

Cutting-edge artificial insemination technique improves breeding success and animal welfare

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A trans-cervical-insemination pipette entering the cervical opening

The Reproduction Clinic of the Onderstepoort Veterinary Academic Hospital (OVAH) at the University of Pretoria's Faculty of Veterinary Science, uses video-endoscopy, an innovative method for transcervical artificial insemination (AI) of female dogs. This technique, which uses frozen-thawed semen to breed dogs with great success, avoids the use of surgical AI under general anaesthesia. This not only improves fertility with frozen semen AI but importantly, reduces risk to the animals and in turn, contributes to improved animal welfare.

The use of frozen semen to breed has become a relatively common procedure. Freezing semen not only ensures the preservation of excellent genes and making these available for use in future generations, it also allows the desired genes to be safely moved to and from international destinations.

Although the technique of freezing dog semen was first described in 1954, initial AI results where this frozen-thawed semen was used were poor. This is because after thawing, the sperm can only survive for 12 to 24 hours within the reproductive tract of the female dog. This is a short period compared to the seven days fresh semen that can survive for. However, since the early days of using frozen dog semen, research has improved vastly. These developments have improved the way semen is frozen and thawed, enhanced its AI and allowed breeders to determine the best time for this insemination to achieve optimal fertility.

Survival of the sperm inside the female reproductive tract is of utmost importance. Female dogs are receptive. They allow mating for several days, but only ovulate towards the end of this receptive period. In addition, at the time of ovulation the oocytes (eggs) have to undergo further development over approximately two days before fertilisation is possible. As sperm in fresh semen can survive for up to seven days, this is rarely a major problem. If frozen semen is used, however, the frozen-thawed sperm have a reduced lifespan. It is therefore critical to determine the optimal time of insemination to ensure fertilisation of the eggs will occur.

At the Reproduction Clinic of the OVAH, qualified specialists in veterinary reproduction regularly monitor the reproductive cycle of the individual female dog. They use a combination of both clinical techniques and testing blood samples to measure progesterone (a hormone secreted by the ovaries) levels. This allows for the optimal timing of AI; it creates the best possible chance of pregnancy.

As frozen-thawed sperm only survives for a limited time, the once thawed semen has to be deposited directly into the uterus, bypassing the cervix, to obtain the best results. Previously, this was mostly achieved by performing abdominal surgery.

“Surgical AI requires general anaesthesia of the female, making an incision into the abdominal wall, locating and exteriorising the uterus and injecting the semen into the lumen of each horn,” said Dr Susan Fouche, specialist in veterinary reproduction at the OVAH.



Dr Susan Fouche (left), Sr Nicolien Fourie (right) and a few final year students busy inseminating a female Labrador with the safer video-endoscopy AI technique.

“Artificial insemination preferably needs to be performed on two consecutive days to maximise the chances of the bitch conceiving and to ensure a large litter size,” she said.

This is far from ideal because both general anaesthesia and abdominal surgery are risky for the female dogs. The risks increase if repeated on successive days. This is where the Reproduction Clinic’s innovative technique comes in.

“A rigid video-endoscope is used to perform a transcervical insemination”, Dr Fouche explained.

“The scope is passed through the vulva into the vagina to locate the cervix visually using the video camera, and this allows a flexible pipette to be passed through the cervix directly into the body of the uterus. The frozen-thawed semen is then deposited through the pipette into the body of uterus, from where it flows up both horns to the uterine tubes (fallopian tubes) where fertilisation takes place.

“We perform the transcervical insemination on two consecutive days, and our success rate (for both conception rate and litter size) compares favourably to that of surgical AIs, with the great benefit that the need for and risks associated with general anaesthesia and surgery is removed completely,” she said.

If you are interested in having your female dog inseminated using this method, please contact the Reproduction Clinic on 012 529 8273.

- Author OVAH
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