

Technical Update

Artificial Insemination

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Artificial Insemination: Estrus Detection and Insemination

Timing is the single most important factor in the successful use of AI - accurate estrus detection is the key. The following points should be followed in order to optimize accuracy of heat detection:

- Heat detection should concentrate on serviceable gilts (i.e., gilts that are old enough) and weaned sows (ideally daily from weaning).
- Carry out ½ hour after feeding and again as near to the end of the day as possible
- Use an old chatty boar that produces plenty of saliva. Restrict movement of the boar by using boards/gates or a second member of staff. A vasectomized boar may be used, particularly in the group situation.
- Nose to nose contact is essential when carrying out the back-pressure test during heat detection
- Nosing of flanks may be of benefit
- As the timing of AI in relation to ovulation is so important, and the timing of ovulation is so variable, it is preferable to conduct twice daily heat detection. Where this is impracticable (due to unit size or staffing levels) once a day estrus detection done well is better than twice a day with little attention paid to detail.
- The housing should facilitate boar exposure but restrict nose to nose contact (which may lead to habituation and refraction)
- Boars should be housed at least 3-4 feet away from the females.
- Walk along the rear end of the sows with the stockmen 3-4 sows behind the boar, observing the behavior and response of the sow.
- Sows/gilts should receive short intense periods of exposure to a mature boar in order to exhibit a “standing reflex”
- When the female is exposed to the boar, both “back pressure” and stimulation (rubbing underline and flanks should be carried out.

Visible Preheat Signs

Some or all of these signs may be visible

- restlessness
- climbing
- loss of appetite
- watery discharge
- bar biting
- grunting, honking whining
- color of the vulva may be cherry red and heavily swollen.

Standing Heat

Some or all of these signs may be visible during standing heat.

- pricked ears
- loss of appetite
- standing reflex
- arched back
- trembling
- glazed eyes
- tail upright and flicking up and down
- mucus discharge from vulva
- reddish pink, lightly swollen vulva
- positive response to the “back pressure test”
- Average duration: 1-2 days per gilt; 2-3 days per sow

Timing of Insemination

- Ovulation timing which is variable appears to correlate with the weaning to estrus interval, and the duration of estrus, occurs 36-48 hours after the onset of estrus in most animals, (range 24-72 hours).
- Checking only once per day will reduce the accuracy of detecting the onset of heat.
- Eggs survive for up to 6-8 hours in the oviduct.
- Sperm should be in the reproductive tract in advance of ovulation allowing for capacitation time. They should be ready and waiting. This is though to take 6-8 hours.
- Sperm remain viable in the uterus for at least 24 hours.

- If heat detecting twice per day, aim to inseminate 12-18 hours after the first signs of standing estrus.
- If heat detecting once per day, aim to inseminate immediately, with a second insemination 18-24 hours later.
- On a nucleus herd using pure AI (i.e. single sire matings) aim to inseminate three times in a 24 hours period.
- the length of standing estrus per farm / per line or by genetics will vary and so each farm should measure it's own standing heat.
- Remember each animal is an individual and should be treated as such.

Insemination Technique

The insemination technique is not difficult, although it requires practical training and a degree of patience. Each sow should be treated as an individual, being offered gentle handling and the appropriate level of stimulation to optimize sperm transport.

- Move the boar to the front of 2-3 estrus females for stimulation. If the female has to be moved, be gentle-avoid stress
- Move a large, chatty, smelly old boar to the estrus female
- Change the boar frequently (very important to avoid boredom and reduce stimulatory effect).
- Use the boar to determine that the female is in standing heat, before the commencement of insemination
- Identify correct female
- Wash hands or wear gloves
- Clean vulva with a dry paper towel, if necessary
- Apply back pressure and rub underline to pre-stimulate.
- Take catheter from a sealed bag (make sure that the bag is resealed to avoid any contamination).
- Apply a non-spermicidal lubricant (KY-jelly, semen or extender) to the head of the catheter.

Gently part the lips of the vulva and gently insert the catheter into the vagina pushing forwards and upwards. This should be carried out gently to minimize stress and damage.

For Spirette-type Catheters:

- Once the catheter has entered 2-3 inches, the catheter should be rotated counter clockwise until resistance is encountered- the catheter will now be positioned in the cervix.
- Continue to rotate counter clockwise until "spring back" is felt - this is a "lock". Gently pull back on the catheter until it is possible to feel resistance as the walls of the cervix hold the catheter in place.
- If a "lock" is not achieved, it may be necessary to remove the catheter and start again. A new catheter should be used.
- Once the catheter is locked in place, rotate the catheter a quarter of a turn clockwise. This will allow semen to flow into the cervix.
- Collect the semen from the storage container (leave bottle in storage until the last possible moment to avoid temperature fluctuations or exposure to sunlight). Semen should be stored at 17°C (63°F)- 15°C, max 18°C.
- Check correct label on the semen bottle
- Resuspend the semen by gently rotating the bottle.
- Continue stimulation of the sow by pulling on her flanks at this stage.
- Cut the tip off the bottle and attach to the stem of the catheter
- Lift the catheter and gently apply pressure to the bottle to fill the length of the catheter and begin semen infusion.
- Avoid heavy pressure as this will force the semen out through the vulva and be wasted.
- Sit on the back of the sow or apply back pressure and rub the underline for stimulation. This will cause the female to release oxytocin.
- A normal service will last from 5-10 minutes; gilts taking longer
- Constant boar and inseminator stimulation must take place throughout the insemination process
- Continue to apply gentle pressure on the semen bottle. When the bottle is 2/3 to 3/4 empty it may be helpful to put a hole in the base of the bottle. This will allow air to enter at the top of the bottle and ease the flow of semen into the female. Or, point the bottle in an upright position and open the bottle or break the seal to release pressure.

- To ease the flow of semen or to minimize the leakage it may be necessary to rotate the catheter either clock / counterclockwise.
- Once the bottle is completely empty, allow time for the catheter to empty.
- Do not force air down the catheter by applying pressure on the empty bottle.
- The catheter can now be removed by rotating the catheter in a clockwise direction.
- The first insemination is now complete.
- Aim to serve the female at least twice while on “standing heat”
- If the female is not standing do not force an insemination
- It is essential that a new catheter is used for each individual insemination in the interests of hygiene

Note: With the development of new semen packaging technology, the standard

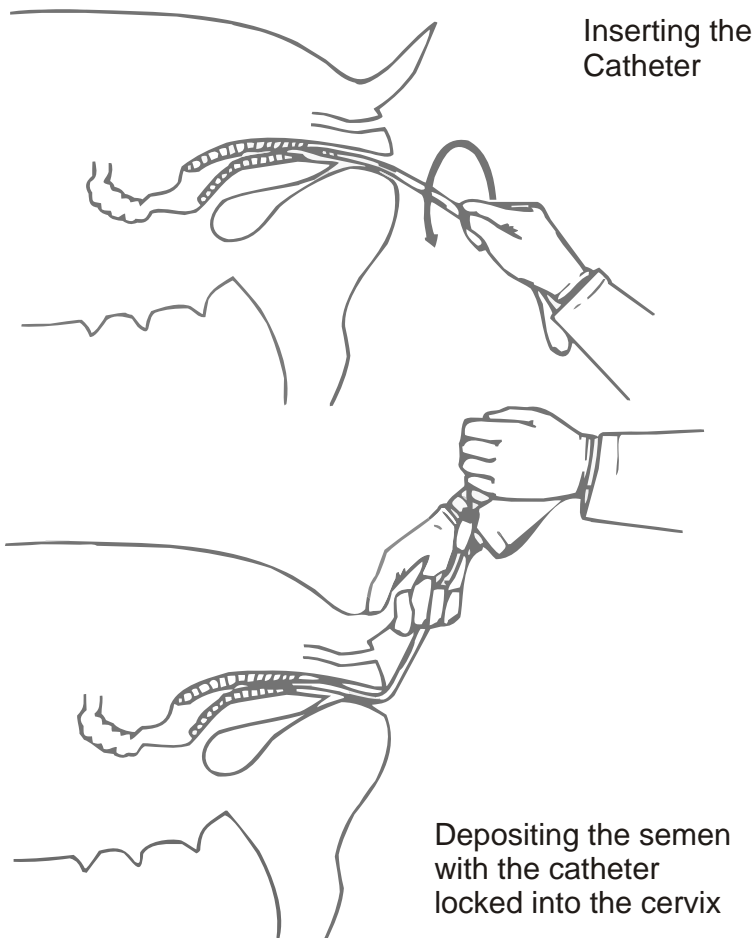
insemination bottle is replaced by a sachet. The technique is almost the same, although the sachet is much more flexible and collapses as it empties.

Scoring of an Insemination

Score the insemination based on the following scale:

standing reflex:	1 - poor
	2 - some movement
	3 - little or no movement
lock:	1 - no lock
	2 - loose lock or when the lock tends to slip
	3 - consistent tight lock
leakage:	1 - heavy leakage
	2 - some leakage or odd spurts
	3 - little or no leakage

Inseminating a Sow



By scoring each service with a value from each of the categories above, it will be possible to evaluate the service routine in order to improve the timing of insemination. E.g, a sow may receive the following scores:

1st service	223
2nd service	333
3rd service	333

This would indicate that the 1st service was possibly too early, and that the last service may still be significantly before ovulation.

E.g., a sow may receive the following scores:

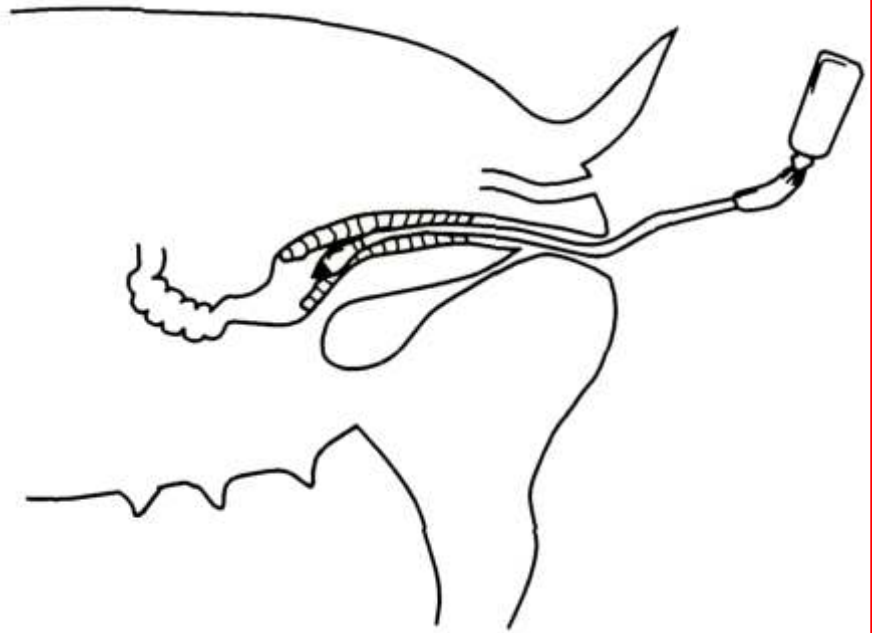
1st service	333
2nd service	222
3rd service	122

This would indicate that the timing of the insemination was too late.

To be able to make worthwhile comparisons all inseminators should score at the same level, and a single inseminator should carry out all services for that female during that heat cycle. Of course in reality this will not happen.)

Procedure for using a Golden Pig Catheter*

- The Golden Pig Catheter consists of a long plastic tube with a polystyrene bulbous shaped tip
- Use the same procedure as for the spirette with regards to cleaning and insertion
- Once inserted the Golden Pig is designed for a push fit
- Push the catheter firmly into the cervix
- The polystyrene will allow the bulbous head to run over the spiral walls of the cervix before becoming "locked"
- This type of catheter forms a good seal and is unlikely to enter the bladder due to the shape of its head.



- The Golden Pig is ideal for the beginner.

(The Golden Pig Catheter is produced by IMV)

Pointers for Successful Heat Detection Based on twice per day heat detection)

