



Dairy production Level

NTQF Level -II

Learning Guide 47

Unit of Competence: Assist dairy animal breeding procedure

Module Title: Assisting dairy animal breeding procedure

LG Code: AGR DPR2 M12 L05 LG 47

TTLM Code: AGR DPR2 TTLM 0919v1

LO 2: Select dairy animal for breeding



Instruction Sheet	Learning Guide 47
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This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Preparing the necessary materials and equipment for insemination
- Preparing animals for insemination.
- Performing AI procedure and Consulting

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Prepare the necessary materials and equipment for insemination
- Carrying out heat detection based on the standard signs
- Prepare animals for insemination.
- Perform AI procedure and Consulting

Learning Instructions:

1. Read the specific objectives of this Learning Guide 47.
2. Follow the instructions described in number 1 to 7.
3. Read the information written in the “Information Sheet (**1, 2 and 3**) in page **2, 5 and 7** respectively
4. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
5. Accomplish the “**Self-check 1, 2 and 3**” in page, **4, 6 and 14** respectively.
6. If you earned a satisfactory evaluation proceed to “Operation Sheet 1 in page 15 and 3 and 4 in page 18 respectively.
7. Do the “LAP test” in page 16 (if you are ready). Request your teacher to evaluate your performance and outputs. Your teacher will give you feedback and the evaluation will be either satisfactory or unsatisfactory. If unsatisfactory, your teacher shall advice you on additional work.

Information sheet-1

Preparing the necessary materials and equipment for insemination

Artificial insemination is the technique which semen with living sperm is collected from the male and introduced in the female reproductive tract at proper time with the help of instruments. This has been found to result in a normal offspring. In this process, the semen is inseminated into the female by placing a portion of it either in a collected or diluted forms into the cervix or uterus by mechanical methods at the proper time and under most hygienic conditions.

The most important materials that used to carry out insemination process include:

- Full hand Gloves: - is important to keep your hands clean and protects the cow from some infection and diseases
- Insemination gun /AI Rod/:- is used to implant the semen into the cow or heifer.
- Semen Straws: - straws contain valuable semen
- Liquid nitrogen Containers:-This refrigerator contains all of your valuable semen that you need to A.I. your cow or heifer. This bottle also contains liquid nitrogen. Never set the refrigerator directly on a cement floor; always have cardboard or carpet under it because the cement wears away the shell of the tank.
- Thermos flask: - is equipment that can hold warm water and keep the water for long time to be warmed.
- Scissors or Cito Cutter- Used to cut the melted end of the straw off. It gives you a square cut so that you can see the straw more secure into the sheath
- Tweezers- It is an easier way to get the straws out of the goblets and it also makes it quicker.
- Cotton Glove- A cotton glove is used to protect your hand when you get the semen out of the liquid nitrogen refrigerator.
- AI Sheath- Snap the straw of semen into the sheath at this end Leave the straw sticking out for about 1 inch. The sheath then goes over the A.I. Rod for cleanliness



- Semen Straws- These straws contain valuable semen

Personal protective equipment (PPE): any material that gives protection against hazard or risk while conducting a given activity.

Personal protective clothes and equipment May include but not limited to:

- Boots
- Overalls
- Gloves
- Sun protection (sun hat, sunscreen)

Heat (Estrus) is a fairly well-defined period that occurs in non pregnant cows once each 19 to 23 days, in other words estrus is the time during which the female will accept the male for copulation or breeding. A time when the animal shows estrous signs or when shows the need to be served by bull or artificially.

Sign of heat

- mounting other cow
- Mucus discharge from vulva
- Swelling and reddening of vulva
- Standing to be mounted
- Frequent urination, tail rising and shaking
- Sniffing genital
- Decrease feed intake and milk yield
- Frequent bellowing, restlessness and trailing





Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What are important materials used for Performing AI (5 points)
2. Define AI (5 points)

Note: Satisfactory rating - 10points Unsatisfactory - below 10 points
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

1. _____

2. _____



Information sheet-2	prepare animals for insemination
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The essential information while preparing female animal includes identity of cow, dates of observed oestrus, dates of mating or insemination, pregnancy/non-pregnancy tests (e.g. progesterone assay and/or manual pregnancy diagnosis), date and result, date of calving and milk production.

Under herd conditions farmers should be advised to observe cows for heat signs at least three times in a day (20 minutes of visual observation each time: morning, afternoon and late evening). This should be done at times other than during feeding and milking. It may be conveniently done during communal grazing.

Body condition at calving and at the subsequent insemination influence the interval from calving to first estrus and also conception rate, and are therefore important. Farmers should aim to have cows in a condition score between 2.5 and 3.5 (based on a scale of 1-5) and to minimize loss of score between calving and insemination. Cows that are too fat at calving are likely to have calving difficulties and are more prone to early foetal death. Cows which are too thin, especially if they are losing condition, will have delayed estrus and poor conception rates. Cows should be at least 42 days after calving before they are served again. For high yielding cows a longer period may be necessary to obtain good conception rates and to reduce embryo and early fetal losses.

The cow should be in good health. Specifically, she should be free of any evidence of infection of the reproductive tract. Particular attention should be paid to cows that have had abnormal calving (e.g. dystocia, retained placenta and prolapsed of the uterus), as they may require a longer period after calving for involution of the uterus and to return to normal fertility.



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. How to prepare animals for insemination (5 points)

Note: Satisfactory rating - 10points Unsatisfactory - below 10 points
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

1. _____



Information sheet-3	consulting AI technical for artificial insemination when required
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Procedure of AI

Step #1: Restrain the animal to be inseminated.

There are several things that should be kept in mind when choosing a location for inseminating cattle. Some of these include safety of both the animal and the inseminator, ease of use, and shelter from adverse weather. A gentle pat on the animal's rump or a soft spoken word as the inseminator approaches will help to avoid startling or surprising the cow.

Step #2: Raise the tail with the right hand and gently massage the rectum with the lubricated glove on the left hand.

Place the tail on the back side of the left forearm so it will not interfere with the insemination process. Cup the fingers together in a pointed fashion and insert the left hand in the rectum, up to the wrist.

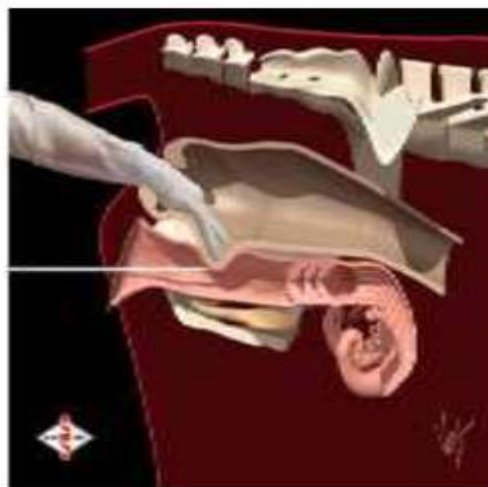


Fig 1. Ways depositions of semen

Step #3: 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 the 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.

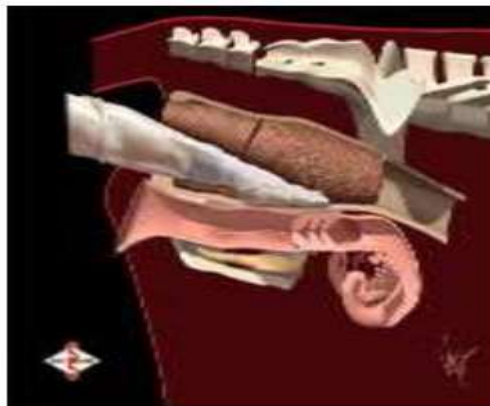


Fig 2. Way of hold cervix

Step #4: Insert the gun at a 30° 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.



Fig 3. Inserting hand through vulva

To become a successful inseminator, it is very important to 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 the left hand in the rectum. As the breeding gun is inserted into the vagina, keep the gloved hand even with the gun tip. Manure in the

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

- 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 can get caught in these folds and little or no progress will be made until they are removed.
- If the cervix can be located, grasp it and gently push it forward.
- This will straighten the vagina and the gun should pass freely up to the cervix.
- The inseminator will note a distinct gristly sensation on the gun when it contacts the cervix.

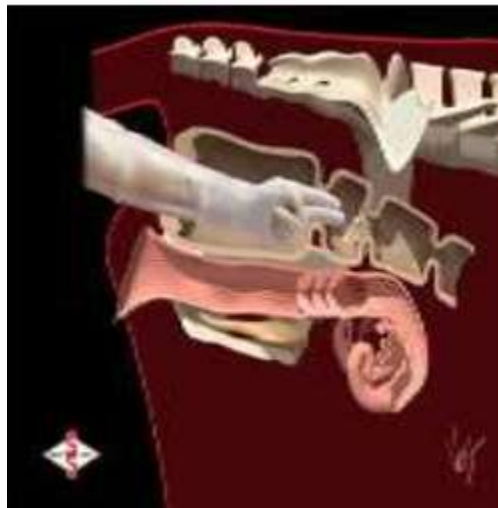


Fig 4. Using two fingers to control AI gun

The cervix consists of dense connective tissue and muscle and is the primary landmark for inseminating cattle. The cervix usually has three or four annular rings or folds. The opening into the cervix protrudes back into the vagina.

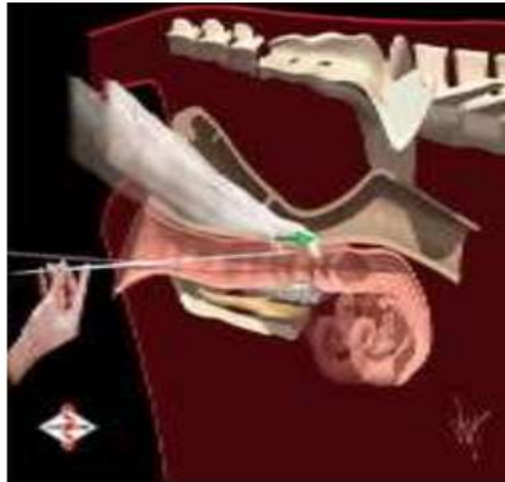


Fig 5. Way of using AI gun

Try to access when the pipette passes the last cervix ring

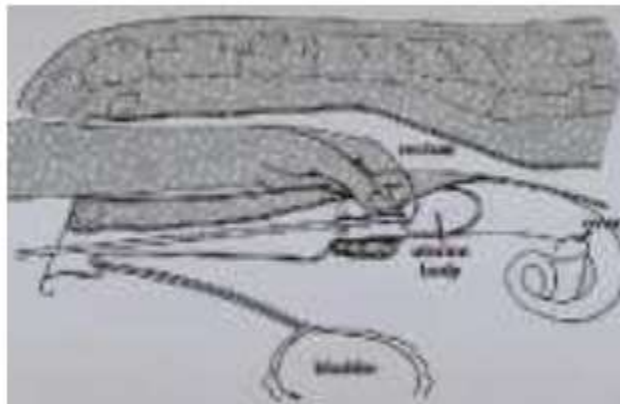


Fig.6 position of cervix and uterus

Step #5: Once the gun is in contact with the external surface of the cervix, the inseminator is ready to begin threading the cervix over the end of the gun.

- Place the cervix on or over the insemination gun; the gun is not passed through the cervix.
- Excessive movement or probing with the insemination gun during this step is seldom productive.
- The key to mastering this step of the insemination process is knowing 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, the inseminator will usually find that the tip is in the fornix area directly over the top of the opening of the cervix.

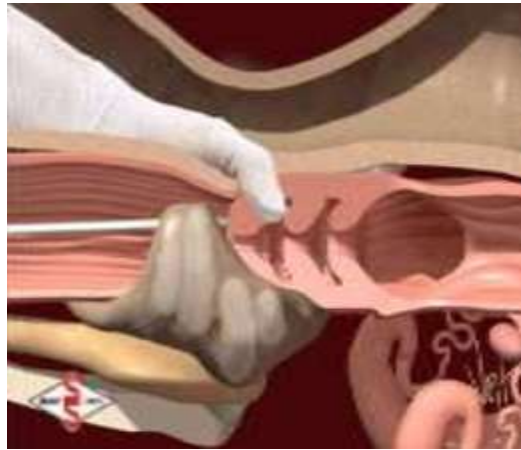


Fig 7 maintaining AI gun

Step #6: Maintain gentle but steady forward pressure on the gun and slide the 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.

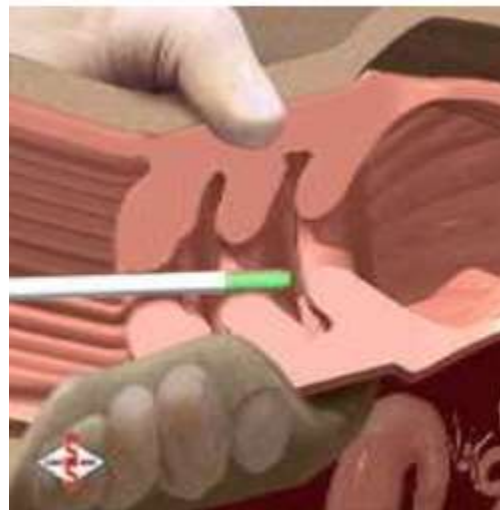


Fig 8. Semen deposition

Step #7: It is now time to check the gun placement and deposit the semen.

- ✓ Rotate the gloved hand until it lies on top of the cervix.
- ✓ With the index finger of that hand, locate the far end of the cervix. Pull back on the gun until the tip of it is directly underneath the index finger near the internal opening of the cervix. Raise the finger and slowly deposit the semen. Push the plunger slowly so that drops of semen fall directly into the uterine body.



Fig 9. Uterine body

Step 8: With proper AI 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 sides.
- ✓ When the insemination gun is more than 1 inch through the cervix, all the semen will be deposited in only one horn.
- ✓ Be sure to raise the index finger after checking gun placement. Not doing so may obstruct one horn, 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, potentially causing infections and reduced fertility.



Fig 10. Distribution of the semen to both uterine horns.

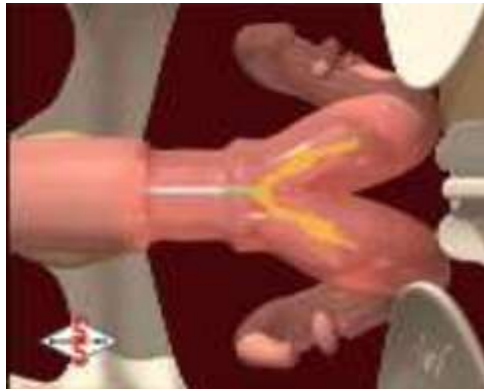


Fig 11. Horn of uterus

Step # 10: After properly depositing semen, slowly pull the gun from the reproductive tract. Remove the gloved hand from the rectum. Check the gun tip for signs of blood, infection or semen leakage inside the sheath.

Disposable materials

- ☞ Full arm glove
- ☞ AI sheath
- ☞ Semen straw
- ☞ Clean paper



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. what are disposable materials (5 points)

Note: Satisfactory rating – 5 points Unsatisfactory - below 5 points
You can ask you teacher for the copy of the correct answers.

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

1. _____



Operation Sheet-1	Performing insemination
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Procedures

1. Check identity of cow
2. Check thermos temperature
3. Select semen not close to cow
4. Place straw in thermos for 15 second
5. Clean straw by tissue paper
6. Cut the plug at the end of straw
7. Put the straw in the insemination gun sealed end first
8. Push the plunger of insemination gun until the semen is visible
9. Keep the insemination gun in your hand or between your teeth
10. Clean the vulva
11. Put your hand in the rectum and remove manure
12. Locate the cervix and uterus with your hand in the rectum
13. Grasp the cervix with your hand and straighten any vaginal folds that encounter with tip of gun
14. Open the cervix in the center if not opened
15. Pass the gun in the cervical folds
16. the gun Slip forwards easily and reach uterine body
17. make sure the semen is deposited in the uterine body



LAP Test	Practical Demonstration
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Name: _____ Date: _____

Time started: _____ Time finished: _____

Instructions: Given necessary templates, tools and materials you are required to perform the following tasks within 1 hour.

Task 1. Artificial insemination





Reference

The Proceedings of National Workshop on Research and Development Strategies for Goat Enterprises in Nepal (Eds. Gurung T.B., Joshi B.R., Singh U.M., Paudel K.P., Shrestha B.S., Rijal K.P. and Khanal D.R.), NARC, Kathmandu, April 2013.(316 page)

Robinson, J. J. 1982. Pregnancy.pg. 114-116 Inl. E. Coop (ed.) Sheep and Goat Production, vol. C1, Elsevier Scientific Pub. Co.: Amsterdam, Netherlands.

