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DAIRY CATTLE HUSBANDRY

1. PURPOSE

- 1.1. The intent of this Animal Care and Use Procedure (ACUP) is to describe routine husbandry and preventative health procedures for dairy cattle at Cornell University. This ACUP is approved by the Cornell's Institutional Animal Care and Use Committee (IACUC). Any deviation must be approved by the IACUC prior to its implementation.

2. SCOPE

- 2.1. This ACUP is intended for use by dairy cattle facility staff.

3. INTRODUCTION

- 3.1. This ACUP provides general husbandry and preventative animal health guidelines for dairy cattle housed at research and / or teaching facilities at Cornell University. These outlined procedures are intended to assure that cattle are maintained in a healthy, clean, and productive environment. Contact CARE at care@cornell.edu for more information or for assistance.

4. MATERIALS AND EQUIPMENT

- 4.1. Personal Protective Equipment (PPE)
- 4.2. Direct Animal Support
- 4.2.1. Feed
 - 4.2.2. Bedding
 - 4.2.3. Equipment (e.g., shovels, skid loaders, feed mixers, etc.)
- 4.3. Health Records

5. PROCEDURE

5.1. Observation of Animals

- 5.1.1. Observe all cattle daily, including weekends and holidays, for signs of illness, injury, or distress.
- 5.1.2. Report any injuries or illness to the facility manager, Principal Investigator (PI), clinical veterinarian, and / or Center for Animal Resources and Education (CARE) veterinary staff. Refer to [ACUP 607 Reporting Sick Animals](#).
- 5.1.3. Clinical Veterinary Care
 - 5.1.3.1. Veterinary care is provided by Cornell's Attending Veterinarian or a designee as specified in a formal letter of agreement as per [IACUC policy 500 Primary Clinical Veterinary Care Performed by Non-CARE Veterinarians](#).

5.2. Animal Identification

- 5.2.1. Use one or more of the following methods for identification of individual animals:
 - 5.2.1.1. Tattoo;
 - 5.2.1.2. Ear Tag;
 - 5.2.1.3. Neck Tag;
 - 5.2.1.4. Electronic Transponder

5.3. Records and Documentation

- 5.3.1. Document details in the animal's records as per [ACUP 542 Maintaining Health and Procedure Records for Research and Teaching Animals](#).

5.4. Animal Health

NOTE: These procedures are conducted by trained and experienced staff unless otherwise indicated.

5.4.1. Quarantine Procedures

- 5.4.1.1. Assess health information for required vaccinations and treatments via health records. Refer to facility SOPs for specific vaccinations and health treatments.

5.4.2. Vaccination

- 5.4.2.1. Vaccinate as per facility veterinarian recommendations.

5.4.3. Internal and External Pest Management

- 5.4.3.1.** Refer to the New York State Integrated Pest Management Program and implement as applicable
(<http://www.nysipm.cornell.edu/livestock/default.asp>).

5.4.4. Foot / Hoof Care

- 5.4.4.1.** Refer to facility SOP for routine foot care, problem identification, maintenance, trimmer's visits, and walk-through foot baths.
 - 5.4.4.1.1.** Report animals with abnormal foot gait for prompt attention. If severe (i.e., appears painful), report to the facility veterinarian immediately.
 - 5.4.4.1.2.** Routine foot trimming services are provided by independent foot-trimming professionals or veterinary care staff.

5.4.5. Milking

- 5.4.5.1.** Machine-milk lactating cows two or three times per day.
- 5.4.5.2.** Follow teat dipping procedures as per facility SOPs.
- 5.4.5.3.** Mastitis:
 - 5.4.5.3.1.** Culture clinical cases of mastitis.
 - 5.4.5.3.2.** Identify treated cows with a distinct leg band and enter the diagnosis in the electronic health record system so as to assure identification prior to milking.
 - 5.4.5.3.3.** Remove band when cattle test negative.

5.4.6. Potentially Painful or Distressful Procedures

5.4.6.1. Animal Restraint

- 5.4.6.1.1.** Some procedures (e.g., vaccinations, rectal palpations, placement of implants or ear tags) require the cattle to be restrained to ensure the safety of the animals and handlers. This is accomplished with the use of a restraining (standing) chute system or stanchion head-lock. In many cases only the use of the head-lock is necessary. Keep restraint in the chute brief. Whenever possible, restrain young calves by hand.

5.4.6.2. Disbudding and Dehorning

5.4.6.2.1. Calves

- 5.4.6.2.1.1.** Disbud calves no later than 4 weeks of age using a thermal disbudder according to the manufacturer's recommendations.

5.4.6.2.1.2. Provide analgesia prior to the procedure as per facility SOP and / or facility veterinarian recommendations (e.g., meloxicam and lidocaine).

5.4.6.2.2. Older Animals

5.4.6.2.2.1. Refer to the facility veterinarian.

5.4.7. Nutrition

5.4.7.1. Feed animals to meet current National Research Council recommendations for dairy cattle nutrition.

5.4.7.2. Store feed ingredients and finished feeds in a manner that minimizes contamination, spoilage, and access by vermin (i.e., clean and dry area). Remove unconsumed feed daily from feeders and mangers.

5.4.7.3. Feed calves colostrum according to their size:

5.4.7.3.1. Immediately postpartum: 2-4 liters of colostrum; this may be followed by a second colostrum feeding about 12 hours postpartum.

5.4.7.3.2. Consult the facility veterinarian for advice on how to ensure that colostrum of adequate quality is being fed.

5.4.7.4. Provide free choice access to potable water.

5.4.8. Breeding Program

5.4.8.1. Use only Artificial Insemination (AI).

5.4.8.2. AI is performed by trained animal care staff or veterinary staff.

5.4.8.3. Use semen from a commercial stud service.

5.4.8.4. Use either natural or synchronized estrus for breeding.

5.4.9. Social and Environmental Enrichment

5.4.9.1. Provide cows with visual and physical contact with one another.

5.4.10. Euthanasia and Disposal of Dead Animals

5.4.10.1. Cattle euthanasia is via:

5.4.10.1.1. IV administration of barbiturates (e.g., pentobarbital) by a veterinarian.

5.4.10.1.2. Penetrating captive bolt by trained personnel.

5.4.10.1.2.1. Follow the captive bolt with pithing to ensure death.

5.4.10.2. Dispose of dead animals by composting on-site or through Cornell's Waste Management System.

5.4.11. Vermin Control

- 5.4.11.1.** Refer to [ACUP 538 Vermin Program](#).
- 5.4.11.2.** Rodent and insect control is performed by a commercial pest control company.
- 5.4.11.3.** Additional methods of pest control may also be performed (e.g., distress call recordings for bird abatement, parasitic wasps for fly control).

5.4.12. Facilities

5.4.12.1. Housing

- 5.4.12.1.1.** There is a wide variety of accommodations for dairy cattle at Cornell.

- 5.4.12.1.1.1.** House adult cattle in one of the following:

- 5.4.12.1.1.1.1.** Pasture with available shelter;
 - 5.4.12.1.1.1.2.** Barn with bedded pens;
 - 5.4.12.1.1.1.3.** Free stalls;
 - 5.4.12.1.1.1.4.** Tie stalls

- 5.4.12.1.1.2.** House calves in one of the following:

- 5.4.12.1.1.2.1.** Individual or group pens;
 - 5.4.12.1.1.2.2.** Individual or group hutches

- 5.4.12.1.2.** Space, Temperature, Ventilation, and Lighting

- 5.4.12.1.2.1.** Meet or exceed regulatory parameters set forth in the Guide for the Care and Use of Agricultural Animals in Research and Teaching, 3rd Edition, 2010.

- 5.4.12.1.2.2.** Guidelines for cattle housed in a biomedical setting can be found in the Guide for the Care and Use of Laboratory Animals, 8th Edition, 2011.

- 5.4.12.1.3.** Cleaning and Sanitation of Stalls and Pens

- 5.4.12.1.3.1.** Calf Hutches:

- 5.4.12.1.3.1.1.** Between animals tip hutch on side, remove bedded pack from the underlying gravel layer, sanitize hutch with hot soapy water and appropriate disinfectant (e.g., bleach to water at 1:10), leave site exposed to sunlight to dry, add layer of fresh gravel and fresh bedding.

5.4.12.1.3.2. Bedded Packs:

- 5.4.12.1.3.2.1.** Frequency as per facility SOP, remove bedded pack, and landscape fabric and top layer of gravel (if present) and replace with fresh gravel and bedding.

5.4.12.1.3.3. Tie Stalls:

- 5.4.12.1.3.3.1.** Remove soiled material throughout the day, add fresh bedding to replace removed material at least once a day.

5.4.12.1.3.4. Free Stalls:

- 5.4.12.1.3.4.1.** Sand: Rake the bed at each milking (twice daily), add sand at least once every week.
- 5.4.12.1.3.4.2.** Shavings: Minimally, clean daily and add fresh shavings every other day as applicable.

5.4.12.2. Cleaning and Sanitation of Equipment

- 5.4.12.2.1.** Use separate equipment for feed and manure, clean and sanitize the equipment per facility SOPs.
- 5.4.12.2.2.** Clean feed troughs daily.
- 5.4.12.2.3.** Clean waterers weekly.
- 5.4.12.2.4.** Clean and sanitize milk buckets or bottles (for calves) after each use.

5.4.12.3. Transportation

- 5.4.12.3.1.** Use appropriate transport vehicle (e.g., stock trailer) with clean, dry, non-slippery floor.
- 5.4.12.3.2.** For shipping, follow the space recommendations set in the Guide for the Care and Use of Agricultural Animals in Research and Teaching, 3rd Edition, 2010.
- 5.4.12.3.3.** Clean truck beds after each use and sanitize after hauling animals from an outside source. Document cleaning and sanitization on the vehicle's cleaning log. Refer to [ACUP 532 Cleaning and Sanitizing Materials Used in the Transport of Animals](#).

5.4.12.4. Waste Management

- 5.4.12.4.1.** Where applicable, follow the EPA's Concentrated Animal Feeding Operations (CAFO) requirements for waste management:
- 5.4.12.4.1.1.** As weather allows, spread manure on the fields daily or compost in designated areas.

6. PERSONNEL SAFETY

- 6.1. Medical Emergencies: **CALL 911**.
- 6.2. When working with animals wear appropriate PPE, observe proper hygiene, and be aware of allergy, zoonosis, and injury risks. Refer to the [CARE Occupational Health and Safety webpage](#) for more information.

7. ANIMAL RELATED CONTINGENCIES

- 7.1. Post contact information for emergency assistance in a conspicuous location within the animal facility.
- 7.2. Emergency veterinary care is available at all times including after working hours and on weekends and holidays:
 - 7.2.1. Biomedical Settings: CARE (pager 1-800-349-2456)
 - 7.2.2. Farm Animal Settings: Ambulatory and Production Medicine Service at (607) 253-3140.
- 7.3. Non-emergency veterinary questions & requests for animal care, email CARE veterinary staff at care@cornell.edu.

8. REFERENCES

- 8.1. IACUC Policy 500 Primary Clinical Veterinary Care Performed by Non-CARE Veterinarians:
<https://www.iacuc.cornell.edu/documents/IACUC%20Policy%20No.%20500%20Care%20by%20Non-CARE%20Vets.pdf>
- 8.2. ACUP 307 Euthanasia of Non Rodent Mammals:
http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP307.pdf
- 8.3. ACUP 532 Cleaning and Sanitizing Materials Used in the Transport of Animals:
http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP532.pdf
- 8.4. ACUP 538 Vermin Program:
http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP538.pdf
- 8.5. ACUP 542 Maintaining Health and Procedure Records for Research and Teaching Animals:
http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP542.pdf
- 8.6. ACUP 607 Reporting Sick Animals:
http://ras.research.cornell.edu/care/documents_k/ACUPs/ACUP607.pdf
- 8.7. Nutrient Requirements of Dairy Cattle, Seventh Revised Edition, 2001:
http://www.nap.edu/openbook.php?record_id=9825&page=R1
- 8.8. Animal Feeding Operations (AFOs). United States Environmental Protection Agency. Washington, DC. 2008:
<https://www.epa.gov/npdes/animal-feeding-operations-afos>
- 8.9. Guide for the Care and Use of Agricultural Animals in Research and teaching, 3rd Edition. Federation of Animal Sciences Societies, Champaign, IL. 2010:
<http://www.fass.org/page.asp?pageID=216>
- 8.10. Guide for the Care and Use of Laboratory Animals, 8th Edition. Institute fir Laboratory Animal Research, Washington, DC. 2011:
http://www.nap.edu/openbook.php?record_id=12910&page=1

- 8.11. New York State Integrated Pest Management Program for Livestock:
<http://www.nysipm.cornell.edu/livestock/default.asp>
- 8.12. CARE Occupational Health and Safety webpage:
<http://ras.research.cornell.edu/care/OHS.html>

9. APPENDIX

- 9.1. None

10. HISTORY

Date:	Event:
01 SEP 16	Most Recent Annual Review – Reviewed by: Dr. T. Pavek
24 FEB 16	New Format – Converted by: J. Kirby
31 OCT 10	Revised – Revision Author: Dr. K. Breyer
31 AUG 04	New Issued – Original Author: R. Corey; Referee: M. Smith