Morphological Indices in Mangalitsa Breed

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Abstract
Observations were made in several Mangalitsa farm from Hungary and Romania on Red, Blonde and Swallow-bellied varieties. Body measurements were performed on a total of 175 individuals of Mangalitsa and Mangalitsa x Duroc hybrids. There are differences in physical development among Mangalitsa varieties: blond variety has the best body development followed by red and swallow-bellied varieties. The average body weight for Mangalitsa pigs was 109.03 ± 1.4 kg and the thoracic perimeter 115.18 ± 0.95 cm. Results obtained indicate that body development of Mangalitsa pigs from Hungary area, are close to the breed standard. In average height at withers was 65.87 ± 2.09 cm, while height at back was 72.59 ± 1.2 cm. Low coefficient of variation for both measurements (CV% = 1.83 for withers height and 1.52% for back height) indicate that pigs populations in which measurements were made are very homogeneous.

Keywords: indices, height, Mangalitsa, perimeter, weight

1. Introduction
Mangalitsa, the typical fat type breed, was developed in the 19th century in the Carpathian basin. The breed population throughout Central Europe remained a small effect, because they kept the features and qualities of color varieties [1]. The exchange of genetic material between Hungary and other European countries, including Switzerland, from all existing varieties, until around 2000, almost extinct breed recovered, and re-restore the herd [2].

In recent decades, attention has returned Mangalitsa pig breeders in Hungary, Austria, Germany and other European countries. Its purpose is to assess as high Mangalitsa in different households and farms in Romania and Hungary [3].

Being a tough race, does not need antibiotics, animal protein, or stimulants to increase yields from slaughter. Meat and fat from pigs are tasty Mangalitsa than those from other modern breeds [4].

Oil has exceptional quality that gives savor meat. Amount of fat in meat or fat is considered as giving palatability and "sweet" meat. Compared to meat from other races, Mangalitsa meat contains a smaller amount of cholesterol and more unsaturated fatty acids [4].

Aim of research was to collect information about the morphological indices in three varieties of Mangalitsa breed, to can compare them, namely: Blonde Mangalitsa, Red Mangalitsa and Swallow-bellied Mangalitsa.

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2. Materials and methods

Researches and observations were made in pig farms from Hungary and Romania: the Fülöp farm (Hajdu Bihar County) for two sows blonde variety; University of Agricultural Sciences Department of Animal Nutrition and Control Debrecen, location: Kis Macs (Hajdu Bihar County); Blonde Mangalitsa 426 heads, Red Mangalitsa–55 heads, Swallow-bellied–33 heads; András Folytán farm, Nyírábrány Location (Hajdu Bihar County) blonde variety, a pregnant sow, a sow with five piglets and a fattening adult; Lăcătuș farm from Valea lui Mihai (Bihor county), blonde and red variety, 91 heads.

In body measurements the following parameters were made: height at withers, height at back, length of body, chest perimeter, whistle perimeter and body weight.

The head of Mangalitsa pigs is proportionate size is moderately sharp, neck and forehead is wide and the profile shows a moderate concavity exhibited sexual dimorphism well. Length head as the boars aged from 1.2 to 2.5 years, is 32-33 cm, the sows of 1.5 years 29 - 30 cm, 30-32 cm sows 2 years and 3 years of the 32-33 cm. Auricle is inserted slightly above, moderately thick and elastic to the touch. Ear length is 2/3 of length of the head, midline ear is 30-45 degrees to each other, and the normal position of the head does not cover the eyes [1].

Viewed from the side, back and the loins are straight or slightly arched, and broad back muscles and well dressed [7].

Thorax and all whole trunk are wide, deep and extends to below the elbow [6].

Croup is well developed, and seen from the back is wide and well dressed in the muscles. Croup sows is fairer and wider as opposed to boars that were narrower and flattened (boar rump). Moreover croup rarely are right, most times is a little blunt. Thigh is broad and well dressed in muscles. Mangalitsa abdomen is long, cylindrical, and in the sows is somewhat wider than boars [5].

Proximal end of the limbs are long, wide, full and well dressed with muscles. In general, previous member area is larger than the posterior, but for pigs with impeccable consistency of these dimensions is identical [7].

The results were worked out statistically by means of the SAS 8.2 (2001) software, using a single-factor analysis of variance.

3. Results and discussion

Morphological indices provides data on body development of individuals, and consequently on the regions from which the meat, lard or bacon get the best quality.

In Table 1 are rendered the morphological indices made on the basis of measurements in Mangalitsa breed.

From the table it can be seen that body size increased in Mangalitsa pigs from Debrecen area. These results shows that the feeding and maintenance of Mangalitsa pigs raised in the Hungary, enjoy the conditions required by this breed.

There are differences in physical development among different Mangalitsa varieties. The blond variety has the best body development followed in order by red variety and swallow bellied variety.

Table 1. Morphological indices made on the basis of measurements in Mangalitsa breed varieties

<table>
<thead>
<tr>
<th>Specification</th>
<th>Hungarian blonde Mangalitsa</th>
<th>Romanian blonde Mangalitsa</th>
<th>Hungarian red Mangalitsa</th>
<th>Romanian red Mangalitsa</th>
<th>Hungarian Swallow-bellied Mangalitsa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height at withers (cm)</td>
<td>66.82 ± 1.3</td>
<td>67.40 ± 3.40</td>
<td>65.34 ± 1.6</td>
<td>65.00 ± 2.30</td>
<td>64.8 ± 1.85</td>
</tr>
<tr>
<td>Back height (cm)</td>
<td>73.44 ± 0.90</td>
<td>74.65 ± 1.10</td>
<td>72.92 ± 0.94</td>
<td>72.10 ± 1.60</td>
<td>69.87 ± 1.53</td>
</tr>
<tr>
<td>Length of the body (cm)</td>
<td>108.17 ± 1.70</td>
<td>109.00 ± 2.60</td>
<td>107.67 ± 1.30</td>
<td>106.10 ± 2.10</td>
<td>105.91 ± 2.08</td>
</tr>
<tr>
<td>Chest perimeter (cm)</td>
<td>117.2 ± 0.30</td>
<td>116.08 ± 0.70</td>
<td>116.4 ± 0.42</td>
<td>115.0 ± 1.70</td>
<td>114.32 ± 1.64</td>
</tr>
<tr>
<td>Perimeter whistle (cm)</td>
<td>17.0 ± 2.30</td>
<td>17.0 ± 1.70</td>
<td>16.9 ± 1.90</td>
<td>16.30 ± 1.30</td>
<td>16.09 ± 1.21</td>
</tr>
<tr>
<td>Body weight (kg)</td>
<td>115.45 ± 1.3</td>
<td>112.36 ± 1.08</td>
<td>108.74 ± 1.98</td>
<td>106.64 ± 1.85</td>
<td>101.97 ± 1.06</td>
</tr>
</tbody>
</table>
Romanian blonde Mangalitsa is a little higher at withers than Hungarian one, while in Red Mangalitsa the height is reverse, in favor of the Hungarian pigs. The smallest height at withers was registered in Hungarian swallow-bellied Mangalitsa with a value of 64.8 ±1.85 cm.

Regarding the back height, registered values are very close to each others: the highest was the Hungarian Mangalitsa and the smallest the Swallow-bellied variety from the same country. Romanian blonde Mangalitsa had the longest body with 109.00 ± 2.60 cm, while the shortest were the pigs from the swallow-bellied variety, of 105.91±2.08 cm.

Data from the literature indicate that boars have a well developed body and can reach a length of 90 cm, while the sows had a body length of 78-82 cm. at 1.5 years of age. In Mangalitsa populations can be found both boars and sows with a body length more than 100 cm. For the same parameter Nagy (2011) mentions in Red Mangalitsa a longer body of 136.3 ±1.36 cm but for a body weight also higher of 105.91±2.08 cm.

In Hungarian blonde Mangalitsa, the chest perimeter was the highest (117.2±0.30 cm) while the same indice was the smallest in swallow-bellied variety (114.32±1.64 cm).

In literature is mentioned in boars of 1.5 years of age, a chest perimeter of 120 -130 cm. At 2-2.5 year’s age and a body weight of 120-130 kg, boars had a chest perimeter of 125-135 cm. For sows of 1.5 years of age, and body weight of 85-95 kg, literature specified a chest perimeter of 105-108 cm.

Blonde Mangalitsa from Hungary and from Romania had the perimeter whistle of much closed value, 17.0±2.30 cm and 17.0±1.70 cm respectively.

Pigs from other varieties had a whistle perimeter from 16.09±1.21 cm in Swallow-bellied variety to 16.9±1.90 cm in Hungarian Red Mangalitsa.

Nagy (2011) mentioned for Red Mangalitsa sows a close value for the whistle perimeter (16.4±0.20 cm) but with a high variability in population of 4.75%.

In literature data for Mangalitsa breed description, well developed boars of 1.5-2.5 years, whistle was 16-17 cm, and in sows of 1.5-2 years of age, 14-15 cm (in adult sows from 15 to 15.5 cm).

Old boars and in good reproductive body size have a weight of 8-10% 20-25% more than gilts.

In the second table are shown the statistical calculation performed for height at withers and height at the back.

In Mangalitsa pigs, in strict accordance with the characteristic of breed are appreciated individuals showing a robust and rustic constitution provided to present a pronounced sexual dimorphism. Swine with such robust constitution have a low water tissue, the body is symmetrical, and often curly hair and limbs of intermediate sizes. Bone is durable and strong, with robust joints. The appearance of boars should always be more robust than sows of the same age.

Table 2. The results of statistical calculation for the height at withers and height at the back of pigs from Mangalitsa

<table>
<thead>
<tr>
<th>Specification</th>
<th>Height at withers (cm)</th>
<th>Height at the back (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>x</td>
<td>65.87±2.09</td>
<td>72.59±1.2</td>
</tr>
<tr>
<td>Ss2</td>
<td>9.05</td>
<td>6.62</td>
</tr>
<tr>
<td>Sss</td>
<td>3.16</td>
<td>2.49</td>
</tr>
<tr>
<td>S</td>
<td>3.63</td>
<td>3.18</td>
</tr>
<tr>
<td>Sss(%)</td>
<td>5.91</td>
<td>4.53</td>
</tr>
<tr>
<td>Cv(%)</td>
<td>1.83</td>
<td>1.52</td>
</tr>
</tbody>
</table>

1x=mean; 2Ss=sum of squares; 3Ss2=sample variance; 4S=sample standard deviation; 5Cv=coefficient of variation; 6Sx= standard error.

Average height at the withers for all analyzed Mangalitsa pigs was 65.87 cm, while the height at back has a mean of 72.59 cm.

The coefficient of variability of 1.83% for height at withers show an average variability for the Mangalitsa pigs in which measures were made. The same situation can be mentioned for the height at back which had a value of 1.52%.
4. Conclusions

Morphological characteristics are described in detail in the literature allowing identification of the individual race clean and elimination half-breeds.

From these comparative observations it may be concluded that the three varieties of Mangalitsa breed had body measurements close to the data known from the literature and from the former researches.

Blonde Mangalitsa has the largest body size while the lowest values of measurements are in swallow–bellied variety.

Increasing interest in products derived mainly from the Mangalitsa determined in recent years increasing flocks but still are relatively small.

References

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