

# THE EFFECT OF THE ENGLISH THOROUGHBRED ON THE SPORT PERFORMANCE OF HORSES IN THE CZECH REPUBLIC

I. Jiskrová

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## Abstract

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The objective of the present study was to evaluate the importance of the English Thoroughbred in sport horse breeding in the Czech Republic. Basic data were taken from the survey of sport horses in the Czech Republic in the years 2005–2008 which contains sport competition results of horses. The sport performance is expressed by the PPB value. We used the GLM method for statistical elaboration. Using the method of multiple comparisons by Tukey-B we defined the differences between the breeds, gender, age, sport seasons and the number of starts in competitions. Statistically highly significant effect was discovered of all the studied effects on the jumping sports performance of the horses. Basing on statistical evaluations we found out that the highest PPB value (3.356) was reached by group 5 (sport horses without a significant share of the English Thoroughbred). Group 5 was also the most numerous one. The best values according to the gender were reached by stallions (4168) and the most numerous group included mares (4766). We also discovered that the highest values were reached by the horses that compete at the age of 12 years (3.5414) and the highest average values were achieved in the 2008 season (3.999). The highest PPB value was achieved by horses with a high number of starts.

horses, English Thoroughbred, sports performance

The thoroughbred breed of sports horses as it is known today was developed when the original working warm-blooded breeds were crossbred with the English Thoroughbred and other noble breeds, for instance with the Arabian or Anglo-Arabian (JISKROVÁ, 2001).

Even today breeding warm-blooded horses requires further improvement, otherwise the mothers will gradually go back to the original heavy working type due to the stronger influence of the genetic potential (HANUŠOVÁ, 2007).

The English Thoroughbred is indisputably the most important breed used for the improvement of warm-blooded horses. When the thoroughbreds are used to improve the warm-blooded horse strict evaluation of the horse's conformation is necessary. Stallions of dubious character and unsatisfactory temperament should not be used. Under these

conditions the English Thoroughbred is ideal for improvement and it almost always corrects the frame of heavy mares. The traits that the thoroughbreds should pass on are greater willingness to work, ambition and a fighting spirit. However we must not forget the negative traits that the thoroughbred frequently brings in, such as: poor fundament, insufficient mechanics of movement in trot and walk, small delicate joints, that it is overly sensitive, nervous etc. (HANUŠOVÁ, 2007).

Bar a few exceptions improvement in West European advanced breeds of warm-blooded horses is carried out exclusively through the stallions; thoroughbred mares are not included at all (Holstein), or only when complying with strict terms for classification in the highest sections of stud books (e.g. Hanover, Oldenburg) (HANUŠOVÁ, 2007).

In sports horse breed in the Czech Republic the English Thoroughbred is used relatively widely. That is why the objective of the present paper was to assess the effect of the English Thoroughbred on the sporting performance of horses in the Czech Republic.

## MATERIAL AND METHODS

The database contained data on the show jumping performance of sports horses in the Czech Republic in 2005–2008. The athletic performance is expressed as the auxiliary point average (PPB). The PPB represents the official system of evaluation of the athletic performance of horses in the Czech Republic. It is based on criteria of the number of penalty points obtained in the competition and using a matrix comprising the degree of difficulty of the competition they are converted to auxiliary points which are then calculated to one start of the horse. In this way the effect of the number of starts of the horse and degree of difficulty of the competition are eliminated.

The name, licence number of the sports horse, year of birth, gender, year of start, age in year of start, number of starts, degree of difficulty, and PPB of each horse were filed in the database.

The horses in the database were divided according to the proportion of the English Thoroughbred in their pedigree. In this way we obtained 5 breeding groups:

1. English Thoroughbred (A1/1)
2. horses with 75% and higher proportion of A1/1 in the pedigree
3. horses with 50%–74% proportion of A1/1 in the pedigree
4. horses with 25%–49% proportion of A1/1 in the pedigree

5. horses with no significant proportion of A1/1 in the pedigree.

Based on their age the horses were divided into 12 groups. The horses take part in show jumping competitions from 4 years of age. Horses older than 15 years were put into one group.

To evaluate the effect of the English Thoroughbred on the sports performance of the Czech warm-blooded horse the file was statistically processed using the GLM method in Unistat, version 5.1. according to the following model equation:

$$y_{ijklmn} = \mu + p_i + s_j + r_k + v_l + t_m + e_{ijklmn},$$

where:

$y_{ijklmn}$ .....evaluated quantity (PPB)

$\mu$  .... overall average of the file

$p_i$ ... fixed effect of the  $i$ -teenth breed group ( $i = 1, \dots, 5$ )

$s_j$ .... fixed effect of the  $j$ -teenth sex ( $i = 1, 2, 3$ )

$r_k$ ... fixed effect of the  $k$ -teenth year of start ( $j = 1, \dots, 4$ )

$v_l$ .... fixed effect of the  $l$ -teenth group based on age ( $k = 1, \dots, 12$ )

$t_m$ ... fixed effect of the  $m$ -teenth group based on starts ( $k = 1, \dots, 45$ )

$e_{ijklmn}$ .....residual effect.

Calculations of the significance of the effects on the sports performance of horses was followed by multiple comparisons using the method of Tukey-B to assess the differences in mean values of performance of the individual compared groups.

## RESULTS AND DISCUSSION

The basic database contained 10 380 data on sports results of horses starting in show jumping competitions. Table I shows the blood proportion in the individual breed groups and PPB average in terms of numbers and per cent.

I: Numbers and percentage representation of breed groups

Breed group	Representation		PPB average
	n	%	
1. A1/1	481	4.63	2.47
2. horses with 75% and higher proportion of A1/1	31	0.30	2.64
3. horses with 50%–74% proportion of A1/1	1 002	9.65	3.19
4. horses with 25%–49% proportion of A1/1	326	3.14	3.02
5. horses with no significant proportion of A1/1 in pedigree	8 540	82.27	3.36
Total	10 380	100	2.94

II: Significance of the effects on the sports performance of the horses

Monitored effect	Df	Level of significance
Breed group	4	$P < 0.0001$
Gender	2	$P < 0.0001$
Year of start	3	$P < 0.0001$
Age	11	$P < 0.0001$
Number of starts	44	$P < 0.0001$

The most numerous group is group 5 (horses with no significant proportion of the English Thoroughbred in the pedigrees), i.e. 8 540 horses, and the smallest is group 2 with a high proportion of the English Thoroughbred in the pedigrees.

Table II gives the results of analysis using the GLM method; here a statistically highly significant

## III: Comparison of breed groups

	Group	n	Average	1.	2.	4.	3.	5.
1.	A1/1	481	2.47			*	*	*
2.	horses with 75% and higher proportion of A1/1	31	2.64					
3.	horses with 25%–49% proportion of A1/1	326	3.02	*				*
4.	horses with 50%–74% proportion of A1/1	1 002	3.19	*				
5.	horses with no significant proportion of A1/1 in the pedigree	8 540	3.36	*		*		

effect was discovered of all the studied effects on the jumping sports performance of the horses.

Statistically significant differences in the PPB values were identified by multiple comparisons of the individual effect using the method of Tukey-B. The groups based on the proportion of the English Thoroughbred in the pedigrees are shown in Table III.

The highest mean value of PPB was detected in group 5, i.e. the group of sports horses with no significant proportion of the English Thoroughbred in the pedigrees. This result was undoubtedly affected by using foreign breeds bred for sports performance and for the improvement of sports horses in the Czech Republic. The performance of this group was statistically significantly higher than group 1 – the English Thoroughbred and indicates the low level of performance of thoroughbreds in show jump competitions.

On the other hand our results indicate that minimally a 50% proportion of the English Thoroughbred in the pedigrees of sports horses has a positive effect on the performance in show jumping competitions because based on the PPB average group 3 was placed second (Tab. III). This result proves the importance of the English Thoroughbred as an improver of sports horses; apart from its strong constitution, appropriate temperament and willingness to work it also improves the sport performance (JISKROVÁ, 1996). The English Thoroughbred corrects the properties of sports horses; in addition to the sports performance it corrects the frame and constitution properties. HANUŠOVÁ (2007) proved that without cross-breeding with the English Thoroughbred the sports horses in the Czech Republic would gradually return to the original heavy type of horses.

Group 4 – horses with a 25%–49% proportion of A1/1 came third in average performance based on PPB. However these values were found to be statistically significantly lower than the average performance of group 5.

The average performance of groups 1 and 2 was markedly lower. In the case of these two groups the thoroughbreds and horses with a predominant effect of the English Thoroughbred are not so convenient for show jumping competitions. It is because the English Thoroughbred had never been bred for jumping performance in show jumping competitions; it tends to be highly strung and frequently shows a poor easiness to ride. Important is also the fact that thoroughbreds frequently take

## IV: Comparison of the groups according to gender

	Group	n	Average	2	1	3
2)	geldings	4 165	3.06		*	*
1)	mares	4 766	3.22	*		*
3)	stallions	1 446	4.17	*	*	

part in lower-degree show jumping competitions with no previous preparation and the reason why they are used in sports is in the first place the fact that they are easily available in terms of their price.

Table IV compares the groups according to their gender.

The stallions achieved the best results, i.e. the highest PPB averages. Geldings achieved the lowest PPB averages and the mares came as the second worst group. These conclusions are not very encouraging considering the fact that mares constitute the cornerstone of the breeding population. Even though the possibility of the individual mare to influence the population by means of her offspring is significantly lower compared to the sire, a balanced herd of mares of high quality is the prerequisite for genetic progress in the population.

The better results of the stallions need not be due to the effect of the gender. Compared to the other two groups some horses of this group had been subjected to relatively strict selection prior to their sports career: pre-selection in a 100-day test, 100-day test and pre-selection for the Young Horse Criterion. In the other two groups this pre-selection had not been conducted. Preparation of the stallions and their management in competitions was probably more responsible due to the demonstration of the potential of the sires. Therefore the lower average PPB values need not unambiguously be the result of the gender, but the result of the co-action of gender and selection.

If we take the number of horses starting in riding competitions according to their gender, the mares had most starts, followed by geldings and stallions (see Table IV). Compared to similar data from abroad we discovered some differences. FORAN *et al.* (1995) evaluated the sports performance of 3936 horses in jumping competitions in Ireland. In their database the starts were as follows: 56% geldings, 34% mares and 10% stallions. In our database the mare/gelding ratio is reversed. In terms of verification of the performance of mares of the Czech warm-blooded horse this finding is favourable. More geldings are

V: Evaluation of the sport performance based on age

Age-based group	n	Average
4	798	2.77
5	1 376	2.97
6	1 429	3.19
15	359	3.20
14	312	3.24
13	442	3.27
7	1 300	3.42
11	728	3.43
9	1 044	3.44
8	1 130	3.48
10	892	3.52
12	570	3.54

probably used in sports in west European countries because riding as a special-interest sport has won widespread popularity. The so-called hobby riders choose geldings because they are easier to manage and, last but not least, they are more available in terms of their price.

Another monitored effect was the age of the horse in the year of start. Table V shows the difference in the PPB values.

We combined the age categories into 12 groups which characterise the respective periods of performance of the horse and at the same time maintain sufficient number of cases in the groups.

Table V shows that the number of horses starting in sports competitions declines with age and that the number of horses older than ten years is low.

Table V shows that the average quality of starting horses increases with age. It is natural with regard to the fact that horses of better quality get to the higher competitions where older horses start, i.e. horses that have passed a certain performance screen. On the other hand we see that performance of the oldest horses is declining.

Horses of 12 years of age achieved the highest average PPB values; on the contrary the youngest horses achieve the lowest values. It is indisputably connected with the increasing physical and psychical maturity of the horses and with the fact that young beginning horses start in competitions of a lower performance level.

In terms of the relation between the numbers of starts and age of the horse Graph 1 shows that mostly six-year, five-year and seven-year-old horses compete in show jumping events. With increasing age the number of starts decreases.

The most frequent age category of horses competing in show jumping events in the Czech Republic is six-year-old horses – see Graph 1. This does not tally with the results of west European authors. FORAN *et al.* (1994) reported that the most frequently starting horses are five-year-old horses and that the numbers of six-year-old horses are

considerably lower. We can give two reasons for this difference.

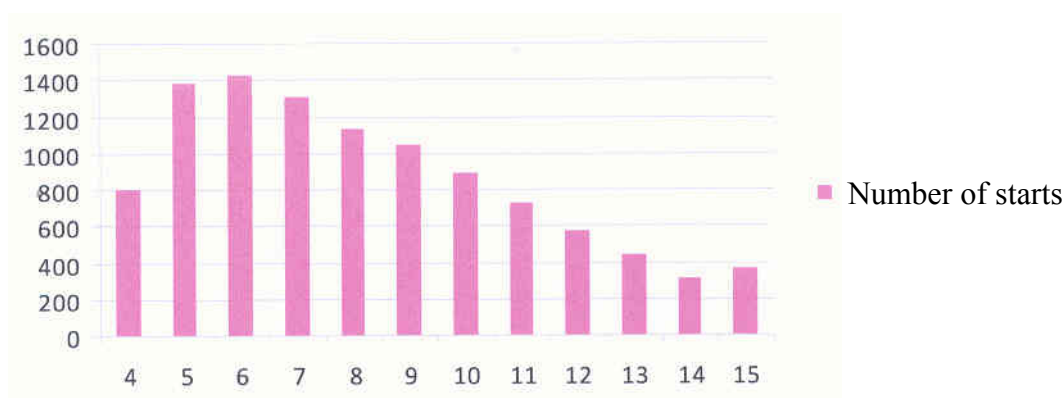
The first reason of the different participation of five-year and six-year-old horses in sports events in the Czech Republic and abroad may be the different system of managing of the horses, different economic pressures and different system of performance testing. It is likely that in west Europe the economical efforts to enforce the products of breeding as soon as possible motivate the owners of young sports horses to a very early demonstration of their sporting capabilities which increase the selling price. It is the same with the breeding horses where the efforts of owners from abroad to speed up the performance testing of young mares before incorporation in breeding predominate. After the accession of the Czech Republic to EU similar economic pressures can also be expected in the breeding of sports horses in the Czech Republic. Performance testing in the Czech Republic also influences the high number of the six-year-old horses. The results of races of the Czech warm-blooded horse (Young Horses Criterion – KMK) allow the best sires to be used for breeding only on the basis of results of the five and six-year-olds.

Another reason is the fact that the horse's preparation is affected by the period when the young horses are incorporated into sports testing. On a permanent basis the Czech trainers and riders are discussing how quickly to proceed in the instruction and training of young sports horses. European instruction and training centres, which are economically forced to make their production as profitable as possible, prepare the horses for the competitions using well-tried routine procedures as quickly as possible with no negative consequences on the quality of their performance or psyche.

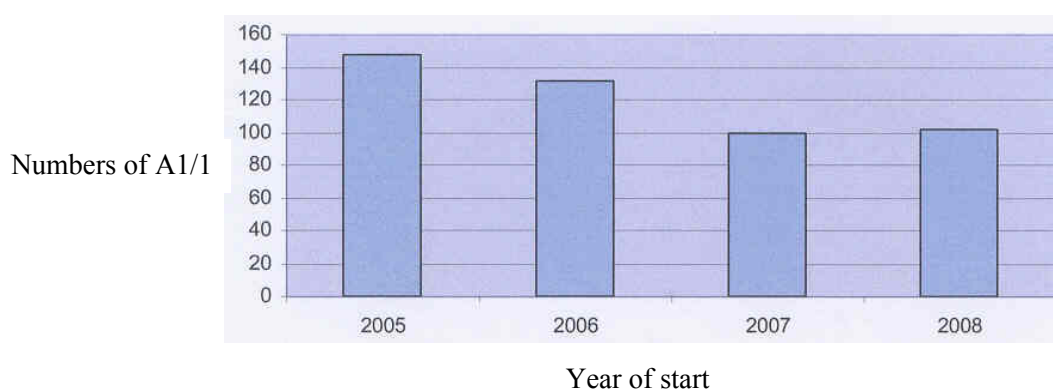
By multiple comparisons we explored the effect of the number of starts. The highest mean PPB value was achieved by horses with a high number of starts and was influenced by the fact that high-performing horses started more frequently. On the contrary the mean PPB value of horses with fewer starts was lower.

Concerning the representation of the English Thoroughbred in show jumping events based on the degree of difficulty, thoroughbred horses started most frequently in competitions of the "ZL" degree, i.e. up to 110 cm (43% of horses); 28% of the thoroughbreds started in competitions of the "L" degree (120 cm); 16% in degree Z and 11% in competitions of degree "S" (130 cm). The number of thoroughbreds starting in higher competitions is negligible. In this case it is also important that in many lower-grade competitions the thoroughbreds classified for show jumping start in show jumping competitions with no previous preparation; the reason why they are used in sports is first and foremost the fact that they are easily available for a reasonable price.





1: Number of starts in the individual age categories



2: Numbers of A1/1 starting in the respective years

Graph 2 shows that participation of the English Thoroughbred in show jumping has been on the decrease.

Graph 2 shows that in 2005 the number of starting English Thoroughbreds was 148; in 2008 it was only

102. Due to the increasing import of foreign breeds bred for sports performance a further decrease in the use of the English Thoroughbred in show jumping events can be expected.

## SUMMARY

The objective of the study was to evaluate the importance of the English Thoroughbred in the breeding of sports horses in the Czech Republic.

Basic data were taken from 2005–2008 surveys on sports horses in the Czech Republic in which contain results of horses in sports competitions. The PPB points (auxiliary sports points) were used to express the sports performance. PPB is the official system of evaluation of the sports performance of horses in the Czech Republic. It is based on the criterion of the number of penalty points achieved in the competition; by means of a matrix showing the level of difficulty of the competition they are converted to auxiliary points which are then calculated per one start of the horse. In this way the effect of the number of starts of the horse and the level of difficulty of the competition are eliminated. To evaluate the statistical results a database was created counting 10,380 data. The file was divided into 5 groups based on the representation of the English thoroughbred in horse pedigrees. Statistical evaluation was conducted by means of the GLM method at the same time taking into account the effect of the following factors: age in the year of the start, number of starts, gender and year of the start. A statistically significant effect was discovered of all the above effects: gender, age in the year of the start, year of the start, number of starts and the group based on the representation of the English thoroughbred.

By multiple comparisons of the groups based on the representation of the English thoroughbred it was discovered that group 5 (horses with no significant proportion of blood of the English thoroughbred in the horse pedigree) had the highest sports performance. This result was undoubtedly affected

by the incorporation of foreign breeds in the breeding of sports horses in the Czech Republic and is influenced particularly by the fact that the horse enters the herd with an already verified sports performance. Nonetheless the English thoroughbred is an ideal improver of sports horses and has a positive effect on the sports performance in show jumping events. This fact proves that group 3 (horses with a 50% proportion of blood of the English thoroughbred in the pedigree) were placed second.

Comparisons of the individual groups based on gender showed that mares were superior in numbers, but stallions achieved the highest sports performance.

In evaluations based on age in the year of the start the highest number of PPB points was acquired by 12-year-old horses; this is due to their physical and psychical maturing. The most frequently competing horses are 6-year-old horses.

We also explored the correlation between the PPB values and the number of starts in competitions. Horses with a high number of starts achieved the highest values. This is due to the fact that horses showing sports performance in show jumping events start oftener than horses with a minimal performance. Horses competing at the age of 12 years (3.5414) achieved the highest values and the highest average values were achieved in the 2008 season (3.999). The highest **PPB** was achieved by horses with a high number of starts.

## REFERENCES

- FORAN, M. K., CROMIE, A. R., REILLY, M. P., KELLEHER, D. L., BROPHY, P. O., 1994: Analysis of show jumping data in the Irish sport horse population. In: 45th Annual Meeting of the European Association for Animal Production, Edinburgh, UK, September 5–8.
- FORAN, M. K., REILLY, M. P., KELLEHER, D. L., LANGAN, K. V., BROPHY, P. O., 1995: Genetic evaluation of show jumping horses in Ireland using ranks in competition. In: 46th Annual Meeting of the European Association for Animal Production, Prague, Czech Republic, September 4–7.
- HANUŠOVÁ, K., 2007: Plnokrevníci v teplokrevném chovu. *Jezdectví*, roč. 55, č. 4, s. 50–51, ISSN 1210-5406.
- HANUŠOVÁ, K., 2007: Plnokrevníci v teplokrevném chovu II. *Jezdectví*, roč. 55, č. 5, s. 50–51, ISSN 1210-5406.
- JISKROVÁ, I., 1996: Vliv importu zahraničních plemen na zvýšení sportovní výkonnosti českého teplokrevníka. (Doktorská disertační práce). Brno, 103 s. Mendelova zemědělská a lesnická univerzita v Brně.
- JISKROVÁ I., MISAŘ, D., 1997: Effects of some factors on the sports performance of the Czech warm-blood horse. *Czech J. Anim. Sci.*, Vol. 42, No. 9, p. 417–425.
- PELLAROVÁ, A., DYKOVÁ, Z., TEPLÝ, V., MORAVEC, S., 2005: Přehled o sportovních koních v ČR, Slatiňany, VSCHK, 258 s.
- PELLAROVÁ, A., DYKOVÁ, Z., TEPLÝ, V., MORAVEC, S., 2006: Přehled o sportovních koních v ČR, Slatiňany, VSCHK, 264 s.
- PELLAROVÁ, A., DYKOVÁ, Z., TEPLÝ, V., MORAVEC, S., 2007: Přehled o sportovních koních v ČR, Slatiňany, VSCHK, 270 s.
- PELLAROVÁ, A., DYKOVÁ, Z., TEPLÝ, V., MORAVEC, S., 2008: Přehled o sportovních koních v ČR, Slatiňany, VSCHK, 254 s.

## Address

doc. Ing. Iva Jiskrová, Ph.D., Ústav chovu a šlechtění zvířat, Mendelova univerzita v Brně, Zemědělská 1, 613 00 Brno, Česká republika, e-mail: jiskrova@mendelu.cz