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The influence of certain factors on the results obtained by horses classified in eventing ranks of the International Federation for Equestrian Sports

Wpływ niektórych czynników na wyniki koni sklasyfikowanych w rankingu Międzynarodowej Federacji Jeździeckiej w dyscyplinie wkkw

Summary. The aim of the present work was to analyse the origin of horses classified in the International Federation for Equestrian Sports and to define such factors as breed, age and sex on the results obtained by the specimens competing in the eventing. 1101 sports horses classified in the ranking were analysed. With the use of a single-factor variance analysis statistical characteristics were calculated for the groups of horses made up according to breed, age and sex. It was concluded there were significant differences between the average numbers of points achieved. A significant share of horse breeds intended for show jumping was observed, especially the French, Dutch and German. Anglo-Arab and German horses achieved the best results. Among the horses classified in the eventing, the largest number of offspring was obtained by thoroughbred stallion Heraldik, whereas the best results were achieved by the offspring from stallion Stan the Man, of the same breed. The largest group in terms of sex were geldings (77.42%), which, alike stallions, over-performed mares for the average number of points. The best performance was found for were 13-years old horses (84.4 pts).

Key words: horses, eventing, use value

INTRODUCTION

Eventing is undoubtedly the most comprehensive test of horse's and rider's skills. During one-, two- or three-day competition the athletes compete across three disciplines: dressage, cross-country and show jumping. The competition requires the highest performance from the horses, which must present good movement in dressage, brave and obedience in cross-country trial as well as precision in jumping in the show jumping course. From the zootechnical point of view, eventing is a professional use value test, which may constitute of negatively correlated sets of features [Thorén Hellsten *et al.*

2006]. The evaluation of genetic predispositions to this discipline is debatable and has been the subject of numerous scientific researches [Ricard 2000, Ricard and Chanu 2001, Kearsley *et al.* 2008]. Mainly thoroughbred horses and the specimens with significant addition of this breed had been used in this discipline for a number of years because the main component, which is the cross-country trial, consisted of four sections which required high endurance and speed [Kędzierski 1988]. Recently, the competition has been organised in a so called shortened version, where the cross-country trial is limited to the short format endurance trial. This generates opportunities for broader participation of other breeds of horses. For a number of years the rankings record increasing number of French (selle francais), German (Hanoverian, Trakehner) and Dutch horses (kwpn) predisposed to achieve high results in dressage and show jumping [Koenen *et al.* 1995].

The aim of the present work is to analyse the origin of horses competing in eventing classified by International Federation for Equestrian Sports and to define the influence of such factors as breed, age and sex on the results achieved by horses.

MATERIALS AND METHODS

The authors analysed 1101 sports horses competing between 1.10.2008 and 30.09.2009 in international eventing discipline and achieved the results that guaranteed locations in the ranking of International Federation for Equestrian Sports (FEI) – Table 1.

Table 1. List of the examined horses
Tabela 1. Zestawienie liczebności badanych koni z uwzględnieniem rasy

Breed/Rasa	No of specimens/Liczba sztuk	
	n	%
Thoroughbred (xx)/Pełna krew angielska	129	12.89
Irish (ish)/Irlandzki koń sportowy	113	11.28
Selle francais (sf)/Selle francais	85	8.49
Hanoverian (han)/Hanowerska	37	3.70
Dutch (kwpn)/Holenderska gorącokrwista	36	3.60
Holsteiner (hol)/Holsztyńska	28	2.80
Trakehner (trk)/Trakeńska	28	2.80
Swedish (swb)/Szwedzka gorącokrwista	17	1.70
Oldenburger (old)/Oldenburska	15	1.50
Belgian (bwp)/Belgijska gorącokrwista	14	1.40
Westphalian (westf)/Westfalska	13	1.30
Anglo-arabian (xxoo)/Angloarabska	11	1.10
Danish (dwp)/Duńska gorącokrwista	5	0.50
Without breed/Bez rasy	312	31.17
Other/Pozostałe	158	15.77
Total/Razem	1001	100

Horses' origin and their positions in rankings were analysed on the basis of the data published by FEI and The World Breeding Federation for Sport Horses (WBFSH). The influence of such factors as breed, age, sex and sports results, presented as average points in the rankings, was analysed. Using single-factor variance analysis statistical character-

istics were calculated for the groups of horses made up according to breed, age and sex. The authors also attempted to define the statistically significant differences between mean numbers of ranking points – t-Tukey's test. The breeds with at least 5 representatives were taken into consideration. A few representatives of breeds were included in "other" category. The specimens which were not labelled with any information about their breed have been marked as "no breed". The authors also scrutinised the origin of horses' fathers, which were classified by the number of points obtained by their offspring.

RESULTS AND DISCUSSION

It was concluded that the most numerous group among the horses competing in the eventing competitions were thoroughbred horses (12.89%). Its representative, gelding Kirby Park was ranked as the second best horse. The second largest group were Irish horses (11.28%), which used to be kept for hunting with hounds, what was one of the elements of English and Irish traditions [Welcome 1982]. Such a use determined the development of skills necessary in cross-country eventing. The highest classified Irish horse was gelding Ringwood Cockatoo (Pecoch xx – Baileys by Folly), which was ranked as 9th. Selle francais horses were a large group (8.49%) manifesting predispositions not only to jumping and dressage but also in the cross-country course [Koenen *et al*. 2004]. The best horse in this class was stallion Leprince des Bois (Yarlands Summer – Escale de Bois), ranked as the third – see Table 1. Significant share of German horse breeds, such as Hanoverian (3.7%), Holsteiner (2.8%) and Trakehner (2.8%) was observed.

Table 2. Statistical characteristics of different breeds' performance in ranking points (R)
Tabela 2. Statystyczna charakterystyka dzielności (w punktach rankingowych – R) badanych koni w zależności od rasy

Breed Rasa	R sum Suma R	$\overline{x}$	SD	Min	Max
Anglo-arabian (xxoo)/Angloarabska	1035	94.09^{Aa}	82.86	29	296
Hanoverian (han)/Hanowerska	2910	78.65	67.41	28	272
Westphalian (westf)/Westfalska	1006	77.38	51.12	28	188
Holsteiner (hol)/Holsztyńska	1932	69.00	46.59	31	252
Irish (ish)/Irlandzki koń sportowy	7590	35.63	49.32	22	258
Thoroughbred (xx)/Pełna krew angielska	8354	64.76	46.73	22	314
Selle francais (sf)/Selle francais	5234	61.58	49.80	23	310
Oldenburger (old)/Oldenburska	895	59.67^{b}	47.99	23	183
Trakehner (trk)/Trakeńska	1662	59.36^{b}	55.12	22	262
Dutch(kwpn)/Holenderska gorącokrwista	2136	59.33^{b}	43.94	23	194
Belgian (bwp)/Belgijska gorącokrwista	813	58.07^{b}	32.58	23	137
Without breed/Bez rasy	17 742	56.87^{b}	42.37	22	256
Other/Pozostałe	9069	57.40^{b}	51.18	22	470
Swedish (swb)/Szwedzka gorącokrwista	935	55.00^{b}	23.23	29	110
Danish (dwp)/Duńska gorącokrwista	168	33.60^{B}	5.41	27	40
Average/Średnia	4098.73	61.36	46.38	24.93	236.13

$^{A, B}$significant difference of average for $P \leq 0.01$ – średnie różnią się istotnie przy $P \leq 0{,}01$.
$^{a, b}$significant difference of average for $P \leq 0.05$ – średnie różnią się istotnie przy $P \leq 0{,}05$.

As for average number of ranking points, thoroughbreds achieved the highest result of 94.1 pts, what is a statistically significantly better result, in comparison to other breeds – see Table 2. The second, third and fourth position was occupied by German horses: Hanoverian (78.64 pts), Westphalian (77.38 pts) and Holsteiner (69.00 pts), what is a sort of novelty in the discipline, and clearly proves the changes that have been made recently, especially in terms of increasing the importance of dressage and show jumping.

The analysis of the results presented in table 3 shows that the largest sex group were geldings (77.42%). In comparison to other disciplines, eventing uses the smallest number of stallions (5%). The differences between average numbers of ranking points were not statistically significant, yet geldings and stallions outperformed mares (62,8 pts, 60,09 pts, 55,4 pts respectively) – see Table 3.

Table 3. Statistical characteristics of performance in ranking points (R) with regards to sex
Tabela 3. Statystyczna charakterystyka dzielności (w punktach rankingowych – R) badanych koni z uwzględnieniem płci

Sex/Płeć	No of specimens Liczba sztuk		R sum Suma R	$\overline{x}$	SD	Min	Max
	n	%					
Gelding/Wałach	775	77.42	48 685	62.82	48.46	22	470
Stallion/Ogier	51	5.09	3104	60.86	62.06	22	310
Mare/Klacz	175	17.49	9703	55.45	40.47	22	256
Total/Razem	1001	100	61 492				
Average/Średnia				59.71	50.33	22.00	345.33

Table 4. Statistical characteristics of performance in ranking points (R) with regards to age
Tabela 4. Statystyczna charakterystyka dzielności w punktach rankingowych (R) badanych koni z uwzględnieniem wieku

Age Wiek	No of specimens Liczba sztuk		R sum Suma R	Average R Średnia liczba R	SD	Min	Max
	n	%					
6	19	1.90	586	30.84	6.95	23	47
7	92	9.19	3762	40.89	17.11	23	133
8	141	14.09	7308	51.83	32.78	23	220
9	148	14.79	9862	66.64	58.56	22	470
10	135	13.49	8251	61.12	48.32	23	310
11	112	11.19	6555	58.53	41.95	22	237
12	89	8.89	5583	62.73	46.17	23	262
13	99	9.89	8358	84.42	62.17	23	296
14	65	6.49	4311	66.32	51.12	22	272
15	38	3.80	2415	63.55	42.20	22	204
16	28	2.80	1948	69.57	53.59	22	190
17	20	2.00	1483	74.15	47.62	22	226
18	8	0.80	569	71.13	78.63	22	258
19	5	0.50	305	61.00	34.34	25	110
20	2	0.20	196	98.00	32.53	75	121
Total/Razem	1001	100	61 492				
Average/Średnia				64.05	43.60	26.13	223.73

Out of 1001 horses classified in FEI ranking, the largest number of specimens was aged 8–11. They made 53.5% of the total number. The lowest share (1.5%) was horses aged 18–20 (Tab. 4). This can be explained by high incidence of injuries in this discipline, what influences shorter period of horses' use [Dyson 2000]. Analysing average number of ranking points per specimen, it turned out that older horses were ranked at the top-most positions. Except for 2 20-year-old horses which scored the highest average number of points (98 pts), the highest performance was recorded for 13-year olds (84.4 pts). 16–18-year-old specimens were just behind them, while 9-year-old horses were ranked as low as the sixth position. This proves that such a difficult discipline as eventing requires experience and practice, as the most important factors.

Analysing the origin of the examined horses it was noticed that the highest rank with regards to average number of points scored by the offspring was obtained by thoroughbred stallion Stan the Man (Tachyporous – Mary Green by Sahib). The largest number of offspring ranked by FEI was Heraldik, thoroughbred stallion born in 1982 (Caramel – Heraldika by Cale). The stallion was raised in Czech and has 14 sons recognised in Danish, German and American breeders association. Herladik is also a father to Polish dressage champion – Ekwador. It is worth to mention Irish stallion Cruising (Sea Crest – Mulla Crew by Nordys), born in 1985, which begot 7 offspring classified in FEI ranking. It passes a very good jumping technique down to its offspring and is father to such horses as Cruise Missile, Cruise Line, Sails Away, Rain Sail, Rincoola Abu, Cruise Hill. Stallion Voltaire han. (Furioso II – Gogo Moevo by Gothard) begot 5 horses classified in the ranking and is very comprehensive in offspring's sports predispositions. Another highly classified stallion in the group of fathers to the ranked horses is Jumbo, listed in Shagya breeders' book. The horses are characterised by high endurance due to high share of Arabian purebred [Fedorski 2009].

CONCLUSIONS

1. Although high share of thoroughbred horses (12.89%) was observed, increasing importance of breeds intended for dressage and show jumping was recorded, including selle francais (8.49%), kwpn (3.60%) and German breeds: Hanoverian (3.7%), Holsteiner (2.8%) and Trakehner (2.8%).

2. The highest average number of ranking points (94.09 pts) was scored by Anglo-Arabian horses, while the second, third and fourth positions were occupied by German breeds, what additionally indicates changes in contemporary eventing competitions.

3. The largest sex group, alike in other equestrian disciplines, were geldings (66%). Geldings and stallions achieved better results than mares.

4. It was observed that the best results were obtained by elderly horses, which were the least numerous group, what may be related to high incidence of injuries which exclude them from use in this discipline.

5. In the group of horses classified in the ranking, the highest number of sons and daughters was begotten by thoroughbred stallion Heraldik (Caramel – Heraldika by Cale), whereas the best results were achieved by the offspring of stallion Stan the Man xx (Tachyporous – Mary Green by Sahib).

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Streszczenie. Celem pracy była analiza pochodzenia koni sklasyfikowanych w rankingu Międzynarodowej Federacji Jeździeckiej oraz określenie wpływu takich czynników, jak rasa, wiek i płeć na wyniki uzyskiwane przez te osobniki startujące w dyscyplinie wszechstronnego konkursu konia wierzchowego (wkkw). Zbadano 1101 koni sportowych sklasyfikowanych w wymienionym rankingu. Wykorzystując jednoczynnikową analizę wariancji, obliczono charakterystyki statystyczne w grupach koni utworzonych według rasy, wieku i płci oraz ustalono istotne różnice między średnimi liczbami punktów rankingowych. Zaobserwowano znaczący udział ras koni hodowanych do dyscypliny ujeżdżenia i skoków przez przeszkody, głównie francuskich, holenderskich oraz niemieckich. Stwierdzono, że najlepsze wyniki uzyskiwały konie angloarabskie oraz konie ras niemieckich. Wśród sklasyfikowanych w wkkw koni największą liczbę synów i córek pozostawił pełnej krwi angielskiej ogier Heraldik, natomiast najlepsze wyniki uzyskało potomstwo ogiera Stan the Man tej samej rasy. Największą grupę pod względem płci stanowiły wałachy (77,42%), które podobnie jak ogiery przewyższały klacze w zakresie średniej liczby punktów rankingowych. Najdzielniejsze okazały się konie 13-letnie (84,4 pkt).

Słowa kluczowe: konie, wkkw, wartość użytkowa