

Morphological and Reproductive Characteristics of the Mangalitsa Swine Population Kept as Genetic Stock at SCDA Turda

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Abstract. The objective of this research is to characterize the morphological traits and sow reproductive performance in a red Mangalitsa swine population kept as genetic stock at SCDA Turda. Body length, height at withers and rump height are larger than the ones reported by in 1999 for the same population, but they are within breed standards. Prolificacy is above breed standard but high piglet mortality until the age of 21 days proves the sows are not good mothers. Lactating ability is high and together with piglet ability to use the ingested feed leads to a doubling of animal weight at weaning (56 days) when compared to the breed standard.

Key words: Mangalitsa, body measurements, reproduction, genetic stock

INTRODUCTION

Economic pressure has lead to a continuous reduction in the number of swine breeds used for meat production. This has had a negative influence on genetic diversity and the possibility to improve existing traits and to develop new characteristics in response to consumer needs. Most important among these would be the improvement of pork quality and traits related to reproduction.

The loss of interest toward meat production from certain breeds has been previously noted. To counteract it the Academy of Agricultural Sciences and Forestry Gheorghe Ionescu Siseşti has encouraged the establishment and consolidation of several swine core populations. Such a population belonging to the Mangalitsa breed, the red variety was founded in 1976 at SCDA Turda (Farkas *et al.*, 1979).

After being established, the population underwent a breeding program and intense research. The studied parameters were related to the dynamics of reproductive indexes, meat production (Farkas *et al.*, 1979; Pop *et al.*, 1993a; Pop *et al.*, 1993b), meat (Stănescu *et al.*, 1987a) and fat quality (Stănescu *et al.*, 1987b; Szabo, 2006; Zăhan *et al.*, 2009), heritability, genetic parameters for the most important carcass traits (Pop *et al.*, 1993b) and the cryopreservation of spermatozoa (Varo-Ghiuru *et al.*, 2011a; Varo-Ghiuru *et al.*, 2011b) and oocytes (Zăhan *et al.*, 2011). Recently, molecular markers have been used to establish genetic variance with regard to meat quality, prolificacy, growth, disease resistance, coat colour (Ciobanu *et al.*, 2001). Microsatellite markers have been employed to assess homozygosity in a population of red Mangalitsa (Zăhan *et al.*, 2011).

MATERIALS AND METHODS

Research was conducted at SCDA Turda on a population of red Mangalitsa and the assessed characteristics were body measurements, reproductive. This population had not been studied in the last 14 years. During this time selection had been abandoned in favour of avoiding consanguinity.

Body measurements were taken on the anatomical regions of 5 males and 10 females that met with breed standards. We believe weight to have reached the value at which the breed's full productive potential could be expressed.

Reproductive performances are related to those traits that have a major influence on the quantity of meat produced by each sow. They were computed for each of the 5 births and at 3 landmark moments in the time frame before weaning: birth, at 21 days and at 56 days. Weaning took place at 8 weeks.

Differences between treatments were analysed using the analysis of variance.

RESULTS AND DISCUSSIONS

Body measurements for both males and females are characteristic to the breed and animal weight (Tab. 1). Body length is similar for both sexes, being 115.21 cm in males and 109.76 cm in females. Together with the data reported by Nagy *et al.* in 1999 our results indicate that when considering weight, body length decreases gradually over time. On the contrary height at withers and rump height are significantly greater which showing that the animals now have a higher but shorter body. Body circumference values indicate that the most important production of this breed is fat. Cannon bone circumference measured at 17.42 cm in males and 15.51 cm in females is characteristic for a breed with a fine bone structure which is characteristic to the breed.

Tab. 1

Average values and variability of the most important body measurements
in the Mangalitsa breed (cm)

Specification	Males			Females		
	X± sx	s	v%	X± sx	s	v%
Body length	115.2178±2.95	6.60	5.73	109.76±6.42	20.30	18.50
Height at withers	105.07±5.53	12.37	11.78	101.47±3.25	10.28	10.14
Rump height	108.02±4.11	9.94	9.21	103.32±2.39	7.56	7.32
Body circumference	117.58±3.07	6.87	5.85	103.25±3.22	0.39	10.07
Cannon bone circumference	17.42±1.35	3.03	17.42	15.51±1.54	2.39	15.41
Live weight (kg)	141.03±5.21	11.66	8.33	126.16±3.49	11.05	8.76

Variance within the female portion of the population is greater than in the male part. The same situation presents itself when discussing height at withers and cannon bone circumference for both sexes. In females body length has the highest variance (18.50). Although there is some heterogeneity for these traits, it is within breed standard.

Prolificacy in the sows as reported by previous authors for animals raised in Romania is a lot lower than our results. While breed standard is between 4 and 6 piglets, for this study the number of animals is above 8 for every birth. The percentage of live piglets varies between 92.90% for the third birth and 87.56% for the fourth. The same values have been reported by other authors who have characterized the Mangalitsa population at SCDA Turda.

Piglet average weight for births 2 and 3 is above 1.00 kg with a maximum of 1.20 kg. Piglet weight varied very little which ensures them a healthy and good start.

Tab. 2

Dynamic of reproductive performances in sows belonging to the Mangalitsa breed

Specification	Birth									
	1 st		2 nd		3 rd		4 th		5 th	
	x±sx	v%	x±sx	v%	x±sx	v%	x±sx	v%	x±sx	v%
No. piglets (heads)	8.03±1.50	7.75	8.70±1.63	8.39	8.03±1.82	7.755	9.25±1.97	8.92	8.64±2.08	8.14
No. live piglets (heads)	7.17±1.46	7.17	8.00±1.21	8.00	7.46±1.57	7.46	8.10±1.55	7.75	7.75±1.55	7.75
Average piglet weight at birth (kg)	1.15±0.05	11.85	1.20±0.04	12.03	1.20±0.06	12.03	1.16±0.05	11.67	1.17±0.06	11.71
No. piglets at 21 days (kg)	6.67±1.30	5.67	7.32±1.24	6.71	6.89±1.26	6.25	7.39±1.26	6.14	7.14±1.03	5.53
Average piglet weight at 21 days (kg)	5.76±1.02	5.75	5.67±0.89	5.64	5.98±0.83	5.96	5.59±0.84	5.57	5.90±1.02	5.89
Lactating ability of sows (kg)	38.41±4.89	4.17	41.05±4.95	4.32	41.20±5.31	4.32	41.31±4.05	4.51	42.12±4.05	4.51
No. weaned piglets (heads)	6.67±1.12	0.64	7.32±1.12	0.98	6.89±1.06	0.67	7.39±1.03	0.72	7.14±1.07	0.70
Average piglet weight at weaning (kg)	12.38±0.82	1.21	12.66±0.48	1.25	12.80±0.54	1.28	12.37±1.04	1.21	12.34±0.89	1.21

Twenty-one days after birth the number of piglet decreases significantly irrespective of sow age. Piglet average weight is between 5.59 and 5.98 kg, significantly higher than previously reported data (3.6 - 3.8 kg). A correlation of the two traits leads us to conclude that animal keeping is poor.

Given that before 21 days piglet growth is based mostly on milk and not supplementary feeding, sow lactating ability is computed based on piglet weight at this age. Minimal requirements for this trait (5 heads x 5 kg/head = 25 kg) are met, the highest value, 42.12 (7.14 heads x 5.90 kg/head = 42.12) being computed for the 5th birth. The large number of piglets and their weight at birth prove that females belonging to this breed continue to have optimal reproductive indexes despite their growing age.

From the age of 21 days until weaning piglet number remains the same and their average weight is above 12 kg, which is more than twice its value at 21 days. Thus, it becomes apparent that sows maintain their lactating ability and piglets can successfully use the ingested feed.

CONCLUSION

- When compared with data published in 1999 body length is smaller, leading us to conclude that the animals have become shorter.
- The same comparison also brings us to the conclusion that animal height has increased in both sexes.
- All body measurements are within breed standards, with certain variations.
- As other authors have already reported, sow prolificacy in this population is much higher than the breed standard.

- Although average piglet weight at birth is above 1 kg, piglet mortality between 0 and 21 days is uncommonly high.
- Prolificacy and sow lactating ability at the fifth birth prove that they have a high reproductive longevity.
- Piglet weight at weaning is due to their ability to successfully use the ingested milk and feed, while also ensuring a good start for the following growth phase.

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