



Cornell University
Cornell Center for Animal Resources and Education

CARE554.01 Performance of Bovine Tissue Biopsies

The intent of this Standard Operating Procedure (SOP) is to describe methods to be followed when performing tissue biopsies in research cattle. This procedure is intended for use by investigators and their staff who have received approval to collect tissue biopsies from research animals. This procedure is approved by the Cornell Institutional Animal Care and Use Committee (IACUC) and the Cornell Center for Animal Resources and Education (CARE). Any exemption must be approved by the IACUC prior to its application.

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1. Introduction

Performing a tissue biopsy has the potential to result in pain, infection, hemorrhage, &/or delayed healing. This SOP defines standard practices to minimize risk and pain when performing tissue biopsy in cattle.

2. Materials

- a. Medications
 - Antibiotic (e.g. ceftiofur or penicillin G).
 - Sedative/analgesic (e.g. xylazine).
 - Local anesthetic (e.g. lidocaine or bupivacaine).
- b. Procedural supplies
 - Clippers
 - Antiseptic soap (e.g. chlorhexidine scrub or betadine scrub)
 - Antiseptic rinse solution (e.g. chlorhexidine solution, betadine solution, or 70% alcohol).
 - Sterile gloves
 - Biopsy device (e.g. Tru-Cut; trocar and biopsy forceps).
 - Scalpel
 - Wound closure material (e.g. suture, needle driver ±surgical staples).

3. Procedures

a. Pre-Operative Care

- i. Administer antibiotic (e.g., ceftiofur at 1.1-2.2 mg/kg) pre and post-biopsy.
- ii. Administer analgesic (e.g. flunixin meglumine @1.1-2.2 mg/kg IV) prior to biopsy.
- iii. Administer sedative (e.g., Xylazine at 0.02-0.03 mg/kg IV) prior to surgery if the animal shows signs of nervousness or discomfort.
- iv. Shave the surgical area and remove hair.
- v. Wash area with antiseptic soap or iodine and water. Scrub the biopsy area starting at the incision site and working progressively towards the margins of the shaved area.
- vi. Remove the antiseptic soap by wiping with a sterile gauze or spraying 70% ethanol solution.

NOTE: Iodine & chlorhexidine compounds require 5 minute contact time for proper antimicrobial activity. Thus, a non-soap based chlorhexidine or iodine solution should be used to rinse the area if the antiseptic soap is not allowed 5 minutes of contact time.

- vii. Administer local anesthetic (e.g., 10-30 mL of 2% Lidocaine SQ) in the area where the incision will be made.

b. Biopsy Procedure

- i. Use aseptic technique:
 - Wash hands
 - Wear sterile gloves and designated protective clothing
 - Do not touch non-sterile surfaces or objects
- ii. Confirm that the level of sedation is adequate.
- iii. Make a small dermal incision to allow biopsy tool access.
- iv. Obtain tissue biopsy.

c. Wound Closure

- i. If deep tissue layers were dissected manually or via a trochar, each layer must be sutured separately.
- ii. Repair the dermal incision (sutures or surgical staples).

d. Post-Operative

- i. Document details of procedure in animal's medical records.
- ii. If animal was under general anesthesia for biopsy procedure, keep under close supervision until it fully regains reflexes.

- iii. Separate the animal from the group and maintain under observation for several hours after biopsy.
- iv. Examine surgery site daily for healing and complications.
- v. Monitor feed intake and body temperature at least once a day for 1 week.
- vi. Remove skin sutures or staples 10–14 days post-biopsy. If no abnormalities are observed, stop daily monitoring.
- vii. Document post-operative activities in animal's medical records.

4. Safety

- Observe SOP 711 for sharp precautions.
- Observe CARE SOP 707 for animal-related injuries.
- Observe CARE SOP 715 for personal protective equipment.
- Refer to CARE - OH&S - Zoonoses webpage for zoonotic information specific cattle.

5. Contingencies

In the event of an emergency or post-operative complications contact CARE or CVM Large Animal Ambulatory Unit veterinarian and the PI.

6. References

- SOP 711 Sharp Precautions:
<http://www.research.cornell.edu/care/documents/SOPs/CARE711.pdf>
- CARE SOP 707 for animal-related injuries:
<http://www.research.cornell.edu/care/documents/SOPs/CARE707.pdf>
- CARE SOP 715 for personal protective equipment:
<http://www.research.cornell.edu/care/documents/SOPs/CARE715.pdf>
- Veterinary Drug Handbook, 5th ed., DC Plumb, 2005.

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