



UNIVERSITY *of* NEW HAMPSHIRE

**MANUAL FOR THE CARE AND USE OF
ANIMALS AT UNH**

Institutional Animal Care and Use Committee

&

Animal Resources Office

February 2008

Preface

This manual was originally approved on August 14, 2002 by the University of New Hampshire (UNH) Institutional Animal Care and Use Committee (IACUC), and last updated on February 29, 2008.

This manual is intended as a guide for UNH faculty, staff, and students who use animals in research, testing, and instruction. This document is dynamic and is subject to change/updates as rules, regulations, and/or policies change. While recognizing the importance of using live animals for these purposes, UNH, for both ethical and scientific reasons, insists upon the highest standards for the care and use of such animals. It is the responsibility for each individual using and/or caring for animals to be familiar with, and to ensure compliance with, these standards.

Changes in the information in this manual will be reflected on the IACUC webpage at <http://www.unh.edu/osr/compliance/iacuc.html>

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I. Introduction

The University of New Hampshire (UNH) recognizes its responsibility to produce and disseminate knowledge in accordance with its research, teaching, and public service mission. Some activities conducted at UNH necessitate the use of live vertebrate animals. Recognizing the importance of using live animals for these purposes, UNH, for both ethical and scientific reasons, insists upon the highest standards for the care and use of such animals.

UNH must comply with federal regulations in order to use animals in research, testing, and instruction. UNH has provided the U.S. Public Health Service (PHS) with an Animal Welfare Assurance (Assurance) that is administered by the U.S. Department of Health and Human Service's (DHHS) Office of Laboratory Animal Welfare (OLAW). This Assurance represents a legally binding commitment to PHS and is critical in maintaining UNH's eligibility to receive federal and private funds for research involving vertebrate animals. OLAW has recommended that the Assurance be made available to animal care staff, project directors, and other interested parties. The core contents of the Assurance are integrated into this manual. The entire document is available upon request from the Animal Resources Office (ARO).

Accordingly, UNH has developed this manual to

1. Provide the reader with an appreciation and basic understanding of the regulatory process and means by which compliance can be assured, and the responsibilities that one assumes when choosing to use animals,
2. Provide a concise, up-to-date accessible source of information about UNH's program for animal care and use to personnel involved with the program,
3. Facilitate good communication between and among animal users, animal care staff, and administrators in the interest of good research and responsible animal care and use,
4. Document UNH's commitment to ensuring the humane use and care of animals required in its various research and teaching programs, and
5. Document, in part, UNH's responsibility for ensuring that all personnel involved with animal care and use are appropriately informed, trained, and qualified to perform their respective duties.

II. Definitions

Activities: Include, but are not limited to, research, research training, biological testing, instruction of students, and maintenance of animal collections, exhibits, flocks, or herds.

Animal: Includes all live vertebrate animals, and any dead dog, cat, nonhuman primate, guinea pig, hamster, rabbit or warm-blooded animal used, or intended for use for research, teaching, or testing (Animal Welfare Act, CFR, Title 9, Chapter 1, Subpart A, part 1.1).

Animal Welfare Act (AWA): Public Law 89-544, 1966, as amended, (P.L. 91-579, P.L. 94-279 and P.L. 99-198) 7 U.S.C. 2131 et. Seq. Implementing regulations are published in the Code of Federal Regulations (CFR, Title 9, Chapter 1, Subchapter A, parts 1, 2, and 3), and are administered by the U.S. Department of Agriculture.

Assurance: UNH Assurance of Compliance with U.S. Public Health Service Policy on Humane Care and Use of Laboratory Animals.

Care and Use: Petting, feeding, watering, cleaning, manipulating, loading, crating, shifting, transferring, immobilizing, restraining, treating, training, working and moving, or any similar activity with respect to any animal.

Guide: The *Guide for the Care and Use of Laboratory Animals*, National Academy Press, 1996, Washington, D.C., or succeeding revised editions.

Institutional Animal Care and Use Committee (IACUC): The committee established by the UNH President to oversee UNH's animal program, facilities, and procedures.

Institutional Official (IO): The individual designated by the UNH President to ensure that activities involving the care and use of animals at UNH are humane and in compliance with all applicable regulations and internal policies. This individual is the Vice President for Research.

Project Director: Any UNH permanent faculty or staff member who accepts responsibility for all aspects of the project (even if a student conducts the work).

III. Applicability

The Assurance, the UNH Policy on the Care and Use of Animals (see Appendix A), and the information in this manual apply to all activities involving animals that are

1. Sponsored by UNH, or
2. Conducted by or under the direction of any employee, student, or agent of UNH in connection with his or her individual UNH responsibilities, or
3. Conducted by or under the direction of any employee, student, or agent of UNH involving the use of any UNH property or facility, or
4. Involving any collaborating, subgranting, or subcontracting individual or institution working with UNH.

Activities involving animals covered by the Assurance and the UNH Policy on the Care and Use of Animals must be conducted in facilities approved by the UNH Institutional Animal Care and Use Committee (IACUC).

IV. Program Overview

UNH's Animal Care and Use Program (Program) fosters the humane care and use of animals in research, testing, and instruction, and adheres to all applicable laws, standards and policies affecting such use. The Program applies to all use of animals at UNH, regardless of whether the activity is funded or not. The responsibility for implementing the Program has been assigned to the ARO subject to periodic review and approval by the UNH IACUC, the IO, and the United States Department of Agriculture (USDA).

The standard for animal activities at all research institutions is the publication entitled, "U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training." (See Appendix B.) In addition, UNH's Program operates in accordance with the Guide, the Animal Welfare Act (AWA), and other applicable regulations. Copies of the Guide and all applicable regulations are available upon request from the ARO or on-line at <http://www.unh.edu/osr/compliance/iacuc.html>

UNH's Policy on the Care and Use of Animals states, "At UNH, all activities proposed to involve the care and use of live vertebrate animals must be reviewed and receive written, unconditional approval from the IACUC before commencing." (See Appendix A.)

UNH has established an IACUC with the authority to oversee animal care and use, and to enforce regulations.

V. Institutional Animal Care and Use Committee

The IACUC is a standing committee comprised of members of the UNH community and the general public. (See Appendix C for membership roster.) To ensure that UNH maintains public accountability for its activities involving animals, the IACUC is responsible for

- Reviewing all research, testing, and instructional protocols involving animals,
- Conducting semiannual reviews of UNH's Program and facilities,
- Reviewing and addressing concerns involving animals in research, testing, and instruction, and
- Advising the IO.

Information about the IACUC is available at <http://www.unh.edu/osr/compliance/iacuc.html>. All correspondence with the IACUC should be sent to the Research Conduct and Compliance Services office (RCCS) in the Office of Sponsored Research (OSR), Service Building, 2nd floor.

VI. Animal Resources Office

The ARO is responsible for assisting UNH project directors with all phases of animal activities. In this effort, the ARO maintains and promotes a cooperative and open relationship among project directors, institutional officials, and government inspectors and officials. The ARO

- Provides technical support, consultation, and training to UNH faculty, staff and students using or caring for animals,
- Provides veterinary services and oversight for animals used or cared for by UNH faculty, staff and students,
- Assists UNH project directors in developing of protocols for animal use,

- Oversees UNH animal facilities to ensure compliance with federal, state, and UNH standards, and
- Accompanies federal inspectors and others on site visits.

VII. Research Conduct and Compliance Services Office

The RCCS office provides administrative support to the IACUC and assists project directors with the IACUC application and review process. The RCCS office can be contacted at 862-2003 or 862-3536.

VIII. Project Directors' Responsibilities

Only full-time UNH faculty and staff members may serve as project directors/principal investigators for activities that involve animals. In doing so, the faculty/staff member accepts responsibility for all aspects of the activities, even if a student conducts the work.

Prior to planning or conducting an activity using animals, involved faculty, staff, and students are expected to be familiar with the regulations and guidelines discussed in this manual. Further, project directors are encouraged to consult with the ARO at an early stage in the preparation of protocols for activities involving animals. The ARO is located in Room B56, Rudman Hall, and can be contacted at 862-4629.

Directors of activities involving animals are responsible for, but not limited to, the following.

They must

1. Acknowledge and accept responsibility for the humane care and use of animals in their activity,
2. Comply with applicable institutional policies and governmental regulations,
3. Delay involvement, including acquisition, of animals pending written approval without contingencies from the IACUC,
4. Possess adequate skills and adhere to high ethical standards,
5. Assure that all project personnel receive adequate training to perform their duties and act in an ethical manner,
6. Ensure that all personnel involved in the activity who are handling animals complete the UNH Medical History & Risk Assessment Questionnaire for Persons Handling Vertebrate Animals and/or Unfixed Vertebrate Animal Tissues (see Appendix N) prior to animal handling,
7. Forward to the IACUC any proposed modification(s) to a protocol prior to initiation, and delay initiating any changes prior to receipt of written approval without contingencies from the IACUC, and

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8. Report progress of an approved activity to the IACUC as often as, and in the manner, prescribed by the approving IACUC, but not less than once a year.

IX. Application and Review Process

A. Application

Prior to any acquisition or use of animals, each individual proposing to conduct an animal activity must submit to the RCCS office a completed Application for Review of Vertebrate Animal Use in Research or Application for Review of Vertebrate Animal Use in Instruction (Application). (See Appendix D.)

B. Planning the Activity

Animal users are strongly encouraged to seek assistance from the ARO during the planning stages for animal activities and prior to completing the Application. There are Federal policies requiring documentation that reduction, replacement, and refinement (the three R's) have been addressed. Individuals proposing to use animals should design projects to conform to these policies. For more information contact the ARO at 862-4629 or visit <http://www.unh.edu/osr/compliance/iacuc.html>.

C. Initial Review

Upon receipt of a completed Application, RCCS staff assign a protocol number. The Application is reviewed by the Attending Veterinarian (AV). Incomplete Applications or those requiring clarification or revisions are returned to the applicant.

D. IACUC Review

Following favorable initial review, the Application is then placed on the agenda for the next IACUC meeting. For consideration, the Application must be received in completed form a minimum of two weeks prior to the next scheduled IACUC meeting. (Visit <http://www.unh.edu/osr/compliance/iacuc.html> for a schedule of upcoming meetings.)

E. Potential Actions

The IACUC may take any of the following actions on an Application at a convened meeting:

- approval,
- approval with modification(s),
- approval pending submission of additional information, or
- disapproval.

Project directors are notified in writing of the IACUC's action. If the activity is not approved, the applicant should work with the ARO to revise the Application for resubmission to the IACUC.

F. Approval

Approval is granted for a maximum of three years, subject to annual review. The project director may proceed to acquire animals only upon receipt of the unconditional approval letter from the IACUC.

G. Appeals Process

Any project director wishing to appeal an IACUC decision can do so in writing to the IACUC Chair. The IACUC Chair will bring the appeal to the next scheduled IACUC meeting where the IACUC will review the appeal. The IACUC Chair will inform the project director in writing of the outcome of the IACUC's review of the appeal within five working days of the IACUC meeting at which the appeal was reviewed. The IACUC's decision regarding the appeal is final.

H. Modifications Subsequent to Approval

Project directors must receive written unconditional approval from the IACUC for any changes to their activity prior to implementing them. If proposed changes are in an activity that has been reviewed and approved by the IACUC within the past three years, and are limited to changes in title, funding source, or personnel (exclusive of project director), or a procedural change deemed minor by the IACUC Chair, the proposed minor changes can be approved by the IACUC Chair. All changes approved by the Chair are reported to the IACUC at the next convened meeting.

I. Proposals for External Funding

Project directors seeking external funding for activities involving animals should coordinate the timing of the submission of their Application to the IACUC with the prospective sponsor's application deadline and OSR. All federal and many private sponsors require IACUC approval at the time of proposal submission.

X. Animal Management

UNH Policy and federal guidelines require that the living conditions of animals are appropriate for their species and contribute to their health and comfort. Accurate records must be kept regarding all aspects of animal management. Animal care and related Standard Operating Procedures (SOPs) are posted/available in all IACUC-approved facilities and/or from the ARO. Housing, feeding, and care of all animals are directed by a veterinarian or other professional trained in animal care and medicine.

A. Acquisition of Animals

1. Acquisition of all animals will be by legal means and all necessary permits and licenses will be obtained by the user.
2. The project director must record, and have available for IACUC review, the following:
 - a. number of each kind of animal,
 - b. species,

- c. source and manner of acquisition, and
 - d. final disposition of each animal.
 - e. where applicable, a list of non-target species/by-catch
3. The source of animals is subject to approval by the ARO and/or IACUC. Animals purchased must be of known health status and from a reputable vendor.
 4. Upon arrival at a UNH facility or satellite facility, animals must be inspected by the ARO or designee. If the animals are found to be unsatisfactory or diseased, the vendor and the ARO must be notified immediately.
 5. Certain animal species require special licenses or documentation, and are strictly regulated: These include endangered species, marine mammals, and wildlife. Project directors anticipating involvement of any of these species should contact the ARO for assistance when planning the activity.

B. Facilities/Housing

All animals will be maintained in housing systems that meet the applicable regulations, laws, and/or policies of USDA, PHS, and/or State of New Hampshire. Space recommendations for animals will be in accordance with PHS policy and the AWA. Minimum space recommendations (from the Guide) are given in Appendix E. Other space recommendations are available on request from the ARO, or can be found in Section X, I, 3 of this manual.

1. All animals must be maintained in an animal facility approved by the IACUC.
2. The physical housing and maintenance of animal facilities must be in accordance with the most recent edition of the Guide, the AWA, or other appropriate guidelines provided by the ARO.
3. IACUC approval of facilities requires that physical parameters of the environment be maintained at a level appropriate for the species housed. These parameters include, but are not limited to, temperature, humidity, ventilation, lighting, and noise. (See Appendix F, Environmental Standards.)
4. All facilities are inspected and approved by the IACUC at least twice a year. In addition, an ARO staff member makes regular rounds of all animal facilities. (See Appendix G for Semiannual Facility Inspection Compliance Checklist.)

C. Biosecurity

Facilities should consider instituting rigorous biosecurity measures. Such measures will vary depending on the status/type of the animals housed, but might include the following:

- Security fences, locks, or entry alarm systems,
- Appropriate signs posted indicating restricted entry,

- Minimizing/controlling visitors unless absolutely necessary,
- A shower-in and shower-out facility, with work clothing furnished by the institution,
- Rodent and bird abatement programs for farms,
- Stray and wild animal trapping and relocation as appropriate,
- A requirement that personnel coming into contact with the animals or facilities do not own or come into contact with animals that may harbor contagious disease agents that may be transferred to the research animals, and
- A requirement that personnel who have delivered animals to markets or slaughterhouses must not enter the research facility for at least 24 hours.

D. Veterinary Care

1. General Animal Health Screening

- a. Regular rounds of all animal rooms and holding areas are made by the ARO, with an emphasis on preventive measures. Any disease problem observed in animal colonies will be reported to the project director and AV for recommended treatment and corrective measures.
- b. All obviously ill animals with suspected contagious disease will be isolated and the project director and AV notified.
- c. Caretakers or project directors are required to inspect animals daily, and to report to the ARO all concerns regarding animal care, facilities, or health status of animals in projects assigned to them.
- d. Appropriate records of veterinary care are required.

2. Diagnostic Services

- a. Services of the New Hampshire Veterinary Diagnostic Laboratory are available on a fee-for-service basis.
- b. Arrangements for health surveillance or specialized or unique laboratory tests may require use of commercial laboratories and associated fees. Fees generally will be the responsibility of the project director.
- c. Where there are instances of suspected contagious diseases, the ARO will initiate and expedite disease diagnosis. Subsequent treatment and control measures will be determined by consultation between the department chairperson and the project director. Costs for such treatment and control generally are the responsibility of the project director.

3. Emergency Care

- a. Provisions for emergency care will be made by the AV.
- b. In the event of animal medical emergencies when the project director cannot be reached, treatment consistent with good veterinary practice will be administered.

E. Quarantining and Conditioning

1. Quarantine and/or isolation of certain newly acquired animals may be required by the IACUC or ARO. This will be done to ensure the health and safety of conditioned animals and to protect ongoing animal projects. (See Appendix H, Veterinary Care, Quarantining, and Conditioning Standards.)
2. Stabilization and conditioning of animals to their surroundings are of the utmost importance. This adaptation period allows the animal to become physiologically and behaviorally stable.
3. Conditioning is strongly recommended for IACUC-approved manipulative procedures, e.g., restraint devices, treadmills, injections, and handling.
4. Animals purchased from a reliable vendor and of known health status can generally be placed in an animal room provided that:
 - a. the health status of the existing colony has been established, OR
 - b. all animals are from the same source, e.g. Charles River Laboratory, Jackson Labs, or Taconic Farms.
5. Separation is generally required for animals from different sources until the health status and compatibility of each group is determined.
6. The ARO has established a program of animal health surveillance and may require the project director to submit animals or tissues for health monitoring or diagnostic purposes. (See Appendix H, Veterinary Care, Quarantining, and Conditioning Standards.)

F. Feeding, Watering, and Animal Identification

1. Nutritional requirements are species-specific. Animal feed must be fresh, palatable, and nutritionally adequate. Attention must be given to those animals with special dietary needs. Pretreatment of feed (e.g., autoclaving) may alter nutrients and require supplementation. All feeds should be stored in a cool, dry place free of potential contamination. The ARO maintains a listing of conventional feeds.
2. Water is to be clean, potable, and uncontaminated. Unless otherwise approved by the IACUC, animals will have ad lib access to water.
3. If animals will be fasted or have water withheld, the IACUC requires close monitoring of such activities. Individual caging or housing of such animals must be clearly identified.
4. Federal law requires that all animals or groups of animals be identified at all times. (See

Appendix I, Identification Methods.) The IACUC protocol number should be clearly shown on all cage cards, pen cards, or other identification records.

G. Sanitation

Sanitary practices are important to maintain good user and animal health, both for the ethical care of the animal and for assuring appropriate scientific standards.

1. Sanitary conditions must be maintained for all animals at all times.
2. A regular schedule of animal care must be maintained for all animal colonies.
3. Animal rooms, storage areas, laboratories, and other support areas must be cleaned as often as necessary with appropriate detergents and disinfectants.
4. Litter or bedding in animal cages must be changed as often as necessary to keep animals dry and clean, and to minimize offensive odors. The ARO maintains a listing of approved bedding materials and sources.
5. Animal cages, feed, water devices, racks, and auxiliary equipment must be regularly cleaned and sanitized.
6. Intake and exhaust ducts, including filters, should be cleaned and kept free of dust.
7. Trash and other waste from animal facilities must be removed and disposed of by animal care personnel in a safe and sanitary manner.

H. Surgery, Anesthesia/Analgesia, and Pain and Distress

1. Surgery may be performed only in facilities intended for that purpose and must include an area for the proper postsurgical management of the animal.
 - a. Project directors must provide evidence of experience, training, or other qualifications of personnel who are to perform the surgeries.
 - b. Aseptic surgical technique is required for major survival surgery in all animals. This technique includes the wearing of sterile gowns, caps, gloves, and face masks, use of sterile instruments, and aseptic preparation of the surgical field.
 - c. Survival surgery on rodents does not require a special facility, but should be performed in a dedicated area using sterile instruments, surgical gloves, and general aseptic techniques to prevent postsurgical clinical infections from occurring.
2. Procedures that involve pain and/or discomfort must be designed to eliminate any unnecessary distress to the animal. (See Appendix J, Assessing Pain and Distress.) Animals must be returned to a normal state as soon as possible, or euthanized immediately.
 - a. Federal law requires that animals be rendered insensitive to distress or pain by the use of appropriate tranquilizing, analgesic, or anesthetizing drugs. Guidelines for the use of these agents in animals are given in Appendix K, Anesthesia and Tranquilizing Agents.

- b. The use of muscle relaxants or paralytic drugs alone (e.g., succinylcholine or other curariform drugs) as anesthetics is forbidden by the IACUC.
- c. The project director has the responsibility for the proper use of anesthetics, analgesics, and tranquilizing drugs and for the education of personnel in the drugs' use, as directed by the AV or ARO. Several anesthetics and tranquilizing agents have been identified as potential human health hazards or subject to abuse. The ARO and UNH Office of Environmental Health and Safety (OEHS) stringently regulate and oversee the use of these agents.
- d. The ARO is available to provide advice and information on pain and distress management.

I. Disposition of Animals at End of Project

1. At the termination of a project, the animals will be disposed of in the most appropriate manner, such as, but not limited to, the following:
 - a. returned to source, if permitted,
 - b. retained for future use, if appropriate,
 - c. transferred, if permitted,
 - d. euthanized if the above disposal methods are not possible, and the remains incinerated (Arrangements for incineration can be made with the ARO or with private vendors approved by the ARO.), or
 - e. disposed of in another appropriate manner approved by the IACUC.
2. Animal euthanasia may be a necessary part of many animal activities.
 - a. The quick and humane euthanizing of all animal species will be performed using methods approved by the American Veterinary Medical Association Panel on Euthanasia. (See Appendix L, AVMA Guidelines on Euthanasia, or on-line at <http://www.avma.org/resources/euthanasia.pdf>.) NOTE: Not all methods listed are approved by the UNH IACUC as a primary means of euthanasia. Euthanasia methods must be approved by the UNH IACUC.
 - b. Use of euthanized animals in a subsequent activity is normally not permitted unless specifically approved by the IACUC in the Application. Changes in disposition that have been approved by the IACUC must be reviewed and approved by the IACUC.

J. Special Considerations

1. Farm Animals and Wildlife

Farm and feral animals used in biomedical research can be housed in conventional animal facilities, biohazard containment units, or on farms, according to generally accepted farm practices. When housing these animals in conventional laboratory or containment facilities,

the criteria found in the Guide should be used for the animals' care and use. When housing animals on a farm, the health, comfort, and well-being of the animal should be of primary importance. If the animals are to be housed in a farm setting, the following items should be considered.

- a. Animals should be provided protection against wind, snow, rain, sun, and other environmental extremes. Dry, clean shelter (at a minimum, roofed and three-sided), adequate to house all animals in the enclosed area, must be provided.
- b. Pens, runs, loafing, or grazing areas, and adequate space should be appropriate for the species.
- c. Adequate drainage, especially in the higher traffic areas (along fences, feed lots, etc.) must exist.
- d. Housing facilities should be structurally sound and maintained in good repair to protect animals from injury and to keep out predators and vermin.
- e. Feeding stations should be cleaned as often as necessary to avoid contamination and to prevent molding of feed (minimum of once a week).
- f. Watering devices (bowls, buckets, tubs, etc.) should be sanitized twice each week and fresh water provided daily or ad lib.
- g. Routine sanitation of the farm facility is required, including the cleaning of stalls, pens, cages, and auxiliary areas.

2. Marine Animals

The program and principles of animal care and use apply to marine animals as well as other species. Where there are differences or unique situations, professional judgment of biologists and ARO staff will be used to resolve these issues.

- a. Provision must be made for the proper aeration, filtration, circulation, pH, and temperature of holding tank water. Chillers and heaters should be used when necessary to maintain optimum water temperature.
- b. Discharged waste water quality is strictly regulated, and project directors should adhere to the most recent Environmental Protection Agency (EPA), state, and local regulations.
- c. Sanitation of holding areas will be done as often as necessary to contribute to the health of the animals and employees.
- d. The use of galvanized materials should be avoided.
- e. Adequate veterinary care must be provided and the proper use of anesthesia, analgesia, and euthanasia will be enforced.

3. The IACUC also recognizes, when appropriate, guidelines developed by the following professional organizations:

- a. Guidelines for the Capture, Handling, and Care of Mammals, American Society of Mammalogists http://www.unh.edu/osr/compliance/support/98_acuc_guidelines.PDF
- b. Guidelines for Use of Fishes in Field Research, American Society of Ichthyologists and Herpetologists (ASIH). <http://www.asih.org/files/fish%20guidelines.doc>
- c. Guidelines for Use of Live Amphibians and Reptiles in Field Research <http://www.asih.org/files/hacc-final.pdf>
- d. Ornithological Council's Guidelines for the Use of Wild Birds in Research, <http://www.nmnh.si.edu/BIRDNET/GuideToUse/index.html>
- e. Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching, (Ag. Consortium, March 1988.)
- f. Methods and Welfare Considerations in Behavioral Research with Animals, National Institutes of Health <http://www.nimh.nih.gov/researchfunding/animals.cfm>

Copies of these publications are available from the ARO.

XI. Reporting Animal Care and/or Use Concerns

Individuals who have concerns about an animal activity at UNH are encouraged to report them to the IACUC, ARO and/or RCCS. Information on reporting procedures is disseminated via the IACUC website, training sessions, and postings in all animal facilities. All reports of concerns involving the care and use of animals at UNH are handled anonymously unless the individual consents to the disclosure of his/her identity.

When a concern about an animal activity at UNH is reported, the ARO reviews the concern with the project director. If a deviation from the conditions of the UNH Program exists, a meeting of the IACUC is convened to determine appropriate action. If the IACUC determines the deviation significant, the project director, department chairperson, college or school dean, ARO, RCCS, and IO will be notified of the IACUC's recommendations or action. If individuals reporting a concern are dissatisfied with the IACUC's resolution, concerns may then be presented to the IO. If appropriate, concerns involving the care and use of animals may fall under the purview of the UNH Policy on Misconduct in Scholarly Activity. Any employee, student, or agent of UNH reporting a concern will be protected against reprisal.

XII. Use of Hazardous Materials in Animals

A. Most hazardous materials can be grouped into one of four broad categories:

1. biohazardous agents and recombinant DNA
2. radioisotopes
3. carcinogens, or
4. DEA controlled substances

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- B. No biohazard will be used in animals without prior approval of the IACUC and the UNH Institutional Biosafety Committee (IBC). The most current applicable federal policies and guidelines for hazardous materials use are the standard for protocol development.
 - C. Use of some hazardous materials requires appropriate state or federal licenses. OEHS maintains current information and applications relative to these requirements.
 - D. Employees involved with, or who may be potentially exposed to, a hazardous material must be educated by the project director or OEHS as to proper laboratory practices and health concerns.
 - E. If indicated, OEHS may require preventative vaccinations and/or health screens before, during, and/or after employee involvement in activities.
 - F. No radioisotopes will be used in animals without prior approval of the IACUC and UNH Radiation Safety Committee (RSC).
 - G. No carcinogens or DEA controlled substances will be used in animals without prior approval of the IACUC. The UNH Chemical Safety Committee (CSC) provides guidance on the safe handling, use, and disposal of regulated carcinogens and DEA controlled substances.
 - H. Protocols that produce hazardous waste must be reviewed by OEHS prior to the commencement of the project.
 - I. Guidelines and source information for the use of hazardous materials in animals are provided in Appendix M.

XIII. Occupational Health Program for Animal Care Personnel

The occupational health program for personnel who work in animal facilities or who have frequent contact with animals is the responsibility of OEHS. Each person working with animals in a project must participate in the UNH Occupational Health Program for Animal Care Personnel. This involves completing the Medical History & Risk Assessment Questionnaire for Persons Handling Vertebrate Animals and/or Unfixed Vertebrate Animal Tissues (Appendix N) and attending scheduled trainings. The UNH Occupational Health Program for Animal Care Personnel includes the following:

1. Medical/work history:
 - a. Completion of medical and work history documentation, and
 - b. Pre-work assignment medical work history review.
2. Physical examinations and immunizations (at the discretion of the attending physician):
 - a. Pre-work physical examination,
 - b. Subsequent periodic physical examinations as required for individuals in some job categories, and

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- c. Pre-work assignment immunizations and booster injections against tetanus and other diseases to which animal care personnel might be exposed.
3. Reporting of illnesses or injuries:
 - a. All work-related illnesses or injuries are reported immediately to the employee's supervisor, and within twenty-four hours to OEHS. These include, but are not limited to:
 - 1) Animal bites,
 - 2) Unprotected exposures, including needle punctures, to infectious agents, and
 - 3) Unprotected exposures to carcinogens and similar high-toxicity materials, radionuclides, or any other hazardous material.
 - b. Illnesses suspected of being related to work with animals must be reported to OEHS as soon as recognized.
 4. Maintenance of individual health records:
 - a. OEHS maintains records that individuals have participated in the Occupational Health Surveillance Program.
 - b. All permanent medical records for all registered animal care personnel are maintained at UNH Health Services or the person's medical provider.
 5. Surveillance program for zoonotic diseases:
 - a. Two copies of protocols proposing work with zoonotic diseases must be submitted by the project director to OEHS. One copy is forwarded to the UNH IBC for approval consideration; a second copy is retained by OEHS.
 - b. Personnel are specifically instructed to notify supervisors and OEHS of illnesses or suspected work-related health problems.
 - c. Consideration is given to obtaining and storing pre- and post-employment serum samples for future diagnostic purposes from certain registered animal care personnel.
 6. Monitoring of hazardous substances:
 - a. Two copies of protocols proposing work with hazardous chemical or physical agents (29 CFR 1910) must be submitted to OEHS. One copy is forwarded to the UNH CSC for approval consideration; the second copy is retained by OEHS.
 - b. Personnel are specifically instructed to notify supervisors and OEHS of illness and suspected work-related health problems.
 7. Employee Occupational Health Education Program:
 - a. OEHS and ARO provide pre-work training to personnel about:

- 1) Personal hygiene as related to work with animals,
- 2) Zoonoses and other biohazards,
- 3) Chemical and physical hazards, and
- 4) Other occupational hazards, including bites, allergies, and, considerations for pregnant women.

8. Personal Health Regulations:

- a. All employees are expected to maintain acceptable health care and hygiene standards.
- b. Animal care personnel are required to wear lab coats, scrubsuits, uniforms or other suitable attire in animal areas. In specific instances other protective clothing may be required.
- c. Under no circumstances are eating, smoking, drinking, or application of cosmetics allowed in animal areas.

XIV. Training Programs

Training or instruction for project directors, animal technicians, and other personnel involved in animal care, treatment, and/or use is the responsibility of the ARO and follows guidelines established by the IACUC.

- A. Semiannually, at the beginning of the Fall and Spring semesters (September/ October, and February/March), the IACUC, ARO, and RCCS conduct general training sessions for project directors, animal technicians, and other personnel involved in animal care and/or use activities. This training includes, but is not limited to, the following:
 - a. The humane practice of animal care and use,
 - b. Research or testing methods that minimize or eliminate animal use or limit animal pain and distress,
 - c. Information sources for alternatives to animal research models, and
 - d. Procedures for reporting deficiencies in animal care and use.

Information presented at training sessions will comply with the AWA, the Assurance, and other recognized training guides, e.g., American Association of Laboratory Animal Science training manuals, and the Institute of Laboratory Animal Resources Guide for Developing Education and Training Programs.

- B. Training is offered to personnel on a regular basis via the following:

-
- a. Providing all individuals involved in animal care and use activities with a copy of the "Manual for the Care and Use of Animals at UNH" upon initial employment and after manual revisions,
 - b. Meeting with individual UNH departments involved in animal activities to update regulations, provide information, and discuss concerns,
 - c. Circulating written material as necessary to inform animal care personnel about new regulations or methods pertinent to animal activities,
 - d. Offering individual instruction to project directors, technicians and students for specific techniques, including animal handling, surgery, anesthesia, and experimental manipulations,
 - e. Inviting UNH or external scientists to lecture on ethical and technical aspects of animal research.
- C. As part of the IACUC application review process, training of all individuals utilizing animals is documented including years of experience with the animal model, and identification of the trainer, if applicable.
- D. Records:
- a. ARO/RCCS maintains records documenting participation of new employees in orientation sessions for animal care personnel.
 - b. Animal care personnel sign a log acknowledging receipt of the "Manual for the Care and Use of Animals at UNH."
 - c. Records of personnel training specific to a given protocol are signed by the participant(s) and instructor, and kept on file by the project director.
- E. IACUC Members:
- a. IACUC members must be qualified to assess the institution's animal program, facilities, and procedures. The institution is responsible for ensuring their qualification, and this responsibility is filled in part through the provision of training and instruction. Training will be provided by the ARO, RCCS or other qualified individuals through methods including, but not limited to, presentations, provision of literature, and site visits.

Appendix A

UNH Policy on the Care and Use of Animals

<http://usnholpm.unh.edu/UNH/VIII.Res/G.htm>

Appendix B

U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research, and Training

U.S. GOVERNMENT PRINCIPLES FOR THE UTILIZATION AND CARE OF VERTEBRATE ANIMALS USED IN TESTING, RESEARCH, AND TRAINING[#]

The development of knowledge necessary for the improvement of the health and well-being of humans as well as other animals requires in vivo experimentation with a wide variety of animal species. Whenever U.S. Government agencies develop requirements for testing, research, or training procedures involving the use of vertebrate animals, the following principles shall be considered; and whenever these agencies actually perform or sponsor such procedures, the responsible Institutional Official shall ensure that these principles are adhered to:

- I. The transportation, care, and use of animals should be in accordance with the [Animal Welfare Act \(7 U.S.C. 2131 et. seq.\)](#) and other applicable Federal laws, guidelines, and policies.*
- II. Procedures involving animals should be designed and performed with due consideration of their relevance to human or animal health, the advancement of knowledge, or the good of society.
- III. The animals selected for a procedure should be of an appropriate species and quality and the minimum number required to obtain valid results. Methods such as mathematical models, computer simulation, and in vitro biological systems should be considered.
- IV. Proper use of animals, including the avoidance or minimization of discomfort, distress, and pain when consistent with sound scientific practices, is imperative. Unless the contrary is established, investigators should consider that procedures that cause pain or distress in human beings may cause pain or distress in other animals.
- V. Procedures with animals that may cause more than momentary or slight pain or distress should be performed with appropriate sedation, analgesia, or anesthesia. Surgical or other painful procedures should not be performed on unanesthetized animals paralyzed by chemical agents.
- VI. Animals that would otherwise suffer severe or chronic pain or distress that cannot be relieved should be painlessly killed at the end of the procedure or, if appropriate, during the procedure.
- VII. The living conditions of animals should be appropriate for their species and contribute to their health and comfort. Normally, the housing, feeding, and care of all animals used for biomedical purposes must be directed by a veterinarian or other scientist trained and experienced in the proper care, handling, and use of the species being maintained or studied. In any case, veterinary care shall be provided as indicated.
- VIII. Investigators and other personnel shall be appropriately qualified and experienced for conducting procedures on living animals. Adequate arrangements shall be made for their in-service training, including the proper and humane care and use of laboratory animals.
- IX. Where exceptions are required in relation to the provisions of these Principles, the decisions should not rest with the investigators directly concerned but should be made, with due regard to Principle II, by an appropriate review group such as an institutional animal care and use committee. Such exceptions should not be made solely for the purposes of teaching or demonstration.

*For guidance throughout these Principles, the reader is referred to the [Guide for the Care and Use of Laboratory Animals](#) prepared by the Institute of Laboratory Animal Resources, National Academy of Sciences.

Appendix C

Institutional Animal Care and Use Committee Membership Roster

<http://www.unh.edu/osr/compliance/iacuc.html#function>

Appendix D

Applications for Review of Vertebrate Animal Use in Research and for Review of Vertebrate Animal Use in Instruction

<http://www.unh.edu/osr/compliance/iacuc.html#application>

Appendix E

Space Recommendations

SPACE RECOMMENDATIONS FOR ANIMALS*

There are few critical and objective data on space requirements for animals (Davis, 1978). Even if all the complex factors affecting caged animals were known and could be evaluated, it is unlikely that a single ideal or perfect system could be developed. Therefore, caging systems based on successful experience and professional judgment must be utilized. Minimum space requirements for animals are given in the following table. They are based on the best available information concerning reasonable space recommendations for housing used animals used in research, testing, and instruction.

Special housing provisions are sometimes necessary for unusual species such as those with unique metabolic or genetic characteristics or special behavioral or reproductive requirements. Exercise areas, runs, or pens should be considered for animals that will be held for long periods of time.

Minimum Space Recommendations for Animals Used in Research, Testing, and Instruction

Animals	Weight	Type of housing	Floor Area/Animal		Height ^a	
			in ²	cm ²	in	cm
Mice	<u>g</u>					
	<10	Cage	6.0	38.71	5	12.70
	10-15	Cage	8.0	51.62	5	12.70
	15-25	Cage	12.0	77.42	5	12.70
	>25	Cage	15.0	96.78	5	12.70
Rats	<100	Cage	17.0	109.68	7	17.78
	100-200	Cage	23.0	148.4	7	17.78
	200-300	Cage	29.0	187.11	7	17.78
	300-400	Cage	40.0	258.08	7	17.78
	400-500	Cage	60.0	387.12	7	17.78
	>500	Cage	70.0	451.64	7	17.78
Hamsters ^b	<60	Cage	10.0	64.52	6	15.24
	60-80	Cage	13.0	83.88	6	15.24
	80-100	Cage	16.0	103.23	6	15.24
	>100	Cage	19.0	122.59	6	15.24
Guinea pigs ^b	≤350	Cage	60.0	387.12	7	17.78
	>350	Cage	101.0	651.65	7	17.78
Rabbits ^b	<u>kg</u>					
	<2	Cage	1.5	0.14	14	35.56
	2-4	Cage	3.0	0.25	14	35.56
	4-5.4	Cage	4.0	0.37	14	35.56
	>5.4	Cage	5.0	0.46	14	35.56

(continued on next page)

* Modified from The Guide, 1996.

Minimum Space Recommendations for Animals Used in Research, Testing, and Instruction
- cont.

Animals	Weight kg	Type of housing	Floor Area/Animal		Height ^a	
			ft ²	m ²	in	cm
Pigeons	---	Cage	0.8	0.074	e	
Quails	---	Cage	0.25	0.023	e	
Chickens	<0.25	Cage	0.25	0.023	e	
	0.25-0.5	Cage	0.50	0.046	e	
	0.5-1.5	Cage	1.00	0.093	e	
	1.5-3	Cage	2.00	0.186	e	
	>3	Cage	3.06	0.285	e	
Sheep & Goats 1-4/Pen	<25	Pen	10.0	0.93	---	---
	25-50	Pen	15.0	1.39	---	---
	>50	Pen	20.0	1.86	---	---
5/Pen	<25	Pen	8.5	0.79	---	---
	25-50	Pen	12.5	1.16	---	---
	>50	Pen	17.0	1.58	---	---
>5/Pen	<25	Pen	7.5	0.70	---	---
	25-50	Pen	11.3	1.05	---	---
	>50	Pen	15.0	1.39	---	---
Swine 1-4/Pen	<25	Pen	6.0	0.56	---	---
	25-20	Pen	12.0	1.11	---	---
	50-100	Pen	24.0	2.23	---	---
	100-200	Pen	48.0 ^f	4.46	---	---
	>200	Pen	60.0 ^f	5.56	---	---
5/Pen	<25	Pen	6.0	0.56	---	---
	25-20	Pen	10.0	0.93	---	---
	50-100	Pen	20.0	1.86	---	---
	100-200	Pen	40.0	3.75	---	---
	>200	Pen	52.0	4.83	---	---
>5/Pen	<25	Pen	6.0	0.56	---	---
	25-20	Pen	9.0	0.84	---	---
	50-100	Pen	18.0	1.67	---	---
	100-200	Pen	36.0	3.34	---	---
	>200	Pen	48.0	4.46	---	---

(continued on next page)

* Modified from The Guide, 1996.

**Minimum Space Recommendations for Animals Used in Research, Testing, and Instruction
- cont.**

Animals	Weight kg	Type of housing	Floor Area/Animal		Height ^a	
			ft ²	m ²	in	cm
Cattle	<350	Stanchion	16.0	1.49	---	---
	350-450	Stanchion	18.0	1.67	---	---
	450-550	Stanchion	22.0	2.04	---	---
	550-650	Stanchion	24.0	2.23	---	---
	>650	Stanchion	27.0	2.51	---	---
1-4/Pen	<75	Pen	24.0	2.23	---	---
	75-200	Pen	48.0	4.46	---	---
	200-350	Pen	72.0	6.69	---	---
	350-500	Pen	80.0	7.43	---	---
	500-650	Pen	105.0	9.75	---	---
	>650	Pen	120.0	11.15	---	---
5/Pen	<75	Pen	20.0	1.86	---	---
	75-200	Pen	36.0	3.34	---	---
	200-350	Pen	54.0	5.02	---	---
	350-500	Pen	72.0	6.69	---	---
	500-650	Pen	93.0	8.64	---	---
	>650	Pen	120.0	11.15	---	---
>5/Pen	<75	Pen	18.0	1.67	---	---
	75-200	Pen	36.0	3.34	---	---
	200-350	Pen	54.0	5.02	---	---
	350-500	Pen	72.0	6.69	---	---
	500-650	Pen	93.0	8.64	---	---
	>650	Pen	108.0	10.03	---	---
Horses	---	Tie Stall	44.0	4.09	---	---
	---	Pen	144.0	13.38	---	---
Ponies						
1-4/Pen	---	Pen	72.0	6.69	---	---
>4/Pen	≤200	Pen	60.0	5.57	---	---
	>200	Pen	72.0	6.67	---	---

^a From the resting floor to the cage top.

^b Space recommendations are comparable to the current regulations of the Animal Welfare Act. Mothers with litters require more space (CFR, 1984a).

^e Sufficient headroom must be provided for birds to stand erect.

^f Space recommendation is not applicable to sows housed in gestation or farrowing stalls.

* Modified from The Guide, 1996.

Appendix F

Environmental Standards

ENVIRONMENTAL STANDARDS*

The purposes of ventilation are to supply adequate oxygen; remove thermal loads caused by animal respiration, lights, and equipment; dilute gaseous and particulate contaminants; adjust the moisture content of room air; and, where appropriate, create static-pressure differentials between adjoining spaces. Establishing a room ventilation rate, however, does not ensure the adequacy of the ventilation of an animal's primary enclosure and hence does not guarantee the quality of the microenvironment.

The degree to which air movement (drafts) causes discomfort or biologic consequences has not been established for most species. The volume and physical characteristics of the air supplied to a room and its diffusion pattern influence the ventilation of an animal's primary enclosure and so are important determinants of its microenvironment. The relationship of the type and location of supply-air diffusers and exhaust vents to the number, arrangement, location, and type of primary enclosures in a room or other secondary enclosure affects how well the primary enclosures are ventilated and should therefore be considered. The use of computer modeling for assessing those factors in relation to heat loading and air diffusion patterns can be helpful in optimizing ventilation of primary and secondary enclosures (for example, Hughes and Reynolds, 1995; Reynolds and Hughes 1994).

The guideline of 10-15 fresh-air changes per hour has been used for secondary enclosures for many years and is considered an acceptable general standard. Although it is effective in many animal-housing settings, the guideline does not take into account the range of possible heat loads; the species, size, and number of animals involved; the type of bedding or frequency of cage-changing; the room dimensions; or the efficiency of air distribution from the secondary to the primary enclosure. In some situations, the use of such a broad guideline might pose a problem by overventilating a secondary enclosure that contains few animals and thereby wasting energy or by underventilating a secondary enclosure that contains many animals and thereby allowing heat and odor accumulation. To determine more accurately the ventilation required, see the Guide.

Recommended Dry-Bulb Temperature for Animal Species Commonly Used in Research, Testing, and Instruction

Animals	Dry-Bulb Temperature	
	°C	°F
Mouse	18-26	64-79
Rat	18-26	64-79
Hamster	18-26	64-79
Guinea Pig	18-26	64-79
Rabbit	16-22	61-72
Chicken	16-27	61-81
Farm animals	16-27	61-81

* **Modified** from the Guide (1996)

Appendix G

ARO /IACUC Semiannual Facility Inspection Compliance Checklist



UNIVERSITY of NEW HAMPSHIRE

Animal Resources Office/Institutional Animal Care & Use Committee Semiannual Facility Inspection Compliance Checklist *

Building _____ Dept. _____ Room # _____ P.I. _____ Date ____/____/____
 _____ Animal Room _____ Surgery _____ Procedure Room _____ Lab _____ Farm

1. Cages/tanks clean?	Y	N	NA	23. Room clean and neat?	Y	N	NA
2. Ventilation adequate?	Y	N	NA	24. Proper equipment available?	Y	N	NA
3. Temp/humidity control?	Y	N	NA	25. Animal equipment clean?	Y	N	NA
4. Lighting acceptable & clean?	Y	N	NA	26. Sharps containers used?	Y	N	NA
5. Floor/wall/ceiling/air vent/door drain surfaces clean?	Y	N	NA	27. Room free of hazards to humans & animals?	Y	N	NA
6. Cages/tanks in good condition w/no rusting or oxidized equipment?	Y	N	NA	28. Medical supplies within expiration date?	Y	N	NA
7. Proper # of animals in cages/tanks?	Y	N	NA	29. Drugs properly locked & stored?	Y	N	NA
8. Pest control adequate?	Y	N	NA	30. Controlled drug log maintained?	Y	N	NA
9. Noise level acceptable?	Y	N	NA	31. Animal use records kept?	Y	N	NA
10. Personal protection info. posted?	Y	N	NA	32. Waterers clean & working?	Y	N	NA
11. Food/bedding properly stored?	Y	N	NA	33. Animal fencing safe?	Y	N	NA
12. Daily log sheet current/complete	Y	N	NA	34. Shade available for animals?	Y	N	NA
13. Any surface violations (e.g., paint)?	Y	N	NA	35. Animal shelters adequate?	Y	N	NA
14. Animal inventory complete?	Y	N	NA	36. Back up power working?	Y	N	NA
15. Cage cards accurate/complete?	Y	N	NA	37.	Y	N	NA
16. Cage washer temp. logbook used?	Y	N	NA	Observations/suggestions:			
17. Proper waste disposal?	Y	N	NA				
18. Feed within expiration date?	Y	N	NA				
19. Animals appear well cared for?	Y	N	NA				
20. Food/water adequate?	Y	N	NA				
21. SOPs posted/adequate?	Y	N	NA	Inspected by: _____			
22. Emergency, weekend, & holiday contact info visibly posted?	Y	N	NA	Repeat inspection needed? Y N			
				Repeat inspection date: / /			

***Deficiencies noted:* Each deficiency identified above is referenced by number and marked M (minor) or S (significant). Deficiencies must be corrected by the date indicated below.**

#	Type	Plans for correction	To be corrected by	Date to be corrected

***This form is to be used as a reviewer checklist for the semiannual animal facilities inspections. It is not an official report.**

**Approved and instituted by the IACUC on 2/27/2002.
Last updated: 8/07**

Appendix H
Veterinary Care, Quarantining, and Conditioning Standards

**QUARANTINE, CONDITIONING and HEALTH SURVEILLANCE -
RODENTS, RABBITS, and OTHER SPECIES**

I. Rodents (mice, rats, hamsters, guinea pigs, gerbils)

A. Animals of known health status

1. A list of approved vendors, supplying animals of known health status, will be assembled. Microbiological, parasitological and, in some cases, histologic data are available upon request for animals from each of these vendors.
2. Animals may be admitted to chronic colonies with no quarantine period.
3. Rodents from the approved vendor list and sentinel animals may be health-surveyed twice a year; monitoring will consist of the items listed under B.3.c & d.
4. Surveillance animal procedures:
 - a. Project director orders extra animals which are introduced at same time to colony.
 - b. Soiled bedding from other cages is introduced periodically into sentinel cages.
 - c. Sentinel cages are rotated to various locations in each room.
 - d. Sentinel animals will be tested after a minimum of one month and at twice yearly intervals.
 - e. In-house screening for sentinel animals will include murine serology as indicated in B.3.c & d.
 - f. Full necropsies, all organs.
 - g. Examination for endoparasites and ectoparasites.
 - h. Microbiologic examination which will include screening for known rodent pathogens.

B. Animals of unknown health status

1. Includes rodents from: i) vendors of animals of unknown health status, and ii) all other non-commercial sources, e.g., other schools, hospital laboratories, or institutions.
2. All animals in this category must undergo the quarantine procedures as determined by the Attending Veterinarian; none may be admitted directly to the established rodent holding rooms.
3. Procedures:
 - a. Quarantine minimum of 3 weeks.

- b. Animals are separated by species and vendor in isolation units. Units are decontaminated between quarantine groups.

C. Microbiologic tolerance in rodents

1. Murine viruses may enter the animal facility in live animals, in tumor material and in cell cultures.
2. All cell lines or tumors received from extramural sources and intended for injection into animals will be monitored as determined by the Attending Veterinarian.
3. The acquisition of known Mycoplasma-positive rodents is discouraged. Such animals may be admitted, but housing and use will be restricted to specific animal rooms.

II. Rabbits

A. Procedures (if vendor is current sole source):

1. Physical exam upon entry.
2. Examine/treat for ear mites, if necessary.
3. Identify by ear tattoo or tag.
4. Admit to chronic colonies.

B. Quarantine (animals procured from vendors of animals of unknown health status):

1. One week quarantine.
2. Physical exam upon entry.
3. Examine/treat for ear mites, if necessary.
4. Identify by ear tattoo or tag.
5. Laboratory determinations, if indicated.

C. Rabbits, purchased as certified Pasturella-free animals, will be housed in quarters physically isolated from other rabbit colonies. Strict management practices will be in effect, to prevent cross-contamination of the Pasturella-free rabbits.

III. Agricultural animals, wildlife, and poultry

A program for adequate veterinary care for agricultural animals, wildlife, horses and poultry is required. This includes a program for disease prevention, surveillance, diagnosis, treatment and endpoint resolution, and is the responsibility of the attending veterinarian(s). In addition, a system of frequent, direct and regular communication between animal care personnel, the project director, the veterinarian and the ARO is an important component of this program. Other important points include:

1. Positive identification of individual or groups of animals
2. Animal records including daily observations, preventive medicine processes, diagnosis, treatments, prognosis, procedures and other relevant information as may be required. All records should be readily available to the ARO, USDA, IACUC or other appropriate persons or entities.
3. Proper acquisition, records, labeling, and disposal of all drugs, solutions etc. are required. All expired or outdated material must be clearly labeled DO NOT USE and may be disposed of by calling the OEHS office at 862-4041.
4. A program for the acquisition, quarantine and stabilization of newly acquired animals; including separation by species, source, age and health status as directed by the veterinary staff or the ARO.
5. Record of euthanasia, including the method and agent.

IV. Fish, Amphibians, and Reptiles

Veterinary care is required for these species, including the following:

1. Animals should be observed daily for signs of illness, injury or changes in behavior. Records of these observations must be kept.
2. Health surveillance, diagnosis, treatment, and control of disease is essential and is coordinated through the ARO and NHVDL.
3. Sick, dead, or injured animals should be reported to the ARO. Animals or tissues may be submitted to the NHVDL for further evaluation.
4. A system of quarantine, stabilization and separation for newly arrived animals.
5. A sound program of management must be in place, including husbandry practices, behavioral management and water quality assessment.

V. Other Animal Species

- A. Pigeons: Routine health surveillance for endoparasites and ectoparasites, chlamydia, coccidia, and pharyngeal and choanal swabs for salmonella. All unexplained deaths must be referred to the NHDVL.
- B. Shipments of other species may require quarantine periods. Quarantine location, duration and housing system may vary with species requirements, size of shipment and research protocol. Arrangements will be made by the ARO on an individual basis.

Appendix I
Identification Methods

ANIMAL IDENTIFICATION

1. **All identification records must include the IACUC protocol approval number.**
2. ID cards may be used on animal cages or pens. Cards should contain the project director's name and phone number, species/strain of animal housed, date of arrival at UNH, source, and any other descriptive information (age, weight, sex, etc.) and IACUC approval number. Cage cards should be securely attached to the cage; tape is generally not acceptable.
3. Sheep, goats, swine, cattle, etc. should be identified by tattoo, ear tag, collar, or pen cards.
4. Poultry, pigeons, and other fowl can be identified by cage/pen cards and/or leg bands.
5. Chronic animals should be identified by the most permanent method possible, i.e., tattoo, ear punch, collars, ear tags, leg bands, etc.

Appendix J

Assessing Pain and Distress

ASSESSING PAIN AND DISTRESS*

Federal law requires that animal procedures which are clearly painful or which induce distress be alleviated through the use of aesthetic, analgesic, or tranquilizing drugs. UNH must provide assurance to the USDA on an annual basis that animals subjected to painful or distressful procedures have received appropriate pain-relieving drugs.

A fundamental approach to assessment of pain in laboratory animals does not begin with chemical or biological evaluations. The key to adequate assessment lies in the hands of the animal care personnel: technicians, laboratory specialists, and researchers. It is here that clinical observations and abnormal behavior should be recognized as possible identifying factors of pain in laboratory animals. It is therefore essential that all personnel involved in the care of animals be well versed in normal animal behavior patterns and that they recognize any deviation from the normal or usual pattern. The conscientious laboratory animal personnel performing daily routine functions should identify changes in personality, eating habits, physiological functions, etc. Such observations should be reported quickly to the clinical veterinarian or appropriate animal health care official. Good communication among all animal health care personnel is essential. Early recognition of abnormal signs, or any deviation from usual daily animal performance can mean the difference between mild, moderate, or severe pain. Anticipating when signs of pain may occur is an important part of minimizing and preventing unintended suffering in animals. This can be accomplished by a thorough knowledge of expected results of all experiments which are known or are likely to produce pain and suffering. In recent years, the field of laboratory animal medicine has established a protocol system that describes each animal experiment prior to its initiation. Clinical veterinarians should review each protocol for assessment of research which may cause pain, stress, distress, discomfort, or suffering to animals. This review also will reveal proposed drug usage which could interfere with or react with post-procedural pain medication. Review of protocols prior to performance and review of drug literature and analgesics known not to interfere with the experimental design or protocol can enhance treatment of post-procedural pain. Knowledge of the general responses of animals to a given procedure is important in the assessment and management of pain. Knowledge of an animal's disposition and normal physiological functions prior to execution of experimental protocols is extremely helpful in determining whether an animal is in pain. Aggressiveness, attempting to bite, hissing, and/or withdrawal can be interpreted as signs of pain. However, if such behavior was present prior to manipulation and is characteristic of the animal in question, then these indices are not necessarily indicative of pain or suffering. It cannot, however, be assumed that the animal is not in pain, and a thorough assessment for post-procedural pain should be performed. Comparison of pre- and post-procedural behavior may indicate that the animal is still growling, hissing, or attempting to bite, but movements or attempts to escape may be minimum to none. The importance of being aware of pre-procedural traits cannot be over-emphasized.

SIGNS OF ACUTE PAIN	SIGNS OF CHRONIC PAIN OR ILLNESS
Guarding (of affected area)	Limping or carrying limb
Crying or vocalizing	Licking area of body
Mutilation	Reluctance to move
Restlessness	Change in personality
Sweating	Dysuria (painful urination)
Recumbency (especially notable in large animals)	Bowel lassitude
Heavy breathing	Animals not up and about 24 hours after surgery
Loss of appetite	

* Modified from Oakland University's Animal Care and Use Training and Information Manual, 1997

Species-Specific Behavioral Signs of Pain*

Species	Vocalizing	Posture	Locomotion	Temperament
Mice, rats, hamsters	Squeaks, squeals	Dormouse posture; rounded back; head titled; back rigid	Ataxia; running in circles	Docile or aggressive depending on the severity of pains; eats neonates
Rabbits	Piercing squeal on acute pain	Hunched; faces back of cage	Inactive; drags hind legs	Apprehensive, dull, sometimes aggressive depending on severity of pain; eats neonates
Guinea Pigs	Urgent repetitive squeals	Hunched	Drags hind legs	Docile, quiet, terrified, agitated
Chickens	Gasping	Stand on one foot; hunched, huddled	None	Lethargic; allows handling
Birds	Chirping	Huddled, hunched	From excessive movement to tonic immobility depending on severity of pain	Inactive; drooping, miserable appearance
Pigs	From excessive squealing to no sound at all	All four feet close together under body	Unwilling to move; unable to stand	From passive to aggressive depending on severity of pain
Sheep	Grunting; teeth grinding	Rigid; head down	Limp; reluctant to move the painful area	Disinterested in surroundings; dull, depressed
Cows, calves, goats	Grunting; grinding teeth	Rigid; head lowered; back humped	Limp; reluctant to move the painful area	Dull, depressed; act violent when handled
Horses	Grunting, nickers	Rigid; head lowered	Reluctant to move; walk in circles "up & down" movement	Restless, depressed

* Modified from Oakland University's Animal Care and Use Training and Information Manual, 1997

Appendix K

Anesthetic and Tranquilizing Agents

TABLE OF DRUG DOSES

Drug	Indication	Dosage	Route	Remarks
Anesthetics				
Ketamine HCl	Dissociative anesthesia	20 mg/kg for restraint 25-40 mg/kg in rabbits and guinea pigs 60-90 mg/kg in rodents	IM	Requires addition of acepromazine, xylazine, or diazepam; irritates IM injection site; IP given diluted
Pentobarbital sodium	Barbiturate anesthetic	10-20 mg/kg in young rodents 35-45 mg/kg in rats, rabbits, and guinea pigs 60-90 mg/kg in mice, gerbils, and hamsters	IV, IP	Dose can vary greatly; generally a high-risk anesthetic with several metabolic effects; a poor analgesic
Thiamyl sodium	Ultrashort-acting barbiturate	25-50 mg/kg or to effect	IV, IP	Causes tissue irritation if extra-vascular
Preanesthetics				
Acepromazine maleate	Tranquilizer and antiemetic	1-2 mg/kg	IM	May precipitate seizures in gerbils; used with ketamine
Atropine sulfate	Anticholinergic; respiratory stimulant	0.1-3.0 mg/kg	SC	Many rabbits and rats possess a serum atropinesterase
Chlorpromazine	Tranquilizer, antiemetic	3-5 mg/kg 3-35 mg/kg	IV IM	Potentiates barbiturates; causes myositis
Diazepam	Tranquilizer muscle relaxant	5-10 mg/kg in rabbits	IM	Used with ketamine and other anesthetics
Xylazine	Sedative analgesic	3-5 mg/kg in rabbits and guinea pigs 4-8 mg/kg in rodents	IM	Widely used in combination with ketamine

SEDATION, ANALGESIA, AND ANESTHESIA DOSAGES FOR INJECTABLE DRUGS (in mg/kg)

Drug	Sedation/Analgesia			Anesthesia		
	IP	IV	IM	IP	IV	IM
MOUSE						
Ketamine	25-50	---	22	100-200	50	400
Thiopental	---	---	---	---	25-50	---
Fentanyl-Droperidol	---	---	---	---	---	0.2-0.?
Pentobarbital	---	---	---	40-80	40-70	---
RAT						
Ketamine	20	---	22	40-160	---	44
Thiopental	---	---	---	25-48	---	40
Fentanyl-Droperidol	---	---	0.13-0.16	---	---	0.3
Pentobarbital	---	---	---	25-40	---	35-40
RABBIT						
Ketamine	---	---	22-35	---	15-20	44
Xylazine	---	---	---	---	3	5-10
Thiopental	---	---	---	---	30	---
Urethane	---	---	---	500-1000	---	---
Fentanyl-Droperidol	---	---	0.15-0.17	---	---	---
Pentobarbital	---	---	---	40	25-40	---
GUINEA PIG						
Ketamine	---	---	22-64	---	---	44-256
Xylazine	---	---	---	---	3	5-10
Thiopental	---	---	---	20	---	55
Pentobarbital	---	---	---	30	---	15-30
HAMSTER						
Ketamine	100	---	40	200	---	100
Thiopental	---	---	---	25-48	---	40
Pentobarbital	30	---	---	50-90	---	---
GERBIL						
Ketamine	---	---	20	---	---	44
Pentobarbital	---	---	---	60	---	---
RUMINANT						
Promazine	---	---	1-2	---	---	---
Acetylpromazine	---	---	0.1	---	---	---
Ketamine (sheep)	---	---	---	---	2	---
Xylazine (cattle)	---	---	0.1	---	---	---
Xylazine (sheep)	---	---	1.0	---	---	---
Xylazine (goat)	---	---	0.05	---	---	---
Thiopental (cattle)	---	---	---	---	10	---
Thiopental (sheep)	---	---	---	---	25	---
Thiopental (goat)	---	---	---	---	25	---
Pentobarbital	---	---	---	---	10	---
SWINE						
Acetylpromazine	---	---	0.2	---	---	---
Ketamine	---	---	5	---	5-7	10-20
Thiopental	---	---	---	---	6-10 with preanes.	---
Pentobarbital	---	---	---	---	35	---

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Appendix L

**Modified from the 2007 Report of the American Veterinary
Medical Association Panel on Euthanasia**

AGENTS AND METHODS OF EUTHANASIA BY SPECIES

Species	Acceptable (Refer to Table 2 for details)	Conditionally Acceptable (refer to Table 3 for details)
Amphibians	Barbiturates, inhalant anesthetics (in appropriate species), CO ₂ , tricaine methane sulfonate (TMS, MS 222) benzocaine hydrochloride, double pithing	Penetrating captive bolt, gunshot, stunning & decapitation, decapitation & pithing
Birds	Barbiturates, inhalant anesthetics, CO ₂ , gunshot (free-ranging only)	N ₂ , Ar, cervical dislocation, decapitation, thoracic compression (small, free-ranging only)
Fish	Barbiturates, inhalant anesthetics, CO ₂ , tricaine methane sulfonate (TMS, MS 222) benzocaine hydrochloride, 2-phenoxyethanol	Decapitation and pithing, stunning and decapitation/pithing
Horses	Barbiturates, potassium chloride in conjunction with general anesthesia, penetrating captive bolt	Chloral hydrate (IV, after sedation), gunshot, electrocution
Marine mammals	Barbiturates, etorphine hydrochloride	Gunshot (cetaceans < 4 meters long)
Mink, fox, and other mammals produced for fur	Barbiturates, inhalant anesthetics, CO ₂ (mink require high concentrations for euthanasia without supplemental agents), CO, potassium chloride in conjunction with general anesthesia	N ₂ , Ar, electrocution followed by cervical dislocation
Rabbits	Barbiturates, inhalant anesthetics, CO ₂ , potassium chloride in conjunction with general anesthesia	N ₂ , Ar, cervical dislocation (< 9 kg), decapitation, penetrating captive bolt
Reptiles	Barbiturates, inhalant anesthetics (in appropriate species), CO ₂ (in appropriate species)	Penetrating captive bolt, gunshot, decapitation and pithing, stunning and decapitation
Rodents and other small mammals	Barbiturates, inhalant anesthetics, CO ₂ , potassium chloride in conjunction with general anesthesia	Methoxyflurane, ether, N ₂ , Ar, cervical dislocation (rats < 200 g), decapitation
Ruminants	Barbiturates, potassium chloride in conjunction with general anesthesia, penetrating captive bolt	Chloral hydrate (IV, after sedation), gunshot, electrocution
Swine	Barbiturates, CO ₂ , potassium chloride in conjunction with general anesthesia, penetrating captive bolt	Inhalant anesthetics, chloral hydrate (IV, after sedation), gunshot, electrocution, blow to the head (< 3 weeks of age)
Free-ranging wildlife	Barbiturates IV or IP, inhalant anesthetics, potassium chloride in conjunction with general anesthesia	CO ₂ , N ₂ , Ar, penetrating captive bolt, gunshot, kill traps (scientifically tested)

TABLE 2 – ACCEPTABLE* AGENTS AND METHODS OF EUTHANASIA: CHARACTERISTICS AND MODES OF ACTION

Agent	Classification	Mode of Action	Rapidity	Ease of performance	Safety for personnel	Species suitability	Efficacy and comments
Barbiturates	Hypoxia attributable to depression of vital centers	Direct depression of cerebral cortex, subcortical structures, and vital centers; direct depression of heart muscle	Rapid onset of anesthesia	Animal must be restrained; personnel must be skilled to perform IV injection	Safe except human abuse potential; DEA-controlled substance	Most species	Highly effective when appropriately administered; acceptable IP in small animals and IV
Benzocaine hydrochloride	Hypoxia attributable to depression of vital centers	Depression of CNS	Very rapid, depending on dose	Easily used	Safe	Fish, amphibians	Effective but expensive
Carbon dioxide (bottled gas only)	Hypoxia attributable to depression of vital centers	Direct depression of cerebral cortex, subcortical structures and vital centers; direct depression of heart muscle	Moderately rapid	Used in closed container	Minimal hazard	Small laboratory animals, birds, cats, small dogs, rabbits mink (high concentrations required), zoo animals, amphibians, fish, some reptiles, swine	Effective, but time required may be prolonged in immature and neonatal animals
Inhalant anesthetics	Hypoxia attributable to depression of vital centers	Direct depression of cerebral cortex, subcortical structures, and vital centers	Moderately rapid onset of anesthesia, excitation may develop during introduction	Easily performed with closed container; can be administered to large animals by means of a mask	Must be properly scavenged or vented to minimize exposure to personnel	Some amphibians, birds, cats, dogs, furbearing animals, rabbits, some reptiles, rodents and other small mammals, zoo animals, fish, free-ranging wildlife	Highly effective provided that subject is sufficiently exposed; ether is conditionally acceptable
Penetrating captive bolt	Physical damage to brain	Direct concussion of brain tissue	Rapid	Requires skill, adequate restraint, and proper placement of captive bolt	Safe	Horses, ruminants, swine	Instant loss of consciousness, but motor activity may continue

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TABLE 2 – ACCEPTABLE* AGENTS AND METHODS OF EUTHANASIA: CHARACTERISTICS AND MODES OF ACTION – cont.

Agent	Classification	Mode of Action	Rapidity	Ease of performance	Safety for personnel	Species suitability	Efficacy and comments
2-Phenoxyethanol	Hypoxia attributable to depression of vital centers	Depression of CNS	Very rapid, depending on dose	Easily used	Safe	Fish	Effective but expensive
Potassium chloride (intracardially or intravenously in conjunction with general anesthesia only)	Hypoxia	Direct depression of cerebral cortex, subcortical structures, and vital centers secondary to cardiac arrest	Rapid	Requires training and specialized equipment for remote injection anesthesia, and ability to give IV injection of potassium chloride	Anesthetics may be hazardous with accidental human exposure	Most species	Highly effective; some clonic muscle spasms may be observed
Tricaine methane sulfonate (TMS, MS 222)	Hypoxia attributable to depression of vital centers	Depression of CNS	Very rapid, depending on dose	Easily used	Safe	Fish, amphibians	Effective but expensive

* Acceptable methods are those that consistently produce a humane death when used as the sole means of euthanasia.

TABLE 3 – CONDITIONALLY ACCEPTABLE[#] AGENTS AND METHODS OF EUTHANASIA: CHARACTERISTICS AND MODES OF ACTION

Agent	Classification	Mode of Action	Rapidity	Ease of performance	Safety for personnel	Species suitability	Efficacy and comments
Carbon dioxide (bottled gas only)	Hypoxia due to depression of vital centers	Direct depression of cerebral cortex, subcortical structures and vital centers; direct depression of heart muscle	Moderately rapid	Used in closed container	Minimal hazard	Nonhuman primates, free-ranging wildlife	Effective, but time required may be prolonged in immature and neonatal animals
Cervical dislocation	Hypoxia due to disruption of vital centers	Direct depression of brain	Moderately rapid	Requires training and skill	Safe	Poultry, birds, laboratory mice, rats (< 200 g), rabbits (< 1 kg)	Irreversible; violent muscle contractions can occur after cervical dislocation
Chloral hydrate	Hypoxia from depression of respiratory center	Direct depression of brain	Rapid	Personnel must be skilled to perform IV injection	Safe	Horses, ruminants, swine	Animals should be sedated prior to administration
Decapitation	Hypoxia due to disruption of vital centers	Direct depression of brain	Rapid	Requires training and skill	Guillotine poses potential employee injury hazard	Laboratory rodents; small rabbits; birds; some fish, amphibians, and reptiles (latter 3 with pithing)	Irreversible; violent muscle contractions can occur after decapitation
Electrocution	Hypoxia	Direct depression of brain and cardiac fibrillation	Can be rapid	Not easily performed in all instances	Hazardous to personnel	Used primarily in sheep, swine, foxes, mink (with cervical dislocation), ruminants, animals > 5 kg	Violent muscle contractions occur at same time as loss of consciousness
Gunshot	Hypoxia due to disruption of vital centers	Direct concussion of brain tissue	Rapid	Requires skill and appropriate firearm	May be dangerous	Large domestic and zoo animals, reptiles, amphibians, wildlife, cetaceans (< 4 meters long)	Instant loss of consciousness, but motor activity may continue

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TABLE 3 – CONDITIONALLY ACCEPTABLE[#] AGENTS AND METHODS OF EUTHANASIA: CHARACTERISTICS AND MODES OF ACTION – cont.

Agent	Classification	Mode of Action	Rapidity	Ease of performance	Safety	Species suitability	Efficacy and comments
Inhalant anesthetics	Hypoxia attributable to depression of vital centers	Direct depression of cerebral cortex, subcortical structures, and vital centers	Moderately rapid onset of anesthesia, excitation may develop during introduction	Easily performed with closed container; can be administered to large animals by means of a mask	Must be properly scavenged or vented to minimize exposure to personnel; ether has explosive potential and exposure to ether may be stressful	Nonhuman primates, swine ether is conditionally acceptable for rodents and small mammals;; methoxyflurane is conditionally acceptable for rodents and small mammals	Highly effective provided that subject is sufficiently exposed
Nitrogen, argon	Hypoxia	Reduces partial pressure of oxygen available to blood	Rapid	Used in closed chamber with rapid filling	Safe if used with ventilation	Cats, small dogs, birds, rodents, rabbits, other small species, mink, zoo animals, nonhuman primates, free-ranging wildlife	Effective except in young and neonates; an effective agent, but other methods are preferable
Penetrating captive bolt	Physical damage to brain	Direct concussion of brain tissue	Rapid	Requires skill, adequate restraint, and proper placement of captive bolt	Safe	Dogs, rabbits, zoo animals, reptiles, amphibians, free-ranging wildlife	Instant loss of consciousness, but motor activity may continue
Pithing	Hypoxia due to disruption of vital centers, physical damage to brain	Trauma of brain and spinal cord tissue	Rapid	Easily performed but requires skill	Safe	Some ectotherms	Effective, but death not immediate unless brain and spinal cord are pithed

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[#] Conditionally acceptable methods are those that by the nature of the technique or because of greater potential for operator error or safety hazards might not consistently produce humane death or are methods not well documented in the scientific literature.

SOME UNACCEPTABLE AGENTS AND METHODS OF EUTHANASIA

Agent or method	Comments
Air embolism	Air embolism may be accompanied by convulsions, opisthotonos, and vocalization. If used, it should be done only in anesthetized animals
Blow to the head	Unacceptable for most species
Burning	Chemical or thermal burning of an animal is not an acceptable method of euthanasia
Chloral hydrate	Unacceptable in dogs, cats, and small mammals
Chloroform	Chloroform is a known hepatotoxin and suspected carcinogen and, therefore, is extremely hazardous to personnel
Cyanide	Cyanide poses an extreme danger to personnel and the manner of death is aesthetically objectionable
Decompression	Decompression is unacceptable for euthanasia because of numerous disadvantages. (1) Many chambers are designed to produce decompression at a rate 15 to 60 times faster than that recommended as optimum for animals, resulting in pain and distress attributable to expanding gases trapped in body cavities (2) Immature animals are tolerant of hypoxia, and longer periods of decompression are required before respiration ceases (3) Accidental decompression, with recovery of injured animals, can occur (4) Bleeding, vomiting, convulsions, urination, and defecation, which are aesthetically unpleasant, may develop in unconscious animals
Drowning	Drowning is not a method of euthanasia and is inhumane
Exsanguination	Because of the anxiety associated with extreme hypovolemia, exsanguinations should be done only in sedated, stunned, or anesthetized animals
Formalin	Direct immersion of an animal into formalin, as a means of euthanasia, is inhumane
Household products and solvents	Acetone, quaternary compounds (including CCl ₄), laxatives, clove oil, dimethylketone, quaternary ammonium products*, antacids, and other commercial and household products or solvents are not acceptable means agents for euthanasia
Hypothermia	Hypothermia is not an appropriate method of euthanasia
Neuromuscular blocking agents (nicotine, magnesium sulfate, potassium chloride, all curariform agents)	When used alone, these drugs all cause respiratory arrest before loss of consciousness, so the animal may perceive pain and distress after it is immobilized
Rapid freezing	Rapid freezing as a sole means of euthanasia is not considered to be humane. If used, animals should be euthanized prior to freezing
Strychnine	Strychnine causes violent convulsions and painful muscle contractions
Stunning	Stunning may render an animal unconscious, but it is not a method of euthanasia (except for neonatal animals with thin craniums). If used, it must be immediately followed by a method that ensures death
Tricaine methane sulfonate (TMS, MS 222)	Should not be used for euthanasia for animals intended as food

* Roccal D Plus, Pharmacia & Upjohn, Kalamazoo, Mich.

Appendix M

Guidelines for Use of Hazardous Materials

USE OF RADIOISOTOPES IN ANIMALS

1. Project directors and their designates are expected to understand and comply fully with regulations of the National Regulatory Commission (NRC), the New Hampshire Rules for the Control of Radiation, and UNH Radiation Safety Committee (RSC) pertaining to the safe handling of radioisotopes.
2. All experimentation in animals is to be done within designated animal holding rooms.
3. Animal technicians will be given explicit instructions by the Office of Environmental Health and Safety (OEHS) personnel and provided with necessary protective monitoring devices to assure their safety.
4. All animals containing radioactive materials are to be housed in approved holding rooms. Room ventilation, surface preparation, drainage, and other room design requirements will be considered. Animals given radioactive materials normally will be housed in rooms separate from conventional animal rooms. Doors will be labeled with appropriate radiation signs.
5. All cages housing radioactive animals shall be clearly labeled as follows:
 - a. Radioactivity warning tape must be affixed to cages
 - b. Name of project director
 - c. Name of radioisotope
 - d. Amount of radioisotope administered per animal
 - e. Date, time and mode of administration
6. Standard animal cages are available for use, when the isotope(s) being used can readily be removed by mechanical cage washing. If, however, difficult decontamination is expected, arrangements must be made for use of disposable plastic cages.
7. Plastic cages holding radioactive animals must contain absorbent bedding. Excreta pans under suspended, wire bottom cages will be lined with disposable, plastic-backed paper.
8. All animal litter, tray paper, feces, gloves, etc., are to be placed in special radioactive waste containers located in the facility. These containers are provided by OEHS, who is responsible for surveillance and disposal.
9. Before animal cages or racks are taken to the cage wash area, and the racks cleaned, the OEHS must be notified for clearance.
10. All handling of radioactive animals and bedding shall be done while wearing disposable rubber gloves. Animal injections will be done over stainless steel receptacles or benches covered with absorbent plastic-backed paper.
11. In event of death of radioactive animals, the project director shall be called as soon as possible. The project director is responsible for notifying OEHS, who will handle surveillance and placement of carcasses in designated radioactivity freezers. Carcasses or parts thereof of radioactive animals shall be wrapped in absorbent material and placed in water-tight plastic bags. If the project director cannot be reached, OEHS will handle disposition.
12. The RSC will not authorize the use of radioactive materials in animal studies until approval by the Institutional Animal Care and Use Committee (IACUC) has been obtained.

13. Violation of any of the regulations pertaining to the use of radioisotopes in animal studies shall result in the immediate suspension of those use privileges pending review by OEHS, RSC, and IACUC.

REFERENCES TO LOCAL, STATE, AND FEDERAL LAWS, REGULATIONS AND STANDARDS

Definitions in this section represent a compilation of many definitions derived from local, state and federal laws, regulations, and standards, as noted below. The intent of these definitions is to be inclusive and comprehensive; that is, all materials defined as hazardous in any applicable source are included.

Hazardous Chemical Substances

NFPA Flammable and Combustible Liquids Code
 National Building Codes
 US 29 CFR 1910.1000 air contaminants
 US 29 CFR 1910.1200 hazard communication standard
 US 29 CFR 1910.1450 laboratory standard
 US 29 CFR 1910.106 flammable and combustible liquids
 US 29 CFR 1910.120 hazardous waste operations and emergency response
 US 29 CFR 1910.1001 specific chemical standards
 NH RSA 277A Right to Know Law
 NH RSA 125c Clean Air Act and Amendments
 US 40 CFR Resource Conservation and Recovery Act
 US 40 CFR Toxic Substances Control Act
 US 40 CFR Hazardous Materials Transportation Regulations
Laboratory Use of Chemical Carcinogens, NIH, US DHHS: PHS

Radioactive Materials

US 10 CFR Parts 19 and 20
 NH He-P 2000 Rules for the Control of Radiation

Hazardous Biological Agents

NH Part Env-Wm 2604 Infectious Waste
 US 42 CFR Part 71 Importation of Etiological Agents, Hosts and Vectors
 US 42 CFR Part 72 Interstate Shipment of Etiologic Agents
 US 49 CFR 173.386 Etiologic Agents; definition and scope/Infectious Substances Human
 US 29 CFR 1910.120 (a) HAZWOPER
 US 29 CFR 1910.1030 BLOODBORNE PATHOGENS
 US Federal Register July 5, 1994 Part IV NIH Guidelines for Research Involving Recombinant DNA Molecules
Classification of Etiologic Agents on the Basis of Hazard, 4th Ed. 1974, US DHEW: PHS Atlanta, GA
Biosafety in Microbiological and Biomedical Laboratories, 5th Ed. May 2007, US DHHS: GPO,
www.cdc.gov/od/ohs/biosfty/bmb15/bmb15toc.htm
Safety Standards for Research Involving Oncogenic Viruses, October 1974, National Cancer Institute NIH 75-790
Biohazards Safety Guide, 1974, National Institutes of Health, US DHEW
Biosafety in the Laboratory (Prudent Practices for the Handling and Disposal of Infectious Materials)
 National Research Council, National Academy Press, 1991.
 Benenson, Abram S. (Ed) (1991). Control of Communicable Diseases in Man. American Public Health Assoc.
 American Academy of Pediatrics. Report of the Committee on Infectious Disease (Red Book)
Biohazard Control and Containment in Oncogenic Virus Research, NIH, US DHEW

Appendix N

Medical History & Risk Assessment Questionnaire for Persons Handling Vertebrate Animals and/or Unfixed Vertebrate Animal Tissues

<http://www.unh.edu/osr/compliance/iacuc.html#application>