EVALUATION TRIAL OF THE EFFECT OF CHOSEN FACTORS ON RACING PERFORMANCE OF THOROUGHBRED HORSES[1]

Maria Kulisa, Bogusława Długosz, J. Łuszczyński, Magdalena Pieszka, Barbara Grel[2]

Abstract: The aim of this study was to evaluate the effect of stallion, sex and body weight after birth on racing performance of Thoroughbred horses. Material for the study was collected in Kozienice Stud. Any differences in racing performance were observed between groups of horses descending from particular stallions. Better racing performance was observed for colts but only for two-years-old horses significant differences between sexes were noted. Any differences were noted between horses with different body weight after birth. Interesting point is that evaluation of racing performance on the base of general handicap and coefficient of success showed similar results.

Key words: Thoroughbred horses, races

Introduction

Thoroughbred horses' selection is carried out concerning only functional selection it means horses races. Exterior and a type are not taken under consideration during selection, only racing performance is important. Racing courage is subjective value and depends on horse's class and also on conditions independent from the horse as foals' rearing, nutrition, training and jockey abilities *(Pikuła et al 2003).*

The aim of this study was to evaluate the effect of stallion, foal's sex and body weight after birth on racing performance of Thoroughbred horses from Kozienice Stud.

Materials and methods

Material for this research was collected in 2002 in Kozienice stud. Analysis was carried out on 126 Thoroughbred horses. Data from documentation of Polish Jockey Club was also used for the study. All studied horses were divided into groups according their sire lines, sex and body weight after birth (I gr 42-48 kg, II gr 49-53 kg, III gr 54-59 kg, IV gr 59-67 kg). Next it was checked if there are any statistically significant differences in racing performance between such a groups using for this aim the Duncan's test. The information concerning racing performance described by general handicap *(Racing Information 2003)* determined at the end of each racing season and coefficient of success (WP) according to following formula *(Chrzanowski et al. 2003)* was taken under consideration.

$$WP = \frac{\text{Sum of money won by horses in season}}{\text{Sum of money won by horses born in one year in season}}$$

Both values of general handicap and coefficient of success were square rooted to obtain the normal distribution of data in the research.

Results and Discussion

Studies carried out by *Chrzanowski et al* (2003) showed the high significant dependence between general handicap and coefficient of success. On this base he stated that both these indicators can similarly evaluate the racing performance and a value of race horse.

Tables 1a and 1b show the results obtained by 2- and 3-years-old horses descending from different sires. Between different groups any significant differences were not observed between 2- and 3-years-old

horses descending from different fathers both for general handicap and coefficient of success. Four sires (Diaglyphard, Jape, Lord Hippo and Saphir) were represented by only one horses the statistic results are not enough for making proper conclusion.

Table 1a. General handicap for 2- and 3-years old Thoroughbred horses descending from different fathers.

Father	N	%	General handicap for 2-years-old horses		General handicap for 3-years-old horses	
			Means	SD	Means	SD
Graf	30	23,8	8,01	4,38	7,48	5,41
Special Power	20	15,9	7,75	4,69	7,56	5,12
Mooving Dream	18	14,3	7,30	4,69	6,75	5,53
All Hands On Deck	11	8,7	7,27	4,32	5,75	5,65
Wolver Heights	10	7,9	7,22	2,38	4,69	5,33
Winds of Light	9	7,1	7,67	4,77	7,60	4,74
Milione	9	7,1	7,96	2,10	8,03	2,79
Beaconsfield	9	7,1	7,95	3,23	7,98	2,44
Omen	6	4,8	7,56	2,39	7,60	2,42
Diaghlyphard	1	0,8	8,51	0	0	0
Jape	1	0,8	6,32	0	0	0
Lord Hippo	1	0,8	0	0	0	0
Saphir	1	0,8	8,36	0	8,45	0
Total	*126*	*100*				
Means for all horses			*7,07*	*2,53*	*5,53*	*3,03*

Table 1b. Coefficient of success for 2- and 3-years old Thoroughbred horses descending from different fathers.

Father	N	%	Coefficient of success for 2-years-old horses		Coefficient of success for 3-years-old horses	
			Means	SD	Means	SD
Graf	30	23,8	1,25	1,23	1,06	1,15
Special Power	20	15,9	1,18	1,11	0,18	1,45
Mooving Dream	18	14,3	0,94	1,07	0,75	0,93
All Hands On Deck	11	8,7	0,77	0,78	0,61	0,70
Wolver Heights	10	7,9	0,59	0,59	0,42	0,49
Winds of Light	9	7,1	0,88	0,81	0,72	0,81
Milione	9	7,1	1,18	0,74	0,93	0,78
Beaconsfield	9	7,1	1,26	1,55	0,71	0,64
Omen	6	4,8	0,77	0,76	0,73	0,62
Diaghlyphard	1	0,8	1,27	0	0	0
Jape	1	0,8	0	0	0	0
Lord Hippo	1	0,8	0	0	0	0
Saphir	1	0,8	1,05	0	1,11	0
Total	*126*	*100*				
Means for all horses			*0,86*	*0,66*	*0,63*	*0,58*

Table 2a and 2b shows the racing results of 2- and 3-years-old horses according to their sex. It was observed that in first racing season all horses obtained better results than in second. In both studied seasons more successful in general handicap were stallions comparing to mares but statistically significant differences were noted only in second racing season. According to second studied indicator – coefficient of success – it was also observed that stallions obtained better results but statistically significant differences were observed

only in first racing season. *Pikuła et al* (2003) observed that independently from racing season the number of races won by stallions, average of general handicap and coefficient of success was significantly higher than in mares.

Table 2a. General handicap for 2- and 3-years old Thoroughbred horses concerning their sex.

Sex	N	%	General handicap for 2-years-old horses		General handicap for 3-years-old horses	
			Means	SD	Means	SD
Mares	68	54	7,19	2,31	5,79 a	3,66
Stallions	58	46	7,59	1,88	6,96 a	2,85
Total	*126*	*100*				
Means for both groups			*7,39*	*2,10*	*6,37*	*3,26*

Table 2b. Coefficient of success for 2- and 3-years old Thoroughbred horses concerning their sex

Sex	N	%	Coefficient of success for 2-years-old horses		Coefficient of success for 3-years-old horses	
			Means	SD	Means	SD
Mares	68	54	0,80 A	0,48	0,63	0,57
Stallions	58	46	1,05 A	0,59	0,77	0,55
Total	*126*	*100*				
Means for both groups			*0,92*	*0,53*	*0,70*	*0,56*

Means marked by the same letters differ significantly:
capital letters – differences highly significant with $P \leq 0,01$
small letters – differences significant with $P \leq 0,05$

The last studied factor was body weight at birth. Table 3a and 3b show the division of racing horses for 4 groups according their body weight at birth concerning the general handicap and coefficient of success. The highest general handicap in first racing season was noted for horses with the highest body weight at birth (59-67 kg) but any significant differences were not observed between studied groups. Similar results were obtained during analysis of coefficient of success. In first racing season the best were horses from IV group (59 – 67 kg). However in second racing season the best were horses from III group (54 – 59 kg) but still differences were not significant.

Table 3a. General handicup for 2- and 3-years old Thoroughbred horses concerning their body weight at birth

Body weight at birth (kg)	N	%	General handicap for 2-years-old horses		General handicap for 3-years-old horses	
			Means	SD	Means	SD
I (42-48)	11	8,8	7,82	0,52	7,27	2,46
II (49-53)	41	32,5	7,34	2,17	5,67	3,71
III (54-59)	59	46,8	7,16	2,49	6,45	3,33
IV (59-67)	15	11,9	7,97	0,60	6,94	2,87
Total	*126*	*100*				
Means for all groups			*7,56*	*1,54*	*6,69*	*3,10*

Table 3b. Coefficient of success for 2- and 3-years old Thoroughbred horses concerning their body weight at birth

Body weight at birth (kg)	N	%	Coefficient of success for 2-years-old horses		Coefficient of success for 3-years-old horses	
			Means	SD	Means	SD
I (42-48)	11	8,8	0,90	0,48	0,66	0,37
II (49-53)	41	32,5	0,90	0,56	0,58	0,50
III (54-59)	59	46,8	0,89	0,54	0,79	0,64
IV (59-67)	15	11,9	1,00	0,62	0,63	0,48
Total	*126*	*100*				
Means for all groups			*0,95*	*0,58*	*0,71*	*0,56*

Parameters of horses' growth and development and its effect on breeding and usability value were studied by many authors. Breeders of Thoroughbred horses do not pay a special attention on horses' exterior as it is described by *Łuszczyński* (1998) but it is possible to suggest that horses with higher biometric parameters, as for example body weight, could be more successful at race track in the future. It is confirmed by *Kolstrung* studies (1988) who stated that horses with shorter height at withers obtained less success as racing horses.

Conclusion

The evaluation of racing performance of Thoroughbred horses on the base of general handicap and coefficient of success showed similar results. Any significant differences were observed between horses descending from different fathers. Better racing results were observed for stallions comparing to mares but only for general handicap of 2-years-old horses the differences were statistically significant. Any statistically significant differences were not observed between horses with different body weight at birth.

OCENA UTICAJA ODABRANIH FAKTORA NA TRKAČKE PERFORMANSE PUNOKRVNIH KONJA

Maria Kulisa, Bogusława Długosz, J. Łuszczyński, Magdalena Pieszka, Barbara Grel

Rezime

Trkačka hrabrost je subjektivna vrednost i zavisi od klase konja kao i od uslova nezavisnih od konja npr. Odgoj ždrebadi, ishrana, trening i sposobnosti džokeja. Cilj ovog istraživanja je bio ocena uticaja pastuva, pola ždrebadi i telesne mase na rođenju na trkačke performanse punokrvnih konja iz ergele Kozienice. Analiza je izvršena na 126 punokrvnih konja na bazi opšteg hendikepa i koeficijenta uspeha odn. njegovih vrednosti. Signifikantne razlike su zabeležene između konja koji potiču od različitih očeva. Bolji trkački rezultati su zabeleženi kod pastuva u odnosu na kobile ali samo kod konja dvogodišnjaka je razlika bila statistički signifikantna. Statistički signifikantne razlike nisu zabeležene između konja sa različitim telesnim masama na rođenju.

References

1. CHRZANOWSKI SZ., KUREK A., ŁOJEK A. 2003, Porównanie przydatności handicapu generalnego i współczynnika powodzenia do oceny wyników wyścigowych koni, *Zeszyty Naukowe Przeglądu Hodowlanego,* 68 z. 5, 311 – 312
2. KOLSTRUNG R. 1988, Ocena współzależności między tempem wzrostu I rozwoju a wynikami prób dzielności koni czystej krwi arabskiej, Praca doktorska, Akademia Rolnicza, Lublin
3. ŁUSZCZYŃSKI J. 1998, Wskaźniki biometryczne i poziom hormonów tarczycy w okresie wzrostu źrebiąt pełnej krwi angielskiej, Praca doktorska, Akademia Rolnicza, Kraków, 53-66
4. PIKUŁA R., GRZESIAK W. 2003, analiza zmienności mierników wartości wyścigowej koni czystej krwi arabskiej, *Zeszyty Naukowe Przeglądu Hodowlanego,* 68 z. 5, 238
5. RACING INFORMATION (1994 – 2002) 2003