ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 09, Issue, 08, pp. 29236-29239, August, 2019

RESEARCH ARTICLE OPEN ACCESS

CHARACTERIZATION OF EQUINO ATHLETE IN DIFFERENT COMPETITIONS

[1]Victória Lucas Camara Antunes, [2, 3, *]Marcia Aparecida Andreazzi, [2, 3]Fábio Luiz Bim Cavalieri, [1]Matheus Cézar Nerone, [2]Maria Fernanda Zamai, [4]Brittany Michelle Sheppard and [2]Vinícius Eduardo Gargaro Silva

[1]Centro Universitário de Maringá - Unicesumar, 87050-900, Maringá-PR, Brazil
[2]Programa de Pós-graduação em Tecnologias Limpas, Centro Universitário de Maringá – Unicesumar, Av. Guedner, 1610, 87050-900, Maringá-PR, Brazil
[3]Instituto Cesumar de Ciência, Tecnologia e Inovação - ICETI, Maringá, PR, Brazil
[4]Missouri State University - Studying General Agriculture, AgricultureCommunications, Springfield, MO, EUA

ARTICLE INFO

Article History:
Received 03rd May, 2019
Received in revised form
17th June, 2019
Accepted 11th July, 2019
Published online 30th August, 2019

Key Words:
Equinoculture, Equestrian tests, Equestrian competitions.

Corresponding author:
Marcia Aparecida Andreazzi

ABSTRACT

Presently, equinoculture has presented great world and national prominence due to the competitions. With efficient genetic selection, a wide diversity of equine breeds have originated, with characteristics increasingly suitable for different types of competitions, aiming at acquiring the best results in the tracks. However, excluding breed, factors such as sex and live weight may also influence the performance of equine athletes. This study was aimed to evaluate the performance of horses of different breeds, ages and weights in different equestrian tests in the South of Brazil. We collected the live weight, age, sex and race at the time of the performance. This data includes time of the animals participating in regional competitions of barrel racing, long laced roping and show jumping mode data. The performance of the animals was not affected by race, sex and live weight. There were no differences (P>0.05) in performance between the animals in the Barrel Racing mode. Likewise, the performance of the equine athletes of the Quarter Horse in long laced roping did not show differences either (P>0.05). Regarding the show jumping equestrian modality, only at 1.10m the females presented better performance (P<0.05), in the other heights the performance was equal or worse, when compared to the males.

Citation: ***Victória Lucas Camara Antunes, Marcia Aparecida Andreazzi, Fábio Luiz Bim Cavalieri et al*****, 2019.** "Characterization of equino athlete in different competitions", *International Journal of Development Research*, 09, (06), xxxxxxxxxxxxx.

INTRODUCTION

More than 6,000 years ago, horses occupied a prominent position in the civilization by acting in wars, agriculture and sports or leisure. In fact, domestic horses are very useful and allow a close relationship between the urban population and the field (Guerrero *et al.,* 2006) and, with genetic selection, are being created to demonstrate resistance to exercise, strength, speed and metabolic efficiency (Curi *et al.,* 2013). It is estimated that the Brazilian equinoculture has around 5.6 million horses, and generates many direct and indirect jobs (MAPA, 2016) and most of financial movement being attributed to sports activities (Almeida and Silva, 2010). The businesses involved in the creation and use of horses occupy major highlights in developed and developing countries, such as Brazil. The knowledge of the Agribusiness of the Equine industry is of extreme importance for the formulation of policies that grant the expansion of the equinoculture, generating a great amount of jobs (MAPA, 2016).

However, in order for the animal to perform well in competitions, it must be properly prepared through training and receive adequate nutrition. In relation to performance, endurance is an important factor, having influence of the physical conditioning of the animal, which includes respiratory and circulatory systems, soil, climatic conditions and management efficiency (Rezende *et al.,* 2016). For the sporting use of any type of horse, one must evaluate the animal's condition to the sport to which it will be submitted (Ferraz *et al.,* 2007). In general, factors such as race, age, live weight and sex should be considered. The breed is characterized by factors such as profile, weight, conformation, height, coat, skin thickness and dominant fitness. Thus, there is a great diversity of equine breeds, evidencing the complexity of the adaptation of the animal's characteristics, its temperament, power and speed, with the best results in equestrian competitions (Pinto, 2010). As an example, horses of classic equestrianism should have a high height and not have a very compact body, so as not to impair the agility of

these animals in the tests (SHB, 2018). The performance of work or sport has strong influence based on the age of the horse. In two-year-old foals, exercise should be done quickly in a shorter duration, since the body of these animals does not yet have complete development; on the other hand, older horses have the ability to perform more intense exercises (Hontang, 2004; Hinchcliff *et al.,* 2008). Another factor that is related to equine performance is live weight. Equines are classified as hypermetric, animals over 550kg, eumetric, animals between 350 and 550kg and hipometric, animals under 350kg. In general, hypermetrics are more appropriate for services that involve force and hipometric ones perform better at their speed (Rezende *et al.,* 2016). The sex of the animals should also be considered. Whole ponies used in racing can avoid overtaking other animals, especially when it comes to mares. Thus, the reproductive instinct ends up hindering the performance of these animals during the race (Hontang, 2004). Based on the above, it is verified that there are several factors that influence the performance of equine athletes during equestrian competitions, in this way, the objective of this research was to characterize breed, age, live weight, sex and equine performance athletes in different modalities of equestrian events.

MATERIALS AND METHODS

This work was carried out from the data collection of evidence of three different equestrian modalities occurring in Maringa, Parana, South region of Brazil, during the period from August / 2017 to May / 2018. The races were equestrian, long bow and three drums, with the participation of a total of 62 animals. The equestrian event, show jumping mode, took place at the Equestrian Club of Maringá, in August 2017, and was attended by 28 animals. The long laced roping mode took place in Rural Society of Maringá, in November 2017, and 5 animals were evaluated. The Barrel Racing test data was collected at the 3rd Recopar Cup, which took place during the agriculture and livestock fair of Maringa Fair, organized by the Rural Society of Maringa, in May 2018, for a total of 29 animals. During the events, data were collected for the characterization of the animals: breed, age, live weight (LW), sex and time spent by each animal in the tests. Data on breed, age and sex were obtained through consultation of the documents and questioning of the animal responsible. The weight of the animals was estimated from the thoracic diameter, by passing a tape measure adjusted by the withers and the caterpillar and, with the result of the diameter, the weight was calculated using the formula: $W = T^3 \times 80$, with T being the thoracic perimeter in meters and W the weight of the animal in kilograms (kg). The time in the tests was obtained directly with the members of the organizing committee. The technicians responsible for the tests were consulted and consent to the data collection. The data was tabulated and analyzed by means of the R (2011) computational package, using t test at 5%.

RESULTS AND DISCUSSION

The data on the performance of the animals in the equestrian event, show jumping mode, are described according to the different heights of the obstacles (Table 1). Many modern equestrian sports have originated in ancient warfare practices, jumping obstacles is an example of military applications, and equestrianism also arose from the custom of European nobles, especially the English, when practicing fox hunting, since horses they needed to skip logs, streams, small ravines and other obstacles hunters found in the forests (SHB, 2018). Currently, in equestrian mode, the animals compete in sand or grass tracks, aiming to overcome the obstacles without committing fouls, in a course containing, on average, 12 to 15 obstacles (Roessler and Rink, 2006). In relation to the breed, it was found that 2.57% of the animals were of the Quarter Horse, 5.13% KWPN, 5.13% Paint Horse, 23.07% crossbred and 64.10% of the Brazilian Equestrianism, evidencing once again the greater frequency of this race in this place and in this modality of equestrian test. In fact, the horse of the Brazilian Equestrianism breed is a light and large horse, with elegant movements, intelligent and with great ability for jumping competitions, training or complete competition, being one of the most docile and easy races to be trained (Days *et al.,* 2000). Andreazzi *et al.* (2014) evaluated the serum levels of muscle enzymes in 15 horses at the same site of this study and reported, as an animal characterization, an equivalent distribution between males and females, aged between 10 and 15 years, live weight between 400 and 500kg and all horses were of the Brazilian Equestrianism breed. These data show that the current troop at this location maintains similar characteristics as mean overall age of 13.44 years and average overall live weight of 513.90Kg.

Table 1. Mean values of age, live weight and time to perform the show jumping test of equine athletes of various breeds according to the height of the obstacles and the sex of the animals

Height 1.20 m			
	General (n= 10)	**Male (n= 7)**	**Female (n=3)**
Age (years)	8.52	6.33a	10.71b
Live Weight (kg)	526.6	520.0a	533.71a
Time (seconds)	71.27	71.46a	74.04a
Height 1.10 m			
	General (n=17)	**Males (n=13)**	**Female (n= 4)**
Age (years)	12.40	13.5b	11.31a
Live Weight (kg)	477.30	442.5b	512.07a
Time (seconds)	69.15	72.01b	66.31a
Height 1.0 m			
	General (n=11)	**Male (n=7)**	**Female (n=4)**
Age (years)	10.66	11.75	9.57
Live Weight (kg)	522.27	523.75	521.43
Time (seconds)	70.27	68.69	71.89
Height 0.90			
	General (n=4)	**Male (n=0)**	**Female (n=4)**
Age (years)	11.0	-	11.0
Live Weight (kg)	538.75	-	538.75
Time (seconds)	71.84		71.84
Height 0.80 m			
	General (n=7)	**Male (n=2)**	**Female (n=5)**
Age (years)	15.8	18.6	13.0
Live Weight (kg)	520.71	502.0	567.5
Time (seconds)	67.94	65.59	70.33
Height 0.60 m			
	General (n=4)	**Male (n=2)**	**Female (n=2)**
Age (years)	18.5	23.0b	14.0a
Live Weight (kg)	519.0	520.0	518.0
Time (seconds)	53.16	51.49	55.33
Height 0.40 m			
	General (n=6)	**Male (n=2)**	**Female (n=4)**
Age (years)	16.0	17.0b	14.0a
Live Weight (kg)	471.33	448.0	518.0
Time (seconds)	60.75	56.55	69.15

* Different letters on the same line differ from each other (P<0.05).

Regarding the performance of the animals, it was verified that, at 1.20 m, although the females were older (P<0.05), no differences were observed in the LW and in the time. At 1.10 m, although the females were younger, they presented higher LW and better time in the course of the test (P<0.05). In contrast, at 0.80 cm, females were younger and had higher

LW, however, the time was higher (P<0.05). At 1.0m, no differences were observed in age, LW and time and, at a height of 0.90m, it was not possible to compare the performance according to sex, since the group consisted exclusively of females. At 0.60 females were observed to be younger (P<0.05), but this fact did not reflect differences in LW and time. At 0.40 cm, the females presented lower age, higher LW and a longer time to complete the course, that is, a worse performance, compared to males (P<0.05). Kearsley *et al.* (2008) analyzed the data in equestrian competitions and observed that male animals presented better performance in the show jumping tests and, as regards age, older animals achieved the best results due to the ability of these animals that tend to increase with age. The performance of the equine athletes of the quarter horse breed in long laced roping showed no differences (P>0.05) (Table 2). In this test, the individual rides a horse with the objective of containing cattle, through the use of the loop (Rezende *et al.,* 2015) and is a modality in which animals exercise intensely, seeking to perform the challenge in the shortest time (Mattosinho *et al.,* 2017).

Table 2. Mean values of age, live weight and time to perform the riding event, long laced roping modality, of quarter horse.

	Overall average (n=5)	Mean of males (n=4)	Mean of females (n=1)
Age (years)	9,2	10,25a	5,0b
Live Weight (kg)	466,2	467,5a	461,0a
Time (seconds)	8,43	8,55a	7,85a

* Different letters on the same line differ from each other (P <0.05).

Table 3. Mean values of age, live weight and time to perform the riding event, Barrel Racing modality, of quarter horse

	Overall average (n=26)	Mean of males (n=13)	Mean of females (n=13)
Age (years)	8,27	8,84a	7,66a
Live Weight (kg)	418,81	411,92a	422,75b
Time (seconds)	16,16	16,21a	16,11a

* Different letters on the same line differ from each other (P<0.05).

The results regarding the riding event, modality Barrel Racing are described in Table 3. No differences (P<0.05) were observed in the performance between males and females, which presented average results compatible with the event. The Barrel Racing is a sporting modality where the sets formed by horse and rider must contour three drums, in the shortest time and without committing faults (Silva *et al.,* 2013; Carvalho, 2016). Several factors can influence the results in riding event, among them, the size and type of track. In this way, in a three-reel race held on the official track, the world record is 16.399 sec for the Quarter Horse breed, the foal category of the future, which was reached in competition at Horse Farms Rafaela, Porto Feliz / SP in 2017 (ABQM, 2018), evidencing the good results found in this research. However, we should point out that the race track evaluated at Agriculture and Livestock Fair of Maringa Fair/ 2018 was not official, presenting a small size, and that the best time of said race was 14.3989seg (SGP Management of Tests). Even so, the values can be considered very good. To evaluate the performance of Quarter Horse in the barrel racing, Donofre and Ferreira (2012) evaluated the animals' conformation through linear measurements and identified that the best results were achieved by the animals with high age, which presented higher amount of body mass and lower height of withers. However, no differences in age were found in this study. For equestrian modalities that require speed, time is the best indicator for assessing the performance of animals (Capelleto *et al.,* 2009). Capelleto *et al.* (2009) and Silva *et al.* (2013) evaluated the performance of horses in the barrel racing mode, finding an average time of completion of 18 and 19.33 seconds, respectively. Data superior to those found in this study, since the animals obtained a general average of completion time of 16.16 seconds in the same modality. The totality of the animals evaluated in the Barrel Racing and long laced roping participants of this research was the quarter horse breed. In fact, the Barrel Racing and long laced roping test have the predominance of the quarter horse breed due to the great strength of these animals, allowing them to obtain a high speed at the time of the start for the start of the race, as well as abrupt stops, change direction and agility to make turns (Coelho, 2011). Considered the most versatile horse in the world, the Quarter Horse has become one of the main breeds in the Brazilian equine market in the last years and adapts to the most diverse sport modalities, with well observed mention of the speed tests, such as Barrel Racing (Donofre *et al.,* 2014). The main characteristic of this breed in a race is the exceptional speed that these animals reach during the first quarter of a mile (420m), and no other breed is able to overcome it (Silva *et al.,* 2013). In this way, the findings of this study prove that this breed is really the most appropriate for these modalities.

Conclusion

The results allowed verifying that in the show jumpingtest, most of the animals were eumetric, male, of the Equestrianism Brazilian breed, and did not show differences in performance in most different obstacle heights. In the long laced roping mode most of the animals were male, eumetric, Quarter Horse breed and presented good performance. In the Barrel Racing mode, the animals were eumetric, with age and distribution of equivalent sex, all of Quarter Horse breed and presented a very good performance. Thus, it was concluded that the animals evaluated were well trained animals and presented standardized characteristics and adapted for each equestrian test, especially in relation to breed and live weight. In this way, differences in performance are attributed to individual training and the genetic superiority of each animal, which resulted in awards in each competition.

Acknowledgments: To the Araucária Foundation - Support for Scientific and Technological Development of Paraná, for granting the scholarship.

REFERENCES

Almeida FQ, Silva VP (2010) Progresso científico em equideocultura na 1ª década do século XXI. Revista Brasileira de Zootecnia, 12:119-129.

ABQM - Associação Brasileira de Quarto de Milha. Três Tambores tem novo recorde mundial conquistado pelo Brasil. Retrieved from: http://www.abqm.com.br/pt/noticias/tres-tambores-tem-novo-recorde-mundial-conquistado-pelo-brasil/ on 28st March 2019.

Capelleto EC, Angeli AL, Graff H (2009) Respostas fisiológicas em Quarto-de-Milha após prova de tambor. Revista Acadêmica: Ciência Animal. 7(3):299-304.

Carvalho RS, Macedo LP, Teixeira FA, Binda MB, Coelho CS (2016) Volume corpuscular médio (VCM) e amplitude da distribuição do tamanho dos eritrócitos (RDW) em equinos da raça Quarto de Milha usados em provas de três tambores. Ciência Animal Brasileira. 17(3): 411-417.

Coelho CS, Lopes PFR, Pissinati GL, Oliveira Ramalho L, Souza VRC (2011) Influência do exercício físico sobre sódio e potássio séricos em equinos da raça Quarto de Milha e mestiços submetidos à prova de laço em dupla. Revista Brasileira de Ciência Veterinária. 18(1):32-35.

Curi R A, Meira CT, Beltrán, NAR, Silva JAV, Mota MDS (2013) Seleção assistida por marcadores para o melhoramento do desempenho de equinos em corridas. Boletim de Indústria Animal. 70(1):88-102.

Dias IMG, Bergmann JAG, Rezende ACC, Castro GHF (2000). Formação e estrutura populacional do equino Brasileiro de Hipismo. Arquivo Brasileiro de Medicina Veterinária e Zootecnia. 52(6):647-654.

Donofre AC, Ferreira IEP, Puoli Filho JNP (2012). Desempenho de cavalos da raça quarto de milha em função de sua conformação corporal. Revista da Estatística da Universidade Federal de Ouro Preto. 12:156.

Donofre AC, Puoli Filho JNP, Ferreira IEP, Mota MDS, Chiquitelli Neto M (2014) Equilíbrio de cavalos da raça Quarto de Milha participantes da modalidade de três tambores por meio de proporções corporais. Ciência Rural. 44(2):327-332.

Ferraz GC, Escodro PB, Queiroz Neto A (2007) Fisiologia do exercício equino: Ferramenta para o desempenho atlético de cavalos atletas. Revista Brasileira de Medicina Equina. 12:6-8.

Hinchcliff K, Geor R, Kaneps A (2008) Equine Exercise Physiology. The Science of Exercise in the Athletic Horse.Elsevier Ltd. 476p.

Hontang M (2004) A psicologia do Cavalo-1. Rio de Janeiro: Globo. 224p.

Kearsley CGS, Woolliams JA, Coffey MP, Brotherstone S (2008) Use of competition data for genetic evaluations of eventing horses in Britain: Analysis of dressage, showjumping and cross country phases of eventing competition. Livestock Science. 118:72–81.

Mattosinho RO, Sampaio AJSA, Balarin, MRS Fiorato CA, Vasques GMB, Silva ALY, Marcusso PF (2017) Alterações hematológicas e bioquímica sérica de equinos atletas. Revista de Ciência Veterinária e Saúde Pública. 4(1):82-91.

MAPA – Ministry of Agriculture, Livestock and Food Supply. (2016) Revisão do Estudo do Complexo do Agronegócio do Cavalo. 2016. 56p. Retrieved from: http://www.agricultura.gov.br/assuntos/camaras-setoriais-tematicas/documentos/camaras-setoriais/equideocultura/anos-anteriores/revisao-do-estudo-do-complexo-do-agronegocio-do-cavalo/ on 28st March 2019.

Pinto RD (2010) Diferenças de desempenho das raças nas provas de velocidade e potência dentro do hipismo. Rio de Janeiro. 44p.

Rezende MPG, Abreu UGP, Souza JC, Santos AS, Ramires GG, Sitorski LG (2015) Morfologia corporal de equinos Quarto de Milha puros e mestiços utilizados no laço comprido no Mato Grosso do Sul. Archivos de Zootecnia. (64)246:183-186.

Rezende MPG, Souza JC, Mota MF, Oliveira NM, Jardim RJD (2016) Conformação corporal de equinos de diferentes grupos genéticos. Ciência Animal Brasileira. 17(3):316-326.

Roessler M, Rink B (2006) Esportes Hípicos. In: Da Costa, L. Atlas do Esporte no Brasil. Rio de Janeiro: CONFEF.

Silva MAG, Gomide LMW, Dias DPM, Martins VB, Albernaz RM, Bernardi NS, Queiroz Neto A, Lacerda Neto JC (2013) Equilíbrio ácido-base em equinos da raça Quarto de milha participantes da prova dos Três Tambores. Revista Brasileira de Medicina Veterinária. 35(2):188-192.

SGP Gerenciamento de Provas. Retrieved from: http://www.sgpsistema.com/ on 28st March 2019.

SHB - Sociedade Hípica Brasileira. Hipismo Salto. Retrieved from: http://www.shb.com.br/hipismo/salto/on 28st March 2019.

****