RECONSIDERATION ON THE OPTIMUM MOMENT OF SELECTING FOR REPRODUCTION IN BOARS FROM THE MARELE ALB BREED AND 345 PERIŞ SYNTHETIC LINE

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ABSTRACT *– At the first fertile services, the dynamics of boars weight increase was tributary to body weight, which must be over 100 kg. Different weights resulted in differences of the values of body indices in female mates. Prolificacy, weight of pigs group at birth, weight of pigs group at 21 days and weight of pigs group at weaning represented the parameters influenced by differences in boar weight. Suckling capacity, weight of pigs at weaning and number of pigs at weaning were the reproductive parameters influenced by age differences in boars. The optimum age for reproduction in boars must be of 224-252 days. The requirements concerning age and body weight must be satisfied at first fertile periods.*

Key words: boars, reproduction, Marele alb, 345 Periş Synthetic Line

REZUMAT – Reconsiderarea noțiunii de optim referitor la momentul introducerii la reproducție a vierilor din rasa Marele alb şi L.S. 345 Periş. *La primele monte fecunde, dinamica creşterii în greutate a vierilor a fost tributară greutății corporale, fiind necesar ca masa corporală să fie de peste 100 kg. Greutățile diferite au determinat diferențe ale valorilor indicilor corporali la femelele partenere. Prolificitatea, greutatea lotului de purcei la fătare, greutatea lotului de purcei la 21 zile şi greutatea lotului la înțărcare au fost parametrii influențați de diferențele de greutate ale vierilor, iar capacitatea de alăptare, greutatea purceilor la înțărcare şi numărul de purcei la înțărcare au fost parametrii reproductivi influențați de diferențele de vârstă ale vierilor. Vârsta optimă la masculii pentru reproducere trebuie să fie de 224-252 zile. Cerințele privind vârsta şi masa corporală trebuie să fie satisfăcute la primele monte fecunde.*

Cuvinte cheie: vieri, reproducere, Marele alb, L.S. 345 Periş

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INTRODUCTION

As concerns the optimum moment for selecting young swine for reproduction, because of diversity of investigated swine breeds and diverse testing conditions, corroborated to specific interpretation of results, the studies from speciality literature emphasized the presence of some insufficiently analysed data. Feredean T. (1968) assesses that in young boars, irrespective of breed, but depending on nutrition and management, the sexual maturity begins at the age of 7-8 months, age corresponding to the body weight of 80-90 kg. The young boars are being used for the reproductive activity since the age of 10-12 months. In some cases, they begin the reproductive activity at the age of 8 months (Nedelniuc, 1978; Stan, 1990).

The aim of this theme is to emphasize the importance of factors age and body weight, as concerns the best reproductive moment, which required the presence of two experimental series.

MATERIALS AND METHODS

The biological material was made up of 18 boars, structured on breeds and experimental factors: **a.** Nine boars belong to Marele alb breed and three boars are distributed to the first experimental series (the influence of body weight differences in young boars on reproductive indicators of mates), three boars distributed to the second experimental series (the influence of age differences in young boars on reproductive indicators of mates), and 18 females. Nine females belong to the first experimental series, and the other nine females, to the second experimental series; **b.** Nine boars belong to 345 Periş S.L.; the repartition on experimental series of boars and their mates was identical to Marele alb breed. We also mention that female mates were at the second farrowing and belong to Marele alb breed and 345 Periş S.L. The working method was of experimental groups. Experiments were conducted under production conditions, within Suinprod Trade Company of Bacău.

RESULTS AND DISCUSSION

First experimental series: **Reproduction performances obtained by female mates, in relation to weight differences of boars, at the moment of first fertile period.**

a. Marele alb breed. For pointing out the influences induced by boar weight on reproductive results in mates, we must take into account the following parameters: duration of gestation, duration of farrowing, prolificacy, weight of pigs group at birth, suckling capacity and weight of pigs group at weaning.

Table 1

Reproduction performances of female mates belonging to Marele alb breed, corresponding to male weight differences

GROUP	Female weight (kg)	Male weight (kg)	Number of females (heads)		Duration of gestation (days) $\bar{X} \pm s_{\bar{X}}$	Duration of farrowing (hours) $\bar{X} \pm s_{\bar{X}}$	Proli-ficacy (heads) $\bar{X} \pm s_{\bar{X}}$	Weight of pigs group at birth (kg) $\bar{X} \pm s_{\bar{X}}$	Suckling capacity (kg)		Pigs weight at weaning (kg)
			At partu-rition	Stu-died					Pigs group (heads) $\bar{X} \pm s_{\bar{X}}$	Weight of group (kg)	
L_1	136±0.28	93.6±0.27	37	9	116±1.34	4.3±0.16	8.8±1.30	9.25±0.23	7.0±1.13	37.7±0.24	52.9±0.6
V%	5.70	12.13			12.32	18.15	17.35	7.14	12.32	9.35	8.20
L_2	134±0.73	116.0±3.42	48	9	116±1.27	3.3±0.24	9.6±1.50	10.40±0.48	8.4±1.05	46.0±0.30	65.3±1.12
V%	6.30	12.72			15.17	7.32	10.12	5.25	15.17	8.13	6.60
L_3	134±0.16	135.6±3.38	42	9	115±1.73	4.2±0.12	9.4±1.28	10.08±0.51	8.4±1.60	44.3±0.70	64.6±1.32
V%	8.12	13.25			18.07	9.42	13.43	8.39	18.35	5.24	6.14
Fischer Test (2,18)					1.20 Insig-nificant	1.13 Insig-nificant	3.20*	3.65*	1.23 Insigni-ficant	4.75**	4.40**

Insignificant = $p>0.05$
* = $p<0.05$
** = $p<0.001$

Boars were divided into three experimental groups, corresponding to differences in body weights: Group L_1, made up of three boars, with body weights between 90-100 kg; Group L_2, made up of three boars, had body weights between 110-120 kg and Group L_3 , made up of three boars, had body weights between 121-140 kg. A group of female mates, made up of nine females/group (L_1, L_2 and L_3), was associated to each group of boars.

Data from *Table 1* have shown that reproduction performances in female mates were different, being in relation to body weights of boars at the beginning of reproductive activity. Therefore, the reproductive performances were not statistically significant for the parameters duration of gestation, duration of farrowing and number of pigs bred by female mates. There are different significances for other parameters, such as: prolificacy (significant differences $\overline{X} \pm s_{\overline{X}}$ = 8.8±1.30 heads, for L_1; 9.6±1.50 heads, for L_2 and 9.4±1.28 heads, for L_3), the weight of pigs group at birth (significant differences $\overline{X} \pm s_{\overline{X}}$ = 9.23±0.23 heads, for L_1; 10.4±0.48 heads, for L_2; 10.8±0.51 heads, for L_3), the weight of pigs group at 21 days (distinctively significant differences $\overline{X} \pm s_{\overline{X}}$ = 37.7±0.24 heads, for L_1; 46.0±0.30 heads, for L_2 and 44.3±0.70 heads, for L_3) and the weight of pigs group at weaning (42 days) (distinctively significant differences $\overline{X} \pm s_{\overline{X}}$ = 52.9±0.60 heads, for L_1; 65.3±1.12 heads, for L_2 and 64.6±1.32 heads, for L_3). The obtained values are found within the values quoted by other authors (*Cuc Aurelia, Stan Tr., Popovici Felicia*) (Popovici, 1975).

b. 345 Periş Synthetic Line. Within the experiments conducted on 345 Periş S.L., we have studied a series of reproductive parameters, according to which we have quantified the values of studied boars. The parameters studied in female mates have concerned duration of gestation, duration of farrowing, prolificacy, weight of pigs group at birth, suckling capacity and weight of pigs group at weaning.

As in the previous case, boars were divided into three experimental groups (L_1, L_2 and L_3). Data from *Table 2* have shown that there were differences with different statistical significances among studied reproductive parameters, differences induced by various body weights of boars at the beginning of the reproduction activity.

Statistically significant values were registered at parameters duration of gestation, duration of farrowing and prolificacy.

Table 2

Reproduction performances obtained by female mates from 345 Periş S.L., in relation to weight differences in boars

Group	Weight of females (kg)	Weight of males (kg)	Number of females (heads)		Duration of gestation (days)	Duration of farrowing (hours)	Prolificacy (heads)	Weight of pigs groups at birth (kg)	Suckling capacity (kg)		Weight of pigs at weaning (kg)
			At parturition	Studied					Pigs group (heads)	Weight of group (kg)	
					$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$	$\bar{X} \pm s_{\bar{X}}$
L_1	133±2.45	94.7±1.65	35	9	115±1.23	4.6±0.13	7.8±1.05	9.64±0.48	6.7±1.03	34.0±0.70	51.0±0.77
V%	6.32	12.43			8.15	17.35	4.32	6.35	7.24	6.14	8.13
L_2	135±2.67	117.3±2.49	47	9	116±1.08	4.1±0.27	8.3±1.14	10.2±0.29	7.3±1.15	40.8±0.35	60.3±1.45
V%	5.48	11.27			8.32	15.24	6.37	6.12	8.36	7.25	9.34
L_3	135±3.83	136.2±2.17	45	9	116±1.47	4.3±0.53	8.2±1.32	9.84±0.40	7.1±1.73	36.9±0.92	55.3±1.62
V%	7.42	11.35			89	13.02	7.17	5.37	8.05	7.65	7.35
Fischer Test (2.18)					1.68 Insignificant	1.28 Insignificant	0.40 Insignificant	3.68**	3.20*	3.63*	4.30**

Insignificant = $p>0.05$
* = $p<0.05$
** = $p<0.001$

Different significance degrees were registered by the weight of pigs group at birth ($\overline{X} \pm s_{\overline{X}}$ = 9.64±0.48 kg, for group L_1; 10.2±0.29 kg, for group L_2 and 9.8±0.40 kg, for group L_3), the number of pigs group until the age of 21 days ($\overline{X} \pm s_{\overline{X}}$ = 6.7±1.03 heads, for group L_1; 7.37±1.15 heads, for group L_2 and 7.1±1.73 heads, for group L_3), the weight of pigs group at 21 days ($\overline{X} \pm s_{\overline{X}}$ = 34.0±0.70 heads, for group L_1; 40.8±0.35 heads, for group L_2 and 36.9±0.92 heads, for group L_3) and the weight of pigs group at weaning (42 days) (distinctively significant differences $\overline{X} \pm s_{\overline{X}}$ = 51.0±0.77 heads, for group L_1; 60.3±1.45 heads, for group L_2 and 55.3±1.62 heads, for group L_3).

The obtained values are within the values quoted by other authors: *Nedelniuc V., Dinu I., Popovici Felicia* (Nedelniuc, 1978; Popovici, 1975).

The second experimental series: **Reproduction performances of female mates, in relation to age differences of boars at the moment of the first fertile reproductive period.**

a. Marele alb breed. Boars belonging to Marele alb breed were divided in three experimental groups (L_1, L_2 and L_3). Their ages were below 8 months for L_1, between 8 and 9 months for L_2 and over 9 months for L_3. Female mates were divided in the same number of groups (L_1, L_2 and L_3), with ages between 412 and 425 days.

As concerns the reproductive parameters of female mates, we have taken into account duration of gestation, duration of farrowing, prolificacy, weight of pigs group at birth, suckling capacity, number of pigs group at 42 days and their weight.

Data from *Table 3* have shown that as concerns the duration of gestation and the weight of pigs group at birth, the differences between female groups were not statistically significant. As concerns the duration of farrowing, differences were statistically insignificant, but between groups L_1 and L_2, the absolute differences concerning the duration of the act of farrowing were of 0.3 hours, and between groups L_1 and L_3 , of 0.1 hours.

As concerns the suckling capacity, statistically significant different values were registered: 40.2±0.73 kg for L_1; 48.2±0.15 kg, for L_2 and 37.6±0.60 kg, for L_3. At the same statistical significance, the number of pigs, weaned at 42 days, should be by 15.7% higher in L_2 compared to L_1, and by 2.8% in L_3, compared to L_1. The weight of pigs at weaning, presenting statistically significant differences, has varied between 52.72±1.60 kg for L_1 and 60.6±2.15 kg, for L_2.

The values obtained by above-mentioned parameters were close to the ones presented in literature and technology: *Cuc Aurelia, Buchanan D., Bogdan A.T.* (Popovici, 1975; Stan, 1990).

Table 3

Reproduction performances of female mates from the Marele alb breed, in relation to age differences of boars and young boars

Group	Age of females (months)	Age of males (months)	Number of females (heads)		Duration of gestation (days) $\bar{X} \pm s_{\bar{X}}$	Duration of farrowing (hours) $\bar{X} \pm s_{\bar{X}}$	Prolificacy (heads) $\bar{X} \pm s_{\bar{X}}$	Weight of pigs group at birth (kg) $\bar{X} \pm s_{\bar{X}}$	Suckling capacity (kg) $\bar{X} \pm s_{\bar{X}}$	Number of pigs group at birth (heads) $\bar{X} \pm s_{\bar{X}}$	Weight of pigs group at weaning (kg) $\bar{X} \pm s_{\bar{X}}$
			At parturation	Studied							
L_1	14,7-15,1	<8	37	9	115±3.14	4.3±0.45	9.3±0.25	10.5±0.53	40.2±0.73	7.0±0.09	52.7±1.60
V%					8.32	7.16	12.17	14.73	17.05	5.14	12.62
L_2	14,7-15,1	8-9	48	9	114±4.09	4.0±0.23	10.0±1.55	11.6±0.65	48.2±0.15	8.1±0.25	60.6±2.15
V%					7.13	7.29	9.17	10.17	15.36	7.32	9.46
L_3	14,7-15,1	>9	44	9	116±4.64	4.2±0.17	9.7±1.67	11.0±0.73	43.6±0.60	7.2±0.40	56.6±1.13
V%					7.25	9.13	8.24	9.76	15.65	7.60	10.60
Fisher Test (2.18)					1.28 Insignificant	1.32 Insignificant	3.05*	1.35 Insignificant	3.17*	3.20*	3.53*

Insignificant = $p>0.05$
* = $p<0.05$

Table 4

Reproduction performances obtained by female mates from 345 Periş S.L., in relation to age differences of boars and young boars

Group	Age of females (months)	Age of males (months)	No. females (heads)		Duration of gestation (days) $\bar{X} \pm s_{\bar{X}}$	Duration of farrowing (hours) $\bar{X} \pm s_{\bar{X}}$	Prolificacy (heads) $\bar{X} \pm s_{\bar{X}}$	Weight of pigs group at birth (kg) $\bar{X} \pm s_{\bar{X}}$	Suckling capacity (kg) $\bar{X} \pm s_{\bar{X}}$	No. pigs at weaning (heads) $\bar{X} \pm s_{\bar{X}}$	Weight of pigs group at weaning (kg) $\bar{X} \pm s_{\bar{X}}$
			At parturition	Studied							
L_1	14.7-15.1	<8	35	9	115±0.60	5.4±0.08	8.0±0.45	9.6±0.85	42.2±0.70	7.2±0.17	51.8±0.12
V%					7.53	9.13	3.24	5.62	8.35	3.12	5.43
L_2	14.7-15.1	8-9	45	9	115±0.64	5.2±0.26	8.5±0.63	10.2±0.17	51.1±0.16	8.3±0.58	61.4±0.70
V%					8.16	9.45	3.86	5.55	8.48	3.45	5.83
L_3	14.7-15.1	>9	42	9	116±0.15	5.0±0.42	8.2±0.19	9.8±0.23	49.0±0.36	8.0±0.80	60.4±0.03
V%					8.65	8.42	4.12	4.17	7.52	3.62	5.17
Fisher Test (2.18)					1.53 Insignificant	0.52 Insignificant	0.40 Insignificant	0.18 Insignificant	3.20*	3.61*	3.22*

Insignificant = $p>0.05$
* = $p<0.05$

b. 345 Periş Synthetic Line. Boars from 345 Periş Synthetic Line were divided into three experimental groups (L_1, L_2 and L_3), their ages being below 8 months for L_1, between 8 and 9 months for L_2 , and over 9 months for L_3 . The female mates were divided in the same number of groups (L_1, L_2 and L_3), with ages between 412 and 425 days (*Table 4*).

In order to notice the influences induced by boars' age at the beginning of reproductive activity on subsequent reproductive results, registered by females, the following parameters were studied: duration of gestation, duration of farrowing, prolificacy, weight of pigs group at birth, suckling capacity, number of pigs group at 42 days and their weight at the same age, of 42 days.

The studied reproductive parameters have presented statistical differences with different significance degrees. Duration of gestation, duration of farrowing, prolificacy, and weight of pigs weight at birth have shown statistically insignificant differences, while suckling capacity, number of pigs group at weaning, and their weight had statistically significant differences ($p<0.05$). Although there were no statistically significant differences concerning the prolificacy, the absolute differences among groups were of 0.5 pigs between L_1 and L_2, and 0.2 pigs between L_1 and L_3. In the same way, the weight differences of pigs group at birth were found: 0.6 kg, between L_1 and L_2, and 0.2 kg, between L_1 and L_3.

As concerns the suckling capacity, in comparison with L_1 (control group), the relative value of this indicator was of 121% for L_2, and 116% for L_3. The number of pigs group at the age of weaning was by 15.2% higher in case of L_2, and by 11.10% higher, in case of L_3. The weight of pigs group at 42 days has registered the following values: $\bar{X} \pm s_{\bar{X}} = 51.8 \pm 0.12$ kg, for L_1, 61.4 ± 0.70 kg, for L_2 and 60.4 ± 0.03 kg, for L_3, that is the differences between 9.6 kg (L_1 and L_2) and 1.0 kg (L_2 and L_3).

At all the above-mentioned parameters, the values were in concordance with the ones from literature and technology (*Dinu I., Stan Tr.*) (Stan, 1990).

CONCLUSIONS AND RECOMMENDATIONS

The dynamics of weight increase in boars was tributary to the body weight, registered at the moment of first fertile services;

The different weights, at the moment of fertile services, have resulted in differences of the values of body indices in female mates;

The age differences in boars had repercussions on some reproductive indicators in mates;

Irrespective of breed or synthetic line, the highly influenced parameters by weight differences in boars were prolificacy, weight of pigs group at birth, weight of pigs group at 21 days, and weight of pigs group at weaning;

The reproductive parameters influenced by age differences in boars were suckling capacity, weight of pigs group at weaning and number of pigs group at weaning;

Boars and young boars culling concerned the groups of boars with body weights between 90-100 kg, and age, below 8 months.

Considering the obtained results, a series of *recommendations* are necessary:

For a subsequent evolution in dynamics of body weight, at the moment of first fertile services, the body weight should be over 100 kg;

A differentiated feeding can be ensured, for compensatory body weight increases, but, in most of cases, the reproductive results are negatively influenced;

The age for male selecting into reproduction must be within 224-252 days;

At first fertile services, both requirements concerning age and body weight should be met. The two elements are not complementary;

The strict delimiting of the "optimum" notions as concerns age and body weight must be done according to biological, economic, financial, zootechnic, and managerial factors.

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