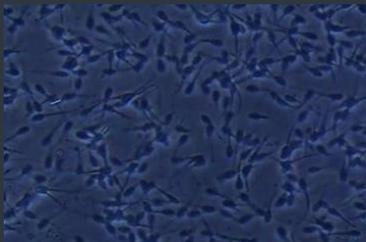


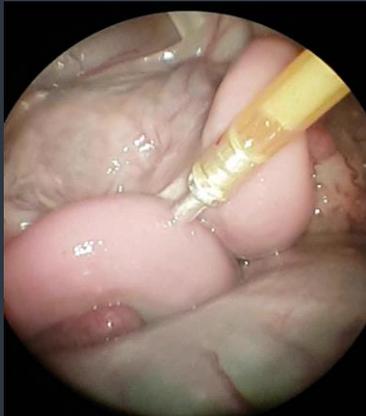
Estrus Synchronization



Semen Evaluation



Lap Insemination



The ARS Team



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Artificial insemination (AI) has been practiced in farm animals since the early 1900's. Originally it was a development based on excess and opportunity, as it quickly became clear that an ejaculate contained sufficient sperm to impregnate tens of females, not just one. Further developments with impact on AI in all domestic species included the ability to synchronize the estrus cycle of females and the ability to freeze semen (1950's). These developments were truly instrumental for AI to become very popular, as they allowed scheduling multiple females to be inseminated together and the ability to inseminate females located in a different area code than the male (i.e. different region or country). However, in the farmed deer and other small ruminant species, frozen semen AI didn't become a successful technology until the late 80's when laparoscopy became available. Frozen semen requires to be deposited in the uterus to achieve high pregnancy rates. With the traditional cervical AI approach it is difficult, many times not possible, to pass the cervix and deposit the semen in the uterus. Consequently, cervical AI with frozen semen can end with frustrating results (low pregnancy). Laparoscopic insemination (LapAI) allows bypassing the cervix and depositing the semen deeply into each horn, thereby resulting in high pregnancy rates (70-90%). Moreover, LapAI is instrumental for taking advantage of semen sexing technology, as the process of sex-sorting usually ends with semen straws with fewer and more damaged sperm that need a "facilitated path" to the site of fertilization.

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LapAI in Deer

by

Dr. Hernan Baldassarre

Why do LapAI?

There are certain advantages of AI in general and some that are specific of Lap AI respect of other methods of AI (vaginal-cervical). In the [general advantages](#) we have:

- **More progeny from valuable males:** by natural mating a buck may cover up to 50 does, while through frozen semen you could have thousands of fawns born per year from your elite buck.
- **Accelerated Genetic Gain:** By needing fewer males it allows been more selective with the males that will sire your next generation of animals.
- **Breed your does to superior bucks without the cost and responsibility of owning the bucks:** Bucks hurt themselves and/or die all the time, just buy semen.
- **Extend the reproductive life of a male beyond its life:** honestly if you own a valuable male, it is suicidal not to have a large number of straws of frozen semen in the tank. Best insurance ever!
- **Genes without borders:** Buy or sell semen from/to different regions and countries, no need to move the animal, just ship the semen.
- **Facilitates crossbreeding:** some deer crosses may be of commercial interest (e.g. whitetail x mule deer), but they don't naturally mate at good rates.

- **Disease control:** AI with semen collected from males tested free of disease is an excellent method to control dissemination of diseases during the breeding season.
- **Other:** It also allows for better record keeping, out-of-season insemination and conservation of rare and endangered wild species.

There are also some advantages that are Specific of LapAI:

- **Lower insemination dose:** Because semen is deposited deep in each uterine horn, the number of sperm required is less than with cervical AI. This has allowed splitting semen straws and inseminating multiple does with one straw, a practice that reduces the cost per head. However, to be successful at splitting, you need an experienced eye to assess the sperm concentration and motility for each straw (that determines how many ways you can split) and the use of specially formulated extender to expand the volume while enhancing sperm motility.
- **Sexed semen:** As mentioned before, the excessive manipulations associated with sex-sorting semen, results in semen with lesser concentration, motility and half-life compared to conventional frozen. With LapAI we can deposit the semen closer to the oviduct, thereby facilitating the job of “debilitated sperm” such as sex-sorted sperm.
- **Full visual of the reproductive tract:** During laparoscopy, we can assess the reproductive organs of the doe and this makes the process more efficient. For example, the ovaries can be visualized to determine if the animals have responded properly to the synchronization protocol and that LapAI is being conducted at the right timing (i.e. around the time of ovulation). On the other hand, we can assess the tone (also a good indicator of response) and the health of the uterus. The latter is important because if the female has a uterine condition (e.g. infection) we can treat her with antibiotics and recover her for breeding at a later time, and save the cost of the semen by not inseminating a female that can't get pregnant with a uterine infection.

For all of the above it is very important to work with an experienced team of veterinarians such as the ARS-team.

There are a few disadvantages of LapAI that need to be considered.

The main disadvantage is the need to conduct the procedure under general anesthesia, which is a life-risk since occasionally animals may have adverse reactions and stop breathing. However, our standard procedures are set to mitigate and minimize the probability of having deaths resulting from anesthesia. On the one hand, we work with anesthetic compounds and doses that have been tested in large numbers of deer. Second, we always conduct LapAI with at least 2 professional veterinarians onsite, experienced in detecting early signs of respiratory problems and capable of teaching the farm team how to detect and quickly react to such signs. We carry reversor drugs and keep them ready to inject during procedures. We provide the farm team with comprehensive training and instructions on how to conduct the 24 hour (minimum) fasting of the animals as well as the post-op monitoring to ensure minimum incidence of regurgitation during procedure and a fast and controlled recovery, including slow and step-wise return to eating and drinking.

Maximizing pregnancy results and minimizing problems require animals in good health and body condition, executing the estrus synchronization program with high attention to detail, excellent preparation of the animals prior to LapAI (manage without stress, good execution of fasting recommendations) and excellent post insemination management. Written and detailed instructions are provided to the clients at the time of signing the LapAI contract. Remember, your role in the preparation of the animals and execution of these instructions are as important as our part inseminating them. **So, we count on you as much as you count on us!**

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