

Reproductive parameters, birth date-effect and body condition of wild boars (*Sus scrofa*) inhabiting forest and forest-farmland environments in Poland

Merta, D.¹, Albrycht, M.¹, Frąckowiak, W.¹, Furtek, J.¹, Mamok, T.²

¹Department of Ecology, Wildlife Research, and Ecotourism, Institute of Biology, Pedagogical University of Krakow, Podbrzezie 3, 31-054 Kraków, Poland, dorota-zbl@o2.pl

²Rudziniec Forest District, Leśna 3, 44-160 Rudziniec, Poland

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Abstract

The following parameters were measured in 315 wild boars harvested in the 2008/2009 hunting season in south-western Poland: carcass mass and length, body condition, age, and – in sows – the reproductive parameters. The material was collected from a large (720 km²), non-fragmented forest called Bory Dolnoslaskie (BD), and from several dozen small forests (SF) with a total area of 703 km² of forested areas surrounded by agricultural land. In the BD among female piglets harvested there, no sexually mature individuals were found. In the SF environment, some of the female piglets reached sexual maturity, and the percentage of pregnant sows was higher compared to animals from the BD environment. The farrowing season in the SF environment spanned 10 months whereas in the BD environment only 6 months. The paper discusses the use of the above-mentioned parameters to devise the strategy for management of wild boar in Poland.

Keywords: age class, agriculture damage, high protein forage, pregnancy, wild boar

Introduction

Over the last 15 years, the population of wild boars soared from 83,900 individuals in 1997 to as many as 249,800 in 2010. Although harvesting wild boars increased in the corresponding period by 198% this activity has failed to stabilize the population of this species. The aim of this study was to investigate the conditions, birth distribution and reproduction parameters for boars within areas that are different in terms of the potentially available food supply.

Methods

Data were collected from October 2008 to January 2009 in south-western Poland during collect hunt. The study areas were a large non-fragmented coniferous forest called Bory Dolnoslaskie (BD) and several dozen of small deciduous forests (SF) surrounded by farmlands. The forest in BD and SF covers 720 and 7.3 km², respectively. For each wild boar (n=315) data on body weight and length were collected and the lower jaw and one kidney with fat were dissected. The date and location of culling were recorded for each carcass. In addition, from each female the reproductive organs were dissected. The age of animals was assessed from tooth eruption and wear of the lower jaw teeth. Two indices of condition were calculated: carcass weight/length ratio (CWL) and kidney fat index (KFI).

Results

The mean carcass weight in boars of particular age classes was always higher in animals living in the forest-farmland environment (piglets: 13.2 kg vs. 24.3; subadults: 37.5 kg vs. 46.9 kg; adults: 64.4 kg vs. 69.4 kg), with the differences among piglets and subadults being statistically significant. The mean kidney fat index (KFI) was also statistically significantly different in the boars harvested in these two environments (BD=1.96, SF=2.23, $F(1.309)=16.63$, $p<0.01$). A similar trend was demonstrated in terms of the CWL condition index. In the forest-farmland environment, the majority of births took place within three months (February, March, April), when 61.4% of piglets were born. The farrowing season in the BD forest lasted 6 months (from January till July) and the peak of piglets births fell in the months of March, April and May, where 78.0% of all piglets were born (Figure 1).

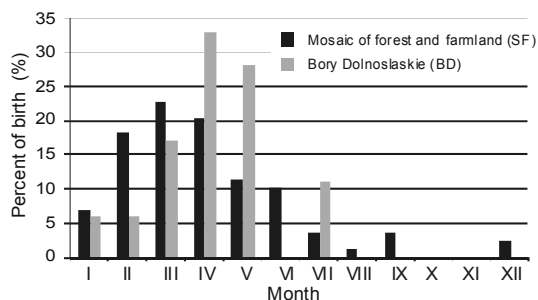


Fig. 1 Fertility period in two environments: mosaic of forest and farmland (SF) and Bory Dolnoslaskie

In female piglets from BD, the presence of neither embryos nor *corpora lutea* was found, whereas in the forest-farmland mosaic 26.8% of animals in this age class had *corpora lutea*, and 12.5% females were pregnant (Table 1).

Tab. 1 Body weight and reproductive parameters of wild boar females (n=184) inhabiting two different environments in south-western Poland

Habitat and age class	Sample size (n)	Carcass weight (kg)	Females with <i>corpora lutea</i> n (%)	Pregnant females n (%)	Average litter size (n)
Bory Dolnoslaskie (BD)					
Piglets	22	15.7	0 (0.0%)	0 (0.0%)	0.0
Subadults	20	39.3	6 (30.0%)	4 (20.0%)	3.0
Adults	26	61.6	6 (23.1%)	2 (7.7%)	5.5
Mosaic of forest and farmland (SF)					
Piglets	56	23.3	15 (26.8%)	7 (12.5%)	4.0
Subadults	39	45.8	21 (53.8%)	16 (41.0%)	5.1
Adults	21	67.0	19 (90.5%)	10 (47.6%)	6.8

Among the embryos (n=48) collected from the forest-farmland mosaic, 69.4% were male individuals, and the average litter size there was 4.8 embryos. The average body mass of the 3 lightest females which had *Corpora lutea*, was 32.0 kg in the Bory Dolnoslaskie, whereas it was 15.5 kg in the forest-farmland mosaic.

Discussion

In coniferous forest stands (BD), the potential food for boars (soil invertebrate fauna, rodents, oak and beech nuts) is much poorer than that in deciduous forest stands (SF). Moreover, in the forest-farmland mosaic environment there is a high-protein additive to the wild boars' diet, primarily obtained from cultivated plants such as maize and rape. The reproductive pattern found in this study for the forest-farmland mosaic (SF) coincides with the results of similar field studies conducted in Western Europe (Gaillard and Jullien, 1993, Santos et al., 2006, Gethöffer et al., 2007). The early maturation of female piglets is a factor adversely affecting the quality of the population. The piglets born in summer and autumn are unable to attain the right body condition in order to survive the winter, and some of them die, whilst those that survive the winter often fail to reach the weight corresponding to their age. Therefore, in the areas where female mature piglets are found, the proportion of piglets in the hunting bag should be very high (Bieber and Ruf, 2005).

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