VIRGINIA TECH

UNIVERSITY VETERINARIAN & ANIMAL RESOURCES

SOP: Blood Collection in Cattle

These SOPs were developed by the Office of the University Veterinarian and reviewed by Virginia Tech IACUC to provide a reference and guidance to investigators during protocol preparation and IACUC reviewers during protocol review. They can be used as referenced descriptions for procedures on IACUC protocols. However, it is the sole responsibility of the Principal Investigator to ensure that the referenced SOPs adequately cover and accurately represent procedures to be undertaken in any research project. Any modification to procedure as described in the SOP must be outlined in each IACUC protocol application (e.g. if the Principal Investigator plans to use a needle size that is not referenced in the SOP, simply state that alteration in the IACUC protocol itself).

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I. Procedure Summary and Goal

Describes procedures for blood collection via the jugular vein in cattle.

Considerations

Refer to SOP: *Cattle Restraint* for methods of restraint

Handlers should be vigilant at all times so as to avoid injury to animals or themselves.

a. Head butting and arc of swing
b. Being caught between animal and solid structure, (e.g., a wall, fence, chute)
c. Avoid being kicked or stepped on:
    i. Front foot pawing
    ii. Hind foot swings forward and back out to the side ("cow kick")

II. Personal Protective Equipment (PPE) and Hygiene

a. Ensure appropriate PPE is used to protect handler from accidental injury or exposure to blood and other body fluids, such as:
    i. Scrubs or coveralls
    ii. Steel-toed shoes or boots
    iii. Optional
        a. Disposable gloves (e.g., latex, nitrile)
        b. Eye protection
    iv. Other PPE as required by protocol/facility
b. Hands should be washed and/or gloves changed between animals; if vacutainer hubs used, ideally, they should be disinfected between barns or other animal holding areas.
c. Promptly dispose of used sharps in the provided leak-proof, puncture resistant sharps container.

III. Supply List

a. Blood collection vials (e.g., syringes, vacutainer tubes)
b. Needles (18 gauge X 1.5 inch) or vacutainer needles and hub
c. Restraint (e.g., halter, squeeze chute)
d. Clippers (optional)
e. Antiseptic
f. Gauze

IV. Detailed Procedure

a. Restrain animal in squeeze chute, halter and secure lead to the stanchion with a quick-release knot (Figure 1) with head elevated and jugular vein exposed.

b. Clip (optional) and swipe with antiseptic gauze to remove superficial dirt and debris. This may also assist in visualizing raised vein.

c. Occlude jugular vein by applying pressure at the base of the jugular groove and visualize raised vein (Figure 2).

d. With bevel up, insert needle firmly into skin and into vein at 20° angle (Figure 2).

e. If using vacutainer, once needle inserted, stabilize needle and push the vacutainer tube into hub. If you have hit the vein, blood will flow freely into tube. Multiple tubes can be filled by removing filled tube and replacing with fresh tube.

NOTE: Do not pull needle out of vein with vacutainer tube still attached as this will release vacuum in vacutainer.

f. If you have missed the vein, carefully reposition needle, with vacutainer attached, until vessel penetrated. Vessel is fairly deep and may roll away from needle. Typically no more than two to three attempts should be made at a time to minimize distress to the animal and potential damage to the vein.

g. Alternately, you can use needle and syringe. Break the seal on the syringe by gently pulling back before using. Clear air, and with needle attached to syringe, insert firmly needle at 20° angle, and aspirate syringe to confirm insertion and collect blood (Figure 3).

h. Once collection complete, remove vacutainer tube, then, applying pressure over injection site, remove needle.

i. Dispose of needle in approved Sharps container.

j. In order to ensure adequate hemostasis, apply pressure with gauze for 30 to 60 seconds.

k. Serial samples can be taken by alternating sides, and by moving insertion sites cranially, as long as there is no hematoma formation.

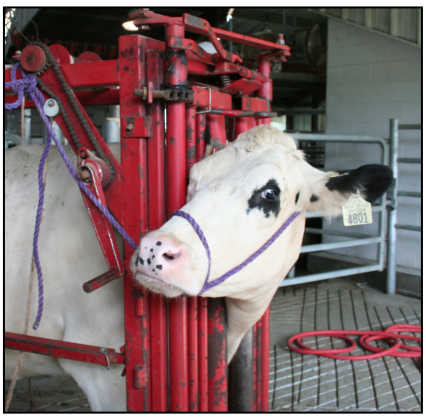

Figure 1. Pull Head to the Side, and Secure Lead with Quick Release Knot

Figure 2. Occlude Jugular Vein by Applying Pressure at Base of Jugular Groove and Insert Needle

Figure 3. Aspirate Syringe to Collect Blood

V. Variations

Blood can be collected via the coccygeal vein (Figure 4).

1. Restrain animal.
2. Raise the tail vertically until it is horizontal to the ground.
3. Locate the groove lying in the ventral midline of the tail.
4. Swab the site with antiseptic.
5. Midway along the body of a coccygeal vertebra, insert the needle perpendicularly to the surface of the skin to a depth of a few millimeters.
6. Withdraw blood sample and remove needle.
7. Dispose of needle in approved sharps container.
8. In order to ensure adequate hemostasis, apply pressure with gauze for 30 to 60 seconds.

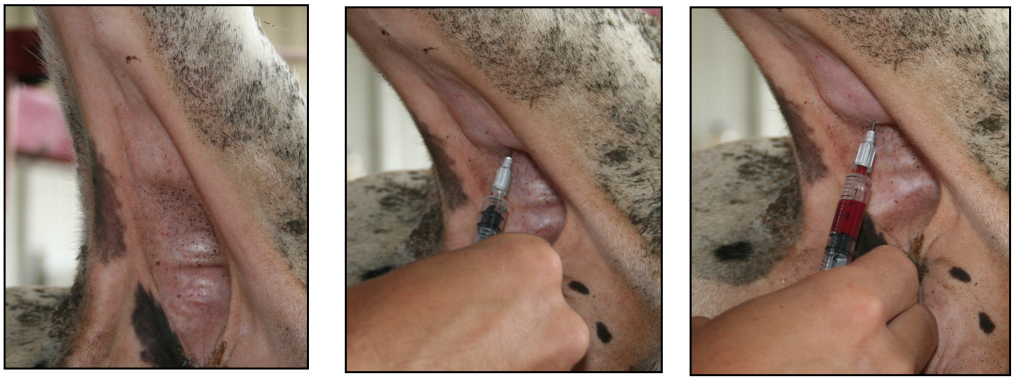

Figure 4. Collecting Blood via the Coccygeal Vein

VI. Potential Adverse Effects, Mitigation, or Treatment

a. Hematoma or thrombus
   i. Enter vessel at an angle of 30 degrees or less
   ii. Use a gauge of needle smaller than the vein
   iii. Apply pressure until bleeding has stopped (1+ minutes)

b. Pain at blood collection site
   i. Use a needle of smaller gauge than the vein
   ii. Practice on vein models prior to live animal

c. Infection at blood collection site
   i. Use sterile single-use devices only
   ii. Clean work surfaces with disinfectant

iii. Wear gloves, wash hands

iv. Contact a qualified veterinarian for treatment recommendations if any of the following are noted.

a. Heat, pain, swelling first noted at the insertion site of the blood draw, purulent material draining from the insertion site.

b. Induration (hardening) of the vessel

c. Pyrexia, local or systemic infections, septic shock

VII. References

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