

STUDY REGARDING MORPHOLOGICAL PARAMETERS OF CERTAIN HORSE CATEGORIES OF SHAGYA ARABIAN BREED IN RĂDĂUȚI STUDFARM

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Abstract

This paper aimed to analyze height, heart perimeter and cannon girth of Shagya Arabian mares, stallions and young horses during their growth; Rădăuți studfarm provided data regarding livestock of these three categories of horses in 2000-2015 and it was interesting to study and compare each bloodline of this wonderful breed (Koheilan, Hadban, Dahoman, Shagya, Siglavy-Bagdady, El-Sbaa, Mersuch, Gazal - only for stallions and young horses). Therefore this study reflected that these body dimensions were representative for Shagya Arabian, regarding the whole population: mares had an average height of 159.59 cm, an average heart perimeter of 177.20 cm and an average cannon girth of 18.54 cm; regarding the stallions, the average height was 160.58 cm, the average heart perimeter was 180.61 cm and the average cannon girth was 18.95 cm; young male horses had an average value of height of 134.82 cm, an average thorax perimeter of 146.53 cm and an average cannon girth of 16.69 cm. Data obtained indicated that the studied population is included in breed standard regarding the main body dimensions that reflect their morphological type.

Key words: body indexes, dimensions, horses, Shagya.

INTRODUCTION

It's very important for sport and endurance horses to maintain certain body dimensions that reflect the characteristics of their breed and also performances. Therefore, we believe it was necessary to analyze the morphological aspects of different categories of Shagya Arabian horses (mares, stallions and young male horses), reared in Rădăuți studfarm, to establish if the breed followed its standards.

The Shagya Arabian horse breed was founded in 1785, in Bablona - Mezohegyes studfarm (Hungary); in 1809, this appendage of the studfarm became an exclusively Arabian breed rearing place. The eastern mares were mated with the famous stallion named Shagya brought from Syria in 1834 specially for founding this exceptional breed (Schipor G., 2007). In the following period the main purpose of the studfarm was to use various and appreciated sires to improve the Shagya Arabian horse breed (Dulugeac, 2005). The Rădăuți stock was founded in 1792, using the Barberino stallion and also Manachi and Hussein which were Pure Arabian sires; the idea was to create a strong

horse breed for the Austrian army so that in 1919 when the studfarm was rebuilt there were used for mating Gazal, Siglavy-Bagdady I, Dahoman XXII and Shagya XV stallions and 31 mares (Manole et al., 2005).

In 1978, the World Arabian Horse Organization (W.A.H.O.) announced that all horses that were reared according to Bablona, Rădăuți and Topolcianky will be acknowledged as Shagya Arabian breed and no longer only a variety of Pure Arabian horse (half-breed).

In 1980 the main morphological parameters of adult Shagya Arabian horses were 151.46 ± 0.26 cm for mares and 152.80 ± 1.21 cm for stallions [8]. The reproduction purpose mentioned in Rădăuți studfarms' registers was to increase the height of mares up to 156 cm, the heart perimeter up to 178 cm and the cannon girth up to 19.5 cm; regarding the morphological parameters of stallions there was specified an increase of height up to 158 cm, the heart perimeter up to 178 cm and the cannon girth up to 20.5 cm.

A study regarding the body dimensions of young horses made by Doliș et al., 2011, reflected that females registered a height of

128.8 ± 1.03 cm and males a height of 135.0 ± 1.52 cm (Dolis et al., 2011).

There was a study made by Manole et al. (2004), regarding morphological parameters of Arabian horses reared in Rădăuți studfarm between 1992-2003 which revealed that the height of each genetic bloodline was different compared to the average height of population: Gazal (+1.58 cm), El-Sbaa (+1.08 cm), Hadban (+0.64 cm), Nedjari (+0.58 cm), Shagya (-1.08 cm), Dahoman (-0.62 cm), Siglavy-Bagdady (-0.45 cm), Koheilan (-0.18 cm). When the thorax perimeter was analyzed there were the following differences Gazal (+3.15 cm), Hadban (+2.89 cm), El-Sbaa (-1.87 cm), Mersuch (-0.99 cm) and regarding the cannon girth there were revealed differences comparing the average values of +0.44 cm for Gazal, +0.31 cm for Hadban, -0.39 cm for El-Sbaa and -0.12 cm for Koheilan (Manole and Radu-Rusu, 2004).

MATERIALS AND METHODS

The studied biological material consisted of three categories of Shagya Arabian horses: mares, stallions and young male horses, reared in 2000-2015, in Rădăuți studfarm. They belonged to Koheilan, Hadban, Dahoman, Shagya, Siglavy-Bagdady, El-Sbaa, Mersuch, Gazal – only for stallions and young horses – genetic bloodlines. We considered interesting in analyzing each bloodline to observe if there were differences between them regarding the height, the heart perimeter and the cannon girth.

Rădăuți studfarm registers revealed that the Shagya Arabian horse breed could achieve the following objectives in improving its characters: mares should increase their height up to 156 cm, the thoracic perimeter up to 178 cm, the cannon girth up to 19.5 cm and stallions – a height of 158 cm, 178 cm for heart perimeter and 20.5 cm for shinbone girth.

RESULTS AND DISCUSSIONS

The results were based on analyzing each genetic bloodline of every category of horses, from Shagya Arabian breed, reared in Rădăuți studfarm. Regarding the mares reared in 2000-2015, it can be noticed in Table 1 that the

minimum average value of height was 155.25 cm (Mersuch genetic bloodline) and the maximum was 158.28 cm (El-Sbaa). Also regarding the thorax perimeter, the minimum average value for this category was 174.88 cm (Siglavy-Bagdady) and the maximum was 179.31 cm (Shagya bloodline). The minimum average value for cannon girth was 17.89 cm and the maximum 18.74 cm (Hadban). All data indicated that there was no genetic bloodline that presents minimum and also maximum average values for all studied parameters.

Table 1. The average values of studied parameters of Shagya Arabian mares

Genetic bloodline	Average values of height (cm)	Average values of thorax perimeter (cm)	Average values of cannon girth (cm)
Hadban	156.21	177.86	18.74
Dahoman	157.43	178.97	18.45
Shagya	156.36	179.31	18.68
Siglavy-Bagdady	156.41	174.88	17.89
El-Sbaa	158.28	178.13	18.88
Mersuch	155.25	176.05	18.72
Koheilan	156.24	175.26	18.48

From Figure 1 results that the average value of mares' height oscillates between 155.25 cm (Mersuch) and 158.28 cm (El-Sbaa) revealing that the objective regarding to increase the height up to 156 cm, was in this case set.

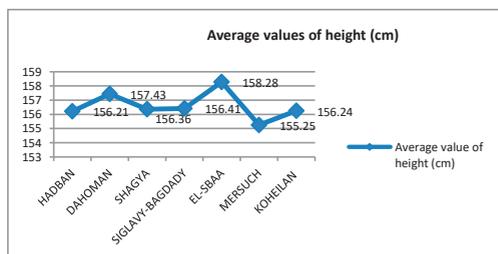


Figure 1. Average values of height of all genetic bloodlines (Shagya Arabian mares)

Figure 2 shows that the average values of thorax perimeter oscillated between 174.88 cm (Siglavy-Bagdady) and 179.31 cm (Shagya) indicating that the objective to increase the thorax perimeter up to 178 cm was set in 57.14% of cases.

Figure 3 reveals that the average values of cannon girth oscillated between 17.89 cm (Siglavy-Bagdady) and 18.88 cm (El-Sbaa) indicating that the objective to increase the shinbone perimeter up to 19 cm in mares isn't

set but is very close in reaching the estimated value (max. of 18.88 cm).

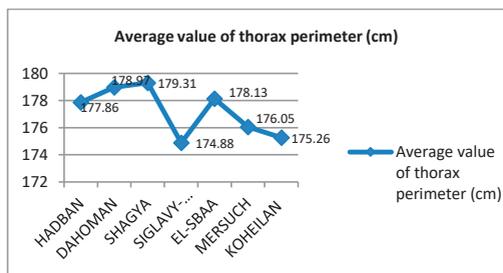


Figure 2. Average values of thorax perimeter of all genetic bloodlines (Shagya Arabian mares)

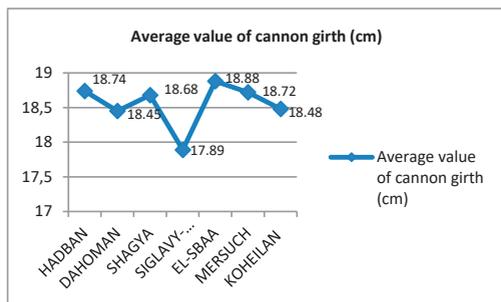


Figure 3. Average values of cannon girth of all genetic bloodlines (Shagya Arabian mares)

Based on average values obtained we calculated the massiveness index, the bone index and the digital-thorax index. The mares' situation is framed in Table 2 and reveals that the average values of massiveness index were situated between 111.80% (Siglavy-Bagdady) and 114.67% (Shagya), the average values of bone index were between 11.43% (Siglavy-Bagdady) and 12.05% (Mersuch), the average values of digital-thorax index were between 10.30% (Dahoman) and 10.63% (Mersuch).

Table 2. The body indexes based on analyzed parameters of Shagya Arabian mares

Genetic bloodline	Massiveness index (thorax perimeter/height, %)	Bone index (cannon girth/height, %)	Digital-thorax index (cannon girth/thorax perimeter, %)
Hadban	113.85	16.46	10.53
Dahoman	113.68	11.71	10.30
Shagya	114.67	11.94	10.41
Siglavy-Bagdady	111.80	11.43	10.22
El-Sbaa	112.54	11.92	10.59
Mersuch	113.39	12.05	10.63
Koheilan	112.17	11.82	10.54

Data obtained indicate that the indexes had similar values between the genetic bloodlines fact that proves that the population is homogenous.

In table 3 is presented the situation of average values of studied parameters of Shagya Arabian stallions.

Data show that all genetic bloodlines have exceeded the objective of reaching the 158 cm height of Shagya Arabian stallions, mentioned in Rădăuți studfarm registers, except the Shagya bloodline which revealed an average value of 157.75 cm for height parameter (however this value is close to the specified objective).

Table 3. The average values of studied parameters of Shagya Arabian stallions

Genetic bloodline	Average values of height (cm)	Average values of thorax perimeter (cm)	Average values of cannon girth (cm)
Dahoman	159.25	178.75	19.12
Hadban	161.33	184.33	19.25
Koheilan	160.14	183.21	19.13
Mersuch	162.75	179.75	19.00
Shagya	157.75	176.50	18.12
Gazal	162.75	184.75	19.25
El-Sbaa	159.00	182.50	19.00
Siglavy-Bagdady	160.50	174.00	18.62

In Figure 4 is revealed the situation of average values of height (cm) of Shagya Arabian stallions, which oscillated between 157.75 cm (Shagya) and 162.75 cm (Mersuch and Gazal).

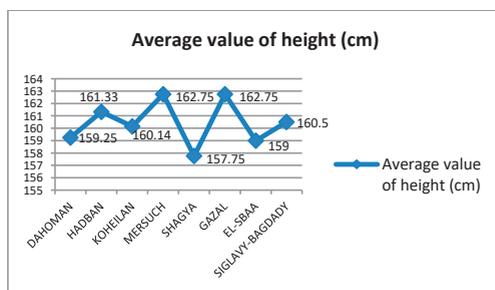


Figure 4. Average values of height of all genetic bloodlines (Shagya Arabian stallions)

Figure 5 shows the situation of average thorax perimeter of stallions, limited between 174.00 cm (Siglavy-Bagdady bloodline) and 184.75 cm (Gazal). The studfarm registers showed that the thorax perimeter of stallions should increase up to 178 cm and data obtained in our study reveal that all genetic bloodlines have

reached and even exceed this limit, except Shagya and Siglavy-Bagdady bloodlines (176.50 cm and, respectively, 174.00 cm).

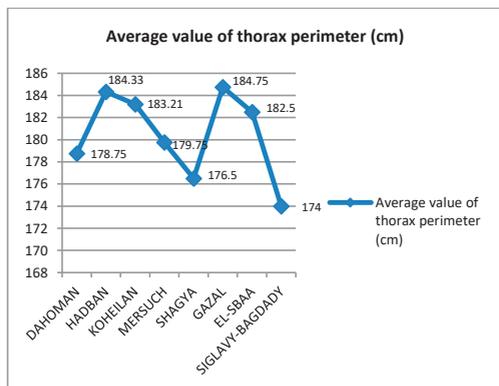


Figure 5. Average values of thorax perimeter of all genetic bloodlines (Shagya Arabian stallions)

The Figure 6 reflects the situation regarding the average values of cannon girth of stallions limited between 19.00 cm (Mersuch and El-Sbaa) and 19.25 cm (Hadban and Gazal); none of the bloodlines have revealed the objective of reaching the 20.5 cm shinbone perimeter mentioned in the studfarm registers.

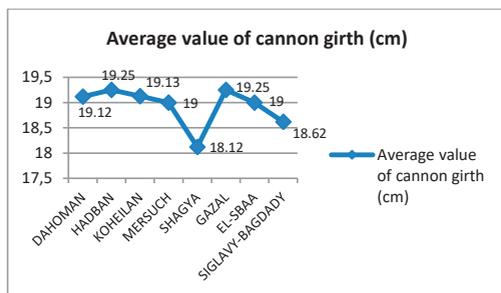


Figure 6. Average values of cannon girth of all genetic bloodlines (Shagya Arabian stallions)

Table 3 shows that the massiveness index had a minimum value of 108.41% (Siglavy-Bagdady) and a maximum value of 114.77% (El-Sbaa). A study regarding this index, revealed an average value of 111.15% for massiveness percent of Shagya Arabian stallions (Prisecaru, 2007). The bone index had limits between 11.48% (Shagya bloodline) and 12.00% (Dahoman) and the digital-thorax index had limits between 10.26% (Shagya) and 10.70% (Siglavy-Bagdady).

Table 3. The body indexes based on analyzed parameters of Shagya Arabian stallions

Genetic bloodline	Massiveness index (thorax perimeter/height, %)	Bone index (cannon girth/height, %)	Digital-thorax index (cannon girth/thorax perimeter, %)
Dahoman	112.24	12.00	10.69
Hadban	114.25	11.93	10.44
Koheilani	114.40	11.94	10.44
Mersuch	110.44	11.67	10.57
Shagya	111.88	11.48	10.26
Gazal	113.51	11.82	10.41
El-Sbaa	114.77	11.94	10.41
Siglavy-Bagdady	108.41	11.60	10.70

Table 4 reveals the situation of studied parameters for Shagya Arabian young male horses, where the average values of height were situated between 130.20 cm (El-Sbaa) and 143.88 cm (Siglavy-Bagdady). The average values of thorax perimeter were situated between 133.50 cm (Dahoman) and 156.77 cm (Siglavy-Bagdady) and the average values of cannon girth had limits between 15.80 cm (El-Sbaa) and 17.25 cm (Gazal). The differences between the genetic bloodlines regarding all parameters are given by the fact that this category is in course of development and it's normal to indicate wide borders.

Table 4. The average values of studied parameters of Shagya Arabian young male horses

Genetic bloodline	Average values of height (cm)	Average values of thorax perimeter (cm)	Average values of cannon girth (cm)
Dahoman	116.75	133.50	16.12
Hadban	138.33	149.50	16.75
Koheilani	135.36	143.27	16.45
Mersuch	138.75	148.75	16.50
Shagya	135.33	149.91	16.95
Gazal	140.00	154.00	17.25
El-Sbaa	130.20	136.6	15.80
Siglavy-Bagdady	143.88	156.77	17.77

Figure 7 shows the average values of height for this category of horses indicating the big difference between the genetic bloodlines (Dahoman 116.75 cm - Siglavy-Bagdady 143.88 cm).

Figure 8 indicates the situation of heart perimeter of young male horses; the minimum average value was registered at Dahoman (133.50 cm) and the maximum at Siglavy-Bagdady (156.77 cm).

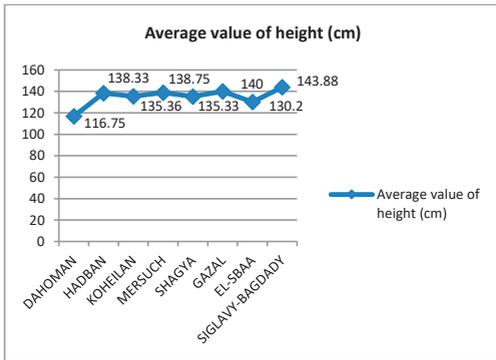


Figure 7. The average values of height for young male horse

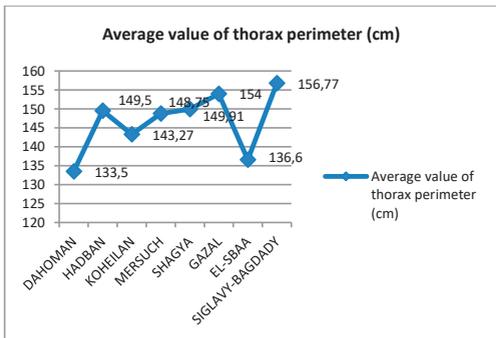


Figure 8. The average values of thorax-perimeter for young male horse

Figure 9 shows that there were big differences between the genetic bloodlines also regarding the cannon girth; the minimum average value was found at El-Sbaa (15.80 cm) and the maximum average value was discovered in Siglavly-Bagdady's case (17.77 cm).

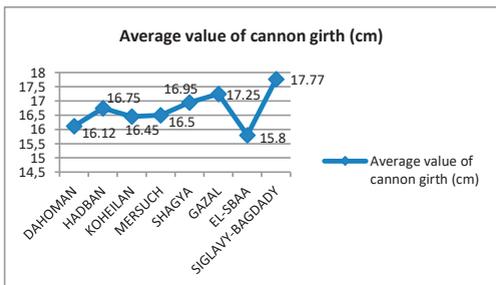


Figure 9. The average values of cannon girth for young male horse

CONCLUSIONS

Regarding the results, we observed that the mares had an average height of 159.59 cm, an average heart perimeter of 177.20 cm and an average cannon girth of 18.54 cm, including the population in breed standard. The average values of massiveness index, bone index and digital-thorax index were close in all bloodline cases.

Regarding the Shagya Arabian stallions, the average height was 160.58 cm, the average heart perimeter was 180.61 cm and the average cannon girth was 18.95 cm; all the indexes were similar to literature specifications and include the Rădăuți population in breed standard.

Studying the young male horses we observed that the average value of height was 134.82 cm, the average thorax perimeter was 146.53 cm and the average cannon girth was 16.69 cm, facts that resemble to literatures' consignments. All data obtained indicate that the studied population is included in breeds' standard regarding the main body dimensions that reflect their morphological type and that Rădăuți studfarm offers optimum conditions for Shagya Arabian horse rearing.

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