Inseminate only once: less stillbirths while maintaining reproductive performance

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Ovulation occurs in sows at 70% of the way through oestrus. However, the large individual variation, both in gilts and sows, of the onset of oestrus to ovulation interval limits the possibility to always inseminate close to the optimal time. Thus, careful oestrus detection together with at least two artificial inseminations with a large number of spermatozoa are generally done to obtain high fertility. Sows are inseminated 2-3 times during oestrus over a 12-24 hours interval.

The ability of exogenous GnRH to induce LH release is used to synchronise ovulation both in gilts and sows minimising the variability of the interval between oestrus and ovulation.

Single fixed time AI

MSD Animal Health has developed a single Fixed Time Insemination program (FTI) using a GnRH agonist, buserelin (Porceptal) to be injected 86 ±3 hours post weaning to induce ovulation, followed by a single AI 30-33 hours later.

The aim of this study was to demonstrate the feasibility of implementing a systematic approach for breeding weaned sows by induced ovulation and confirm the safety and efficacy of induced ovulation with Buserelin (Porceptal) followed by single fixed time AI in sows.

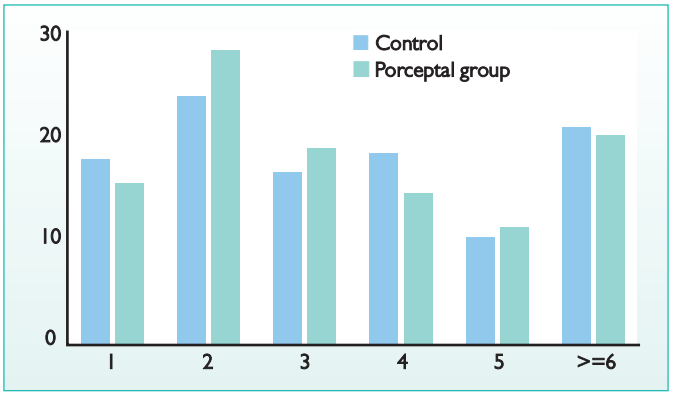

Fig. 1. Parity distribution.

Confirmation that there is no significant change in reproductive parameters compared to the conventional reproductive management is investigated in this trial on a 1000 sow multiplying farm.

Real field conditions

The trial began in August and the details of the farm were:

- 1000 sow farm.
- 100% landrace.
- Farrow to finish unit.
- Two week batch system.
- Weaning at 21 days of age.
- 4-6 days weaning oestrus interval.
- Post-cervical insemination (1.5 billion of spermatozoids).

The structure of the trial was as follows:

- Four batches (202 in total) of weaned (different) parity sows.
- Two groups – P (Porceptal) or C (Control).

Sows were randomised according to:

- Homogeneity of parity and litter.
- Semen to minimise variation between groups.
- Body condition score, wean to oestrus interval and lactation length.

Sows were placed individually in crates and oestrus was checked by a sexually mature boar, using the standing reflex in response to back pressure, twice daily.

In September/October the sows were inseminated and heat checked. Some boars were selected for both groups, and the same worker inseminated and performed heat checks.

- **P group protocol:**

Porceptal= 10µgr Buserelin. Standing reflex as inclusion.

- **Control (C) protocol:**

Based on oestrus behaviour (2 x per day), first insemination ±12 hours after first standing heat, second insemination 12 (±4) hours.

- **Optimised schedule:**

Day 1: weaning at 16.00 -> day 2: Porceptal administrated at 7.00am (86 hours post weaning) - > day 3: insemination at 1.00pm (30 hours post Porceptal administration).

The number of inseminations performed, dates and reference insemination doses of semen were scored.

In addition the following was scored as well: the result of ultrasound diagnosis of pregnancy at 20 and 35 days, repeat with oestrus if it occurred, date of birth and number of piglets born alive. In empty females were discarded ultrasound ovarian cysts the day of diagnosis of pregnancy.

Favourable results

After the treatment in all four batches in the trial, production test data of a total of 202 sows was collected. The data is summarised in Table 1.

Duration of oestrus decreased in a statistically significant manner. With a single insemination in Porceptal

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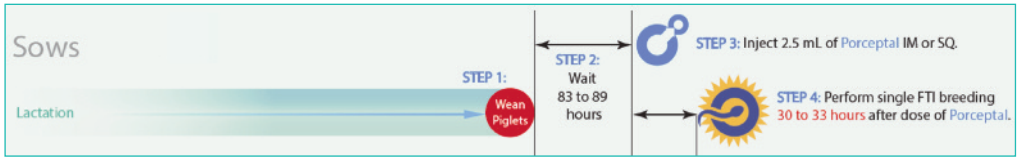
Fig. 2. Protocol for the Porceptal group.



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group versus 2.2 in the control group.

The same production results were achieved in terms of fertility ultrasound, fertility at farrow, total born and total live born.

The number of litters with some stillborn piglet was significantly lower in the Porceptal group than in the control group (29.6% vs 51.2% p <0.001).

Farrowing occurred over a nine day period, from the week before the scheduled time to a week after. It took place between Wednesday to Friday in 92.96% of the sows in the FTI group (Porceptal) vs. 81.25% in the control group ($p<0.05$).

On Wednesday the farrow took place in 70.4% of the sows in Porceptal group, but only 43.7% in the control group (see Fig. 3).

Optimise farm profitability

This system allows breeding once at a fixed time following a buserelin injection while maintaining reproductive performance at a level similar to that of sows bred twice during oestrus.

Homogeneity of piglets will be an important point to evaluate, because fewer boars are used to fertilise a batch.

	Porceptal	Control
Number of sows	100	102
Oestrus length	2.12[a]	2.74[b]
Number of inseminations	1[a]	2.2[b]
Oestrus (%)	84[a]	90.2[a]
Fertility at 21-23 days (%)	90.4[a]	88[a]
Farrowing rate (%)	90[a]	87.9[a]
Litters with still-birth(%)	29.6[a]	51.2[b]
Total live born	11.4[a]	11.8[a]
Total born	12.6[a]	13.4[a]

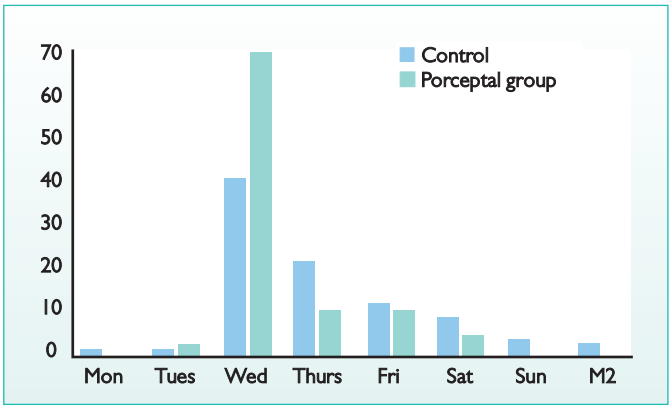
a, b: values with different superscripts in each column represent statistically significant differences ($p<0.001$)

Table 1. Productive results in Porceptal group vs control group.

The significant decreas of the number of litters with stillborn piglets in Porceptal group that may have occurred for several reasons but one explanation is that the distribution we get at birth due to the single insemination is performed, a large percentage of farrows occur in working days (93%) so the attention to these will be more appropriate than those occurring on days where we have specific staff to serve them.

In addition, concentrating the farrowing in a shorter time period facilitates cross-fostering of piglets at birth, which allows creating more homogeneous litters at the beginning of lactation.

Fig. 3. Spread of farrowing during the week.



This in turn leads to more homogeneous piglets at weaning which benefits dietary and health management.

On the other hand the semen doses and the labour are clearly reduced and a standard working protocol is implemented in farms.

The Fixed Time Insemination protocol was demonstrated to be useful for industrialised farms interested in simplifying oestrus management and reduction of cost of semen and labour. ■

References are available from the author on request