

BODY GROWTH IN A CONFINED WILD BOAR POPULATION

Mattioli S. *, Pedone P. **

* Dipartimento di Biologia Evolutiva, Gruppo di Etologia e Ecologia Comportamentale, Università di Siena, Via P.A. Mattioli 4, 53100 Siena, Italy.

** D.R.E.Am. Italia, Via Roma 172, 52014 Ponte a Poppi (Arezzo), Italy.

Abstract: We have studied a high density population of Wild boar in a fenced area. As expected, overcrowding and food shortage have heavily influenced body growth, with differential effects on the two sexes. Mean live weight of adults was only 38.3 kg.

Keywords: Wild boar, *Sus scrofa*, Suidae, Body weight, Sexual dimorphism, High density.

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1. Introduction

It is a well known fact that high density greatly affects body growth. In sexually dimorphic species males and females tend to respond differently to stressful environmental conditions; in polygynous animals subjected to overpopulation male growth is more sensitive to the associated food shortage and social pressure (Clutton-Brock *et al.*, 1982; Fowler, 1987).

We have studied a Wild boar population exposed to a very high density, to verify the differential effects of density on members of both sexes. In addition a comparison has been drawn with wild boars at low density from neighbouring areas.

2. Study area, material and methods

The study area is located at the "Azienda Il Giardino" (43° 20' N, 10° 32' E; province of Pisa, Italy); it is a game production center owned by the Regional Administration of Tuscany and used to rear wild boars for restocking operations. The enclosure covers 290 ha. During late winter about 20-25% of animals are caught and removed; this number is not sufficient to maintain the population at acceptable levels. Supplementary feeding was virtually limited to special fodder for piglets and bait for traps. Between 1989 and 1991 1435 captures were carried out and 409 animals were weighed; 380 weight data are used in our analysis. By the Lincoln-Petersen method the confined population present at 31 December

1989 was estimated in 460 head, equal to 160 head per km² (reduced to 120/km² after removal and sale). In the same period data concerning body weight of 359 wild boars from the neighbouring areas were collected; from hunting statistics it was possible to assess a mean winter density of about 2-3 free-ranging animals per km².

3. Results and discussion

As can be seen in table 1 the body weights of fenced wild boars are extremely low in all age classes and in both sexes. In adults (> 24 months old, combined sexes) mean weight was just 38.3 kg (n = 95): confined adult males weighed on average only 54.1% of free-roaming adults (44.0 kg vs 81.4 kg), while adult females at high density weighed on average 62.3% of females at low density (36.3 kg vs 58.2 kg). Sexual size dimorphism, typical of the species (males being larger than females) was absent in piglets (about 4 months old), young (7-11 months old) and subadults (12-23 months old). In fact, in subadult wild boars from the enclosure females were on average 1 kg heavier, although this difference is not statistically significant. Dimorphism in size can be lacking in adults, as observed in 1989-90, when males were on average 1.8 kg heavier than females ($t = 0.429$; $p > 0.1$). The heaviest sampled animal in the fence was a sow weighing 70 kg. Five of 22 adult males (22.7%) weighed < 30 kg.

Table 1: Mean live weights (x, in kg) of two neighbouring populations of Wild boar: a comparison.

age class	sex	CONFINED			FREE-RANGING*		
		weight	sd	n	weight	sd	n
piglets	m	12.2	2.9	22	-	-	-
	f	11.2	2.7	24	-	-	-
	u•	10.5	2.4	8	-	-	-
young	m	16.2	3.8	69	27.7	8.6	81
	f	17.1	3.3	62	26.0	8.3	70
subadults	m	28.9	5.6	42	60.1	12.4	79
	f	29.9	5.5	56	52.7	11.9	32
	u•	31.7	4.9	2	-	-	-
adults	m	44.0	14.6	22	81.4	14.4	66
	f	36.3	9.6	70	58.2	14.2	31
	u•	42.4	5.6	3	-	-	-

* reconstructed live weights (by the formula $y = 1.4154 + 1.1735x$ following Mattioli & Pedone, this volume)

• undetermined

As expected, growth rates differed greatly in both sexes: by their first 23 months of age males reached just 65.6% of their final mass, while females in the same period attained 82.3% of their ultimate weight (against 73.9% and 90.4% in the free-ranging population).

In the fenced area both sexes exhibited an attenuated body growth, reaching remarkably low adult weights. Overpopulation influences environmental conditions reducing in quality and quantity available food; moreover it increases inter- and intra-sexual competition. Even at low density in polygynous species body growth patterns are different in males and females; females reach final weight earlier in life, allowing the allocation of more energy to reproduction and parental care for later; males, contributing little to offspring production and care, tend to devote more energy to mass accumulation. In high density conditions males grow even more slowly and reach a modest final weight. In young and subadults these sex-specific differences may be principally due to the greater energetic requirements and to the particular metabolism of males (lesser fat deposition and faster proteic catabolism). In adult males this may depend on costs associated with competition for mates and on a lesser ability to select high quality food (cf. Clutton-Brock *et al.*, *op. cit.*).

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