

# BODY SIZE AND GROWTH PATTERNS IN WILD BOARS OF TUSCANY, CENTRAL ITALY

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**Abstract:** We have examined 790 weights of Italian wild boars collected in Tuscany from 1988 to 1991. We describe patterns of body growth and try also to assess microgeographical and temporal variation.

**Keywords:** Wild boar, *Sus scrofa*, Suidae, Body weight.

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## 1. Introduction

The region of Tuscany harbours one of the most abundant Italian populations of Wild boar. Although accurate figures are lacking, annual harvests are possibly assessable at 20,000-30,000 head. In a previous paper (Pedone *et al.*, 1991), we used 613 weight data to outline general trends in body growth of wild boars from internal Tuscany. Here we present a preliminary analysis of an augmented sample from the same zone; in particular we describe body size and patterns of growth, seeking to evaluate differences related to age, sex, area and year.

## 2. Study area, material and methods

From 1988 to 1991 a total of 885 wild boars shot by hunters was examined; weight data were available for 790 animals (396 males and 394 females). The global sample originates from 4 different areas: Casentino (CA), Valtiberina (VT), both in the province of Arezzo, Valdelsa (VE), in the province of Siena, and Val di Cecina (VC), in the province of Pisa. CA and VT are mainly mountainous; the climate is cool temperate, woods cover 60-80% of the territory, and agriculture is not particularly developed. VE and VC are hilly areas; the climate is warm temperate, woods and maquis scrub account for 20-40% of the surface, and cultivations (vineyards, oliveyards, cereal growing) are frequent. Shot animals came from both traditional hunting districts and protected areas (State forests etc.).

Age was estimated by tooth eruption, replacement and wear patterns (Matschke, 1967; Briedermann, 1986; Boitani & Mattei, 1992); wild boars 4 or more years old were pooled in a single category. Three main age classes are generally considered: young (7-12 months old), subadults (13-24 months old), and adults (more than 24 months old).

## 3. Results and discussion

The overall mean dressed weight of males was 42.6 kg (SD = 20.0), whereas the overall mean figure for females was 37.6 kg (SD = 16.0). Sexual dimorphism in size was not statistically detectable in the young and subadult classes. Actually sex-specific differences in growth rate begin to appear at around 18-19 months of age. In the adult class males were on average 25.2% heavier than females (65.7 kg vs 52.5 kg, see table 1). Only 6.8% of adult males had a body mass > 90 kg. The maximum dressed weight reported was 102.3 kg, which probably approaches the normal limits for wild boars in Tuscany.

A polynomial growth curve was fitted for each sex (males:  $y = -1.749 + 3.628x - 6.491e^{-2x^2} + 4.319e^{-4x^3}$ ,  $R^2 = 0.752$ ; females:  $y = -6.495 + 4.73x - 0.1256x^2 + 1.102e^{-3x^3}$ ,  $R^2 = 0.631$ ; where:  $y$  = weight -  $x$  = age -  $e$  = Neperian number) (Fig.1).

Males attained 50% of their adult weight at about 12-14 months of age, and 75% by 20-22 months; actually weight gain continued over 36 months of age. Females reached 50% of

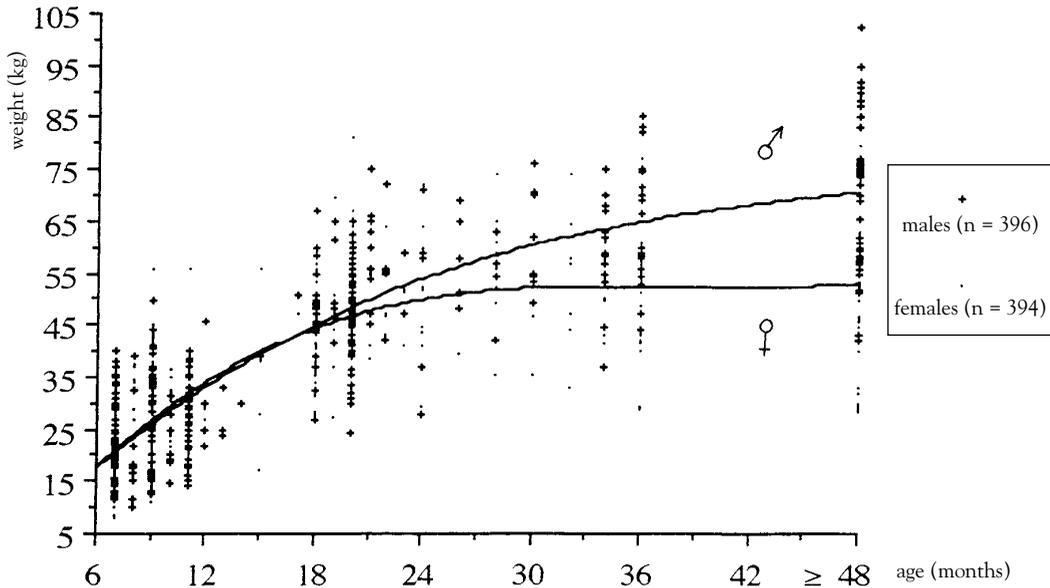


Figure 1: Growth curves for dressed weight of Tuscan wild boars.

their ultimate mass at about 9-10 months, 75% by 16-17 months, and 90% by 22-23 months; body weight of sows 48 months and older did not differ from that of sows 25-36 months old. ANOVA showed significant differences in mean weights of the four areas, both in males and females. But much variation due to environmental effects was not detectable; differences were partly masked by the compound origin of subsamples, with specimens coming from localities at various levels of density, protection and hunting pressure. Within areas body size showed evident varia-

tions among years. In VC animals shot during the winter 1989-90 after an "acorn year" were on average 33% heavier than those harvested in 1988-89 and 1990-91; the most sensitive to annual changes in seed crops were young wild boars, whose mean body weight changed from a maximum of 29.1 kg to a minimum of 20.5 kg. As previously reported (Pedone *et al.*, *op. cit.*), body weights and growth rates of Tuscan wild boars are substantially modest in each age class and in both sexes, but fall within the range of most European populations (Tab 1).

Table 1: Comparison of dressed weights (x, in kg) of Tuscan wild boars with those from other European Wild boar populations.

Location	Age class								Authority
	Young		Subadults		Adults				
	x	n	x	n	males	females	x	n	
F. Czechoslovakia	30.8	186	64.9	126	103.8	30	84.2	53	Hell & Paule 1983
E. Germany	30.5	298	50.8	276	88.0	26	58.1	39	Stubbe <i>et al.</i> 1980
Switzerland	24.6	161	53.0	174	87.2	45	66.3	18	Moretti 1993
E. Germany	25.1	1383	52.9	533	70.7	116	65.9	234	Briedermann 1986
Central Italy	25.1	363	47.6	219	65.7	103	52.5	105	this study
E. Poland	24.9	370	37.5	1094	64.6	1058	57.8	439	Milkowski & Wojcik 1984

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