

## MORPHOLOGICAL STUDY OF FURIOSO-NORTH STAR BROODMARES, FROM RUSEȚU STUD FARM

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### Abstract

The research was conducted on 66 broodmares from the 2001-2019 generations, which were part of the reproduction herd of Furioso North Star horse breed, from Rușețu Stud farm, reared in 2022. Horses were evaluated based on data obtained from standard measurements (height at the withers, heart girth, and cannon girth) during the annual conformation assessment.

The results regarding height showed an average value of  $161.29 \pm 0.23$  cm for the mares; the heart girth had an average value of  $183.73 \pm 0.29$  cm, while the cannon girth registered  $20.83 \pm 0.1$  cm. Based on these results, it was observed that the studied group is homogeneous regarding all three analyzed characteristics. The morphological aspects fall within the breed standard, justifying the promotion and maintenance of these horses in the reproduction population of the stud farm.

**Key words:** horses, morphology, dimensions, broodmares, stud farm

### INTRODUCTION

The Furioso-North Star is a Hungarian origin horse breed and it was created at the Mezöhegyes Stud Farm, in the early 19<sup>th</sup> century, by merging two half-blood of English Thoroughbred horse families founded by the stallions Furioso and North-Star. The breed possesses intermediate qualities for both draft and riding purposes.

Furioso-North Star horses are known for their elegant and imposing appearance. They have a harmonious conformation and a rectangular body shape. They exhibit relatively large, over mature development (with a height at the withers of 164-166 cm and a body weight of 550-600 kg) and a robust constitution with broad, solid foundations and joints.

In 1919, an important herd of Furioso-North Star horses (44 broodmares and 7 Furioso-North Star stallions, along with 2 English Thoroughbred stallions) was introduced in Romania at the Bonțida Stud

Farm, in Cluj County, originating from the Mezöhegyes Stud Farm.

From 2000 to 2004, the Furioso-North Star breed was raised at the Jegălia Stud Farm, and from 2004 to 2010, it was relocated to the Slatina Stud Farm; then briefly it was moved to Beclean Stud Farm for a year. Since 2012, the Furioso North Star breed has been bred at the Rușețu Stud Farm, in Buzău County.

Throughout the years, specialists involved in breeding it have continuously sought to improve the quality of the horses raised, especially those within the breeding herd. Through this study, we attempt to contribute to the understanding of certain morphological aspects that influence the performance of horses from this breed. Given the limited and outdated data on how the Furioso-North Star has evolved in our country, we believe that research on the current broodmare population of the breed is important.

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## MATERIAL AND METHOD

The researched material consisted of 66 broodmares, which formed the breeding nucleus for the Furioso-North Star breed at the Rușețu Stud Farm from 2012 to 2022. The information used in this study was taken from the data recorded in the stud farm's genealogical registry, specifically broodmares from the 2001-2019 generations.

The characteristics that were the subject of the study included height at the withers, heart girth, and cannon girth. Measurements were taken using standard tools, as the wither stick and the measuring tape [2, 4].

The data obtained from these dimensions were statistically processed using Microsoft Excel [1].

## RESULTS

The data obtained from the measurements have been statistically processed and summarized in Table 1. According to the results, it is observed that the height at the withers ranged from 155 to 171 cm, registering an average of  $161.29 \pm 0.23$  cm. Regarding this aspect, the studied population was homogeneous, fact proved by the value of the coefficient of variation (2.19%). These values fall within the specified limits for the Furioso-North Star breed found in the literature [8].

Comparing the current height at the withers data ( $161.29 \pm 0.23$  cm) with those from the '70s ( $157.81 \pm 0.38$  cm), when Furioso-North Star was bred at the Bonțida Stud Farm, it was noticed that the average value for this parameter has increased by 3.4 cm.

The heart girth recorded absolute values ranging from 171 to 197 cm. It can be stated that the population is also homogeneous in this aspect, with a coefficient of variation of 3.11%. The average values for this characteristic were  $183.73 \pm 0.29$  cm. These values respect the breed standard [8] and are close to those mentioned in the literature [3, 4, 5, 6, 7].

Comparing the data from the '70s ( $188.80 \pm 0.70$  cm), registered at the Bonțida Stud Farm, it can be stated that an average reduction of 5.7 cm of the hearth girth was noticed.

The cannon girth had values within the breed standard, ranging from 19.5 to 22 cm, with an average of  $20.83 \pm 0.1$  cm. Regarding this characteristic, the coefficient of variation was 3.08%, proving that the studied population is homogeneous. Compared to the data from the Bonțida Stud Farm in the '70s ( $19.87 \pm 0.09$  cm), there is an average increase of 0.96 cm.

Table 1 The morphological characteristics of Furioso-North Star broodmares

Specification	Height at the withers (cm)	Hearth girth (cm)	Cannon girth (cm)
n	66	66	66
$\bar{X}$	161.29	183.73	20.83
$s^2$	12.49	32.69	0.41
s	3.53	5.72	0.64
$\pm s\bar{X}$	0.23	0.29	0.10
V%	2.19	3.11	3.08
MIN	155.00	171.00	19.50
MAX	171.00	197.00	22.00

$n$ =the number of broodmares;  $\bar{X}$  = the mean of analyzed character;  $s^2$ =variance;  $s$ =standard deviation;  $\pm s\bar{X}$  = standard error of mean;  $V\%$ =coefficient of variation;  $MIN$ =minimum value;  $MAX$ =maximum value.

The body measurements were also used to calculate certain body indices, as the digital-thoracic index, bone index, and massiveness index (Table 2).

The digital-thoracic index (the percentage ratio between the cannon girth

and thoracic circumference) had values ranging from 10.64% to 12.64%, with an average of  $11.34 \pm 0.08\%$ . Compared to the value recorded in the '70s (10.52%), the current population shows a slight increase, on average by 0.82 percentage points.

The bone index (the percentage ratio between the hearth girth and the height at the withers) had similar values, ranging from 12.26% to 14.19%, with an average of  $12.91 \pm 0.08\%$ . Compared to the '70s value (12.59%), there was a minimal increase of only 0.32 percentage points.

Regarding the massiveness index (the percentage ratio between the hearth girth and the height at the withers), it had an average value of  $113.93 \pm 0.22\%$ , with limits between 106.79-121.66%. The calculated value for the current population is 5.71 percentage points lower than that of the '70s (119.64%).

Table 2 The values of body indices calculated for Furioso-North Star broodmares

Specification	The digital-thoracic index (%)	Bone index (%)	Massiveness index (%)
n	66	66	66
$\bar{X}$	11.34	12.91	113.93
$s^2$	0.18	0.15	9.85
s	0.43	0.39	3.14
$\pm s\bar{X}$	0.08	0.08	0.22
V%	3.79	3.01	2.75
MIN	10.64	12.26	106.79
MAX	12.64	14.19	121.66

$n$ =the number of broodmares;  $\bar{X}$  = the mean of analyzed character;  $s^2$ =variance;  $s$ =standard deviation;  $\pm s\bar{X}$  = standard error of mean; V%=coefficient of variation; MIN=minimum value; MAX=maximum value

## CONCLUSIONS

The study conducted on the broodmare population of the Furioso-North Star breed at the Rușețu Stud Farm, led to the following conclusions:

- The studied population was homogeneous in terms of all analyzed characteristics, with coefficients of variation having values lower than 3.11%.
- The data obtained in this study fall within the specified limits for the Furioso-North Star breed.
- The analyzed broodmares exhibited appropriate development, allowing them to be promoted to the breeding nucleus.
- Based on the differences in the values obtained for the measurements (height at the withers, hearth girth, and cannon girth), as well as the body indices (digital-thoracic index, bone index, and massiveness index) between the current broodmare population and the one of the '70s, a trend of increasing the height at the withers (moving towards hypermetric development) and the development of a fine and fine-robust constitution is observed over time.

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