

PRODUCTION PROPERTIES OF THE BLACK SLAVONIAN PIG BREED

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ABSTRACT

The paper discusses the situation in the endangered autochthonous Black Slavonian Breed, developed in Croatia. A program for preserving this breed was initiated in 1996, which allowed the size of effective population (N_e) to grow from 18.46 to 32.32. Production properties of the Black Slavonian Breed are presented, i.e. litter size and fattening properties. According to the obtained results, production properties of this breed are rather limited. The number of liveborn and reared pigs per litter is 6.89 and 5.76 respectively. Under extensive conditions of fattening, daily gain in body mass starting at 27.20 and reaching 106.05 kg was 478 g, meat percentage being 42.95%.

Key words: pigs / autochthonous breeds / Black Slavonian breed / production properties / litter size / daily gain / meat percentage

PROIZVODNE LASTNOSTI ČRNE SLAVONSKE PASME PRAŠIČEV

IZVLEČEK

Avtorji v delu razpravljajo o stanju ogrožene avtohtone pasme črnega slavonskega prašiča, ki je nastala v R.Hrvatski. S programom za ohranitev te pasme so pričeli v letu 1996, kar je omogočilo povečanje efektivne populacije (N_e) z 18,46 na 32,32. V delu so prikazane proizvodne lastnosti črne slavonske pasme, to je velikost gnezd in pitovne lastnosti. Dobljeni rezultati kažejo, da so proizvodne lastnosti omenjene pasme skromne. Število živorojenih pujskov v gnezdu znaša 6,89, odstavljenih je 5,76. V razmerah ekstenzivnega pitanja od začetne mase 27,20 kg do končne 106,05 kg je znašal dnevni prirast povprečno 478 g, odstotek mesa v klavnih polovicah pa je bil 42,95.

Ključne besede: prašiči / avtohtone pasme / črna slavonska pasma / proizvodne lastnosti / velikost gnezda / dnevni prirast / odstotek mesa

INTRODUCTION

Black Slavonian Breed is an autochthonous breed developed in Croatia. By importing thoroughbred pig breeds, the number of this breed was drastically reduced. As Croatia signed the Convention on Preservation of Biological Diversity in 1996, it pledged itself to preserving the endangered breeds. For that purpose "A Survey of the State of Biological and Environmental Diversity of Croatia with a Strategy and Protection Plan Action" was elaborated (1999), as well as "A program for Breeding up of the Black Slavonian Breed" (2000). In 1996, the size of effective population was less than 20, which is why the mere survival of the breed was

threatened. Production properties of the Black Slavonian Breed have not been sufficiently studied, therefore, the aim of this paper is to contribute to a better knowledge of this breed.

MATERIAL AND METHODS

Actual number of sows and boars of the Black Slavonian Breed was determined by the end of 1996. Black Slavonian Breed is identified by phenotypic characters described by Hrasnica *et al.* (1958) Registers of birth on family farms have provided information to calculate the size of effective population, number of live born and weaned piglets as well as the influence of certain factors on litter size. The size of effective population was calculated using a formula of Falconer and Mackay (1996):

$$Ne = 4 * \frac{Nm * Nf}{Nm + Nf};$$

Nm is the number of males
Nf is the number of females

For statistical data processing of sows fertility, the following model was used eliminating systematic effects:

$$Y_{ijklm} = \mu + a_i + b_j + c_k + d_l + e_m + \Sigma_{ijklm}$$

Y_{ijklm} = fertility characteristics

μ = observation mean value

a_i = farm influence (1-3)

b_j = influence of the boar, i.e. the father of the litter (1-5)

c_k = order of farrowing (1-6)

d_l = influence of the year of farrowing (1-3)

e_m = influence of the farrowing season (1-3); spring and fall (1), summer(2), winter (3)

Σ_{ijklm} = other unidentified influences.

Properties of the Black Slavonian Breed in fattening were determined on a family farm in outdoor keeping. Twenty piglets with about the same body mass were included. Fattening period lasted for 165 days. Beside a pasture and its nutrients from the soil, the pigs were fed limited quantity of maize. Carcass meatiness was found by the dissection method after Weniger (1963). The results of the investigations were processed by the GML method (SAS, 1989).

RESULTS AND DISCUSSION

Table 1 presents the number of sows and boars at the end of 1996 and 1999, from which the size of effective population (Ne) was calculated:

Table 1. Number of sows and boars

Year	Number of sows	Number of boars
1996.	60	5
1999.	79	9

According to the FAO criteria (World Watch List, 1995) this pig breed has reached a critical stage of its survival. Calculated sizes of effective population were 18.46 and 32.32 respectively. This size of population does not permit maintenance of genetic diversity at the satisfactory level, because the degree of inbreeding per generation is growing by more than 1%. Calculated by a formula

$$\Delta F = \frac{1}{2N}$$

by Falconer and Mackay (1996), relatedness is growing by 2.71 and 1.55% per generation.

Mean values of liveborn and weaned piglets for the 161 analyzed litters were 6.89 and 5,76 respectively. Variation of mean values of number of liveborn and fattened pigs by analyzed influences are presented in Table 2.

Table 2. Litter size per analyzed influences

Influence		Number of liveborn piglets			Number of reared pigs			
		Litter no.	\bar{x}	s	F-value	\bar{x}	s	F-value
Farm	1	77	5.38	1.11	17.62**	5.06	1.16	6.45**
	2	76	6.83	1.84		5.97	1.90	
	3	8	6.12	1.46		5.75	1.58	
Boar	1	8	6.13	1.46	9.00**	5.75	1.58	5.15**
	2	35	6.87	1.83		5.91	1.76	
	3	63	5.48	1.38		5.24	1.47	
	4	38	5.79	1.45		5.00	1.58	
	5	17	7.53	1.46		6.82	1.29	
Order of farrowing	1	29	5.55	1.72	3.28**	5.03	1.89	1.46
	2	37	6.57	1.95		5.76	1.67	
	3	35	5.89	1.53		5.23	1.57	
	4	33	6.46	1.52		5.97	1.68	
	5	14	5.93	1.38		5.71	1.06	
	6	13	5.84	1.28		5.46	0.96	
Year of farrowing	1	7	6.14	1.46	1.19	6.02	1.29	3.76**
	2	50	5.80	1.40		5.02	1.80	
	3	104	6.24	1.78		5.74	1.51	
Farrowing season	1	59	6.17	1.80	0.40	5.61	1.79	0.28
	2	45	5.91	1.26		5.38	1.63	
	3	57	6.18	1.80		5.56	1.46	

** Significant difference at $P < 0.01$

The obtained results show that fertility of the Black Slavonian Breed of pigs has been reduced in comparison with the data reported by Hrasnica *et al.* (1958) and Jančić (1971). They reported that the number of liveborn and weaned piglets of this breed ranged from 7 to 8 and from 6 to 7 per litter respectively.

Table 3. Fattening and slaughter characteristics

Items	\bar{x}	s	Minimum	Maximum
Initial body mass, kg	27.20	2.03	25.20	30.10
Final body mass, kg	106.05	9.68	91.00	116.00
Daily gain, g	478	43.68	380	538
Carcass mass, kg	85.18	8.52	72.80	89.50
Muscle tissue, kg	36.71	3.25	30.82	40.30
Muscle tissue, %	42.95	3.56	37.33	48.91
Fat tissue, kg	29.10	5.09	24.40	35.70
Fat tissue, %	33.77	3.98	26.48	39.66

Among the analyzed factors in this study, the number of liveborn piglets was significantly influenced by the farm, the boar and order of farrowing, while the number of weaned pigs was significantly affected by the farm, the boar and the year of farrowing. Nonsignificant differences in litter size by farrowing seasons can be attributed to exceptional resistance of this breed.

Low gain during fattening as well as meat percentage in cooled carcasses can be attributed to meager feeding during long fattening periods.

The obtained meat percentages were higher than the ones reported by Petričević *et al.* (1988) and Gordana Kralik *et al.* (1988). They found out that meat percentages in cooled carcasses weighing 79.80 and 79.89 kg were 32.59 and 28.51% respectively. The authors did not give any information about the conditions of fattening. Higher meat percentage in this investigation could be attributed to scanty feeding and outdoor keeping. Gains of this breed did not appreciably differ from the gains of thoroughbred pig breeds under the same conditions. Marija Uremović *et al.* (2000) reported that daily gains of crosses between Large White and Landrace was 485 g.

CONCLUSIONS

During the last few years, reduction in the number of the autochthonous Black Slavonian Breed has stopped. The size of effective population has grown from 18.46 to 32.32. Fertility of this breed is low. Carcass meat percentage under long and extensive fattening is considerably higher in comparison with the results reported earlier for this breed. Data on production properties of this breed are scarce, especially the data on crossing this breed with thoroughbred breeds, which would probably be a way for producing resistant genotypes for cheaper outdoor keeping.

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