

## STUDY ON THE EVOLUTION OF THE BODY HEIGHT SIZES IN MALE YOUNG HORSES OF THE SHAGYA BREED

M.G. Doliș, Luminița Doliș, M.G. Usturoi, P.T. Nagy, C. Nistor

University of Agricultural Sciences and Veterinary Medicine Iasi  
e-mail: mariusdolis@yahoo.com

### Abstract

*The scientific paper belongs to a larger project, which has as aim to study the growth and development of young horses. Thus, based on the body measurements done at different periods, we followed the evolution of main growth indices in Shagya young horses, under conditions of the Radauti Herd, Suceava County. This paper focused on the four sizes: withers height, back height, croup height and tail height. Our results have shown that on the entire studied period, height had a mean relative growth of 49.6%; the highest growth was recorded until the age of 6 months (18.4%). The relative growth of the back height was, on the average, of 45.9%, the greatest growth being found at the age of 6 months (17.6%). The croup height had a mean relative growth of 43%, the highest growth being of 17.6% at the age of 6 months. The relative growth of the tail height was, on the average, of 47.3%, the greatest growth being found at the age of 6 months (15.4%). Data found in this scientific paper may be compared to those in the literature, showing that the Radauti Herd has offered good breeding conditions for Shagya horses.*

**Key words:** growth, horses, indices, Shagya, young horses

### INTRODUCTION

Shagya, which for a long time was only a variety of the Arabian Breed, was acknowledged as a breed in 1978, when W.A.H.O. (World Arabian Horse Organization) considered all the horses that were bred according to the methodology from Babolna, Radauti and Topolcianky as being assimilated to the Shagya Arabian horses. In the origin certificate of the Shagya Arabian horse, at the fourth generation, no more than nine horses from 16 offspring can be Purebred Arabian horses [1].

Although having a high percent of Arabian blood, the Shagya horse differs from the Purebred Arabian horse by its great height, stronger framework skeleton and specific structure of a robust horse [8, 12, 13, 17]. Shagya is bred today in Hungary, Czech Republic, Romania, Austria, USA, Croatia, etc.

At the Radauti Herd, the strict specialization in this breed has relatively recently begun, after the transfer of the Gidran Breed from Radauti to Tulucești (1998). Having in view the little information found in literature about the specific features

of the Shagya Breed, which is often mistaken for the Purebred Arabian Breed, we carried out a study on the detailed knowledge of growth and development of young horses from this breed.

### MATERIALS AND METHODS

The biological material is represented by 10 males of young Shagya horses, from the Radauti Herd. We followed their growth until the age of 3 years.

In order to follow the evolution of the growth process, we have done body measurements (withers height, back height, croup height and tail height) at birth, at the age of 3 months, 6 months, 12 months, 24 months and 36 months. The obtained data after the body measurements were processed and statically interpreted, using the classical methods (arithmetic mean, standard deviation of mean, analysis of variance, etc.).

The increase in the analysed body sizes was evaluated according to the following growth indices: growth energy, absolute growth rate (AGR), relative growth rate (RGR), growth intensity (GI) and growth coefficient (GC).

**RESULTS AND DISCUSSION**

Data of body measurements were processed and centralized in Table 1. According to these data, we have made the

growth curve for each body size (Figure 1, 2) and calculated the growth indices (Tables 2, 3, 4, 5; Figures 3, 4, 5), according to the literature. [2, 3, 4, 9, 10, 11].

Table 1 - Data on growth energy

Body size	Withers height (cm)	Back height (cm)	Croup height (cm)	Tail height (cm)
Age				
Birth	97.3 ± 2.37	96.5 ± 2.64	99.8 ± 2.14	93.3 ± 2.21
3 months	111.0 ± 2.55	110.2 ± 2.66	113.0 ± 2.76	107.8 ± 3.00
6 months	128.8 ± 1.03	123.5 ± 0.97	128.4 ± 1.67	122.0 ± 1.23
12 months	136.6 ± 1.14	132.0 ± 1.13	135.0 ± 1.60	129.9 ± 1.14
24 months	147.0 ± 1.24	141.0 ± 1.37	144.6 ± 1.11	135.8 ± 1.50
36 months	149.0 ± 1.30	146.2 ± 1.30	147.5 ± 1.22	139.0 ± 1.75

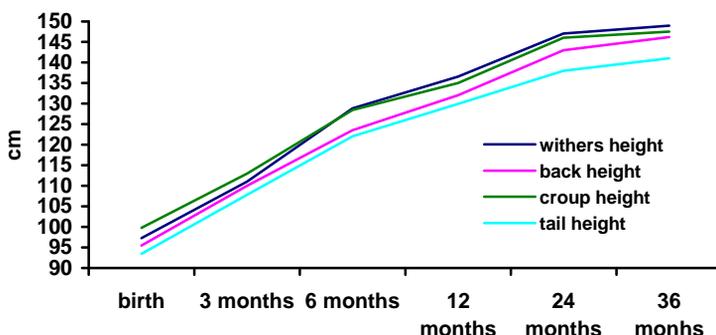


Fig. 1 - Growth curve of withers height, back height, croup height and tail height, from birth until the age of 3 years

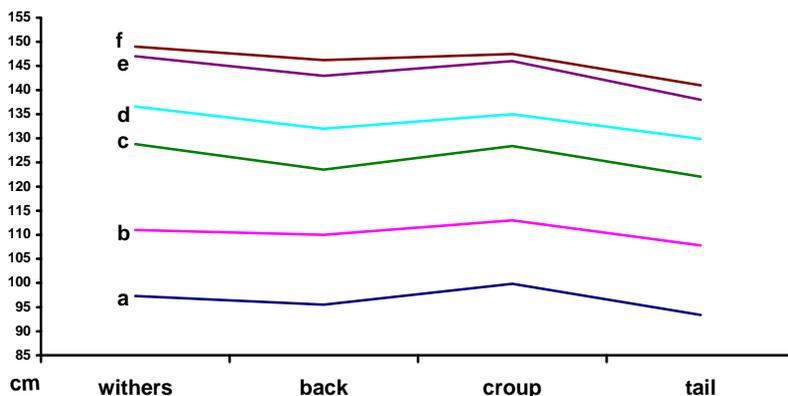


Fig. 2 - Evolution of upper line of the trunk, according to age. (a-birth, b-3 months, c-6 months, d-12 months, e-24 months, f-36 months)

The withers height at birth was comprised between 91 cm and 107 cm, with a mean of 100.2 cm. Their height has increased by 22.7 cm, until the age at weaning, when the growth intensity was the highest (29.6%) and

the growth coefficient represented 90.12% of the size value reached at the age of 3 years. After weaning and until the age of 3 years, the height has increased by 14.8 cm and the

growth intensity diminished by times, until the age of 3 years.

At birth, the back height had a mean value of 99.6 cm. Until the age of 3 years, the thoracic perimeter recorded an increase of 45.7 cm and 45.9%, respectively. The growth intensity was higher until the age of 6 months, when it was the highest (19.3%), and then it decreased significantly, recording values of only 0.6% at the age of 3 years.

At birth, the males' croup height measured 103.5 cm, on the average. Until the age of 3 years, this body size recorded an increase of 44.5 cm, respectively, 43%. The highest growth intensity was found during the weaning period. At the age of 6 months, this value was of 17.6%, and then, as in case of the other sizes, it decreased significantly, reaching 0.9% at the end of the studied period. At weaning, the croup height had 91.22% of the value recorded at the age of 3 years.

Table 2 - Growth indices for withers height

Age	Growth energy (cm)	Growth expressed by:			
		AGR (cm)	RGR (%)	GI (%)	GC (%)
Birth	97.3	-	-	-	65.30
3 months	111.0	13.7	14.1	13.2	74.50
6 months	128.8	17.8	16.0	14.9	86.44
12 months	136.6	7.8	6.1	5.9	91.68
24 months	147.0	10.4	7.6	7.3	98.66
36 months	149.0	2.0	1.4	1.4	100
Total growth		51.7	53.1	-	-

Table 3 - Growth indices for back height

Age	Growth energy (cm)	Growth expressed by:			
		AGR (cm)	RGR (%)	GI (%)	GC (%)
Birth	96.5	-	-	-	66.01
3 months	110.2	13.7	14.2	13.3	75.38
6 months	123.5	13.3	12.1	11.4	84.47
12 months	132.0	8.5	6.9	6.7	90.29
24 months	141.0	9.0	6.8	6.6	96.44
36 months	146.2	5.2	3.7	3.6	100
Total growth		49.7	51.5	-	-

Table 4 - Growth indices for croup height

Age	Growth energy (cm)	Growth expressed by:			
		AGR (cm)	RGR (%)	GI (%)	GC (%)
Birth	99.8	-	-	-	67.66
3 months	113.0	13.2	13.2	12.4	76.61
6 months	128.4	15.4	13.6	12.7	87.05
12 months	135.0	6.6	5.1	5.0	91.53
24 months	144.6	9.6	7.1	6.9	98.03
36 months	147.5	2.9	2.0	2.0	100
Total growth		47.7	47.8	-	-

At birth, the tail height measured 97.3 cm, on the average. Their tail height has increased by 31.2 cm, until the age at weaning, when the growth intensity was the highest (15.4%) and the growth coefficient represented 89.67% of the size value reached

at the age of 3 years. After weaning and until the age of 3 years, the tail height has increased by 14.8 cm and the growth intensity diminished until the age of 3 years (0.9%).

Table 5 - Growth indices for dock height

Age	Growth energy (cm)	Growth expressed by:			
		AGR (cm)	RGR (%)	GI (%)	GC (%)
Birth	93.3	-	-	-	67.12
3 months	107.8	14.5	15.5	14.4	77.55
6 months	122.0	14.2	13.2	12.4	87.77
12 months	129.9	7.9	6.5	6.3	93.45
24 months	135.8	5.9	4.5	4.4	97.70
36 months	139.0	3.2	2.4	2.3	100
Total growth		45.7	49.0	-	-

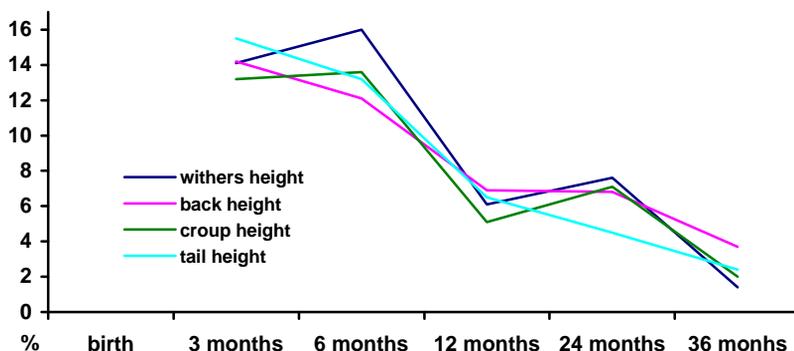


Fig. 3 – Relative growth rate of withers height, back height, croup height and tail height, from birth until the age of 3 years

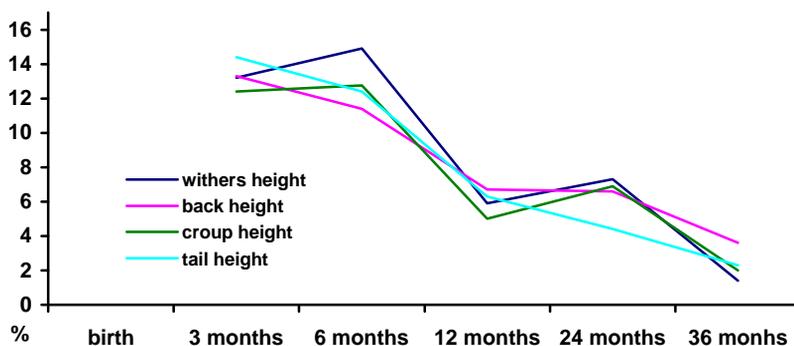


Fig. 4 - Growth intensity of withers height, back height, croup height and tail height, from birth until the age of 3 years

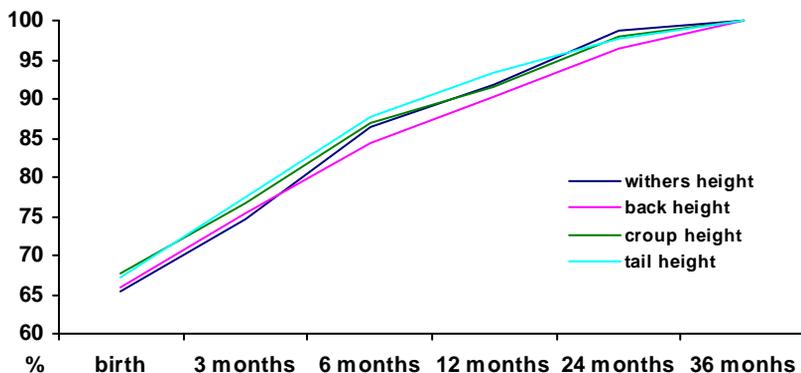


Fig. 5 - Growth coefficient of withers height, back height, croup height and tail height, from birth until the age of 3 years

The obtained results during the three years of investigations on the evolution of three studied body sizes were similar to those from literature concerning young horse husbandry [5, 6, 7, 11, 14, 15, 16]. These results were close to those recorded for Arabian and Gidran horses, showing that the Radauti Herd offered the best conditions for Shagya breeding.

## CONCLUSIONS

Each body area has a genetically determined growth rate and potential, found in tight connection with the other areas. When reaching the age of adult, each body area gives the horse the harmonious aspect and the body size typical of the breed.

Growth has known the highest intensity during the first year of horse life, especially until the age of 6 months (suckling period); then, the intensity has greatly diminished.

Generally, the recorded growth coefficients had values, which were adequate to the breed standards.

The results obtained in this work may be compared to those found in the literature.

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