

**THE COMPARISON OF TWO METHODS OF EVALUATING  
THE RACING PERFORMANCE OF ARABIAN HORSES****Sz. Chrzanowski, J. Łojek, A. Kurek***Introduction*

Three methods of estimation of racing performance of Arabian horses are employed in Poland: 1) Expressed as earnings or average earning per start; 2) General handicap weight estimated at the end of the racing season; 3) Coefficient of success. Each of the methods features some advantages as well as disadvantages. The first one requires some adjustments as the prizemoney for the races and shares of the placings are variable. The second method appears as a subjective one. The third method has also been based upon the earnings pattern, however requires no corrections with the inflation index; on the other hand it allows no comparison of horses of different birth year.

*Material and Methods*

The investigations were carried out on 1129 three-year old and 674 four-year old Arabian horses, raced in Poland in the years 1973-1991. During that period the horses entered 2948 group races and 373 classic races.

The recent study has been aimed at developing a new method for estimation of the racing performance of Arabian horses, based on the scoring system where each horse gains some points for the races run, according to the selection value of the race, placings and the winning style expressed as the number of lengths between the winner and the second horse in the race. The allocation of points with the places won have been estimated on the basis of the results of horses winning races and placed. Scoring for each place, with alteration for the style of win has been presented in Table 1.

Selection value of the classic races was estimated on the basis of results achieved by the winning horses and the placed ones in this kind of races. The Comparative Prize appeared as the most significant one as here, the winners achieved the best results on their racing career.

Selection value coefficients for each placing in particular classic races were calculated as the total of points won in other classic races by horses winning

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the first, second, third or four place throughout the period in which the race had been carried out, divided by the total of points gained by the Comparative Prize winners in other classic races.

Selection value coefficients for each placing in group races were determined as the total of points won:

- in classic races - for group I races
- in classic and group I races - for group II races
- in classic, group I and II races - for group III races
- in classic, group I, II and III races - for group IV races

by horses placed first, second, third or fourth in the given group race, divided by the total of points gained by the Comparative Prize winners. Evaluation of the selection value of the group races employed correction of scores, quoted in Table 1, with the selection rank and placing coefficient calculated earlier for particular race groups.

Table 1. - THE ALLOCATION OF POINTS WITH THE FOUR FIRST PLACES IN THE RACE WITH ALTERATION FOR THE STYLE OF WIN EXPRESSED AS THE NUMBER OF LENGTHS BETWEEN FIRST AND SECOND HORSE IN THE RACE

No.	Winning style (number of lengths)	Number of points allocated with the:			
		1 place	2 place	3 place	4 place
1	up to 0.75	10.0	8.0	3.0	1.0
2	1 - 2 lengths	10.0	6.0	3.0	1.0
3	above 2 lengths	10.0	5.0	2.5	0.5

Selection rank coefficients calculated for particular races and places won were applied for estimation of the racing performance of horses. 100 points were allocated for the first place in the Comparative Prize. In order to obtain scoring for the remaining races, the selection rank coefficient for the given place won in a particular race was multiplied by 100.

The totals of points gained by the horses were employed to calculate the coefficient of succes of the racing performance. The coefficients have been compared to those calculated as the earnings indices. In order to accomplish this, the following values had to be determined:

1. Pearson's correlations for three groups of horses
  - a. very good - coefficient of succes above 2
  - b. good - coefficient of succes above 1 and below 2
  - c. poor - coefficient of succes below 1
2. Spearman's rank correlation coefficients
3. Repeatability - for the racing results of three- and four-year old horses.
4. Heritability of the racing performance for three- and four- year olds.

### Results

The data quoted in Table 2 indicated that the selection rank coefficients determined for particular races and placings, employing the authors' method, differed significantly from the selection value expressed as the earnings index. For example, Derby, featuring the highest prizemoney, has been classified third when using the authors' method.

Table 2. - SELECTION RANK COEFFICIENTS CALCULATED FOR SOME CLASSIC AND GROUP RACES AND PLACINGS, EMPLOYING EARNINGS INDEX AND SCORING SYSTEM

Name of the Race	Earnings index 1 place	Scoring system			
		1 place	2 place	3 place	4 place
Comparative Prize	50.0	100.0	82.8	55.3	41.1
Cometa	15.0	85.8	57.7	46.3	37.3
Derby	100.0	84.2	77.4	49.5	38.5
Janowa	30.0	82.5	71.6	50.2	40.7
Wielkiego Szlema	15.0	73.9	56.4	45.1	41.9
Sabelliny	30.0	64.1	42.4	50.1	31.9
Oaks	40.0	58.1	34.0	24.1	7.0
Michalowa	15.0	57.0	50.3	29.2	39.3
Sasanki	15.0	36.3	39.7	18.9	17.2
Group I	9.0	22.0	13.1	9.0	6.2
Group II	7.5	12.9	7.2	5.1	4.3
Group III	6.0	5.7	3.9	3.9	3.3
Group IV	5.0	2.4	1.9	2.1	1.5

Correlation between the coefficients of success calculated on the basis of the author's own method and the earnings indices were as follows:

- a. for very good horses: three-year olds  $r=0.63$  and  $0.68$  for four-year olds;
- b. for good horses:  $0.63$  and  $0.30$  respectively;
- c. for poor horses:  $0.83$  and  $0.60$  respectively.

The correlation coefficients presented point to considerable discrepancies between the racing results estimations, when employing the authors' own method and traditional one.

Spearman's rank correlation coefficients equaled 0.95 for three-year olds and 0.87 for four-year olds. High correlation values indicate that the ranking of horses provided with the use of both measures is similar for different coefficient of success values of the same horses.

Repeatability coefficient of the racing results for three- and four-year olds, estimated by the author's method equaled  $r_p = 0.73$ . With the measure employing the coefficient of success calculated on the earnings basis, the repeatability coefficient value equaled  $r_p = 0.46$ . Higher repeatability points to the coefficient of success calculated by the scoring method as more adequate for evaluation of the genetic variability of the racing ability than one basing upon the earnings.

Heritability of the racing performance calculated on the basis of both measures were similar and equaled: for the scoring method  $h^2 = 0.227$  for three-year olds and 0.106 for four-year olds, and in case of the traditional method 0.236 and 0.09 respectively.

#### USPOREDBA DVIJE METODE OCJENJIVANJA USPJEŠNOSTI (PERFORMANCE) ARAPSKIH KONJA NA TRKAMA

##### Sažetak

U Poljskoj se primjenjuju tri metode procjene uspješnosti (performance) arapskih konja na trkama: 1. Izražena u bodovima ili kao prosječni bod na početku; 2. Opća težina opterećenja na trkama izračunata na kraju sezone; 3. Koeficijent uspjeha. Svaka od ovih metoda ima dobre i loše strane. U prvoj su potrebna usklađivanja u vezi s novčanim nagradama za utrke, a udio u plasmanu varira. Druga metoda je subjektivna. Treća se metoda također temelji na uzorku bodovanja, ali nisu potrebni ispravci s indeksom inflacije; s druge strane ne dozvoljava usporedbu konja različite dobi. Podaci navedeni na tablici 2 pokazuju da su se koeficijenti selekcije, određeni za pojedine utrke i plasman, prema metodi autora, značajno razlikovali od vrijednosti selekcije izražene kao indeks bodova. Na primjer, Derby, gdje je novac za nagrade najveći, klasificiran je treći prema metodi autora. Korelacija između koeficijenata uspjeha izračunatih na osnovi vlastite metode autora i indeksa bodova bila je:

- a. za vrlo dobre konje: trogodišnjake  $r = 0.63$ , a za četverogodišnjake 0.68.
- b. za dobre konje: 0.63 odnosno 0.30.
- c. za slabe konje: 0.83 odnosno 0.60.

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