

# COMPARASION OF THOROUGHBRED RACE PERFORMANCE IN BRAZILIAN HIPPODROMES

## COMPARAÇÃO DO DESEMPENHO EM CORRIDAS DE CAVALOS PURO-SANGUE INGLÊS NOS HIPÓDROMOS BRASILEIROS

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### ADDITIONAL KEYWORDS

Horsrace. Average speed.

### PALAVRAS CHAVE ADICIONAIS

Corrida de cavalos. Velocidade média.

### SUMMARY

The aim was to compare the performance in Thoroughbred horse races that won competitions of the Classical Calendar in Cidade Jardim (1110 animals), Gávea (975), Taruma (653) and Cristal (420) hippodromes. The data used were provided by the Association of Race Horse Breeders and included 6179 finishing times of winners. The analyses were conducted using the GLM procedure of the SAS. Race year (1974-1998), grade (5 levels), call (sex and age combination, 14 levels), track condition (light, smooth, heavy and drenched turf and sand) and distance (700 to 3200 meters) were considered as fixed effects in the model. The best speed averages for the 1000, 2000 and 3000 meters were collected in Gavea (17.15, 16.21 and 15.84 m/s) respectively, whereas the worst ones were reported from Taruma (16.26, 15.19 and 15.09 m/s). As the distance varied from 1000 to 2000 meters, the average speed decreased more steeply in Taruma (1.05 m/s) and even less in Cidade Jardim (0.75 m/s from 16.80 to 16.05 m/s). When the distance increased from 2000 to 3000 meters, the average speed displayed an opposite situation to the previous interval, i.e., the slightest drop in

average speed (0.1 m/s) was verified in Taruma, whereas the most remarkable one was shown in Cristal (0.49 m/s from 16.05 to 15.58 m/s).

### RESUMO

O objetivo deste trabalho foi comparar o desempenho em corridas de cavalos PSI vencedores de provas do calendário clássico nos hipódromos de Cidade Jardim (1100 animais), Gávea (975 animais), Tarumã (653 animais) e Cristal (420 animais). As informações utilizadas neste estudo foram provenientes do "Stud Book" da Associação Brasileira dos Criadores do Cavalo de Corrida. Os dados incluíram 6179 tempos finais de PSI vencedores em 402 diferentes tipos de corrida. Para as análises estatísticas utilizou-se o procedimento GLM do SAS (1996), incluindo os efeitos fixos de ano da corrida (1974 a 1998), grau (5 níveis), chamada (combinação entre sexo e idade, 14 níveis), raia (pistas de grama e areia leves, macias, pesadas e encharcadas) e distância da corrida (700 a 3200 metros) no modelo linear. As melhores médias de

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desempenho para as distâncias de 1000, 2000 e 3000 metros foram constatadas no hipódromo da Gávea (17,15 - 16,21 e 15,84 m/s) respectivamente, enquanto que as piores aconteceram em Tarumã (16,26 - 15,19 e 15,09 m/s). A medida que a distância crescia de 1000 para 2000 metros, a velocidade média decrescia mais acentuadamente no hipódromo de Tarumã (1,05 m/s) e menos em Cidade Jardim (0,75 m/s de 16,80 m/s a 16,05 m/s). Por outro lado quando a distância aumentava de 2000 para 3000 metros, a velocidade média apresentou comportamento oposto ao intervalo anterior, ou seja, em Tarumã foi constatado a menor queda da velocidade média (0,1 m/s) ao passo que em Cidade Jardim a maior (0,47 m/s de 16,05 m/s a 15,58 m/s).

## INTRODUCTION

Although Brazil has approximately 10 p.100 horse world population (6.4 million head), involving 35 thousand breeders, 350 thousand ownerships and 1 million of direct job positions (IBGE, 1998), little research has been carried out on this species, mainly concerning to its population features.

Studies on this subject are important so that the national breeding situation might be known. According to that, the study has been performed aiming to assess the performance in best-timer Thoroughbred race horses, in the 4 most important Brazilian Hippodrome classical calendar, contributing to a better knowledge of Thoroughbred race horse breeding.

## MATERIAL AND METHODS

The data used in this study were provided by the Stud Book of the Brazilian Association of Race Horse

Breeders (ABCCC), located in the city of São Paulo, Brazil. The overall information was recorded in the *Quadro de Honra CD-99* file, which considered all races of the classical calendar held in Cidade Jardim, Gávea, Tarumã and Cristal hippodromes from 1974 to 1998.

6179 final time of 3158 winners of races over 25 analyzed years have been considered. The analyses were performed using the GLM procedure of SAS (1996), considering the linear model with the fixed effects of race year (1974-1998), track condition (light, smooth, heavy and drenched turf and sand); grade (I-group I races, II-group II races, III-group III races, 4-listed and 5-special), call (sex and age combination, 16 levels) and race-distance (700, 800, 1000, 1100, 1200, 1300, 1400, 1500, 1600, 1609, 1800, 2000, 2200, 2400, 3000 and 3200 meters).

The following linear model was used for data analysis:

$$Y_{ijklm} = \mu + G_i + C_j + R_k + A_l + b_1(X_{ijk} - X) + b_2(X_{ijk} - X)^2 + E_{ijklm}$$

Where:

$Y_{ijklm}$  = time observed for each animal (seconds);

$\mu$  = Overall mean;

$G_i$  = grade fixed effect (i = 1...5);

$C_j$  = call fixed effect (j = 1..16)

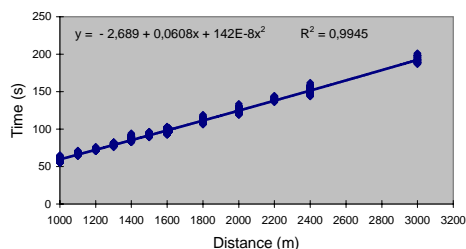
$R_k$  = track condition fixed effect (k = 1...8)

$A_l$  = race year fixed effect (l = 1974...1998)

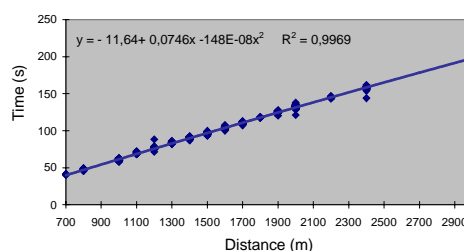
$b_1$  and  $b_2$  = linear and quadratic partial regression coefficients of the  $Y_{ijklm}$  variable in relation to distance (meters);

$X_{ijk} - X$  = difference between the distance when the final time was

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**Figura 1.** Regression of the time on race distance in Cidade Jardim hippodrome. (Regressão do tempo de cavalos ganhadores de corridas sobre a distância-hipódromo Cidade Jardim).



**Figura 2.** Regression of the time on race distance in Tarumã hippodrome. (Regressão do tempo de cavalos ganhadores de corridas sobre a distância-hipódromo Tarumã).

observed and the overall mean racing distance;

$E_{ijkm}$  = random error associated with each observation.

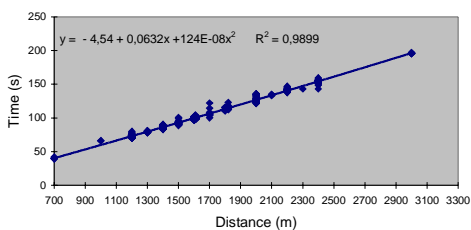
The comparisons among classes involving grade, call, track condition and year effects were performed through the Tukey Test at 5 percent significance level.

### RESULTS AND DISCUSSION

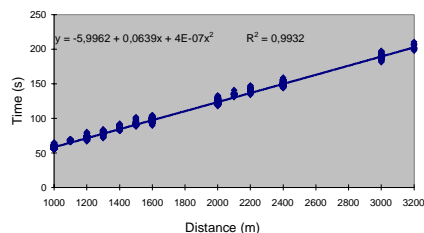
All the included factors in the model were significant ( $p < 0.05$ ) except race year in Cristal hippodrome. Group I

aces (considered the most important ones and with the greatest awards) and light turf track were statistically higher than the others in all hippodromes. In relation to call, there was significant difference only in Cidade Jardim hippodrome for 3-4 year old-geldings and sires, while there was no significant difference for several other age-sex combinations, agree with those reported by Mota *et al.* (2000).

The following **1** to **4** figures show the time quadratic regression in relation to distance for each hippodrome. **Figure 1** (Cidade Jardim) shows 0.75 m/s decreases in average speed when



**Figura 3.** Regression of the time on race distance in Cristal hippodrome. (Regressão do tempo de cavalos ganhadores de corridas sobre a distância-hipódromo Cristal).



**Figura 4.** Regression of the time on race distance in Gávea hippodrome. (Regressão do tempo de cavalos ganhadores de corridas sobre a distância-hipódromo Gávea).

the race distance goes from 1,000 m (16.80 m/s) to 2,000 m (16.05 m/s) and 0.47 m/s from 2,000 to 3,000 m (15.58 m/s). The Gávea hippodrome (**figure 2**) was the place with the highest average speed in distances of 1,000m; 2,000m and 3,000 m: 17.15 m/s, 16.21 m/s and 15.84 m/s respectively. This represents decreases in the animal average speed of 0.94 m/s from 1,000 m to 2,000 m and 0.37 m/s from that to 3,000 m. On the other hand, the lowest speed values were gotten in the Tarumã (**figure 3**): 16.26 m/s, 15.19 m/s and 15.09 m/s respectively for 1,000; 2,000 and 3,000 meters, which were slightly lower than those from Cristal hippodrome: 16.69 m/s; 15.77 m/s and 15.28 m/s (**figure 4**).

It's interesting to notice that even with differences among hippodromes in the studied distance interval, the average speed of the animals is likely to slow down less markedly when the race distance increases. When the distance increases from 1,000 to 2,000

meters, the average speed slows down faster in Tarumã (1.07 m/s) and less in Cidade Jardim (0.75 m/s). On the other hand, when the distance has extended from 2000 m to 3000 m, Tarumã has been the place where the average speed decreased more slowly, 0.1 m/s, i.e., 1/10 occurred in this hippodrome from 1,000 to 2,000 m. Cristal was the hippodrome where the average speed dropped more intensity, 0.49 m/s, a little more than half of the decrease observed between 1,000 and 2,000 m in this place. This has also been the hippodrome where the average speed mostly slowed down in the 1,000 to 3,000 meter interval (1.41 m/s), whereas Tarumã was the place where there was the smallest decrease (1.17 m/s).

The higher average speed in Gavea and Cidade Jardim hippodromes might partially mean the better quality of animals that run in these tracks, since their awards are pretty higher compared to the others hippodromes, drawing higher potential horses.

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