

## Artificial Insemination in Pigs

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<https://doi.org/10.5281/zenodo.7377755>

### Introduction

Pig is a domesticated animal that can survive and produce under adverse husbandry practices. Farmers reared pigs mainly for meat purposes and as a main source of income. There is a huge gap in the demand and supply of pork and pork product. The use of artificial insemination will improve pig production. Artificial insemination (AI) is a reproductive technique in which semen is collected from the male, processed in the laboratory and deposited into the female reproductive tract through a catheter or cannula. AI with liquid-stored boar semen showed farrowing rates greater than 90% and litter sizes reaching  $\geq 12$  piglets born alive (Rodríguez-Gil and Estrada, 2013). AI in pigs covered more than 90% in many countries (Waberski, Riesenbeck, *et al.*, 2019). However, In India, hardly 1-2% of pigs are bred through AI (Singh and Mollier, 2020). The most common site of insemination in the pig is the cervix. Intrauterine AI is also reported with good results; however, intrauterine AI has certain limitations due to the difficulty of intrauterine catheter insertion in gilts.

### Advantages of AI

- Introduction of superior genes in the sow herd
- Disease control
- Cost-effectiveness
- Less stress on gilt/sow (can use larger boar on smaller gilts)
- Avoid inbreeding due to repeated use of the same boar in natural mating
- Reduce the number of boars needed on a farm
- Better record keeping in farm

## **Disadvantages of AI**

- Cryopreserved semen decreases fertility
- Higher level of management
- Need a trained person for collection, semen preservation, processing and insemination
- Equipment needed
- Time/Labor

## **Estrus detection**

Estrus is the primary indicator for timing AI. Regular estrus detection at the farm with the help of boar aids in correct and accurate heat detection. The average length of the estrus cycle is 21 days. The duration of estrus in sow is 3-4 days. Ovulation occurs at mid-late estrus. After weaning the sow may return to heat for 4–6 days. Sows are checked for estrus once a day and gilts twice a day. Gilts should be bred 12-24 hours after detection of heat and again 12 hours later. Sows should be bred 24-36 hours after detection of heat, and again 12 hours after the first insemination. Estrus detection relies on the behavioral sign of estrus.

## **Behavioral signs of estrus**

- Standing to be mounted by the boar
- Lordosis reflex/ back pressure test, when back-pressure given
- Boar-seeking activity in group-housed sows
- Swollen redish vulvar lips and a thin mucous discharge
- Depressed appetite, restlessness, alertness, pacing, grunting, and chomping of the jaws



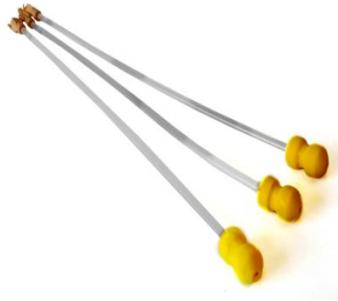
**Fig.1: Back pressure test**



## Catheters used in pig AI



Spiral Tip



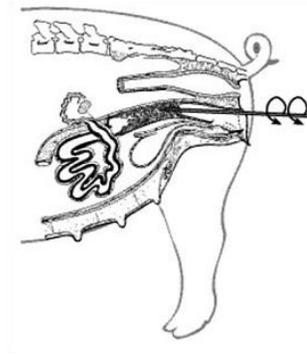
Foam Tip



Intrauterine

## Procedure of AI in pig

- Detect the sow/gilt is in standing heat. Don't breed the sow/gilt which is not in standing heat
- Clean the vulva to remove urine and feces so that no dirty material is introduced into the reproductive tract when the AI catheter is inserted.
- Lubricate the tip of the AI catheter (approximately 50–60 cm in length) with a non-spermicidal gel and insert it into the vagina at an angle of 30° for passage into the cervix while rotating counter-clockwise in case of spiral tip (Figure .2).

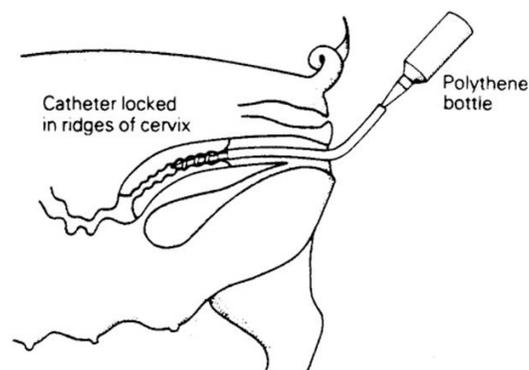


**Fig.2. Counter-clockwise rotation to insert the spirette or catheter into the cervix (spiral tip)**

- Lock the catheter in the cervix, the semen pouch is then fitted to the catheter. With a foam tip just slide it (exerting some pressure) into the cervix until it locks.
- Deposit a total volume of 70–100 ml semen (1.3–4 billion sperm cells) into the cervix using gravity and apply gentle pressure over a 3 to 4-minute period.



- For intrauterine AI, an inner rod is passed into the uterine body through the outer rod locked into the cervix and semen doses with 1–2 billion sperm cells extended in a reduced volume of 40–50 ml semen is deposited using pressure in only a few seconds.
- Simultaneously rub the flank and underlying region to stimulate the female to suck semen into the uterus.
- Once inseminations have been made, remove the catheter clockwise in the first case (spiral tip) and pulled softly outward in the others (foam tip).



**Fig.3. AI in pigs**

## **Conclusion**

The use of AI in pigs will increase the pig population. AI with freshly liquid-stored semen has been shown good fertility and is widely used in the world.

## **References**

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