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## Biometric data in wild boar (*Sus scrofa ferus*) populations from Transylvania over 3 years of age

Teofil Oroian, Rareș G. Oroian, Vasile Cighi, Simona Pașcalău, Ilie Covrig

University of Agricultural Science and Veterinary Medicine, Faculty of Animal Husbandry and Biotechnologies, 3-5 Calea Manastur, Cluj Napoca, 400372, Romania.

Corresponding author: T. Oroian, teoroian@yahoo.com.

**Abstract.** A total number of 90 individuals from all the experimental devices (10 forest districts) were analyzed from 10.11.2010 to 10.02.2011, representing wild boars of both sexes and different ages: 60 males and 30 females with the age of about 3 years and over. The following conformation measurements were performed: oblique body length, withers height, rump height, thorax perimeter, body weight, head length and forehead width. The body length of the 60 males had an average of  $170 \pm 2.49$  cm, 14 cm superior to the average of 30 females of similar age. Withers height is  $95 \pm 1.65$  cm in males, the average of the analyzed females reaching  $88 \pm 2.21$  cm. Rump height for both males and females is lower than withers height. Back height achieves an average of  $88 \pm 1.63$  cm in males of 3 years and older and  $79 \pm 2.21$  cm in females of the same age. The 60 adult males had an average thoracic perimeter of  $140 \pm 2.40$  cm, but the standard deviation is 18.6 cm, which indicates large differences between specimens, conditioned primarily by the maintenance state. The body weight recorded an average of  $142 \pm 3.64$  kg for males and  $115 \pm 5.31$  kg for females. The head length measures  $49 \pm 0.55$  cm in males and  $43 \pm 0.75$  cm in females. The head width is superior in males.

**Key Words:** wild boar, phenotypical traits, measurements, gender, age.

**Introduction.** The paper data resulted from an extensive research conducted in the experimental device of the project PN II 52105/2008.

In this paper we present the means and dispersion indices for the following phenotypical traits in Romanian wild boar: oblique body length, withers height, rump height, thorax perimeter, body weight, head length and forehead width. The data are presented for young animals, aged over 3 years, separately by age and gender.

Wild boar development is in direct link to habitat conditions (Almășan et al 1973, Cotea et al 2001, Pascal 2002). Data presented here shows good overall body development, indicating proper natural conditions for the species.

**Materials and Methods.** A total number of 90 individuals from all the experimental devices (10 forest districts) were analyzed from 10.11.2010 to 10.02.2011, representing wild boars of both sexes and different ages: 60 males and 30 females with the age of about 3 years and over. At the collection date of each piece we made conformation measurements and there were taken hair samples (with bulb) and blood for DNA analysis. The following conformation measurements were performed: oblique body length, withers height, rump height, thorax perimeter, body weight, head length and forehead width.

Age was estimated as shown in our previous studies (Oroian et al 2010).

Measurement data were processed statistically by estimating the average and dispersion indices represented by the variance, standard deviation, standard error of mean, coefficient of variation, using the consecrated formulae (Oroian et al 2009).

**Results and Discussion.** The body length of the 60 males indicates an average of  $170 \pm 2.49$  cm, 14 cm superior to the average of 30 females aged similarly. The values

featuring wild boars from Romania at this age exceed the ones of the wild boars analyzed by Moretti (1995) with 15-20 cm.

Withers height is  $95 \pm 1.65$  cm in males, significantly superior with 7 cm up against the average of the analyzed females, reaching  $88 \pm 2.21$  cm. Rump height for both males and females is lower than withers height, with 12 cm in males and 10 cm in females, which confirms the specific body size of the species *Sus scrofa ferus* in Romania, characterized by a trapezoidal shape, with the large base at the head. Back height achieves an average of  $88 \pm 1.63$  cm in males of 3 years and older and  $79 \pm 2.21$  cm in females of the same age. Thoracic perimeter is an indicator of both the body conformation and the morphotype, being closely correlated with chest depth and body weight at a certain stage of age. At this trait, the 60 adult males achieve an average of  $140 \pm 2.40$  cm, but the standard deviation is 18.6 cm, which indicates large differences between specimens, conditioned primarily by the maintenance state.

Table 1

Conformation dimensions in wild boars aged 3 years and over  
Average and mean dispersal indices

Trait	Sex	n	$\bar{X} \pm s_x$	s	V%
Body length (cm)	♂	60	$170 \pm 2.49$	19.3	11.36
	♀	30	$156 \pm 3.43$	18.8	12.05
Withers height (cm)	♂	60	$95 \pm 1.61$	12.5	13.16
	♀	30	$88 \pm 2.21$	12.1	13.75
Rump height (cm)	♂	60	$83 \pm 1.51$	11.7	14.10
	♀	30	$78 \pm 2.10$	11.5	14.74
Back height (cm)	♂	60	$88 \pm 1.63$	12.6	14.32
	♀	30	$79 \pm 2.21$	12.1	15.32
Thorax perimeter (cm)	♂	60	$140 \pm 2.40$	18.6	13.29
	♀	30	$125 \pm 3.08$	16.9	13.52
Body weight (kg)	♂	60	$142 \pm 3.64$	28.2	19.86
	♀	30	$115 \pm 5.31$	29.1	25.30
Head length (cm)	♂	60	$49 \pm 0.55$	4.3	8.78
	♀	30	$43 \pm 0.75$	4.1	9.53
Forehead width (cm)	♂	60	$15 \pm 0.30$	2.3	15.33
	♀	30	$13 \pm 0.38$	2.1	16.15

The 30 females were mainly analyzed in January, after the period of rut and in parsimony feeding conditions which is why the average of this trait ( $125 \pm 3.08$  cm) is 15 cm lower than the average of the males. Body weight is extremely important for domestic species of swine and it tends to grow in precocious races at younger ages. For the wild boar this trait is correlated with age, feeding conditions, soil yield data and supplementary feeding, as well as with the analyzing month. This is reflected in the standard deviation value of the trait which is 28.2 kg in males and 29.1 kg in females, the males' average at this age registered in our experiment being  $142 \pm 3.64$  kg and  $115 \pm 5.31$  kg in females.

Sexual dimorphism in wild boar gets obvious with age. Solitary and dominant boars can get over the age of 5 years and their weights can reach up to 300 kg. Head length, which is an indicator of adaptability to hostile environment measures  $49 \pm 0.55$  cm in males and  $43 \pm 0.75$  cm in females. This trait knows a strong homogeneity in both males and females reflected by the coefficient of variation (V%), which is 8.74 in males and 9.54% in females. The head width is superior in males, as expected, with 2 cm extra in comparison to the females, their average being  $15 \pm 0.30$  cm. Although there are evaluation differences from a forest to another, as well as different densities of feral pigs, the crops in the adjacent areas and the beechnuts and acorns fructifications of this year, generated average weights of 115 kg for sows and 142 kg for boars. Head length and forehead width indicate increased sexual dimorphism with age.

Within the three age stages analyzed, the variation coefficient values indicate a good uniformity and equality between the sexes and within the same sex, confirming the population robustness.

Other observations conducted upon 27 males and 10 females, within Sovata forest range from 15 August 2011 to February 4, 2012. The observations aimed to emphasize any differences of the genetic material analyzed depending on the area and conditions, but also on the years and climatic conditions, which vary from one area to another and from one year to another (Oroian et al 2012). The biometric measurements in wild boars analyzed on Sovata forest district are given below (Table 2).

Table 2

The average and dispersal indices in wild boar at over 3 years of age (according to Oroian et al 2012)

Trait	Sex	n	X±sx	s	V%
Body length (cm)	♂	27	183 ± 2.63	13.7	7.30
	♀	10	161 ± 4.11	13	8.07
Withers height (cm)	♂	27	97 ± 1.96	10.2	10.52
	♀	10	90 ± 3.58	10.6	11.78
Rump height (cm)	♂	27	86 ± 2.17	11.3	13.14
	♀	10	81 ± 2.23	11.6	14.32
Thorax perimeter (cm)	♂	27	137 ± 3.17	16.5	12.04
	♀	10	121 ± 5.51	17.4	14.38
Body weight (kg)	♂	27	170 ± 3.55	16.4	9.65
	♀	10	139 ± 5.09	16.1	11.58
Head length (cm)	♂	27	49 ± 0.83	4.3	8.78
	♀	10	45 ± 1.55	4.9	10.89
Forehead width (cm)	♂	27	20 ± 0.42	2.2	11.0
	♀	10	15 ± 0.66	2.1	14.0

For many years, in the range of Sovata forest district were observed the biological material quality and the fact that food is always supplemented. Here the priority of the observation was on males for trophy and past reproductive maturity sows (over 3 years). Body length in male specimens analyzed within the forest district has an average distance of 183 ± 2.63 cm, superior by 13 cm when compared to the average male boars analyzed in 10 experimental devices during 2011. Females analyzed here are superior with 5 cm up against the ones from 2011 (see Tables 1 and 2). Withers height in males analyzed experimentally in this device is superior with 2 cm when compared to the average of the 60 heads from 2011. Females analyzed in 2012 have an average higher by 2 cm when compared to the one of 30 females in 2010-2011 from the other experimental devices. Because they are given extra food throughout the year and capital animals were analyzed, the average body weight of the 27 males is 170 ± 3.55 kg, superior with 28 kg up against the weight of males analyzed in other experimental devices in 2010-2011. The female average is 139 ± 5.09 kg, 31 kg lower than males, but higher with 24 kg when compared to the average of female specimens analyzed in 2010-2011.

Wild boar populations from Transylvania are superior to most traits observed within the wild boar populations studied by Moretti (1995) and Gallo Orsi et al (1995).

**Conclusions.** Due to size and rump height the Transylvanian boar specimens are included into the trapezoidal specific format, with the large base at the head, indicating a perfect stamina, as a result of feeding mode and habitat type. Thorax perimeter cannot be used as an indicator of age or as a factor correlated with it, because it is strongly influenced by chest depth and body weight of the specimens at certain times that succeed in one year. Through the values achieved in both males and females, the body

length indicates the population stamina in the studied areas, also confirmed by the head length, as well as the forehead width at certain ages. In this species is imperative that food is supplemented in times when natural food, represented mainly by acorns and beechnuts is lacking and when temperatures go down a lot, causing deep soil freezing and covering it with thick layers of snow.

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### Authors:

Teofil Oroian, University of Agricultural Science and Veterinary Medicine, Faculty of Animal Husbandry and Biotechnologies, 3-5 Calea Manastur, Cluj Napoca, 400372, Romania, European Union, e-mail: teoroian@yahoo.com

Rareș G. Oroian, University of Agricultural Science and Veterinary Medicine, Faculty of Animal Husbandry and Biotechnologies, 3-5 Calea Manastur, Cluj Napoca, 400372, Romania, European Union, e-mail: oroianrg@yahoo.com

Vasile Cighi, University of Agricultural Science and Veterinary Medicine, Faculty of Animal Husbandry and Biotechnologies, 3-5 Calea Manastur, Cluj Napoca, 400372, Romania, European Union, e-mail: vasile\_cighi@yahoo.com

Simona Pașcalău, University of Agricultural Science and Veterinary Medicine, Faculty of Animal Husbandry and Biotechnologies, 3-5 Calea Manastur, Cluj Napoca, 400372, Romania, European Union, e-mail: spascalau@personal.ro

Ilie Covrig, University of Agricultural Science and Veterinary Medicine, Faculty of Animal Husbandry and Biotechnologies, 3-5 Calea Manastur, Cluj Napoca, 400372, Romania, European Union.

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