

COMPARISON BETWEEN CLASSICAL INSEMINATION AND POSTCERVICAL INSEMINATION APPLIED WITH DIFFERENT DOSES

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0. HISTORY.

In 2004 was held from ITG Ganadero the experimentation with different artificial insemination systems in sows. The Classic system with the container-catheter Gedis and post cervical deep and insemination were compared.

The results were favourable to the classic system and Gedis, a variant of the same. See article "Navarra agrarian", no. 144, April-May 2004.

The new post cervical insemination catheter developed by IMPORT-VET, was received by ITGG with scepticism by results obtained in the previous experimentation. The similarity of its design was important. The main difference in the flexibility of the material and application technique was assessed as interesting.

However, decided to test the effectiveness of the new design and technique reducing to the time the volume of the dose to apply.

1. APPROACH.

ITG Ganadero maintains in Oskotz (Imotz, Navarra) a swine centre of insemination. The reduction of volume and number of sperm by dose contributes improvements in production, organization and distribution the AIC.

This AIC, as the other centres, are dimensioned, designed and managed for the development of dose with a mean concentration of 3×10^9 sperm and in volumes of 80-100 cc destined for the artificial insemination traditional.

Deployment of management in bands in pig farms, has caused that 70 % of orders are made in the first three days of the week.

Both aspects generated difficulties of organization, extraction to a large number of boars and their consequent valuation, force to overloads of work, more early starting work and an important stress working for finish the preparation of dose as soon as possible. Another important obligation of the centre is the fast distribution to farms and more spaced customers to the AIC.

Average production by boar is approximately 1,500 dose per year; reduction of volume and concentration of sperm to 30 or 15 cc reveals as effective from the reproductive point of view, productivity per boar will become of 4,500 or 9,000 year dose.

As a result it will be necessary to resize centres. Required less boars, squares and work to attend the demand.

If demand for farmers is geared towards small dose volume is forced a restructuring of the AIC.

For farms, obtaining a greater number of doses by boar, it will increase the uniformity of final production. The average dose obtained by ejaculate in insemination classical is approximately 20, for the post cervical insemination multiply by 3 or 6, according to be made 30 cc. (one billion sperm) or 15 cc. (500 million). Thus, a ejaculate would serve for 60 or 120 doses. With them it would obtain between 300 and over 700 pigs per ejaculate. **Commercial assessment of the homogeneity of the finalized pig makes very interesting increased doses by boar.**

The application of this technique has the following advantages:

- More homogeneity in the final production.
- Best profit of boars of higher quality.
- Reduction the costs of dose production.
- Increase interest in the production of sexed semen.

As disadvantages must include:

- More cost of the new catheters.
- It's necessary learn another technique of semen application more sophisticated.
- Gilts, at first, must be inseminated with classic system.
- More affectation by temperature variations at doses of lower volume.

Balance will be clearly favorable if it is shown that the post cervical insemination maintains or improves reproductive outcomes of insemination Classic.

2. OBJECTIVE.

The experimental design is compare the results of the classical insemination in front of the post cervical. This is using IMPORT-VET catheters.

1. Classical (Test).

Classical insemination with 90 cc diluted semen and 3,000 million (3×9^{10}) sperm per dose.

2. Postcervical 30 cc

Post cervical application with one billion sperm by dose in 30 cc of volume.

3. Postcervical 15 cc

Insemination with half billion ($0,5 \times 10^9$) sperm in 15 cc of volume per dose. This modality is complemented by the application, immediately after, of 10 cc of the same diluent, searching, on the one hand, the thrust effect to small number of sperm, and get an enough total volume of insemination.

Must be noted that the post cervical insemination requires the use of a specific catheter, and another management regarding stimulation and application.

Is undesirable and even recommended the non presence of male during the application.

It's necessary that, after the placement of the catheter and introduction of the internal guide through the cervix, it has to be placed in the way that sperm were deposited as more close as possible to their destination, both uterine horns. To do this the guide has a line, located on the top and related two holes in the tip facilitates that semen is poured, driven, to both horns of the uterus.

After the deposition of the semen, the guide is partially removed and performs a rotary motion that would improve the stimulation of the sow and as a result, the results of insemination.

3. THE TEST DESIGN.

Experimentation has been made nine partner farms of ITG Ganadero with a total of 24 inseminated bands.

The three types of insemination are compared in each farm: classical, making the reference, and two in post cervical insemination, one of a 30 cc. and the another 15 cc.

Each band has been allocated a similar number of sows in each type of insemination, distributed consistently by number of farrowing (average of 3 to 3.2).

Hygiene interventions have been equal on all farms.

The application of the semen has made by the usual farmer of each farm and according to their own guidelines are used 2 or even 3 doses by sow, in any case, respecting accustomed intervals.

Semen used has been provided by the AIC of Oskotz of the same way as the rest of farms.

The maximum homogeneity has sought for all the inseminations, have developed the dose for a same farm with the fewest possible of boars, avoiding possible male effect.

3.1 Reproductive results average in participant farms.

Reproductive results average in ITG and participant farms are similar.

FARM N ^{er} .	1 st CUBRICION FECUNDITY	TOTAL BIRTHS /FARROWING	BORN ALIVE/FARROWING
1	76.7	11.66	11.04
2	81.5	11.82	11.19
3	88.4	11.89	11.13
4	85.5	12.51	11.63
5	82.2	11.16	10.94
6	83.5	11.03	10.31
7	93.7	12.21	11.46
8	77.8	11.66	10.95
9	87.3	12.19	11.33
2006 ITGG AVERAGE	83.8	12.01	11.20
FARM AVERAGE	83.9	11.80	11.11

4. FIELD RESULTS.

In each inseminated sow is written the number of farrowings, the date of weaning, date of insemination (always from the first dose day), the result of the pregnancy diagnosis, the farrowing result of live births and deaths. If there are some situation noticeable, abortion, empty sow, etc.... noted as comments.

4.1 Results by farm.

Experimental results are presented in this box of each farm, in the bottom average results of farms.

In order to appreciate the best values in each index, these have been shaded.

GRAN JA	A.I. N ^{er}	CLASSIC				POSTCERVICAL 30 cc.				POSTCERVICAL 15 cc.			
		Fert. +	P/C	N.T/P	N.V/P	Fert. +	P/C	N.T/P	N.V/P	Fert. +	P/C	N.T/P	N.V/P
1	46	80.4	80.4	12.0	11.5	79.6	79.6	12.2	11.6	86.7	86.7	11.7	11.2
2	55	85,5	85,5	12.9	12.4	86,2	81,0	12.0	10.8	82,4	80.4	13.2	12.8
3	12	83.3	66.7	12.8	12.1	75.0	75,0	11.5	10.8	85,7	71,4	13.2	13.0
4	8	87.5	75.0	14.3	13.5	62.5	62.5	12.2	9.2	42.9	42.9	10.7	9,7
5	41	95,1	92.7	11.8	11.8	97,4	92.1	11.1	8.5	97.0	97,0	12.0	12.0
6	15	93.3	86.7	11.3	10.8	80,0	73.3	11.9	11.5	100.0	93.3	11.7	11.3
7	31	80.6	74.2	10.4	9.9	96.6	93.1	9.7	9.6	83.3	80.0	11.0	10.2
8	13	69,2	76,9	11.4	10.5	75.0	75.0	14.6	13.8	80,0	80,0	15.3	14.6
9	14	92.9	92.9	11.0	10.0	80,0	80,0	14.1	12,4	80,0	80,0	10.9	10.2
AVERAGE		85.3	81.2	12.0	11.4	81.4	79.1	12.1	10.9	82.0	79.1	12.2	11.7

BEST RESULTS

There is greater concentration of shaders in the right-hand column (post cervical 15 cc).

4.2 Total results.

Whereas the total inseminated sows, regardless of the farm are housed, these are the results.

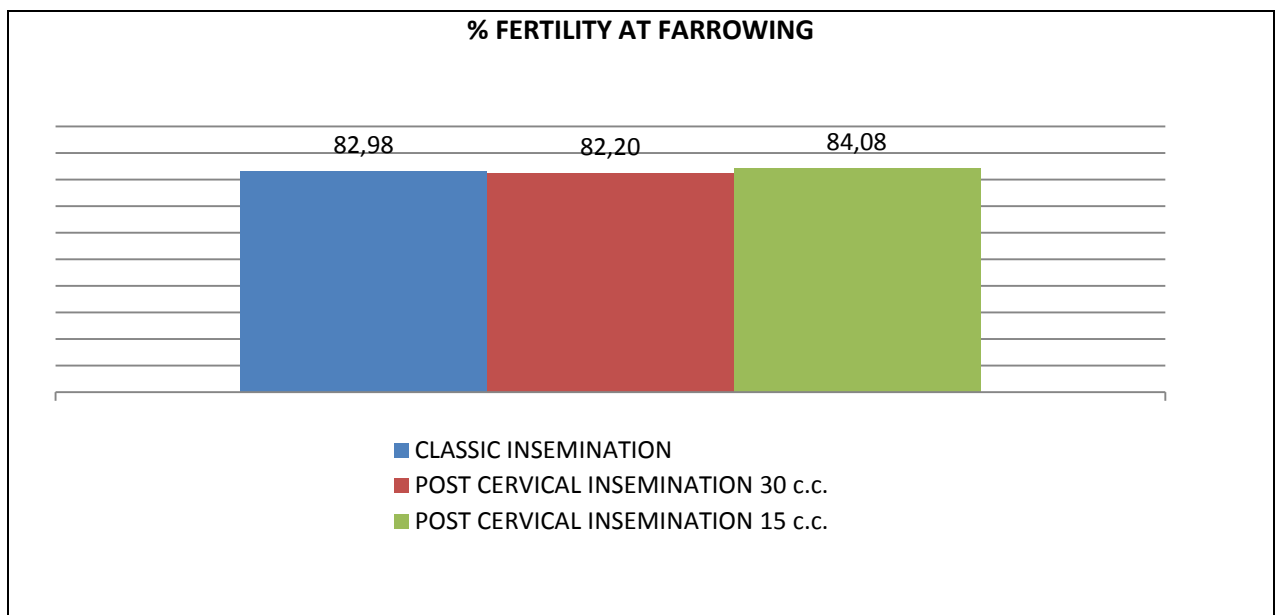
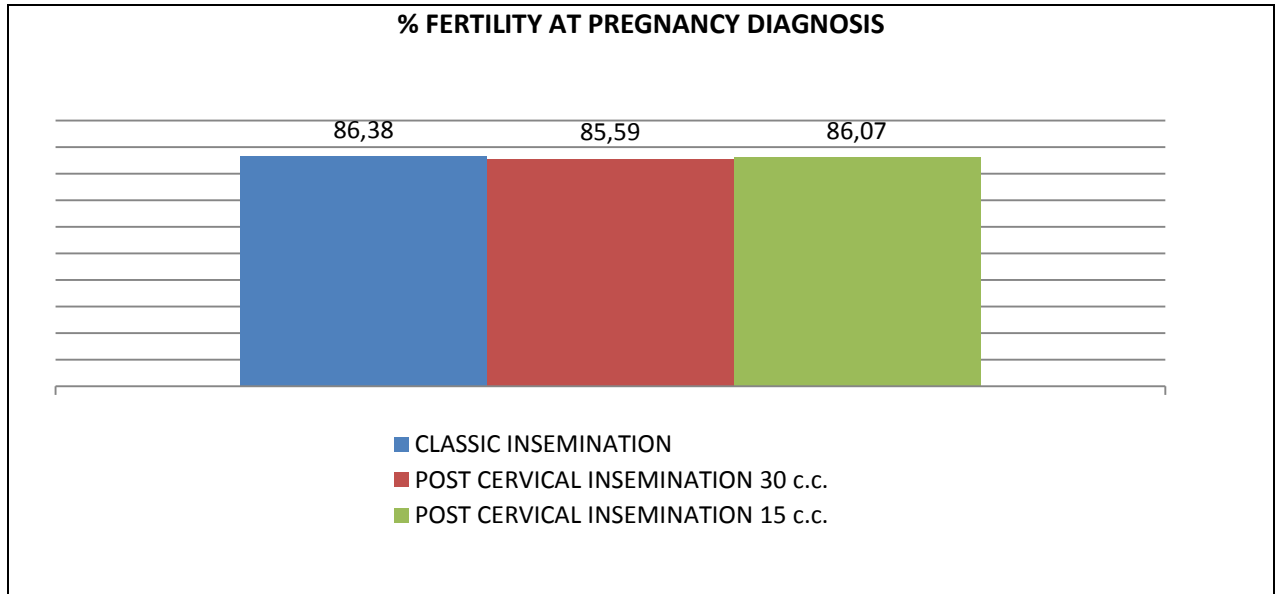
RESULTS	CLASSIC 90 cc.	POST-CER. 30 c.c.	POST-CER. 15 c.c.
N ^{er} . inseminations	235	236	201
N ^{er} . positive	203	202	173
Farrowing N ^{er} .	195	194	169
born alive	2.239	2.148	1.995
born dead	92	148	78

Obtained reproductive rates are presented in the following box.

	CLASSIC INSEMINATION 90 cc	POST-CERVICAL 30 cc	POST-CERVICAL 15 cc
% Fertility at 1 st serving	86.38	85.59	86.07
% Fertility at farrowing	82.98	82.20	84.08
Total births by farrowing	11.95	11.84	12.27
Births alive by farrowing	11.48	11.07	11.80

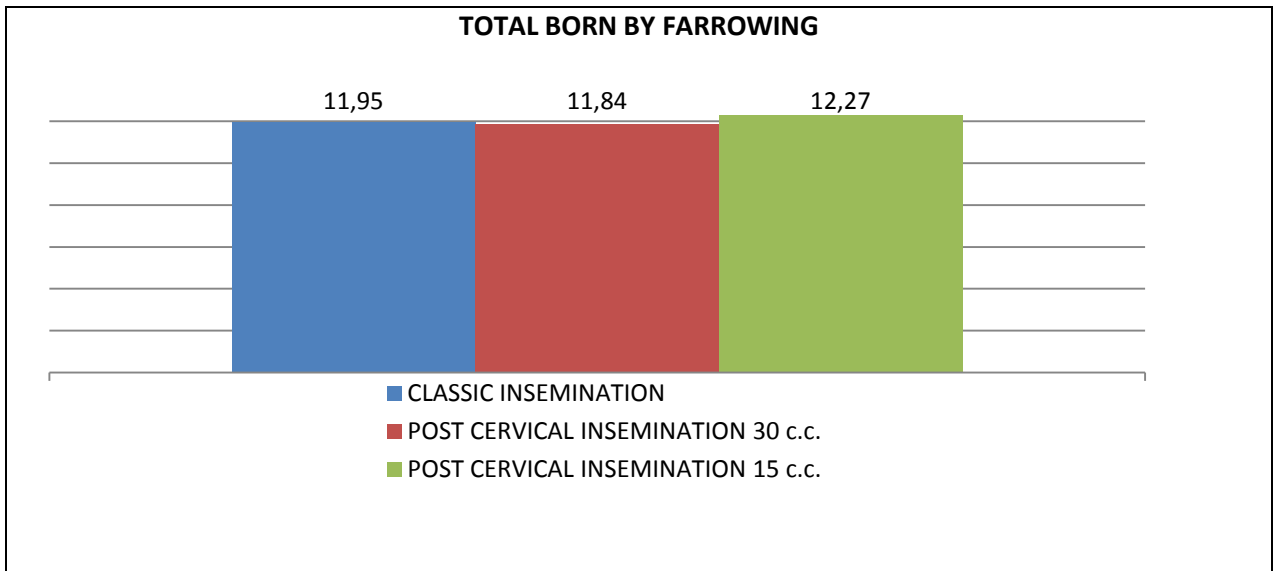
Except fertility diagnosis of pregnancy, slightly superior in Classic insemination, the rest of indexes are superior in the post-cervical 15 cc.

GRAPHICS OF FERTILITY

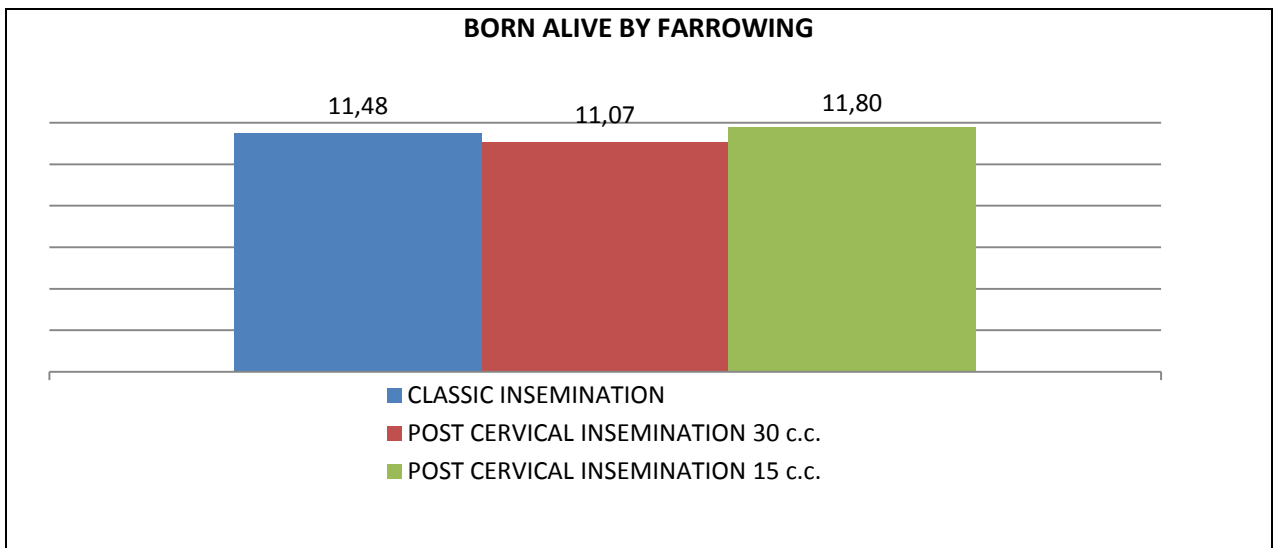


GRAPHICS OF PROLIFICITY.

Reduction of the amount of sperm per dose presents, in principle, more risks in the maintenance of the prolificity (total births and alive by birth), which on fertility. Surprisingly, the highest rate of births occurred with the least amount of those.



Rates of stillbirths are normal, between 4 and 6 % of born do dead.



5. STATISTICAL ANALYSIS.

The statistical treatment has been carried out by Paola Eguinoa of ITG Ganadero.

For statistical validity was assessed as necessary a minimum 180 sows inseminated with three techniques. These objectives have been exceeded, are 235, 236 and 201 by batch respectively. For the processing of data, an analysis of variance factor method of insemination has been made, for the varying number of inseminations, total births and births alive by farrowing.

In the case of the variable % of fertility to farrowing, a Chi-square was tried.

STATISTICAL TREATMENT

Insemination method	N ^{er} . sows inseminated	% farrowings	Total births / farrowing	Birth alive / farrowing
Classical	235	82,98	11,95	11,48
Post-cervical 30 cc	236	82,20	11,84	11,07
Post-cervical 15 cc	201	84,08	12,27	11,80
Significance		n.s.	n.s.	n.s.

n.s.: differences not significant

In the test conditions, there are not statistically significant differences among the three insemination systems tested.

6. INDEX OF BIRTHS FOR INSEMINATION.

By calculating result in piglets by insemination, a technical-productive differential valuation of the three alternatives can be done.

Insemination Method	N ^{er} . of Inseminations	N ^{er} . of farrowings	born alive	Total born	Born per insemination
Classical	235	195	2.239	2.331	9.92
Post-cervical 30 cc	236	194	2.148	2.296	9,73
Post-cervical 15 cc	201	169	1.995	2.073	10,31

7. CONCLUSIONS.

- The highest percentage of births is obtained with post cervical 15 cc insemination, 84,08%, improving 1,1 and 1,9 points to classic and post cervical 30 cc.
- The best number of total births by farrowing gets also with the post cervical 15 cc. The differences are 0,32 and 0,43 piglets regarding classical and 30 cc.
- In live births by farrowing, best results correspond to the post cervical 15 cc, improving classical and 30 cc in 0,32 and 0,73 piglets.

With minor differences, best results correspond to the insemination with half a billion sperm and 15 cc. of volume. It's necessary remembered that 10 cc of diluent have to be applied after this technique.

It should be noted that, in any case, **not significant statistically differences** between the three methods of insemination tested.

Reproductive results of fertility, total births, and alive per farrowing delivery are kept although reduced volume and number of sperm dose if uses the post cervical insemination technique.

So therefore can inseminate with 30 cc (1 billion) and 15 cc (500 million of sperm) of diluted semen with post cervical technique getting similar results to the classic insemination with three billion of sperm and 90 cc applied.

Acknowledgements.

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