



Standard Operating Procedure: Bovine Intramuscular Injection

These SOPs were developed by the Office of the University Veterinarian and veterinarians at the VMCVM 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 or instructional activity. 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).

Table of Contents

I.	Procedure Summary and Goal	2
II.	Personal Protective Equipment (PPE) and Hygiene	2
III.	Supply List	2
IV.	Detailed Procedure	2
V.	Variations	3
VI.	Potential Adverse Effects, Mitigation, or Treatment.....	4
VII.	Suggested Literature Search for Pain Category D and E Procedures.....	4
VIII.	References	4

I. Procedure Summary and Goal

Describes procedures for intramuscular injections in cattle.

Considerations:

Having a basic knowledge of the animal's behavior is important in safe and humane handling. When approaching a cow, assess the cow's reaction and adjust accordingly. Use appropriate level of restraint.

Intramuscular injection requires an understanding of anatomical landmarks as well as precise technique.

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.
- b. Always wash your hands after handling an animal.

III. Supply List

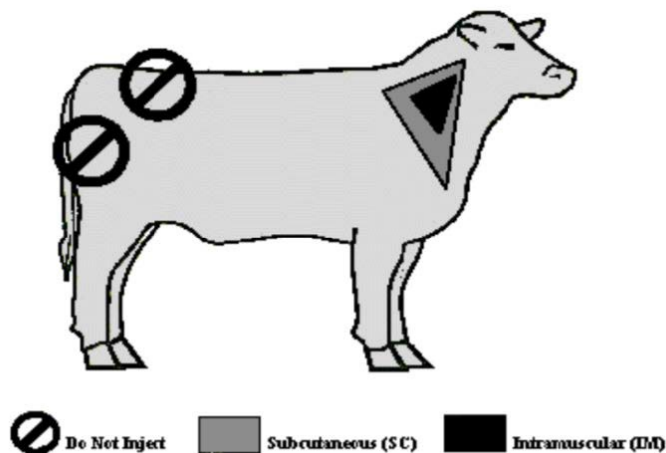
- a. Proper restraint
- b. Needles (16-20- gauge 1-1.5 inch)
- c. Syringe
- d. Small square of gauze (alcohol soaked)

IV. Detailed Procedure

- a. Restraint
 - i. Adequate restraint of cattle prior to injection is necessary to decrease the risk of injury to the animal or the human involved. Appropriate restraint will depend on the size of the animal, the disposition of the animal, and the type of injection. Appropriate restraint is defined as restraint sufficient that the animal is held well enough that the operator can safely approach and administer the injection and that the animal is not injured by the restraint or the injection. Anticipate how a cow could respond to an injection and assure yourself that the animal's reaction to the injection will not lead to the injury of yourself or others.
 - ii. See the OUV SOP on Cattle Restraint for further details.
- b. Needle Selection
 - i. 1. Injection needles are available in varying lengths and diameters (gauges.) The larger the gauge, the smaller the diameter of the needle. Use the largest gauge needle (thinnest) that the injected substance will pass through and that will not bend or break during injection. Typically, a 16- or 18-gauge needle that is 1 ½ inches long is used for IM injections in cattle weighing over 500 pounds. Injection needles suitable for calves under 500 pounds are typically 18- or 20-gauge and 1 inch long.
 - ii. Only needles with aluminum hubs should be used as they are less likely to break on injection than needles with plastic hubs.

c. Injection site selection

- i. All injections should be given in the neck. Never inject into the top butt or top of the rump. Inject cranial to the scapula, dorsal to the spine and ventral to the nuchal ligament.



Subcutaneous and Intramuscular injection sites. Image from <https://goo.gl/jkEx9q>

d. Site Preparation

- i. Use the alcohol-soaked gauze to clean the area you intend to inject.

e. Volume of injection

- i. Do not exceed 10 cc at any intramuscular injection site

f. Injection

- i. A new, unused needle should be rapidly placed into the site at a 90-degree orientation to the skin, the injection administered, and the needle quickly removed.
 1. The needle may be placed in the muscle without the syringe attached.
 2. Alternatively, the syringe may be connected to the needle and then the needle inserted into the skin and muscle.
- ii. Some medications must not be placed into the bloodstream. For these medications, it is necessary to draw back on the syringe and observe for blood before injecting. If blood is observed upon drawing back on the do not inject. The needle may be repositioned without removing it from the animal. Draw back on the syringe once the needle is redirected.

V. Variations

Alternatives for intramuscular injections vary based on the substance and may include intravenous and subcutaneous injections. Please follow the labeled instruction.

Alternative sites for intramuscular injection include the rear leg or over the rump. Injections at these locations leave blemishes in valuable cuts regardless of the age of the animal and should not be given.

VI. Potential Adverse Effects, Mitigation, or Treatment

- a. Trauma
 - i. Bruising, lacerations
 - ii. Hematoma formation
 - 1. Contact veterinary staff
- b. Spread of disease
 - i. Injection with multiple-use needles can spread anaplasmosis, bovine leucosis and other diseases. Dull, dirty, or bent needles may lead to injuries or infection of the injection site.

VII. Suggested Literature Search for Pain Category D and E Procedures

Not applicable

VIII. References

Griffin, Smith, & Grotelueschen. "G98-1351 Proper Injection Procedures for Cattle." University of Nebraska Lincoln Extension. Digital Commons. 1998. Accessed September 22, 2017. <https://goo.gl/yyMpJJ>