COMPARISON OF REPRODUCTIVE PERFORMANCE IN TWO OLD BREED PIGS BREEDS IN ROMANIA AND BULGARIA

G.V. Hoha[1*], Nadezhda Palova[2], A.Al. Casapu[1], R.P. Arsinte[1], Elena Costăchescu[1], B. Păsărin[1]

[1]Faculty of Animal Sciences, University of Agricultural Sciences and Veterinary Medicine of Iaşi, Romania
[2]Scientific Center of Agriculture – Sredets, Bulgaria

Abstract

Reproduction characteristics of the two old breed pigs, Mangalita from Romania and East Balkan from Bulgaria were monitored over a three-year period (2015-2018). The reproduction characteristics: age and the weight at the first insemination; age at farrowing; duration of gestation; duration of lactation and prolificity from 20 sows of 2 litters were analyzed and compared. The results recorded for each parameters was: 530.42 vs 450.25 days for age at the first insemination; 112.52 vs. 90.45 kg for weight at the first insemination; 645.1 vs 563.7 days for age at farrowing; 114.7 vs 113.4 days for duration of pregnancy; 52.6 vs 59.2 days for duration of lactation; 5.62 vs 4.95 piglets at first birth; 6.28 vs 6.15 piglets at second birth. The obtained results confirm the data from the literature mentioning that the two breeds are tardiv. We also notice that the Mangalita breed is more tardiv than the East Balkan breed but has a higher weight at first insemination and a higher prolificity.

Key words: breeds, pigs, performance, reproduction

INTRODUCTION

Pork consumption is at the forefront of consumer preferences in both Romania and Bulgaria. The increase of swine is very popular in the two countries being made for hundreds of years. The pigs are grown both in semi-intensive systems, in small farms and intensively in large-scale farms. The environmental conditions in the two countries allow the increase of the pigs in very good conditions. Pigs are considered to be a very prolific species with a high rate of ovulation, which if properly discovered leads to a large number of piglets in sows [13]. Suine are recognized as a very prolific and productive species compared to other farm animals [1].

Breeding performance of the sow stock on a farm is the main factor influencing the efficiency of swine meat production [7, 16]. Breeding performance is generally appreciated by the number of live pigs per sow or per year, or by the number of weaned piglets obtained per sow or per year. Low levels of reproductive performance will not only result in a decrease in sow profit, but will also limit the possibilities for genetic improvement of the sow stock [16]. There are several indicators of reproduction performance measurement: fertility index, piglet size, fertility index, pig weight 21 days [10]

The Mangalita pig breed is certified on the territory of Romania between 1830 and 1835, having the origin of the domestication of the wild pig "Sus Vittatus". Since 1895, Mangalita breed has developed a descending curve, and after the Second World War it has reached the growth basin at 2.1 million, compared to 6.5 million. In the 1970s, the race has become extinct, with small flocks found in the households and sometimes in the intensive system of growth. The prolificity of this breed is 5 to 6 pigs [2]. Mangalita is typical fat pig breed, it has in carcass sides 65-70% of fat and approx. 30-35% meat [8, 9].

*Corresponding author: gabihoha@yahoo.com
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East Balkan swine, similarly to wild forms, are characterized with a late onset of maturity and their growth end by the age of 2.5 years. They reach a live body weight of 100 kg for about a year [12]. The reproduction could begin after reaching live body weight of 70 kg in sows or 80 kg in boars. They usually give birth twice yearly – in the spring and the autumn. The duration of gestation is 112–114 days. The fertility varies from 5 to 8 live born piglets and 3.5-6 piglets alive at weaning [17], but studies in this field are very few and sporadic. Danchev, 1984 [6] pointed out that East Balkan swine was phylogenetically able to utilize natural trophic resources with a low nutritive value.

According to FAO classifications, the Mangalita and East Balkan swine breeds are part of the conservation populations (vulnerable populations) or in preservation. Although they are rustic, specialized for fat, they have a very good quality of the carcasses, being especially suitable for the production of raw-dried products of exceptional quality. According to FAO reports nowadays the remained races in Europe constitute almost 30% of the whole pig genetic resources with nearly 165 pig breeds. Several fatty pig breeds are still in danger of extinction, but fortunately lots of them have been rediscovered in the 1980–90ies by breeders, the meat industry, consumers and researchers again [4,5].

Considering the above we consider that it is absolutely necessary to know the reproductive parameters of the two breeds, Mangalita and East Balkan pigs. Knowing the values of these breeding parameters will increase the productivity of these breeds by improving the growth conditions.

MATERIALS AND METHODS

The research was conducted on a two pig farm in Romania and Bulgaria. A total of 20 sows were analised, out of which 10 red from Mangalita sows and 10 sows Eastern Balkan pigs (Fig. 1).

Female Mangalita, red variety

East Balkan pigs

The sows were managed in traditional system. In traditional system, managed small hold farms, sows were under grazing freely daily. All sows had free access to drinking water and to consume compound feed. There was no restriction of sucking by piglets. Weaning is occurred around 50-60 days, for all sows. Reproductive traits were analyzed from all 20 sows during two calving. The value for the first mating age, weight at first calving, age at farrowing, duration of gestation, duration of lactation, duration of the reproductive cycle, piglets at first birth, piglets weaned after first birth, piglets at second birth, piglets weaned after second birth were expressed as mean ± standard deviation.

The software used for statistical analysis was SPSS. We calculated the average, standard deviation, coefficient of variation and statistical significance of differences between samples, using Anova Single Factor.

RESULTS AND DISCUSSION

Age optimal breeding sow occur when body weight reach a certain influencing the number of piglets produced, and their weight at birth. Gilts using a lower body weight will have negative impact on fetal development and therefore, piglets born will have lower

body weights and lower viability. In general, gilts should be introduced first time to artificial insemination after touching body weight of 100 - 120 kg, and at the age of about eight months, the improved breeds, and at age 10-12 months late as the breed.

In table 1 are shown the age and the weight at the first insemination of Mangalita and East Balkan sows.

The mean age at first insemination was 530.42± 24.15 days for Mangalita sows and 450.25± 19.67 days for East Balkan sows. The minimum age at first insemination was 498 days and the maximum age at first insemination was 575 days for Mangalica sows. The minimum age at first insemination was 362 days and the maximum age at first insemination was 664 days for East Balkan sows.

The mean weight at the first insemination was 112.52± 32.42 kg for Mangalita sows and 90.45± 0.88 for East Balkan sows. Differences between the two breeds were very significant in both parameters analyzed.

Table 1 The age and the weight at the first insemination of Mangalita and East-Balkan sow

Breeding system		Breeds	MU	N	Statistical parameters		Limits	
					Mean	Standard Deviation	Min.	Max.
Traditional	Age	Mangalita	Days	20	530.42	24.15	498.0	575.0
		East-Balkan	Days	20	450.25	19.67	362	664
		Significance of differences			***	-	-	-
	Weight	Mangalita	Kg	20	112.52	32.42	98.4	126.5
		East-Balkan	kg	20	90.45	0.88	83.0	98.0
		Significance of differences			***	-	-	-

It is knon that the unlearned breeds of pigs reach sexual maturity lately – after the age of year, whereas the age at first farrowing is 450-470 days [12]. In table 2 are shown the age at farrowing, duration of gestation, duration of lactation and duration of the reproductive cycle.

Table 2 Age at farrowing, duration of lactation, duration of pregnancy and duration of the reproductive cycle at Mangalita and East-Balkan sow

Breeding system		Breeds	MU	N	Statistical parameters	
					Mean	Standard Deviation
Traditional	Age at farrowing	Mangalita	Days	20	645.1	26.31
		East-Balkan	Days	20	563.7	19.71
		Significance of differences			***	-
	Duration of gestation	Mangalita	Days	20	114.7	2.14
		East-Balkan	Days	20	113.4	0.18
		Significance of differences			n.s.	-
	Duration of lactation	Mangalita	Days	20	52.6	16.45
		East-Balkan	Days	20	59.2	0.65
		Significance of differences			***	-
	Duration of the reproductive cycle	Mangalita	Days	20	207.5	23.14
		East-Balkan	Days	20	232.6	0.76
		Significance of differences			***	-

The mean age at first insemination was 645.1± 26.31 days for Mangalita sows and 563.7 ± 19.71 days for East Balkan sows. The analysis of our data showed average age at first farrowing of days that was over the physiological limit for the breed This fact could be explained by the seasonal pattern of breeding and farrowing that presumes omitting of first oestruses and delayed breeding with regards to the formation of technological groups in the season, most favorable for herd reproduction.

The mean value for duration of gestation was 114.7± 2.14 days for Mangalita sows and

113.4 ± 0.18 days for East Balkan sows, between the two breeds are not significant differences for this parameter. Similarly, average gestation length of 114±2.0 has been reported elsewhere [14] . Cole and Foxcroft, 1982 [3] also reported a gestation length of 114 days in domestic sows and 119 days in wild sows.

In our study, the mean duration of lactation was 52.6 ± 16.45 days days for Mangalita sows and 59.2 ± 0.65 days for East Balkan sows. The two values are much higher than those practiced in commercial swine-breeding farms but normal for unlearned breeds.

Reproductive capacity in pigs is assessed by prolificacy, which requires a complex application and enforcement activities and measures, some dependent animal, and others related to ensuring the environment, ending with the number and quality of weaned piglets during a production year. The number of piglets weaned is higher and fertility is good quality even better. Prolificacy is conditioned by ovulation rate, fecundity, nidation of zygotes, as well as by embryonic and fetal mortality.

Table 3 Prolificity of Mangalita and East-Balkan Pigs breed

Breeding system		Breeds	MU	N. of sow	Statistical parameters		Limits	
					Mean	SD	Min.	Max.
Traditional	Piglets at first birth	Mangalita	Head	20	5.62	2.16	4.0	7.0
		East-Balkan	Head	20	4.95	0.27	2.0	6.0
		Significance of differences			***	-	-	-
	Piglets weaned after first birth	Mangalita	Head	20	4.82	1.51	4.0	6.0
		East-Balkan	Head	20	3.50	0.33	0	6.0
		Significance of differences			***	-	-	-
	Piglets at second birth	Mangalita	Head	20	6.28	2.22	5.0	7.0
		East-Balkan	Head	20	6.15	0.35	4.0	10.0
		Significance of differences			ns	-	-	-
	Piglets weaned after second birth	Mangalita	Head	20	5.64	1.28	5.0	7.0
		East-Balkan	Head	20	4.95	0.39	1.0	8.0
		Significance of differences			***	-	-	-

In the present study, the mean number of piglet production was 5.62 piglets for first birth and 6.28 piglets for second birth for Mangalita breeds. For East-Balkan breeds the mean number of piglet production was 4.95 piglets for first birth and 6.15 piglets for second birth. Mean piglet number on the second birth is higher to that registered on the first birth. This is in accordance with the research [8, 11, 15] who have shown that in Mangalita sows during the first month of gestation the increase in length of the uterus and horns is minimal although the increase in weight is significant.

The number of piglets per female is similary with the breed average for the first birth. Other authors [8, 5, 11, 15] mention that the average for Romanian Mangalita is 5 to 6 piglets and for Hungarian Mangalita being similar with 4-7 piglets.

Regarding the number of weaned piglets, one can also notice the superiority of the Mangalita breed, which had 4.82 piglets compared to East-Balkan breeds which had 3.50 weaned piglets.

CONCLUSIONS

1. Age at first mating was lower at the Eastern balkan sow (450.25 days) compared to the Mangalita breed (530.42 days). The weight at first sowing was higher at the Mangalita breed compared to Eastern balkan breeds.

2. Value registered for duration of gestation, duration of lactation, duration of the reproductive cycle was closer to the two studied breeds.

3. The number of piglets at first and second birth were higher at breed Mangalita compared to Eastern balkan breeds.

4. The Mangalita and Eastern balkan breeds is a representative example for the success of preserving endangered breeds. Due to the very good qualities of the meat and for the preservation of the diversity of the swine breeds, it is necessary to continue to grow these two breeds.

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