Research on the Morphological Characteristics Variability of Three Horse Breeds

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Abstract
The aim of this study was the characterization of some morphological parameters of some horse population improved with stallion of Arab, Hucul and English thoroughbred breeds. The biological material was represented by the stallions belonging to the three breeds and the population improved with them. Measurements have been made in order to determine the height at withers, oblique length of the trunk, cannon girth and weight. The height at withers presented smaller dimensions at the Arab and English thoroughbred breeds and at the Hucul breed the stallions had a height at withers of 140 cm and the improved population 143.80 cm. Oblique length of the trunk presented values slightly lower at the improved horses in comparison with the stallions used at mount. The English thoroughbred presented a value of 21.50 cm of the cannon girth at the improved population in comparison with the value of 19.5 cm obtained at the mount stallions. The weight has been lower at the improved populations than the one of the stallions. Most of the morphological characteristics of the improved population are close to the ones if the stallions used at mount.

Keywords: cannon girth, height at withers, oblique length of the trunk, stallion, weight

1. Introduction
Analysis of metric traits of the horse body is an ongoing research trend in the fields of horse breeding and performance, as well as in investigations of their origin [2]. Conformation has been thought of as an indicator of performance and orthopedic health of horses and there has been a constant supply of publications in this area over the last few centuries [1]. These parameters are usually measured from the external appearance of an animal [3].

2. Materials and methods
The researches have been done on 15 Arab stallions, 12 Hucul stallions, 14 English thoroughbred stallions and horse population improved with them. The biological material was represented by public mounting stallions from Dumbrava depot. On the biological material studies on the morphological characteristics have been done, being studied the height at withers, oblique length of the trunk, cannon girth and body weight.
The improved population was constituted from 20 Arabian horses, 25 Hucul horses and 15 English thoroughbred horses. The height at withers was determined with a ribbon from the higher point of the withers to the ground. The oblique length of the trunk was determined using a ribbon.

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Cannon girth was determined using a ribbon, from the level where the middle third of the flute unites with its upper third, where the whistle has the smallest perimeter. Weight was obtained by weighing. Data collected from the conducted research were processed using tabular MsExcel computing applications. Usual statistical estimators were calculated.

3. Results and discussion

After analyzing the data on studied horses height at withers we have observed that at the Arab and English thoroughbred breeds it has recorded smaller values at the improved population, 138.96 cm respectively 151.49 cm, in comparison with the stallions used for mount, 152 cm respectively 152.1 cm (table 1 and 2). At Hucul breed we have obtained a higher height at withers at the improved horses (143.80 cm) in comparison with the stallions one (140 cm).

Oblique length of the trunk at Arab breed presented a smaller value at the improved population (141.25 cm) in comparison with the stallions used for mount (149.8 cm), the same thing being observed at the English thoroughbred (156.15 cm respectively 159.9 cm). At the Hucul breed the improved horses presented a oblique length of the trunk of 145.90 cm and mount stallions 144.1 cm (table 1 and 2). The cannon girth presented a smaller dimension at the improved horses in comparison with the mount stallions in the case of Arab and Hucul breed. English thoroughbred presented a cannon girth of 19.5 cm at the mount stallions and 21.50 cm at the improved horses (table 1 and 2).

<table>
<thead>
<tr>
<th>Specification</th>
<th>Measure unit</th>
<th>Stallion bred</th>
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<tbody>
<tr>
<td>Number of animals</td>
<td>-</td>
<td>Arab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hucul</td>
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<tr>
<td></td>
<td></td>
<td>English thoroughbred</td>
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<tr>
<td>Height at withers (cm)</td>
<td>cm</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
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<tr>
<td>Oblique length of the trunk (cm)</td>
<td>cm</td>
<td>149.8</td>
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<tr>
<td></td>
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<td>144.1</td>
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<tr>
<td></td>
<td></td>
<td>159.9</td>
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<tr>
<td>Cannon girth (cm)</td>
<td>cm</td>
<td>19.5</td>
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<td></td>
<td></td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19.5</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>kg</td>
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<tr>
<td></td>
<td></td>
<td>462.1</td>
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<tr>
<td></td>
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<td>497.1</td>
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<table>
<thead>
<tr>
<th>Specification</th>
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<th>Horse bred</th>
</tr>
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<tbody>
<tr>
<td>Number of animals</td>
<td>-</td>
<td>Arab</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hucul</td>
</tr>
<tr>
<td></td>
<td></td>
<td>English thoroughbred</td>
</tr>
<tr>
<td>Height at withers (cm)</td>
<td>X ± s_x</td>
<td>138.96±0.33</td>
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<tr>
<td></td>
<td>s</td>
<td>3.84</td>
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<tr>
<td></td>
<td>V%</td>
<td>2.76</td>
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<tr>
<td></td>
<td>Min=Max</td>
<td>132±145</td>
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<tr>
<td></td>
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<td>143.80±0.18</td>
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<tr>
<td></td>
<td>s</td>
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<tr>
<td></td>
<td>V%</td>
<td>1.49</td>
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<tr>
<td></td>
<td>Min=Max</td>
<td>152±140</td>
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<tr>
<td></td>
<td></td>
<td>151.49±1.05</td>
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<tr>
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<td>X ± s_x</td>
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</tr>
<tr>
<td></td>
<td>s</td>
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<tr>
<td></td>
<td>V%</td>
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<tr>
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<tr>
<td></td>
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<td></td>
<td>V%</td>
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<tr>
<td>Body weight (kg)</td>
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<tr>
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<td>s</td>
<td>28.15</td>
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<tr>
<td></td>
<td>V%</td>
<td>7.38</td>
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<tr>
<td></td>
<td>Min=Max</td>
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<td>s</td>
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<td>V%</td>
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<td>Min=Max</td>
<td>360±520</td>
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</table>
Data on the corporal weight showed smaller values at all the three breeds at the improved horses in comparison with mount stallions. Weight of Arab horses varied between the limits of 360 kg and 435 kg at improved horses, at Hucul breed the limits have been 320 kg and 470 kg (table 2). Mount stallions of English thoroughbred had a weight of 497.1 kg while the improved horses varied between the minimum of 360 kg and the maximum of 520 kg (table 1 and 2).

4. Conclusions

In order to obtain morphologic parameters characteristics to breed it is necessary to use public mount stallions. Morphological characteristics of the improved populations have been in most of the cases closed to the ones of the stallions used at mount.

Some parameters recorded higher values at the improved population in comparison with the stallions, due to the growth and management techniques.

References