Standard Operating Procedure
Clemson University Simpson Beef Cattle Farm
Clemson University

Section I: Title
SOP ID: BF-AH-027v2 revised October 2018
Title: Collection of Muscle Tissue via Biopsy
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Approval Signatures:

_________________________________________
University and Attending Veterinarian / Date

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Facility Manager / Date

Disclaimer: This SOP has been prepared and approved for sole use by the Clemson University Simpson Beef Cattle Farm and may not be applicable to other facilities. Changes to this SOP require approval by the University Veterinarian.

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**Standard Operating Procedure**

**Collection of Muscle Tissue via Biopsy**

1.0 **OBJECTIVE**

The objective of this Standard Operating Procedure (SOP) is to describe the steps required to collect a muscle biopsy of beef cattle during a live animal research trial.

2.0 **HEALTH AND SAFETY**

- Attire appropriate to the task must be worn at all times.
- Closed toe shoes, jeans, and clothing appropriate for work with beef cattle should be worn.
- Latex or Nitrile gloves should be worn while performing the biopsy and handling animal tissues.
- All Clemson University personnel must be enrolled in the Clemson University Medical Surveillance Program.

3.0 **PERSONNEL/TRAINING/RESPONSIBILITIES**

- Personnel familiar with the equipment and laboratory techniques and trained in this and referenced SOPs may perform this procedure.
- All Clemson University personnel must have completed the IACUC on line training.
- Prior to being assigned full responsibility for performing this procedure, personnel must have demonstrated proficiency in the use of the technique in a closely supervised environment.
- Review the accompanying SOP training log for documentation of training for personnel trained to perform this procedure.

4.0 **REQUIRED AND RECOMMENDED MATERIALS**

4.1 **Required Materials**

- Biopsy Needle
  - Sterile
  - 1 per animal, per biopsy
  - Needle shall be 10G
  - Needle shall be 10 cm or less in length, as appropriate for muscle depth: i.e. 5 cm
- Lidocaine HCl
  - 8 mL per animal, per biopsy
- Sterile gauze
  - 4 sq. in per animal, per biopsy
• 70% ethanol wash solution
• Chlorohexadine 2% wash solution
• Staples for closing hide incision
• Betadine Solution (5%)

4.2 Recommended Materials
• N/A

4.3 Prepared Materials
• Chlorohexadine solution (2%)
• Ethanol solution (70%)
• Betadine solution (5%)

5.0 GUIDELINES

The following procedures were developed to meet or exceed the National Institute of Health (NIH) Guide for the Care and Use of Laboratory Animals and the Foundation of Animal Science Societies Guide for the Care and Use of Agricultural Animals in Research and Teaching.

6.0 PROCEDURE

To collect biopsies, animals will be immobilized in a chute or individual stalls with stanchion permitting side access to the animal. The back will be clipped or shaved over the longissimus muscle for a length of about 16 cm and rinsed with warm water to remove any debris if necessary. The site will then be prepared for aseptic surgery using triplicate scrubs of 2% Chlorhexidine followed by 70% Isopropyl alcohol rinse. After the third application, local anesthetic (lidocaine HCl; 20 mg/mL; 8 mL per biopsy) will be administered subcutaneously in a 1 sq. in. diamond pattern using 4 injection sites (2 mL per site). The area will then be sprayed with 5% Betadine Solution and a waiting period of 10 minutes will be used to ensure numbness. An approximately 1-cm incision will be made with a sterile scalpel. The longissimus tissue sample will then be extracted utilizing a sterile biopsy needle. A target of 1 gram of tissue will be extracted from the animal per biopsy. The site will then be closed with a surgical staple and monitored daily for seven days to ensure proper healing. Subsequent biopsies taken from the same animal will occur on alternating sides and/or occur at least 2 ribs apart from the previous position to ensure proper healing and avoid sampling remodeled tissue.

7.0 QUALITY CONTROL CHECKS AND ACCEPTANCE CRITERIA

All procedures are subject to periodic review by the Attending Veterinarian and the Institutional Animal Care and Use Committee.

8.0 LITERATURE CITED