A.I. Technique in Cattle

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The recto-vaginal technique is the most commonly used method to artificially inseminate cattle. The basic skills required to perform this technique can be obtained with about three days practice under professional instruction and supervision. Additional proficiency and confidence will be achieved with further work on your own.

The first step in the insemination process is to restrain the animal to be inseminated. There are several things to keep in mind when choosing a location for inseminating cattle including:

- *Safety of both the animal and the inseminator.*
- *Ease of use.*
- *Shelter from adverse weather.*

Regardless of whether you are left or right handed, it is recommended that you use your left hand in the rectum to manipulate the reproductive tract and the right hand to manipulate the insemination gun. This is because the rumen or stomach of the cow lies on the left side of the abdominal cavity, displacing the reproductive tract slightly to the right. Thus, you will find it much easier to locate and manipulate the tract with your left as opposed to right hand.

A gentle pat on the rump or a soft-spoken word as you approach for insemination, will help to avoid startling or surprising the animal. Raise the tail with your right hand and gently massage the rectum with the lubricated glove on your left hand. Place the tail on the back side of your left forearm so it will not interfere with the insemination process. Cup your fingers together in a pointed fashion and insert your hand in the rectum, up to the wrist.

Gently wipe the vulva with a paper towel to remove excess manure and debris. Be careful not to apply excessive pressure, which may smear or push manure into the vulva and vagina. With your left hand make a fist and press down directly on top of the vulva. This will spread the vulva lips allowing clear access to insert the gun tip several inches into the vagina before contacting the vaginal walls. Insert the gun at a 30º upward angle to avoid entering the urethral opening and bladder located on the floor of the vagina. With the gun about 6 to 8 inches inside the vagina, raise the rear of the gun to a somewhat level position and slide it forward until it contacts the external portion of

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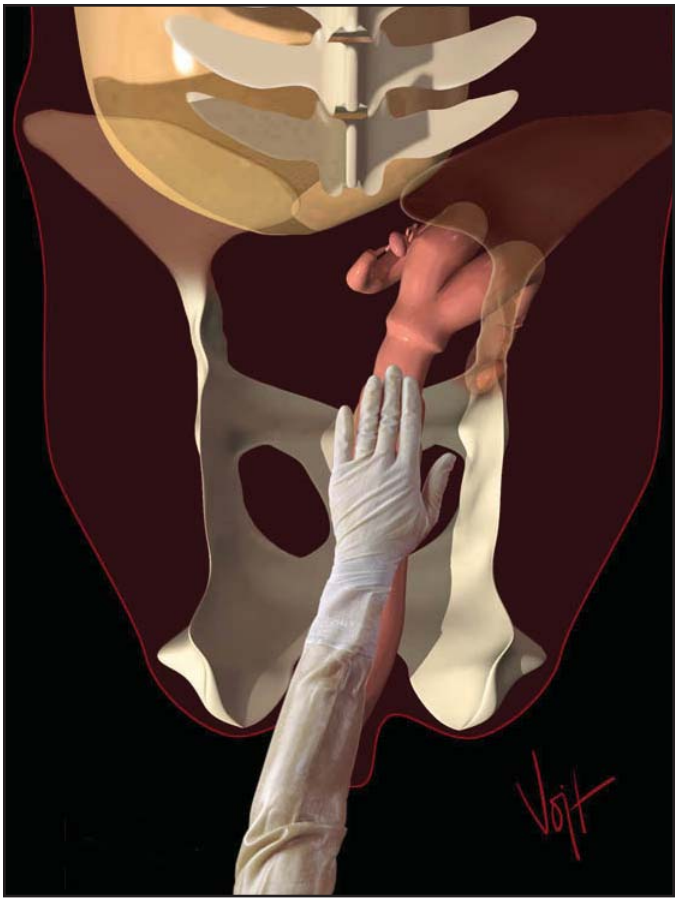
- *Be gentle. Don't use too much force.*
- *Insemination is a two-step process. Get the gun to the cervix, and then place the cervix over the gun.*
- *Deposit the semen just through the cervix into the uterine body.*
- *Take your time.*
- *Relax.*



Because the rumen displaces the reproductive tract to the right, it is much easier to locate and manipulate the tract with your left hand.

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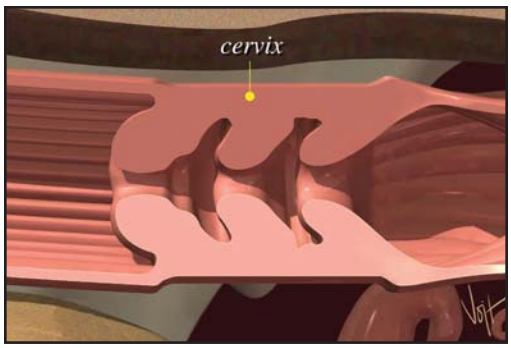
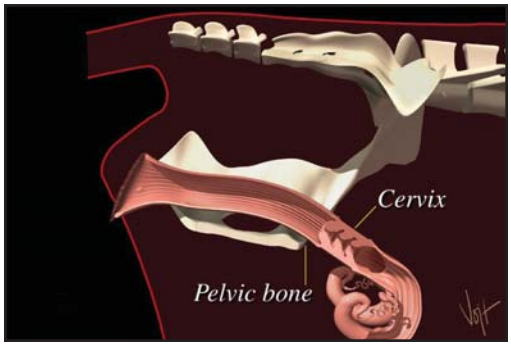
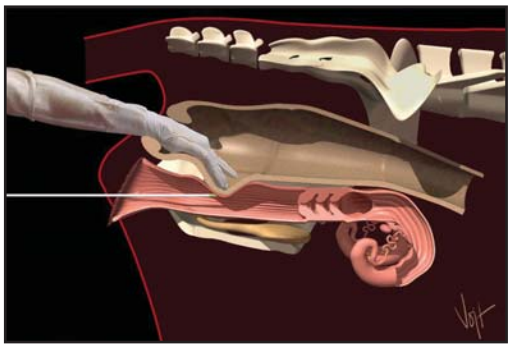
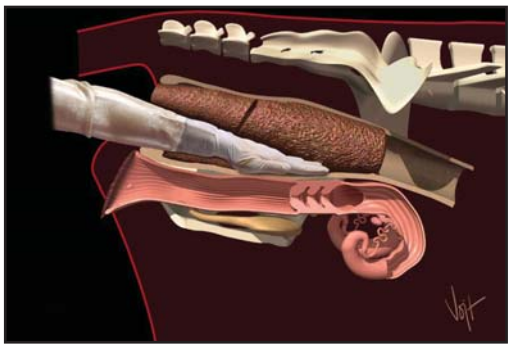


The opening into the cervix protrudes back into the vagina.



The cervix is located on the floor of the pelvic cavity near the anterior end of the pelvic bone.


As you insert the breeding gun into the vagina, keep your gloved hand even with the gun tip.


Keep your open hand flat against the floor of the rectum, allowing manure to pass over the top of your hand and arm.

the cervix. You will note a distinct gristly sensation on the gun when it contacts the end of the cervix.

The cervix, consists of dense connective tissue and muscle and is your primary landmark for inseminating cattle. It has often been described as having the size and consistency of a turkey neck. The size will vary, with post partum interval and age of the animal. The cervix usually has three or four annular rings or folds. The opening into the cervix protrudes back into the vagina. This forms a 360º blind-ended pocket completely around the cervical opening. This pocket is referred to as the fornix. In most cows, the cervix will be located on the floor of the pelvic cavity near the anterior end of the pelvic bone. In older cows with large reproductive tracts, the cervix may rest slightly over the pelvic bone and down into the abdominal cavity.

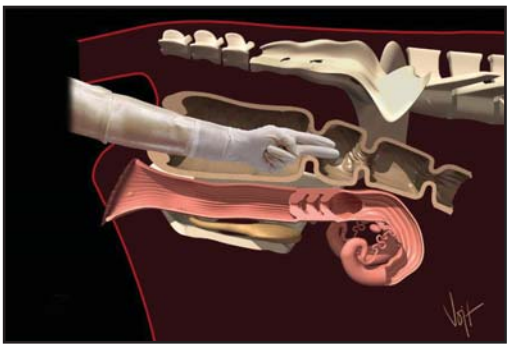
To become a successful inseminator it is very important that you always know where the tip of the insemination gun is located. The walls of the vagina consist of thin-layered muscle and loose connective tissue. The insemination gun can be easily felt with your palpating hand. As you insert the breeding gun into the vagina, keep your gloved hand even with the gun tip.

Manure in the rectum can often interfere with your ability to palpate the cervix and gun tip. However, it is seldom necessary to remove all the manure from the bowel. Instead, keep your open hand flat against the floor of the rectum, allowing the manure to pass over the top of your hand and arm.

While handling the cervix you may notice rectal constriction rings attempting to force your arm from the cow. To relax these rings, place two fingers through the center of a ring and massage back and forth. The constriction ring will eventually relax, pass over your hand and arm, and you can continue the palpation process.

Because the reproductive tract is freely movable, cows that have strong rectal and abdominal contractions in response to being palpated may actually push their reproductive tract back into the pelvic cavity. This will cause many folds to form in the vagina. In such cases, the insemination gun will often get caught in these folds and little or no progress will be made until they are removed. If you can locate the cervix, grasp it and push it forward. This will straighten the vagina and the gun should pass freely up to the cervix. If you cannot locate the cervix, encircle the gun tip with your thumb and forefingers. With a straightening motion of your wrist, gently "milk" the folds out of the vagina a little at a time. Slide the gun forward and repeat the process until the cervix is reached.

At this point it is important for you to understand that inseminating a cow is a two-step process. The first step is to get the gun tip to the cervix. To accomplish this you must work the vagina and cervix forward, away from you to straighten the vaginal folds. If you do not feel the gristly sensation of the cervix on the gun, you are still in step one of the process.


To relax rectal constriction rings, insert two fingers through the center of the ring and massage back and forth.

Once the gun is in contact with the external surface of the cervix you are ready to begin step 2. In step 2, you place the cervix on or over the insemination gun. That's

right, the cervix is placed on the gun, the gun is not passed through the cervix. Excessive movement or probing with the insemination gun during the second step is seldom productive and in fact, is very often counterproductive. Ground gained is often lost and we find ourselves back in a vaginal fold. The key to mastering step 2 of the insemination process is to know how to hold and manipulate the cervix and concentrating on doing the work with the hand inside the cow, not the one holding the gun.

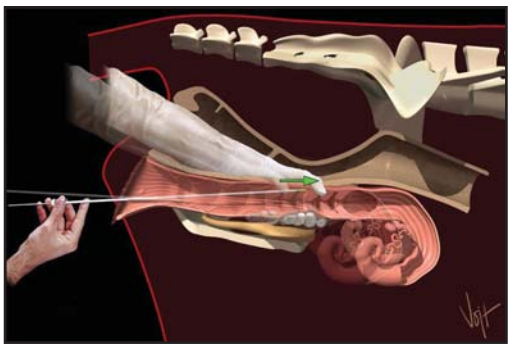
When the gun first contacts the cervix, you will usually find that the tip is in the fornix directly over top of the opening. Grasp the external opening to the cervix with the thumb on top and forefingers underneath. This closes the fornix at top and bottom. As in step 1 we must still know the location of the gun tip. This is accomplished with the palm and third and fourth fingers of your palpating hand. Use your palm and these two fingers to guide the gun tip to the cervical opening located between your thumb and forefingers.

With gentle probing the opening should be located. You will feel the gun slide forward until it contacts the second cervical ring. Maintain gentle but steady forward pressure on the gun and slide your thumb and forefingers just in front of the gun tip and re-grasp the cervix. Because the cervix is composed of dense connective tissue and muscle, it is difficult to clearly distinguish the gun tip when it is located within this structure. However, you can determine the approximate location by bending the cervix. Using the flexibility of your wrist, twist and bend the cervix until you feel the second ring slide over the gun tip. Repeat the process until all the rings have been passed over the gun tip. In some cases, it may be necessary to bend the cervix at a 90º angle to clear the cervical folds. Remember, you are placing the cervix over the gun, not the gun through the cervix.

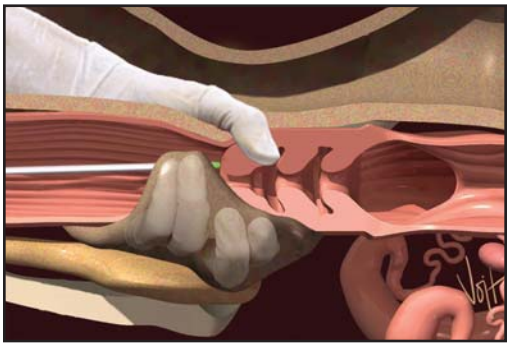
A slight jiggle or "give-and-go" of the gun may sometimes be necessary to help pass by a fold, but for the most part gentle forward pressure is all that is necessary and gun movement should be minimal.

When all rings of the cervix have been cleared, the gun should slide forward freely with little resistance. Since the uterine wall is very thin, you will once again be able to clearly feel the insemination gun. You are now ready to check your placement and deposit the semen. Rotate your gloved hand until it lies on top of the cervix. With your index finger, locate the far end of the cervix. Pull back on the gun until you feel the tip directly underneath your finger near the internal opening of the cervix. Raise your finger and slowly deposit the semen. Push the plunger slowly so that drops of semen fall directly into the uterine body.

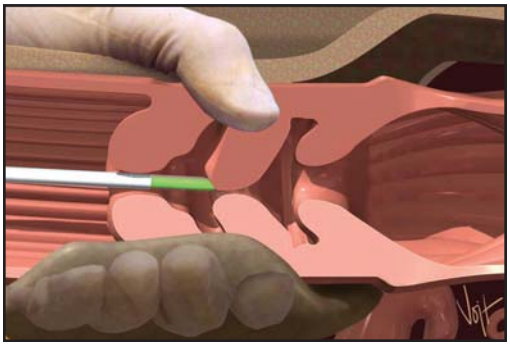
With proper A.I. technique and gun placement, semen will be deposited in the uterine body. Uterine contractions will then transport spermatozoa forward to the horns and oviducts with a good distribution of both



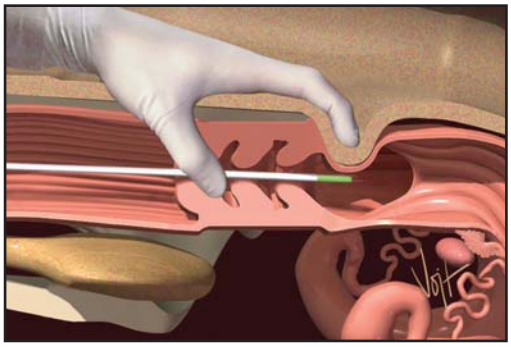
Grasp the cervix and push it forward to straighten vaginal folds.



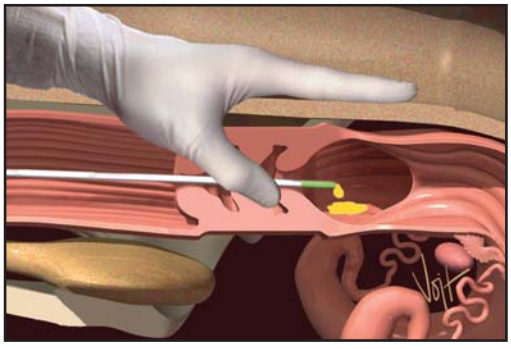
Grasp the external opening to the cervix with the thumb on top and the forefingers underneath to close the fornix and guide the gun tip into the cervix.



Using the flexibility of your wrist, twist and bend the cervix until you feel the second ring slide over the gun tip.



Use your index finger to check gun placement (1/4 inch past the end of the cervix) before depositing semen.



Push the plunger slowly so that drops of semen fall directly into the uterine body.

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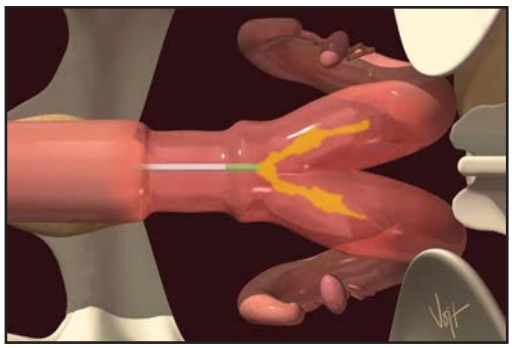
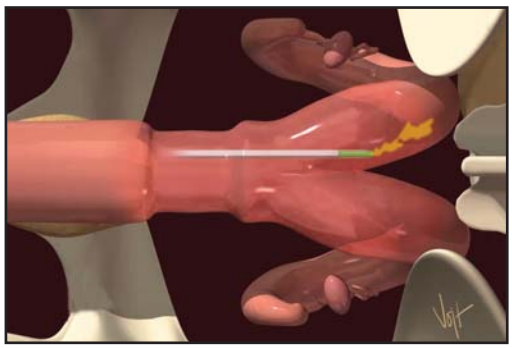
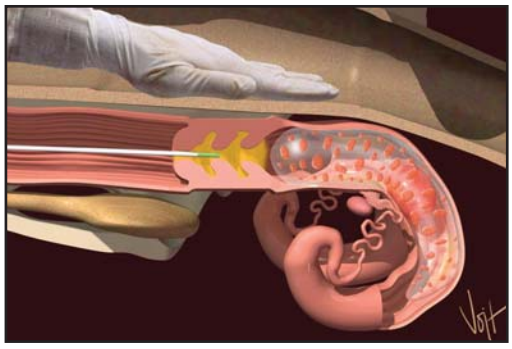


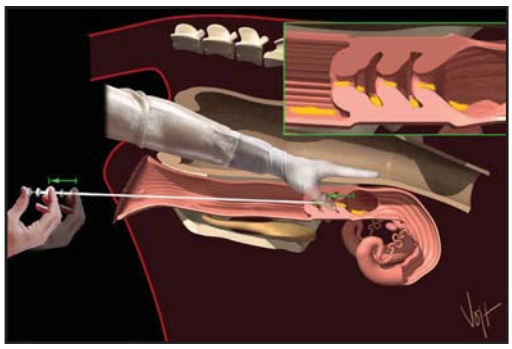
With proper A.I. technique and gun placement, semen will be deposited in the uterine body and contractions will transport spermatozoa forward to the horns and oviducts.



If the gun is more than 1 inch through the cervix, all the semen will be deposited into only one horn.



If you encounter cervical mucous which feels thick and sticky on the gun in a cow that has been previously inseminated, she may be pregnant. In this case, deposit the semen halfway through the cervix.



Make sure you push in with the plunger and do not pull back on the gun. Pulling back may result in much of the semen dose being deposited in the cervix and vagina.

sides. When the insemination gun is more than 1" through the cervix, all the semen will be deposited in only one horn. This creates a situation of uneven semen distribution. Should the animal ovulate from the opposite horn, conception rates may be compromised.

Be sure to raise your finger after checking gun placement. Not doing so may obstruct one horn, again creating a situation of uneven semen distribution. When checking gun tip placement, be careful not to apply excessive pressure. The delicate uterine lining is easily damaged, predisposing the cow to uterine infections and reduced fertility.

Make sure you push in with the plunger and do not pull back on the gun. Pulling back may result in much of the semen dose being deposited in the cervix and vagina instead of the uterine body.

Although the recommended site of semen deposition is in the uterine body, research suggests that when exact gun tip placement is in doubt, depositing semen slightly into one uterine horn is less likely to compromise fertility than cervical deposition. However, If the cervical mucous of a cow which has been previously inseminated feels thick and sticky on the gun, she may be pregnant. In this case deposit the semen about halfway through the cervix.

After properly depositing semen, slowly pull the gun from the reproductive tract. Remove the gloved hand from the rectum and shake off the excess manure. Check the gun tip for signs of blood, infection or semen leakage inside the sheath. Make notes for your veterinarian or future reference where appropriate. Remove the sheath from the gun and hold it in the gloved hand. For the final time, check to confirm which bull you have used. Remove the glove starting at the top of your arm by turning it inside out as you remove it. Remove air from the glove and tie a knot at the open end to trap manure, the sheath and dirt inside. Dispose of the used glove in a proper receptacle. Wipe the gun clean and dry and return it to the proper storage location.

Some of the most important aspects to remember when inseminating a cow to attain maximum breeding efficiency are:

- *Be gentle. Don't use too much force.*
- *Insemination is a two-step process. Get the gun to the cervix, and then place the cervix over the gun.*
- *Deposit the semen just through the cervix into the uterine body.*
- *Take your time.*
- *Relax.*

Correct insemination procedures will result in better breeding efficiencies. More selection pressure can then be placed on economic traits such as milk and beef production enabling you and your family to realize a higher return on your semen investment dollars. ◆

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