BIOMETRIC DATA AND GROWTH RATES OF A MOUNTAIN POPULATION OF WILD BOAR (Sus scrofa L.*), TICINO, SWITZERLAND*

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Abstract: Biometric data from 386 wild boars *(Sus scrofa)* killed during the hunting seasons 1988-1992 in the Malcantone and Gambarogno regions of Ticino canton (Southern Switzerland) are presented. From each animal many body measurements were collected. Animals were aged from the tooth eruption and tooth wear and divided into age classes. Weight and length of the body appear to be connected with age in both sexes, while weight alone is different between males and females from the 4th age class (19-27 months) on.

Keywords: Wild boar, *Sus scrofa,* Suidae, Biometry, Growth rate.

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1. Introduction

The population of wild boars in Ticino (Swiss Canton, south of the Alps) is very recent. The first animals were recorded at the beginning of the 80's in the Malcantone region, on the border to the Lombardic Alps region (Italy). In the subsequent years it quickly spread northwardly and the population increased significantly (Baettig, 1985; Moretti, 1991, Moretti, 1992). The presence of Wild boar in Ticino was caused by immigration of some animals coming from Italy, *i.e.* from a boar- and pig-farm in the Varesotto region, a few kilometers away from the Swiss border. At the beginning there was obvious evidence of a hybridisation (genetic contamination) between the wild and the domestic type (spotted fur, curly tails and ears bending forward). The presence of hybrid populations in Europe is also mentioned by several authors (Mauget *et al.*, 1984, Apollonio *et al.*, 1988; Gerard *et al.*, 1991; Gallo Orsi *et al.*, 1992). This is generally due to restoking (for hunting purposes) of animals from East-European countries or to interbreeding between domestic pigs and the local population. Such heterogeneity affects the species' phenotypical and eco-ethological features. On the other hand, environmental conditions (such as water, climate, availability of food, etc.) can modify the growth rate. The aim of this study is to present preliminary biometric data of a relatively recent mountain Wild boar population and to compare it with other European populations.

2. Study area

The Malcantone region (Southern Switzerland) covers an area of 7,000 ha with a southern orientation; altitudes range from 200 to 1,800 m u.s.l. (Fig. 1). The annual rainfall is 1,700 mm (mean of the last 30 years). The environment is as follows: wood 60%; urbanized area 15.5%, agricultural area 10.5%, alpine meadows 10%, uncultivated land 4%. The chestnut *(Castanea sativa)* predominates between 200 and 1,000 m, either pure or mixed with beech *(Fagus sylvatica)* or with oaks *(Quercus* sp.).

3. Methods

During the hunting season (September-January) between 1988 and 1992, 987 wild boars were killed. 39% of them (n = 386, 211 males and 175 females) were examined in order to collect some biometric data. All animals were shot in the study area between 200 m and 1,600 m above sea level. The hunting code did not provide any restriction about the killing of particular age classes and therefore all classes were present in the analysed samples. All animals were aged from tooth eruption and tooth wear according to Iff (1978). Age classes were adapted from the recent works of Boitani and Mattei (1992) and Genov *et al.* (1992) in accordance with Matschke (1965). All body measurements were taken according to Briedermann (1986) and in part to Gallo Orsi *et al.*, 1992 (Fig. 2).
Biometric differences between sexes and age

Table 1: Means and S.E. of the mean for each age class.

	Class 1 (4-8 months)		Class 2 (8-12 months)		Class 3 (13-18 months)		Class 4 (19-27 months)		Class 5 (> 27 months)	
	m (n=50)	f (n=39)	m (n=39)	f (n=29)	m (n=71)	f (n=54)	m (n=21)	f (n=29)	m (n=31)	f (n=23)
Weight (kg)	18.5 ± 0.9	19.5 ± 1.1	30.1 ± 1.5	35.6 ± 1.7	53.6 ± 1.5	47.0 ± 1.7	74.4 ± 3.7	52.8 ± 3.2	86.1 ± 3.3	62.6 ± 3.9
Body length (cm)	91.4 ± 1.9	93.1 ± 2.2	107.9 ± 1.5	112.5 ± 1.8	128.7 ± 1.1	125.9 ± 1.2	138.9 ± 1.7	130.9 ± 1.5	145.1 ± 1.4	137.0 ± 1.7
Height at withers (cm)	53.9 ± 1.3	54.9 ±1.5	64.7 ± 1.1	66.5 ± 1.2	76.1 ± 0.7	72.7 ± 0.8	85.2 ± 1.6	75.6 ± 1.4	85.6 ± 1.7	75.7 ± 1.9
Length of metatarsus (cm)	20.6 ± 0.4	20.4 ± 0.4	23.1 ± 0.3	23.2 ± 0.4	26.6 ± 0.3	24.3 ± 0.3	27.0 ± 0.3	25.5 ± 0.3	27.3 ± 0.4	25.6 ± 0.4
Ear length (cm)	9.6 ± 0.3	10.3 ± 0.3	11.6 ± 0.2	11.7 ± 0.2	13.1 ± 0.2	12.5 ± 0.2	13.6 ± 0.3	12.6 ± 0.3	14.2 ± 0.3	14.0 ± 0.3
Tail length (cm)	13.6 ± 0.4	13.6 ± 0.4	16.1 ± 0.4	16.4 ± 0.5	19.6 ± 0.3	18.6 ± 0.4	21.2 ± 0.6	20.3 ± 0.5	20.7 ± 0.5	20.2 ± 0.6

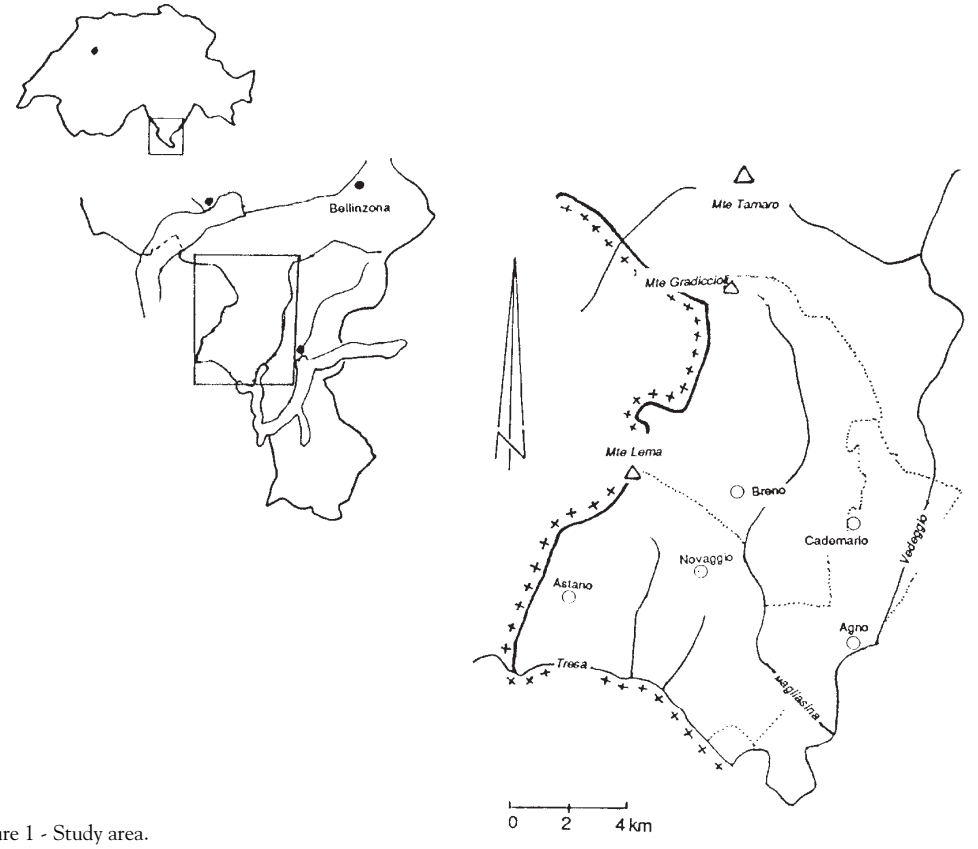

Figure 1 - Study area.

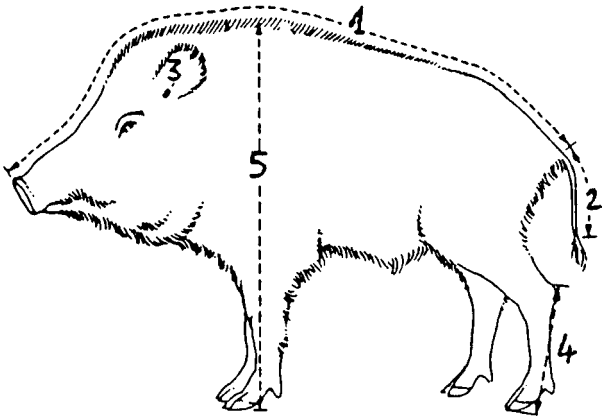

Figure 2 - Measurement methods of: (1) Body length; (2) Tail length; (3) Ear length; (4) Length of metatarsus; (5) Height at withers.

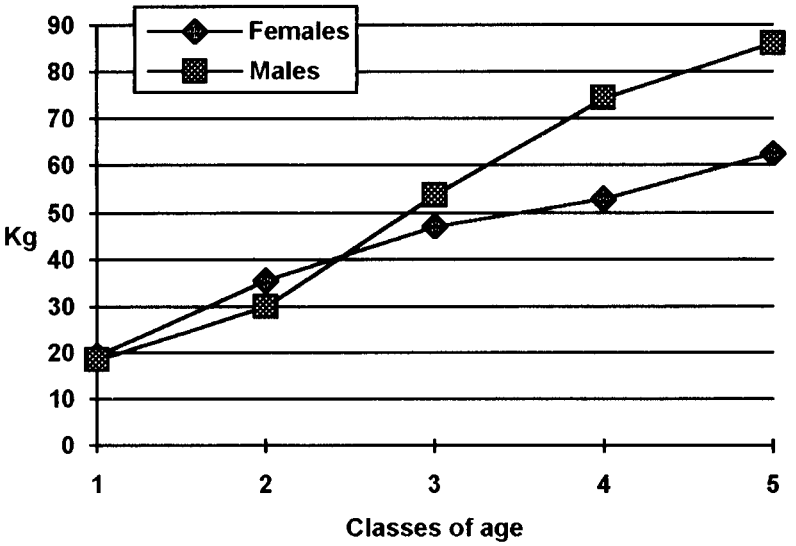

Figure 3 - Development of body weight in relation with age and sex of Wild boar (n = 386). Classes of age: (1) 4-8 months.; (2) 8-12 months.; (3) 13-18 months.; (4) 19-27 months.; (5) > 27 months.

classes were determined through discriminant analysis ($p<0.05$). The data follow a normal distribution.

4. Results

Table 1 shows the mean standard error for each age class. Up to the age of 12 months (classes 1 and 2) females appear larger than males. In all following age classes the males grow faster. Males differentiate significantly to females by weight, body length, height at withers and length of metatarsus ($p<0.05$).

From a deeper analysis of the weight development of both sexes, a difference in body growth between males and females is noticeable. Up to 12 months of age (class 2) the weight increase of males is slower than that of females. It reaches maximum values only between class 2 and class 3 with a body increase of 78%. In the following years it decreases progressively affecting important body variations, especially from the second year on, but after that it does not seem to become stable. On the other hand, the body weight of females increases by 83% between 4-

8 months (class 1) and 8-12 months (class 2), but it increases only by 76% from the second age class on. Even for the females weight does not become stable and seems to increase even more after the 27th month of age (Fig. 3).

5. Conclusions

The body growth progress in both sexes agrees with that of other authors (Mauget *et al., op. cit.*, Meriggi *et al.*, 1988; Baettig, 1988; Gallo Orsi *et al.*, *op. cit.*). Means are also in accordance with those recorded in Europe by Baettig (*op. cit.*), Gallo Orsi *et al.* (*op. cit.*), Klein (1984) and Pepin *et al.* (1986, in Gerard *et al.*, *op. cit.*). Other authors, *i.e.* Marsan *et al.* (1990), Koslo (1975, in Briedermann, *op. cit.*) and Briedermann (*op. cit).*, show biometric data that seem to be inferior by 10-20%, between 13 and 27 months. However, from the 19th month it becomes more difficult to compare the values because the variability of the mean value in each class is too important. Such variations are possibly due to the different environmental resources of the study areas, as shown by the results of Klein (*op. cit.*) and Briedermann (*op. cit.*), and also to the phenotypic appearance of the different genetic polymorphism of the populations (Gallo Orsi *et al.*, *op. cit.*). However, it is important to mention that the authors quoted in these studies used different methods to determine the age (based on tooth eruption) which led to different classifications. Differences of estimates of 2 months (at 14 months of age) and of 4 months (at 24 months of age) are noticeable between the classes named by Iff (*op. cit.*) and by Matschke (*op. cit.*) and most recently by Boitani and Mattei (*op. cit.*) and Genov *et al.* (*op. cit.*). This discrepancy can affect the interpretations of the recorded differences between the various populations.

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