

INFLUENCES OF ADDITION OF PROSTAGLANDIN F_{2α} TO BOAR SEMEN

DILUENT UPON VIABILITY OF SPERM, CONCEPTION RATE AND ACHIEVEMENT OF PIGLETS

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Introduction: Researches are currently under way in the field of livestock reproduction on applications of prostaglandin F_{2α} (hereinafter to be abbreviated as PGF_{2α}).

We have conducted studies on PGF_{2α} application to the reproduction of sows and boars and earlier reported on the amounts of PGF_{2α} in semen of boars and PGF_{2α} injection to boars upon sperm production. This study relates to the evaluation of the effects of addition of PGF_{2α} to boar semen diluent upon viability of sperms, conception rate and achievements of piglets.

Method: Normal semen collected from 11 boars including 10 Landrace boars and 1 Hampshire boar was each diluted with skim milk-glucose diluent (Polyzanon). The diluted semen was cooled to lower its temperature gradually and was stored at 15°C for subsequent tests.

Two groups of semen samples were prepared including the control group of only the above-mentioned diluted semen with addition of citric acid buffer containing no PGF_{2α} (placebo: 0 mg/3 ml) and the test group containing 6 μg/3 ml of PGF_{2α} in 50 ml of the diluted semen. The tested items were the effects of addition of PGF_{2α} on the viability of sperms, conception rate and achievements of piglets by duration time of storage of semen, by number of farrowings of sows and by individuals of boars.

Results:

1. Effects upon viability of sperms: The viability of sperms following addition of PGF_{2α} or placebo to boar semen was good and the terms (in days) which were assumed to accept conception were extended. There was no significant difference between the two groups.

2. Overall results: The conception rate of 73.6% (81 conceiving out of 110) in the group with addition of PGF_{2α} was significantly higher (P = 0.05) than that of control group of 59.2% (67 conceiving out of 113) following insemination.

The mean litter size of the test group (PGF_{2α} group) was 9.66, while that of control group was 9.51.

The mean surviving piglets were 9.19 each for both control and test groups, while the mean rate of survivals was 96.85% in the control group and 96.17% in the test group, showing no significant difference between each other.

3. Results of conception by duration time of storage of semen: The results were as shown in Table 1. There was no specific difference between the two groups in terms of litter sizes, number of surviving piglets or surviving rates by individual boars. (Ref. Table 1).

4. Results of conception by number of farrowings of sows:

The results were as demonstrated in Table 2. There was no appreciable difference between the two groups in terms of litter sizes, surviving piglets, or survival rates by number of farrowings. (Ref. Table 2).

5. Results of conception by individuals of boars: The results were as shown in Table 3. There was no appreciable difference between the two groups in terms of litter sizes, surviving piglets, or survival rates by individuals of boars. (Ref. Table 3)

Table 1.

Hours of storage	Control group			Tested group		
	Inse- mina- ted sows	Con- cei- ved	Concep- tion rate	Inse- mina- ted sows	Con- cei- ved	Concep- tion rate
0 h(12)	32	19	59.38%	61	43	70.49%
12 h(24)	7	7	100.00	10	9	90.00
24 h(48)	36	18	50.00	28	21	75.00
48 h(96)	27	16	59.26	7	6	85.71
72 h(144)	11	7	63.64	4	2	50.00

Table 2.

Number of farrowings	Control group			Tested group		
	Inse- mina- ted	Con- cei- ved	Concep- tion rate	Inse- mina- ted	Con- cei- ved	Concep- tion rate
First	26	14	53.85%	25	16	64.00%
Second	25	15	60.00	33	25	75.76
Third	22	14	63.64	21	17	80.95
Fourth	14	9	64.29	7	5	71.43
Fifth & more	23	13	56.56	24	18	75.00

Table 3.

Boars	Control group			Tested group		
	Inse- mina- ted	Con- cei- ved	Concep- tion rate	Inse- mina- ted	Con- cei- ved	Concep- tion rate
No.1	37	24	64.86%	29	24	68.97%
No.2	24	14	58.33	17	13	76.47
No.3	17	9	52.94	15	11	73.33
No.4	10	4	40.00	10	7	70.00
No.5	7	7	100.00	6	5	83.33
No.6	4	2	50.00	8	4	50.00

Conclusion:

Following dilution of boar semen with diluents containing 12 mg of PGF_{2α} or placebo not containing PGF_{2α}, the temperature of semen was gradually lowered, and the semen was stored at 15°C so as to examine the viability of sperms and to evaluate the results of artificial insemination with the diluted semen in terms of conception rate, litter size, and number of live piglets. The following results were obtained.

(1) With addition of PGF_{2α} or placebo to boar semen diluent, the viability of sperms was in no difference and the period in which conception was deemed to be possible could be extended.

(2) The conception rate was 59.29% and 73.64% in the groups without and with addition of PGF_{2α}, respectively, and significant differences were noted between the two groups with 5% level.

(3) Conception rate of PGF_{2α} group tended to be better by both the days of semen storage and by number of farrowings of sows.

(4) No significant difference was seen between the group with addition of PGF_{2α} and the group without it in terms of litter size and number of live piglets.

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