



## Mating Technical Module-Semen storage & Insemination.

While there are still producers that prefer to use natural matings the majority of the Australian Pig Industry uses either Artificial insemination (AI) or Post Cervical AI (PCAI) to breed sows. Gene Transfer Centres (GTCs) in Australia that stock PIC Elite Boars supply semen doses to PIC clients. These GTCs are managed and staffed by people with not only exemplary stockskills but they are also highly skilled in processing, storage and transport of semen. GTCs have both internal and third party auditing to ensure semen doses transported to your farm are of the highest quality but this will all come to nothing if semen storage on farm and insemination techniques are not of high standards. In this edition of the Australian Pig Improver we will cover Semen storage and Insemination Technique.

### Semen Management and Storage

Poor semen storage can reduce shelf life and the fertility of the stored semen. There are several points which should be considered to optimise semen fertility duration and storage (Table 2).

**Table 1. Semen doses management recommendations**

Component	Recommendations
<b>Storage Capacity</b>	Semen storage device should be sized for weekly delivery; Storage capacity equivalent to 0.6 L per dose; Batch farrowing systems might require more storage capacity than continuous flows; Two small storage devices instead of one big can mitigate the risk of technical failures; To improve safety, have surge protectors and battery backups in place
<b>Distance from semen fridge to wall</b>	> 2.5 cm
<b>Semen fridge location</b>	In a temperature-controlled shed or room.
<b>Semen fridge maintenance</b>	At least annually
<b>Semen fridge temperature</b>	16 – 18°C; Record maximum and minimum temperature daily or use temperature dataloggers
<b>Semen fridge temperature fluctuations</b>	< 1°C; Every fluctuation > 1°C can reduce semen dose shelf life up to 1 day Semen fridge must be able to heat and cool to maintain the correct temperature
<b>Handling</b>	Store doses loose, unpacked, and horizontal; First in - first out principle: use oldest doses first; Rotate semen doses once a day
<b>Transport to mating shed</b>	Take doses to the mating shed in an insulated container with gel packs to maintain temperature; Have enough doses for maximum 1 hour of inseminations; One-way street; no semen doses from mating shed back to semen storage fridge

## Insemination of the sow

The correct stimulation of the sow (for routine AI), placement of the catheter and hygiene are crucial for a successful insemination. For routine (as opposed to PCAI) stimulation induces contractions of the uterus which transport the sperm cells to the fertilisation site. During a natural mating the boar may inseminate the sow with enough sperm cells to get up to 40 sows pregnant (60-120 billion sperm). During artificial insemination we only use about 2-3 billion sperm which is the minimum amount of sperm for an AI. These low numbers (compared to sperm cells in a natural ejaculate) means that attention to details such as cleanliness and hygiene are very important. In general for routine or cervical AI:

- The contractions of the uterus, draw the semen up from the tube and into the uterus
- To maximise uterine contractions keep boars in front of sows during insemination by using a board, a gate or door. One boar should cover no more than five mating stalls to ensure a strong standing reflex is seen
- “Be the boar” and mimic the behaviour of a boar. While the stockperson is supposed to be imitating the boar in terms of the sexual stimulation of the sow, they shouldn’t be very rough otherwise such “stimulation” will increase the sow’s fear of humans. The stockperson should be firm but gentle at all times; rubbing the sow’s back and underline as well as nudging her in the flank gently with their knee.
- Make sure that the vulva is also as clean and dry as possible; carefully clean the vulva using a disposable paper towel
- Catheters should be handled with care to make sure that the tips don’t become dirty.
- Position the catheter at downward angle so as you insert the catheter through the vulva, it will go forwards and upwards into the vagina, avoiding the entrance to the bladder.
- The catheter should be inserted in one gentle but firm movement; if its pushed in gradually, the sow may react by contracting the cervix. This means that when you’re trying to insert the catheter, the cervix may be partially or fully closed, and the catheter head will not be locked into the cervix.
- Push the catheter gently through the first folds of the cervix. You’ll feel the catheter tip “bump” over the folds. To test if the cervix has engaged the tip, pull back gently and you’ll feel the cervix pulling back as you release the tension on the catheter.
- After ensuring that the catheter is firmly locked into the cervix, push the nozzle of the semen flat pack onto the end of the catheter and make sure that it is attached firmly.
- Quite often, it appears that the semen dose is not moving and then the semen is drawn into the sow quickly. This happens because the cervix has adapted to the catheter and relaxed which allows the semen to flow through. At this time there is some danger of the rigid catheter slipping out from the cervix, and the semen being deposited in the vagina especially if you’re using a hand free system (which allows a stockperson to inseminate several sows at the same time), that forces the catheter into a sharp angle and under pressure. Quite often this is how backflow or leakage occurs. When this happens, the catheter must be re-positioned
- If the sow takes up the semen too quickly drop the angle of the catheter so that it is below the level of the sow’s back for a couple of minutes. This will make sure the semen flows through at a lower rate. If you do get leakage during the insemination make sure that the catheter tip is still locked into the cervix.
- The insemination should take 3-10 minutes.
- When all the semen dose has been drawn in, the catheter can be left in for a short time (about 10 minutes or so) so that all the semen dose can be taken up by the uterus. The open end of the catheter needs to be capped or bent over to stop potential contamination. The catheter should not be left there for long periods of time.

## For PC AI

- There needs to be separately scheduled times for heat detection and insemination as the sows should not be in standing heat at insemination. Time between heat detection and breeding should be less than 2 hours (after 2 hours sows could go back into standing heat if handled)
- Keep it simple, inseminate females once a day
- Inner catheter insertion
  - Has around a 95% success in sows;
  - Wait at least 2 minutes from outer catheter insertion until attempt to insert the inner catheter;
  - Inner catheter should be fully inserted;
  - More challenging in younger parities;
  - If the inner rod does not go in completely do not force the passage; perform routine AI the female with a boar in front, back pressure and a conventional semen dose
- Insemination
  - No stimulation needed; possibility to squeeze the dose;
  - No backflow during the insemination;
  - If backflow occurs check and correct inner rod position;
- Change inner rod if bent or inseminate her using routine AI with a boar in front, back pressure and a conventional semen dose
- Boar stimulation during PC AI is not required
- Boar exposure after PC AI should be provided for 1 hour after insemination and assure all sows are standing up.
- The PC AI process should take no less than 1.5 minutes and no more than 3 minutes

## References

PIC Australia Technical Updates

PIC 2017 Gilt and Sow Management Guidelines

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