaczy (n), średnia i odchylenie standardowe (SD) dla analizowanych cech z uwzględnieniem wieku klaczy

Traits Cechy	Age of mares – Wiek klaczy											
	3			4			5			> 5		
	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD
Character (pts) Charakter (pkt)	475	8.12 ^a	0.98	200	8.10 ^b	0.89	52	8.16	0.95	24	8.58 ^{ab}	0.76
Temperament (pts) Temperament (pkt)	475	7.41	0.82	200	7.45	0.84	52	7.52	0.82	24	7.42	0.80
Rideability (pts) Przydatność (pkt)	475	6.78	1.15	200	6.88	1.16	52	7.01	1.27	24	6.77	1.01
Free jumping (pts) Skoki luzem (pkt)	475	7.03	0.84	200	7.02	0.89	52	6.96	0.83	24	6.86	0.77
Walk (pts) Stęp (pkt)	475	6.73	0.80	200	6.71	0.85	52	6.63	0.92	24	6.65	1.02
Trot (pts) Kłus (pkt)	475	6.84	0.90	200	6.82	1.00	52	6.69	0.88	24	6.87	0.94
Gallop (pts) Galop (pkt)	475	6.82	0.86	200	6.78	0.92	52	6.66	0.87	24	6.66	1.04
Rideability (pts) Jezdność (pkt)	475	6.58	1.36	200	6.62 ^a	1.33	52	6.78 ^b	1.03	24	6.23 ^{ab}	1.35
Total (pts) Razem (pkt)	475	56.31	5.01	200	56.36	4.96	52	56.42	4.33	24	56.04	4.92

a, b – values in the same rows with different letters differ significantly at $P \leq 0.05$

a, b – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,05$

Table 5. Number of mares (n), means and standard deviation (SD) for traits analysed into account of breeds
Tabela 5. Liczba klaczy (n), średnia i odchylenie standardowe (SD) dla analizowanych cech z uwzględnieniem rasy

Cechy traits	Breeds – Rasy								
	Wielkopolski wielkopolska			Polish Half Bred polski koń szlachetny półkrwi			Małopolski małopolska		
	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD
Character (pts) Charakter (pkt)	237	8.19 ^a	0.85	357	8.30 ^b	0.95	157	7.65 ^{ab}	0.94
Temperament (pts) Temperament (pkt)	237	7.38	0.77	357	7.49	0.83	157	7.37	0.86
Trainability (pts) Przydatność (pkt)	237	6.85 ^a	1.13	357	6.93 ^b	1.18	157	6.53 ^{ab}	1.09
Free jumping (pts) Skoki luzem (pkt)	237	6.93	0.87	357	7.09	0.88	157	7.00	0.75
Walk (pts) Step (pkt)	237	6.73	0.73	357	6.70	0.93	157	6.74	0.73
Trot [pts] Kłus (pkt)	237	6.82	0.84	357	6.88	1.02	157	6.72	0.80
Gallop (pts) Galop (pkt)	237	6.79	0.73	357	6.82	0.99	157	6.73	0.82
Rideability (pts) Jezdność (pkt)	237	6.59	1.29	357	6.65	1.26	157	6.46	1.52
Total (pts) Razem (pkt)	237	56.28 ^{ab}	4.25	357	56.85 ^{ac}	5.26	157	55.19 ^{bc}	5.00

a, b... – values in the same rows with different letters differ significantly at $P \leq 0.05$

a, b... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,05$

Table 6. Number of mares (n), means and standard deviation (SD) for traits analysed into account of breeders

Tabela 6. Liczba klaczy (n), średnia i odchylenie standardowe (SD) dla analizowanych cech z uwzględnieniem hodowców

Cechy Traits	Breeders – Hodowcy								
	stud farm of Wielkopolska wielkopolskie stadniny państwowe			stud farm stadniny państwowe			individual breeders hodowcy indywidualni		
	n	\bar{x}	SD	n	\bar{x}	SD	n	\bar{x}	SD
Character (pts) Charakter (pkt)	52	8.38 ^{ab}	0.78	210	7.95 ^{ac}	1.04	489	8.18 ^{bc}	0.91
Temperament (pts) Temperament (pkt)	52	7.38	0.80	210	7.29	0.82	489	7.50	0.82
Trainability (pts) Przydatność (pkt)	52	6.67 ^a	0.91	210	6.51 ^b	1.03	489	6.97 ^{ab}	1.20
Free jumping(pts) Skoki luzem (pkt)	52	7.01	0.64	210	7.17	0.75	489	6.95	0.90
Walk (pts) Step (pkt)	52	6.82 ^a	0.80	210	6.82 ^b	0.71	489	6.66 ^{ab}	0.87
Trot (pts) Kłus (pkt)	52	7.24 ^{AB}	0.71	210	7.02 ^{AC}	0.79	489	6.70 ^{BC}	0.97
Gallop (pts) Galop (pkt)	52	7.07 ^A	0.65	210	6.93 ^B	0.72	489	6.70 ^{AB}	0.95
Rideability (pts) Jezdność (pkt)	52	6.62	1.08	210	6.48	1.39	489	6.64	1.33
Total (pts) Razem (pkt)	52	57.19 ^{AB}	3.86	210	56.17 ^A	4.80	489	56.30 ^B	5.10

a, b... – values in the same rows with different letters differ significantly at $P \leq 0,05$

a, b... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,05$

A, B... – values in the same rows with different letters differ significantly at $P \leq 0,01$

A, B... – wartości w wierszach oznaczone różnymi literami różnią się istotnie przy $P \leq 0,01$

Table 7. Correlation among traits are show in table 1
 Tabela 7. Współczynniki korelacji między badanymi cechami zawartymi w tabeli 1

Traits Cechy	Character (pts) Charakter (pkt)	Tempe- rament (pts) Tempe- rament (pkt)	Trainabi- lity (pts) Przydat- ność (pkt)	Free jumping (pts) Skoki luzem (pkt)	Walk (pts) Stęp (pkt)	Trot (pts) Kłus (pkt)	Gallop (pts) Galop (pkt)	Rideabi- lity (pts) Jezdność (pkt)	Total (pts) Razem (pkt)
Character (pts) Charakter (pkt)		0.3521	0.2637	0.1104	0.1390	0.1647	0.1539	0.2245	0.4736
Temperament (pts) Temperament (pkt)	**		0.6905	0.2456	0.2023	0.1408	0.2118	0.4463	0.6559
Trainability (pts) Przydatność (pkt)	*	***		0.3219	0.2329	0.1783	0.2605	0.4495	0.6947
Free jumping (pts) Skoki luzem (pkt)	NS	*	**		0.3303	0.3146	0.3774	0.1800	0.5394
Walk (pts) Stęp (pkt)	NS	*	*	**		0.6982	0.7524	0.2337	0.6668
Trot (pts) Kłus (pkt)	NS	NS	NS	**	***		0.8608	0.2260	0.6690
Gallop (pts) Galop (pkt)	NS	*	*	**	***	***		0.2927	0.7346
Rideability (pts) Jezdność (pkt)	*	**	**	NS	*	*	*		0.6564
Total (pts) Razem (pkt)	**	***	***	***	***	***	***	***	

Correlation rates significant: ***at $P \leq 0.001$, **at $P \leq 0.01$, *at $P \leq 0.05$

Współczynniki korelacji istotne: *** przy $P \leq 0,001$, ** przy $P \leq 0,01$, * przy $P \leq 0,05$

NS – correlation non significance – korelacje nieistotne statystycznie

A strong positive correlation was observed between usability and temperament of the mares. The correlation coefficient amounts to $r_p = 0.6905$ and it is very highly statistically significant. The value of that indicator shows that the temperament of a mare is an important selective criterion affecting the usability of the animal. Allbertsdottir *et al.* [2011] showed strongly correlated to some traits field tests.

CONCLUSION

The stationary performance tests constitute an important selective criterion allowing for early, albeit initial, evaluation of usability. For that reason they are particularly important for female horses. Based on the conducted studies we conclude that gradual increase of mean total scores for tests took place: in 2007, the mean was $\bar{x} = 56.40$ pts, and in 2010 $\bar{x} = 57.24$. The final result was influenced by the following factors: breeder and breed of mares. Half-bred mares obtained best results: character evaluation ($\bar{x} = 8.30$ pts) and usability for training ($\bar{x} = 6.93$ pts). They also obtained most pts in total ($\bar{x} = 56.85$) differences between mean values are statistically significant.

REFERENCES

- Albertsdottir E., Eriksson S., Sigurdsson A., Arnason T., 2011. Genetic analysis of breeding field test status in Icelandic horses. *J. Anim. Breed. Genet.* 128, 124–132.
- Bagniewski T., 2005. Klacze w Myślęcinku. *Koń Pol.* 8, 28.
- Kownacki M., 1991. Czy można lekceważyć ocenę wartości użytkowej klaczy? *Prz. Hod.* 5, 22–23.
- Lewczuk D., 2008. The effect of the age on the 60-days performance test of young mares in Poland. *Proceedings of the 59th Meeting of EAAP, Vilnius.*
- Nowicka-Posłuszna A., Kubiński K., Szwaczkowski T., 2006. Próby dzielności i wstępna ocena wartości użytkowej klaczy półkrwi w SK Racot. *Prace i Mat. Zoot.* 16, 131–135.
- Posta J., Kamlosi I., Mihok S., 2010. Genetic parameters of Hungarian sport horse. Mare performance tests. *Anim. Sci. Pap. Rep.*, 28 (4), 373–380.
- Thoren Hellsten E., Viklund A., Koenen E.P.C., Ricard A., Bruns E., Philipsson J., 2006. Review of genetic parameters estimated at stallion and young horse performance tests and their correlations with later results in dressage and show-jumping competition. *Livest. Sci.* 103, 1–12.
- Willham R.L., 1980. Problems in estimation maternal effects. *Livest. Sci.* 7, 405–418.

Streszczenie. Celem pracy była ocena wpływu różnych czynników na wyniki prób dzielności klaczy półkrwi. Ocena wartości użytkowej jest jednym z ważniejszych kryteriów selekcji hodowlanej. Warunki przeprowadzania tych prób nie są jednorodne, oprócz oczywistych wpływów genetycznych i warunków wychowu na ostateczny wynik poszczególnych prób ma również wpływ szereg innych czynników, w tym np. miejsce przeprowadzenia próby. Przedstawiono wynik stacjonarnych prób dzielności z lat 2007–2010, w których uczestniczyło 751 klaczy. Ocenie podlegały następujące cechy: charakter, temperament, przydatność do treningu, skoki luzem, stęp, kłus, galop i jezdność. Zauważono stopniowy wzrost średniej końcowych ocen prób: w roku 2007 $\bar{x} = 56,40$ pkt, a w roku 2010 $\bar{x} = 57,24$ pkt. Na ostateczny wynik wpływ miały takie czynniki, jak hodowca i rasa klaczy. Klacze rasy szlachetnej półkrwi najlepiej wypadły w ocenie charakteru ($\bar{x} = 8,30$ pkt) i przydatności do treningu ($\bar{x} = 6,93$ pkt). Uzyskały również najwięcej punktów ogółem ($\bar{x} = 56,85$). Różnice między średnimi okazały się statystycznie istotne.

Słowa kluczowe: klacze, testy użytkowości, czynniki środowiskowe