

RESEARCH ON FERTILITY AND PROLIFICACY OF THE SOWS ARTIFICIALLY INSEMINATED WITH DIFFERENT AMOUNTS SPERMATOZOIDS

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Abstract

For the proposed research were used doses of semen obtained from two PIC boars and one Large White boar. Observations were extended from 16 months old boars up to 33 months. With the semen collected from the three boars were inseminated 567 half-breeds sows accommodated in household system. Sows were divided into two groups: the L1 group - comprising sows inseminated with 4 billions mobile spermatozooids /dose and L2 group - comprising sows inseminated with 2.5 billions mobile spermatozooids/dose. The average fecundity of sows in L1 group was 83.6%, insignificantly higher than that of sows in L2 group (82.4%). The average number of piglets obtained/farrowing at sows in L1 group was with 0.22 piglets higher than the number of piglets obtained at sows in L2 group (8.60 ± 0.2 piglets for L1 group; 8.38 ± 0.1 piglets for L2 group). The results show that the reduction from 4 billions to 2.5 billions the number of mobile spermatozooids/dose does not diminish the results of insemination.

Key words: boars, artificially insemination, spermatozooids amount

INTRODUCTION

On the national and international level the main concern is to reduce the mobile gametes per dose [5, 6], in order to use for the reproduction a smaller boar number, holding the most valuable one.

This idea could be significant for the future, when the gametes will be sexated for female and male controlled obtaining. The sexation is expensive having a low efficiency. Researches performed in Germany proved that surgical laying of 5 millions mobile spermatozooids on the uterine horns anterior segments lead to adequate reproducing indexes [7].

Also, there were good results by non-surgical inoculation of 200 millions mobile spermatozooids. The best results are mentioned frequently using intrauterine laying of 1.5 billions mobile spermatozooids [2, 3].

MATERIAL AND METHOD

Semen was collected from two PIC boars and one Large White boars, reared in individual pens. Observations began at the

age of 16 months and continued until 33 months old boars. After harvesting were assessed the main spermogram indices: volume, spermatozooids concentration and the mobility. Depending on these parameters were obtained doses with 4 billions mobile gametes and 2.5 billions mobile gametes. For dilution was used an synthetic diluter. The female biological material was represented by 567 half-breed sows reared in extensive system, in different conditions, characteristic of each ascending. The effective was divided in two groups, depending on the number of mobile gametes from insemination dose: the L1 group - composed with sows inseminated with 4 billions mobile spermatozooids/dose and L2 group - composed with sows inseminated with 2.5 billions mobile spermatozooids/dose. Sows in estrus were identified by the breeder, based on characteristic symptoms. There were made two inseminations/estrus cycle: the first, at the installation of immobility reflex with fresh semen and the second, after 12 hours, with the semen preserved at 17°C. The fecundity was calculated as the ratio between the number of sows who not shown estrus for

63 days after insemination and the total number of insemination sows. The prolificacy obtained represents the average

number of piglets/farrowing. The number of artificially sown sows is presented in table 1.

Table 1. The number of artificially inseminated sows

The race	No.spermatozoids/dose (billions)	A.I. sows (no) july 2008-july 2009	A. I. sows (no) august 2009-february 2010	Total july 2008-february 2010
Large White	4	60	56	116
	2.5	42	31	73
Total Large White		102	87	189
PIC	4	155	114	269
	2.5	57	52	109
Total PIC		212	166	378
Total general		314	253	567

A. I. = artificially insemination

RESULTS AND DISCUSSION

The mean values for spermogram indices at the boars studied were included in the limits cited in the literature [1, 4]. Thus, the average volume of semen was 261 ± 21 ml at PIC boars and 242 ± 17 ml at Large White boars; the average sperm concentration ranged between 214 ± 11 billions at Large

White boars and 225 ± 19 billions at PIC boars; the average spermatozoids mobility was $85 \pm 2.1\%$. After artificial insemination of sows with different of mobile spermatozoids numbers were not found differences in terms of fecundity. Thus, the fecundity of sows from group L1 was 83.6%, while those in group L2, the 82.4% (table 2).

Table 2. The fecundity of artificially inseminated sows (%)

The race	No.spermatozoids/dose (billions)	A.I. sows (no.)	Pregnant sows (no.)	Fecundity (%)
Large White	4	116	96	82,7
	2.5	73	60	82,1
PIC	4	269	226	84,0
	2,5	109	90	82,5
Average	4	385	322	83,6
	2.5	182	150	82,4

A. I. = artificially insemination

These results demonstrate that the use of 4 billions spermatozoids/dose is an unjustified waste of gametes. The economic advantage of using the doses with fewer number gametes mobile is considerably in case of large pig units where desired the growth of a small number of boars with high yields (higher number of doses/ejaculate). The seasonal analysis of fecundity show levels slightly lower in summer, regardless of the number of mobile spermatozoids/dose and semen source (table 3).

The level of fecundity differs slightly from the literature who citing lower values in summer (65-75%) and higher in the rest of the year (85%) [1, 4]. The explication can be given that temperatures have not exceeded 30°C in the specified period. The mean prolificacy at birth was 8.60 piglets when was used doses with 4 billions mobile spermatozoids/dose and 8.38 piglets when they were used doses with 2.5 billions mobile spermatozoids/dose (table 4).

The difference between the two groups was 0.22 piglets.

Table 3. The seasonal dynamics of sows' fecundity

The race	Number of spermatozooids/dose	A.I. period	A. I. sows (no.)	Pregnant sows (no.)	Fecundity (%)
Large White	4	jul-aug	24	18	75,0
		sep-may	92	79	85,8
	2.5	jul-aug	8	7	87,5
		sep-may	65	57	87,6
PIC	4	jul-aug	51	39	76,4
		sep-may	218	194	88,9
	2.5	jul-aug	26	19	73,0
		sep-may	83	73	87,9
Large White +PIC	4	jul-aug	75	57	76,0
		sep-may	310	273	88,0
	2.5	jul-aug	34	26	76,4
		sep-may	148	130	87,8

A. I. = artificially insemination

Table 4. The sows' prolificacy

The boars' race	No. mobile spermatozooids/dose (billions)	Sows pregnant (no.)	Mean prolificacy (no. piglets/farrowing)	Total piglets
Large White	4	96	8,29	787
	2.5	60	7,90	474
PIC	4	226	8,80	1989
	2.5	90	8,70	783
Total and mean	4	322	8,60	2776
	2.5	150	8,38	1257

CONCLUSIONS

The biological value of semen from boars maintained for artificial insemination of sows owned by small growers is appropriate.

The sows fecundity was not influenced by the number of mobile spermatozooids/dose.

The prolificacy of sows was similar, regardless of the number of mobile spermatozooids used in sowing.

The number of mobile spermatozooids /dose may be reduced below the limit cited in the literature (3 billions mobile spermatozooids/dose) without the fecundity and prolificacy for the sows kept in extensive system to be diminished.

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