



# **Policies and Procedures Manual**

for the Use of Animals at the University of Nebraska-Lincoln

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## FOREWORD

This *Policies and Procedures Manual for the Use of Animals at the University of Nebraska-Lincoln (UNL)* has been prepared to assist the investigator, instructor, graduate student or technician with the use of animals. It was prepared by the Institutional Animal Care Program Office, approved by the Institutional Animal Care and Use Committee (IACUC) and approved by the vice chancellor for research and economic development.

This manual supersedes any previous printed policies and procedures manual for animal use at UNL. This manual is intended to be used to supplement *The Guide for the Care and Use of Laboratory Animals* (2011), *The Guide for the Care and Use of Agricultural Animals in Research and Teaching* (2010) and *The 1985 Animal Welfare Act*. Any different, more restrictive statements in this manual reflect stronger university policies and these policies supersede the above references, as long as they are at least equal to or provide more humane treatment of the animals.

The University of Nebraska–Lincoln filed and received approval of an assurance document with the Office of Laboratory Animal Welfare (OLAW). The assurance document states that “the University of Nebraska will comply with the ‘Public Health Policy on Humane Care and use of Laboratory Animals’ and be guided by the ‘U.S. Government Principles for the Utilization and Care of Vertebrate Animals Used in Testing, Research and Training’.” The assurance is necessary in order to be eligible for federal grant money. We also are subject to unannounced inspection of our animal facilities and programs by the USDA Animal and Plant Health Inspection Service (APHIS) at any time. The welfare of the animals is of prime concern at UNL. Your assistance in maintaining the standards outlined in this manual will ensure the university stays in compliance with our assurance document and the Animal Welfare Regulations.

Please talk to a member of the IACUC or call the Institutional Animal Care Program Office at (402) 472-4486 if you have questions concerning the interpretation of information contained in this manual.



Prem S. Paul  
Vice Chancellor for Research and Economic Development  
University of Nebraska-Lincoln

# TABLE of CONTENTS

<b>ABBREVIATIONS.....</b>	<b>6</b>
<b>NATIONAL LAWS, RULES AND REGULATIONS .....</b>	<b>7</b>
Animal Welfare Act (Public Law 89-544) and subsequent amendments (PL 91-579, PL 94-279, PL 99-198).....	7
Public Health Service Policy on Humane Care and Use of Laboratory Animals .....	8
Published Care and Use Guidelines .....	8
<i>The Guide for the Care and Use of Laboratory Animals</i> .....	8
<i>The Guide for the Care and Use of Agricultural Animals in Research and Teaching</i> .....	8
Good Laboratory Practices Act of 1975 .....	9
Endangered Species Act .....	9
Controlled Substances Act.....	9
U.S. Government Principles for the Use and Care of Vertebrate Animals .....	9
Wildlife and Biological Societies.....	10
Association for Assessment and Accreditation of Laboratory Animal Care, International .....	11
Various Granting Agencies .....	11
<b>UNIVERSITY POLICIES .....</b>	<b>11</b>
<b>INSTITUTIONAL ANIMAL CARE PROGRAM .....</b>	<b>12</b>
<b>INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC).....</b>	<b>12</b>
Composition of the IACUC .....	13
Responsibilities of the IACUC .....	13
Authority of the IACUC.....	14
<b>POLICY ENFORCEMENT AND COMPLIANCE .....</b>	<b>14</b>
Inspections and Programmatic Evaluations .....	14
<i>IACUC Evaluation</i> .....	14
<i>USDA Inspection</i> .....	14
<i>IACUC Inspection</i> .....	15
Individual Responsibilities .....	15
<i>Department Chairs/Heads and Facility Administrators</i> .....	15
<i>Investigators</i> .....	15
<i>All Personnel Who Work with Animals</i> .....	16
Submission of University of Nebraska-Lincoln Application to Use Animals Form (AUAUF) .....	17
<i>Review Process</i> .....	17
<i>Time Frame for Approval of the Application</i> .....	17
<i>Animal Use Protocols</i> .....	17
<i>Reporting Deficiencies in Animal Care and Treatment</i> .....	18
<b>ANIMAL ACQUISITION AND MANAGEMENT .....</b>	<b>18</b>
Procurement of Animals.....	18
<i>Receiving Laboratory Animals</i> .....	18
<i>Quarantine</i> .....	19

Animal Management.....	19
<i>Security</i> .....	20
<i>Sanitation</i> .....	20
<i>Vermin Control</i> .....	21
<i>Housing</i> .....	21
<i>Isolation Cage Sizes</i> .....	22
<i>Bedding</i> .....	22
<i>Ventilation</i> .....	22
<i>Feed For Animals Used in Research and Teaching</i> .....	22
<i>Water</i> .....	23
Identification of Animals, Projects and Facilities.....	24
<i>Animal Identification</i> .....	24
<i>Record Keeping</i> .....	24
Veterinary Care/Medical Surveillance Programs .....	24
Emergency, Weekend and Holiday Care .....	25
Disposal of Dead Animals and Animal Wastes.....	25
Special Considerations .....	26
Surgery .....	26
<i>Multiple Major Surgical Procedures</i> .....	26
<i>Anesthesia/Analgesics</i> .....	27
Use of Adjuvants.....	27
Ascites Production .....	27
Death as an Experimental Endpoint.....	28
Euthanasia of Animals Used in Teaching and Research.....	28
<b>OCCUPATIONAL HEALTH AND SAFETY PROGRAM .....</b>	<b>28</b>
Personnel to be Included in the OHSP.....	28
Program Monitoring .....	28
Record Keeping/Verification.....	29
Oversight and Funding of the OHSP .....	29
Injury Reporting .....	29
<b>OCCUPATIONAL SAFETY GUIDELINES .....</b>	<b>29</b>
Protective Clothing/Equipment.....	29
Inhalation Anesthesia Hazard .....	30
Exposure to Biological Hazards .....	30
Animal Experimentation Involving Hazardous Agents .....	30
Special Qualifications for Personnel Using Hazardous Agents.....	30
Hazardous Waste Handling and Disposal .....	31
Disposal of Sharps.....	31
Engineering Controls .....	32
Working In Outside Areas .....	32
<b>HELPFUL LINKS.....</b>	<b>32</b>

## ABBREVIATIONS

<b>AAALAC-I</b>	<b>Association for Assessment and Accreditation of Laboratory Animal Care - International</b>
<b>AALAS</b>	<b>American Association for Laboratory Animal Science</b>
<b>Ag Guide</b>	<b>The Guide for the Care and Use of Agricultural Animals in Research and Teaching</b>
<b>APHIS-VS</b>	<b>Animal Plant and Health Inspection Service-Veterinary Services</b>
<b>AUAF</b>	<b>Application to Use Animals Form</b>
<b>AV</b>	<b>Attending Veterinarian</b>
<b>AVMA</b>	<b>American Veterinary Medical Association</b>
<b>AWA</b>	<b>Animal Welfare Act</b>
<b>DEA</b>	<b>Drug Enforcement Agency</b>
<b>EHS</b>	<b>Department of Environmental Health and Safety</b>
<b>EPA</b>	<b>Environmental Protection Agency</b>
<b>FASS</b>	<b>Federation of Animal Science Societies</b>
<b>FCA</b>	<b>Freund's Complete Adjuvant</b>
<b>FCR</b>	<b>Full Committee Review</b>
<b>FDA</b>	<b>Food and Drug Administration</b>
<b>FIA</b>	<b>Freund's Incomplete Adjuvant</b>
<b>GLP</b>	<b>Good Laboratory Practice</b>
<b>HVAC</b>	<b>Heating Ventilation and Air Conditioning</b>
<b>IACP</b>	<b>Institutional Animal Care Program</b>
<b>IACUC</b>	<b>Institutional Animal Care and Use Committee</b>
<b>IBC</b>	<b>Institutional Biosafety Committee</b>
<b>IO</b>	<b>Institutional Official</b>
<b>IRAC</b>	<b>Interagency Research Animal Committee</b>
<b>NASULGC</b>	<b>National Association of State Universities and Land-Grant Colleges</b>
<b>NIH</b>	<b>National Institute of Health</b>
<b>NRC</b>	<b>National Research Council</b>
<b>OHSP</b>	<b>Occupational Health and Safety Program</b>
<b>OLAW</b>	<b>Office of Laboratory Animal Welfare</b>
<b>PHS</b>	<b>Public Health Service</b>
<b>PPE</b>	<b>Personal Protection Equipment</b>
<b>PPVM</b>	<b>Professional Program in Veterinary Medicine</b>
<b>PI</b>	<b>Principal Investigator</b>
<b>SOP</b>	<b>Standard Operating Procedure</b>

<b>The Guide</b>	<b>Guide</b> for the Care and Use of Laboratory Animals, eighth edition
<b>UNL</b>	University of Nebraska-Lincoln
<b>USDI</b>	United States Department of Interior
<b>VDC</b>	Veterinary Diagnostic Center

## NATIONAL LAWS, RULES AND REGULATIONS

### **Animal Welfare Act (Public Law 89-544) and subsequent amendments (PL 91-579, PL 94-279, PL 99-198)**

The purchase, sale, housing, care, handling, treatment and transportation of animals used in teaching, research, exhibitions, and those sold as pets are regulated by authority granted in the Animal Welfare Act (AWA) of 1966 and its amendments. The law is implemented in the Code of Federal Regulations, title 9, chapter I, subchapter A (Animal Welfare). Subchapter A serves as the USDA regulatory guide that defines the specific standards and requirements governing the humane handling, care, treatment and transportation of animals. **Failure to comply with these standards may lead to civil or criminal prosecution resulting in substantial fines and/or suspension of animal research activities.**

The act specifically includes dogs, cats, non-human primates, guinea pigs, hamsters, rabbits, all wild animal species and any other warm-blooded animal being used or intended for use in research, testing, experimentation, exhibition purposes or being sold as a pet. Specifically exempted are birds, rats of the genus *Rattus* and mice of the genus *Mus* bred for use in research, horses not used for research and other farm animals used for food, or livestock and poultry used for the improvement of animal nutrition, breeding, management or production.

Recent amendments address such issues as exercise for dogs and care of non-human primates to ensure their psychological well-being. The composition and duties of an Institutional Animal Care and Use Committee (IACUC), adequate veterinary care and responsibilities of the

attending veterinarian, training of all personnel using laboratory animals in humane methods of animal maintenance and experimentation, and record keeping are addressed.

The act is administered by the United States Department of Agriculture (USDA), specifically, the sector veterinary component of the Animal and Plant Health Inspection Service-Veterinary Services (APHIS-VS). Research facilities are subject to unannounced inspections by USDA veterinarians.

The IACUC is responsible for reviewing all protocols using animals to make certain the protocols meet criteria listed in the Animal Welfare Act and Animal Welfare Regulations, U.S. Government Printing Office, 2005. In addition, the IACUC must conduct semiannual inspections of all animal study areas and animal facilities. The importance of this requirement is underscored by the fact that the chief executive officer of the institution must certify that the attending veterinarian (AV) and IACUC have the authority to enter any animal area at any reasonable time.

The IACUC also is required to furnish annual reports that include, in addition to other information and assurances, the common names and number of animals used, listed by procedures involving no pain or distress; pain or distress for which appropriate anesthetic, analgesic, or tranquilizing drugs were used; and pain or distress for which the use of appropriate drugs would have adversely affected the procedures, results or interpretation of the research. The report must certify anesthetic, analgesic and tranquilizing drugs were used appropriately during research

and testing and ensure the principal investigator (PI) considered alternatives to painful procedures.

## **Public Health Service Policy on Humane Care and Use of Laboratory Animals**

The *Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals* incorporates the changes in the Public Health Services Act (PHS Act) mandated by the Health Research Extension Act of 1985, Public Law 99-158, November 20, 1985. The PHS Policy, frequently referred to as the NIH Policy, requires each institution receiving PHS funds for research involving animals to submit detailed information regarding the institution's program for the care and use of animals (including farm animals, mice and rats) to the Office for Laboratory Animal Welfare (OLAW). This information is in the form of an animal welfare assurance statement that must be resubmitted at least every four years. Significant changes in existing assurance status or problems encountered in implementing this policy must be reported immediately to the OLAW.

Institutions are required to identify an institutional official (IO) who is ultimately responsible for the institution's program for the care and use of animals and a veterinarian qualified in laboratory animal medicine who will participate in the program. At the University of Nebraska-Lincoln, the vice chancellor for research and economic development or his/her designee has the responsibility as the institutional official (IO). The director of the Institutional Animal Care Program (IACP) is appointed by the IO. Each institution is also required to have an attending veterinarian (AV) with designated clear lines of authority and responsibility for those involved in animal care and use in university activities.

The PHS policy clearly defines the role and responsibilities of the IACUC. The committee must be composed of at least five members and include an individual unaffiliated with the institution; a veterinarian who has program responsibilities along with training or experience in laboratory animal science and medicine; a practicing scientist experienced in research

involving animals; and a member whose concerns are in a nonscientific area. USDA requires at least a three-member committee: a veterinarian, a person unaffiliated with the institution other than by his committee membership and one other member.

The policy requires the IACUC to review and approve those sections of PHS grant applications relating to the care and use of animals before reviews by the PHS will be conducted. The IACUC also is required to conduct semiannual assessments of the institution's program based on *The Guide for the Care and Use of Laboratory Animals (The Guide)*. Significant deficiencies in the institution's program must be identified by the committee, and the institution must adhere to an approved plan and schedule for correction of those deficiencies.

**An institution's failure to comply with these policies may lead to various actions, including termination of PHS support for all projects at the institution.**

### **Published Care and Use Guidelines**

#### *Guide for the Care and Use of Laboratory Animals*

In 1963, NIH contracted with the Animal Care Panel to develop *The Guide for Laboratory Animal Facilities and Care*, which was revised in 1965, 1968, 1972, 1978, 1985, 1996 and 2011 and became the *Guide for the Care and Use of Laboratory Animals*. Its purpose is to assist scientific institutions in using and caring for laboratory animals in ways judged to be professionally appropriate. It is a long-standing NIH policy that grantees and contractors using live vertebrate animals in projects or activities supported by NIH should be guided by the recommendations in this publication.

#### *Guide for the Care and Use of Agricultural Animals in Research and Teaching*

The National Association of State Universities and Land-Grant Colleges (NASULGC) organized a consortium in May 1986 to develop the *Ag Guide*, to be used much as the *Guide* is used for animals in biomedical research. The *Ag Guide* was revised by the Federation of Animal Science Societies (FASS) in 2010. The *Ag Guide* provides



information on the most common agricultural animals under a variety of teaching and research circumstances. This is the basis upon which care and use of agricultural animals are evaluated in UNL food and fiber research, teaching and extension education programs.

### **Good Laboratory Practices Act of 1975**

The Good Laboratory Practices (GLP) Act pertains to non-clinical laboratory studies done in support of applications for research or marketing permits for products regulated by the Food and Drug Administration (FDA). All product studies submitted to the FDA or Environmental Protection Agency (EPA) must follow the GLP, and compliance is demanded to meet the regulatory requirements for the release of new products.

The GLP regulations, as they apply to the use of animals, address such issues as construction and maintenance of facilities, quarantine and isolation, disease diagnosis and treatment, animal identification, caging, routine care, sanitation, and record keeping on all aspects of the research and testing of each individual animal.

### **Endangered Species Act**

The Endangered Species Act is supplemental to the Endangered Species Conservation Act of 1969. The law seeks “to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered and threatened species, and to take all steps as may be appropriate to achieve the purposes of the treaties and the conservation of wild flora and fauna worldwide.” Regulatory authority of these acts lies with the Secretary of the U.S. Department of the Interior (USDI) and is implemented by the USDI Fish and Wildlife Service. Copies of the regulations and/or lists of endangered species can be obtained through the Office of Endangered Species, USDI Fish and Wildlife Service, Washington, D.C. 20240 or [www.fws.gov/Endangered/species/](http://www.fws.gov/Endangered/species/).

### **Controlled Substances Act**

Potentially addictive or habituating drugs for human and animal use are classified under this law. Examples of controlled substances include barbiturates and narcotics. The Department of Justice, Drug Enforcement Administration (DEA), enforces this law and requires appropriate security and record management for use of these substances. Several departments at the University of Nebraska-Lincoln have DEA permits. Records of where the drugs go from the departments and what animals receive the drugs must be a part of the record management for the DEA permit.

### **U.S. Government Principles for the Use and Care of Vertebrate Animals**

These principles were developed by the U.S. Government Interagency Research Animal Committee (IRAC) and have been included as Institutional Policy in the University of Nebraska-Lincoln Assurance Statement to the PHS. <http://grants.nih.gov/grants/olaw/references/phspo1.htm#USGovPrinciples>

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 the U.S. Government agencies develop requirements for testing, research, or training procedures involving the use of vertebrate animals, the following principles shall be considered; whenever these agencies actually perform or sponsor such procedures, the responsible IO shall ensure that these principles are adhered to:

1. 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.
2. Procedures involving animals should be designed and performed with due consideration of the relevance to human or

- animal health, the advancement of knowledge, or the good of society.
3. 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.
  4. 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 procedures that cause pain or distress in humans may cause pain or distress in other animals.
  5. Procedures with animals that may cause more than momentary or slight pain and/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.
  6. 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.
  7. 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.
  8. 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.

9. 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.

## Wildlife and Biological Societies

Guidelines have been established by various wildlife and biological societies for the use of wildlife in field research. Adherence to such guidelines is required by multiple wildlife and biological journals for publication of research. The following guideline publications are available directly from the specific publishing society.

- ◆ Guidelines for Proper Care and Use of Wildlife in Field Research, Chapter 6 in Field Manual of Wildlife Disease- General Field Procedures and Diseases of Birds. USGS National Wildlife Health Center, 6006 Schroeder Road, Madison, WI 53711-6223.  
[http://www.nwhc.usgs.gov/publications/field\\_manual/chapter\\_6.pdf](http://www.nwhc.usgs.gov/publications/field_manual/chapter_6.pdf)
- ◆ Guidelines to the Use of Wild Birds in Research. Third edition, 2010. The Ornithological Council. [www.nmnh.si.edu/BIRDNET/guide](http://www.nmnh.si.edu/BIRDNET/guide)
- ◆ Guidelines for the Use of Fishes in Field Research, American Society of Ichthyologists and Herpetologists, American Fisheries Society, American Institute of Fishery Research Biologists. *Fisheries*, Vol. 13, No. 2. Business Office: American Fisheries Society, 5410 Grosvenor Lane, Bethesda, MD 20814. [www.nal.usda.gov/awic/pubs/Fishwelfare/ASIH.pdf](http://www.nal.usda.gov/awic/pubs/Fishwelfare/ASIH.pdf) and [http://fisheries.org/docs/policy\\_useoffishes.pdf](http://fisheries.org/docs/policy_useoffishes.pdf)
- ◆ Guidelines of the American Society of Mammalogists for the use of wild mammals in research. *Journal of Mammalogy*, 92(1):235-253, 2011. American Society of Mammalogists, 810 E. 10<sup>th</sup> Street, Lawrence, KS 66604. [http://www.mammalsociety.org/uploads/Sikes\\_et\\_al\\_2011.pdf](http://www.mammalsociety.org/uploads/Sikes_et_al_2011.pdf)
- ◆ Guidelines for the Use of Live Amphibians and Reptiles in Field Research, American Society of

Ichthyologists and Herpetologists. 2006. The Herpetologists' League Society for the Study of Amphibians and Reptiles.

[www.asih.org/pubs/herpcoll.html](http://www.asih.org/pubs/herpcoll.html)

### **Association for Assessment and Accreditation of Laboratory Animal Care, International**

The Association for Assessment and Accreditation of Laboratory Animal Care, International (AAALAC-I) is a non-profit organization established by scientific and educational organizations to ensure high standards of laboratory animal care and use. The program works on a voluntary peer-review basis, evaluating animal care programs and facilities of applicant institutions. AAALAC-I standards follow the guidelines set forth in the *Guide* in determining whether or not accreditation

should be granted. If there are agricultural animals used at the institution, the *Ag Guide* is used as the standards for evaluating the program. Accredited facilities are required to submit annual reports on the status of their animal facilities, and announced accreditation visits are conducted every three years. The NIH, in its current policies, accepts AAALAC-I accreditation as the best means of demonstrating conformance with NIH requirements for animal care. AAALAC-I accreditation is the "Good Housekeeping" seal of approval of an animal care program.

[www.aaalac.org/index.cfm](http://www.aaalac.org/index.cfm)

### **Various Granting Agencies**

Most granting agencies have established policies for the care and use of laboratory animals. Investigators should fully understand the requirements of each agency from which funds are sought.

## **UNIVERSITY POLICIES**

All research, teaching or extension education activities utilizing animals owned by UNL, conducted at UNL or performed by university faculty, students, staff or representatives of other institutions will be reviewed and approved by the IACUC prior to starting the project.

University of Nebraska-Lincoln campus and outstate facilities are registered as a single research and teaching facility with both the USDA and the PHS. Thus, the care and use of animals at UNL are regulated by federal law and by this institution's commitment to the Office for Laboratory Animal Welfare (OLAW) through its institutional assurance statement. This requires adherence to the eighth edition of the *Guide*, for laboratory animals and biomedical research using agricultural animals. Also, research using production animals must comply with the *Ag Guide*. These publications establish comprehensive standards for the care and use of vertebrate animals. In addition, the PHS Policy on Humane Care and Use of Laboratory Animals includes a document titled "Principles for the Use and Care of Vertebrate Animals" to which adherence is required (see page 9)

To ensure proper care and use of wildlife species, investigators should follow guidelines established by national and/or regional wildlife

and biological societies for the specific group of animals being used: avian, mammals, reptiles, amphibians or fish.

**Any research or instructional use of live vertebrate animals by UNL faculty, staff or students requires the submission to the IACUC of an Application to Use Animals Form (AUAF). The AUAF must be submitted and approved by the IACUC before any animal user may acquire, house or use animals.**

### **UNL Pet Policy**

The UNL Pet Policy is posted at the following url: <http://bf.unl.edu/policies/pets>. Pets are prohibited from UNL-controlled buildings with specific listed exemptions. Additional exemptions were approved September 6, 2012: 1. Animals used for teaching and/or research as specified in a current IACUC approved protocol. 2. Animals used for demonstration, exhibition or non-classroom teaching as specified in an "Application To Use Animals for Demonstrations, Exhibition or Non-classroom Teaching" that has been approved by the Institutional Animal Care Program. 3. Live animals submitted to the Veterinary Diagnostic Laboratory for diagnostic purposes.

## INSTITUTIONAL ANIMAL CARE PROGRAM

The UNL Vice Chancellor for Research and Economic Development has delegated responsibility for the animal care program to the Institutional Official (IO). The Director of the Institutional Animal Care Program (IACP) has the responsibility for oversight of the animal care program and working with the IACUC <http://research.unl.edu/orr/icap.shtml>. The attending veterinarian (AV) is a member of the IACUC and responsible for the health care of the animals. Veterinary care for animals at the out-state facilities has been arranged to use private practitioners.

The director of IACP and support staff can be reached at (402) 472-4486 and are located at 110 Mussehl Hall, 38<sup>th</sup> & Fair Street, Lincoln, NE 68583-0720. The IACP director's oversight authority is implemented through open access to all the animal facilities to IACP personnel, on an as-needed basis.

**The day-to-day operation, management and maintenance of the Life Sciences Annex (LScA) is the responsibility of the IACP; the other animal facilities operation and maintenance rest with the departmental units where the facilities are located.**

Facility problems or animal care deficiencies are addressed by the IACP director at the facilities level, between the IACP personnel and the animal care personnel if possible. The IACP director reports on deficiencies of facilities and animal care to deans/department chairs and/or the IO.

The IO, IACP director, AV or IACUC chair all have the authority to stop unacceptable activities in the use of animals "on-the-spot" or take other measures as necessary for the benefit of the animals. Any order to stop animal work will be followed by an investigation by the IACUC. This investigation must include an opportunity for the principal investigator to provide pertinent information, explanation, and if appropriate, the course of action to be taken to alleviate the cause for the order. Resolution of the cause(s) for animal work stoppage may result in continuation of the work. Issues of health care may be handled by the AV and the IACUC in coordination with the Director and IO while keeping the unit administrator informed.

The director works with the IACUC as appropriate. The IACP staff may communicate with animal caretakers, facility managers, unit administrators or deans/directors as needed and also interact collectively with the administrators of units having animal facilities.

The AV reports to the IACP director and the IO and is responsible for overseeing animal health at all campus facilities. The AV has the authority to act on behalf of the IACP director in his/her absence and can overrule a facility manager or unit administrator regarding animal welfare matters if such were ever needed. The AV participates in training programs, conducts diagnostic procedures as appropriate and directs the administration on health care of the animals.

## INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

The PHS Policy and the amendments to the Animal Welfare Act require the establishment of an Animal Care and Use Committee to ensure the care and use of animals are appropriate and humane.

The UNL IACUC was organized in 1985. It has the responsibility to evaluate:

1. Requests for use of vertebrate animals owned by the university or used by faculty, staff, or students in research, teaching or testing.
2. Animal use by faculty from other institutions when the animals are owned by or housed in UNL facilities, or funding is provided by UNL.

3. The UNL Institutional Animal Care Program and Policies.

### **Composition of the IACUC**

The following criteria for establishing the UNL IACUC were developed from the Animal Welfare Act (AWA) and PHS policy. The members of the committee are appointed by the IO and include:

1. Four practicing scientists experienced in animal research.
2. One member whose primary concerns are in a non-scientific area.
3. One member not affiliated with the university and not a member of the immediate family of a person who is officially affiliated with the university.
4. A veterinarian who has training or experience in laboratory animal science and medicine or in the use of the species in question.
5. Appointments may include, but are not limited to: representatives of UNL departments and units whose faculty members use animals in research, teaching, extension and service.

Administrators who have positions on the committee are ex-officio members and do not vote as committee members. An ex-officio non-voting member from the Environmental Health and Safety Office will also be a consultant to the committee.

Consultants may be used by the IACUC in areas of special needs that are not covered by members of the committee.

Each IACUC member's term will be for three years, appropriately staggered, in order to ensure continuity. The chair of the committee will be appointed by the IO for a three-year term and will serve as a non-voting member except in instances of a tie vote.

<http://research.unl.edu/orr/iacuccomp.shtml>

### **Responsibilities of the IACUC**

The IACUC will serve as adviser to the university administration in matters dealing with animal care and use. It will also ensure university

compliance with all applicable federal, state and institutional policies, laws and regulations.

The IACUC shall:

1. Monitor the use of animals in teaching, research and extension education at UNL animal facilities or other animal facilities utilized by university faculty and staff (i.e., contract facilities operated by another agency but utilized by UNL personnel).
2. Review protocols for use of animals in teaching and research. Criteria for approval shall be determined by the most current federal laws and policies.
3. Provide, every six months, an evaluation of facilities and programs within each university unit performing research involving the use of animals. A summary report of these evaluations will be submitted to the IO in accordance with the AWA and the PHS Animal Welfare Policy.
4. Prepare the annual USDA report for the university and for the signature of the IO.
5. In the event an animal is discovered to be in significant pain due to injury or other cause, and after a reasonable effort to notify the person responsible for the animal has failed, or those responsible fail to take immediate action, the committee chair, AV or his/her designated representative has the authority to immediately direct alternative care, administer analgesics or euthanize the animal as appropriate. Such cases will then be reviewed by the IACUC with a report to the appropriate department head/chair and the IO.
6. Review concerns involving the care and use of animals or reported violations of the AWA and, if warranted, investigate these concerns.
7. Assist in establishing training procedures for scientists, students, research technicians, animal technicians and other personnel involved with animal use, care and treatment.
8. Provide prompt review of Application to Use Animals Form (AUAF) and maintain communications with the investigator.
9. Be authorized to suspend an activity involving animals in accordance with the AWA. The

committee will also maintain communication with other university committees that have related responsibilities.

The IACUC is responsible for maintaining a list of animal housing sites at this university. Maintenance of such a list is a legal requirement. Each approved animal housing facility is subject to oversight by the IACUC, USDA, NIH and OLAW.

### **Authority of the IACUC**

The IACUC has the authority to withdraw approval to use animals from any project that is not being conducted in accordance with the approved protocol or is not in compliance with the guidelines. Any withdrawal of approval will be based on a thorough investigation by the IACUC that includes an opportunity for the principal investigator to provide information, explanation, and if appropriate, the course of action to be taken to alleviate the cause for withdrawal of approval. Resolution of the cause(s) for withdrawal of approval may result in reinstatement of approval and continuation of the work.

If an investigator continues with a project for which he/she has been notified that approval has been withdrawn, the investigator will be subject to withdrawal of approval of **all** animal use

privileges. The IACUC must report, through the IO, major deficiencies in projects to the funding agency as soon as they are identified. If non-compliance continues, a recommendation by the IACUC to the funding agency to terminate funding would be in order.

The authority of the committee is delegated by the UNL vice chancellor for research and economic development, through the IO, for the purpose of performing duties and functions set forth in the following documents:

- *Public Health Service Policy on Humane Care and Use of Laboratory Animals*
- *The Animal Welfare Act (89-544) and Animal Welfare Regulations*
- *The Guide for the Care and Use of Agricultural Animals in Research and Teaching*
- *Guide for the Care and Use of Laboratory Animals*
- *Health Research Extension Act of 1985 and amendments*
- *UNL Policies & Procedures Manual for the Use of Animals* (this document)
- *UNL Assurance to OLAW of Intent to Comply.*

## **POLICY ENFORCEMENT AND COMPLIANCE**

### **Inspections and Programmatic Evaluations**

#### *IACUC Evaluation*

The IACUC reviews the animal facilities and programs for animal care using as its criteria the *Guide* and standards set forth in the *Ag Guide*. Reports are made to the IO and facility administrators who are, in turn, responsible for correcting deficiencies noted by the reviewers. If assistance from department heads, deans or other administrative officials is needed, facility administrators should ordinarily assume responsibility for seeking such assistance. The IACP director, IACUC and AV will offer

whatever assistance they can. They will initiate informal and formal actions to correct deficiencies whenever intervention is necessary to assure humane treatment of animals and to protect the interests of the institution.

#### *USDA Inspection*

Unannounced inspections are conducted by the USDA. Generally, one annual visit per site is accomplished. Criteria used by the USDA are found in Title 7, Chapter 54, Sections 2131-2159 of the Federal Code of Regulations. These are published in the USDA publication “Animal Welfare Act and Animal Welfare Regulations”,

USDA inspectors are not responsible for inspecting agricultural animals (unless they are used for biomedical research), rodents or domestic birds. All animals and animal facilities used for the Professional Program of Veterinary Medicine (PPVM) also come under USDA inspection.

### *IACUC Inspection*

The dates and times for conducting the twice-per-year animal facilities inspections conducted by the IACUC are scheduled with animal facilities managers, but unannounced visits may occur as needed. The inspection schedule is approved by the IACUC and distributed to all PIs, animal facilities managers and department heads or chairs.

All UNL, USDA and other inspectors shall abide by the security measures required by the research facility to reduce the spread of disease, including the use of clean clothing or showering between facilities where appropriate. Inspection personnel will take special care not to interfere with research being performed, unless willful disregard of animal welfare is found.

## **Individual Responsibilities**

### *Department Chairs/Heads and Facility Administrators*

Administrators must be aware of animal care and use requirements and assure that policies and procedures (herein) are implemented and the standards are maintained.

They must assure safeguards and safe procedures are maintained in the work place for all employees and that occupational health and personal hygiene standards and use of proper personal protection equipment (PPE) as outlined in this manual are adhered to by faculty, staff and student employees.

They must assure that animal research and other use is appropriately reviewed and approved, before initiating work.

They should remind new faculty that an AUAF must be completed as part of grant proposals. And before research projects or

academic use of animals begins the application must be approved by the IACUC.

They must assure that support staff clearly understand and follow the procedures and expectations for animal care, safety and well being, and discuss any questions or concerns with the principal investigator.

Department administrators may call upon or alert the IACUC or seek their guidance in addressing unique needs. Support from the department chair/head can make the duties of the IACUC much easier.

It is the responsibility of each department with animal facilities to hire qualified personnel as animal caretakers. Excellent candidates have come from graduates of AVMA accredited veterinary technology programs, animal science, biological sciences, fisheries and wildlife, and veterinary sciences programs or AALAS certification programs.

Supervisors of new employees are required to notify the IACP of the employees' names and starting date.

Continuing education is required for all personnel working with animals within UNL animal research facilities. It is the responsibility of the IACP to establish training and continuing education programs. When training is provided by the PI and documented, this will help meet the training requirements.

The supervisors of new employees, including part-time student employees, undergraduate students, graduate students, technicians or others working with animals, are required to contact the IACP office to arrange training sessions appropriate to their assignment.

### *Investigators*

The integrity of the investigator is the most valued part of responsible animal use. All investigators using animals in teaching, research or extension education are responsible to ensure that their staff (both professional and technical) and any students and student employees under their supervision know how to handle and properly care for the species being used. Staff

must also know how to perform the techniques being used. The IACP staff should be consulted if there are questions. IACP provides generalized training and will assist with specialized training as requested.

The research investigator or instructor is responsible to design experiments or activities involving animals to assure compliance with the UNL Assurance Document, the *Guide* and the *Ag Guide* as listed above. Investigators should try, whenever possible, to **reduce** the number of animals used, **refine** techniques to minimize pain or suffering, and **replace** animals with alternative or adjunctive methods if available. Unnecessary replication of studies may be avoided by using proper literature reviews and the literature reviews should be documented in the AUAF. Investigators should assure that animal unit managers, care staff and student employees have access to the approved document.

In procedures involving unavoidable pain or distress, the investigator must justify the procedure in accordance with current federal regulations and the policies of the IACUC. **Projects with procedures that may cause more than momentary or slight pain or distress to the animals must be discussed with the AV or his designee during the planning stages. ((9CFR, subpart C, 2.31, (d), i. v., (B))**

### *All Personnel Who Work with Animals*

Training of all full- or part-time undergraduate students, animal care staff, technicians, graduate students and faculty to assure and maintain proficiency and compliance in working with animals is a requirement of the AWA. In order to comply with these requirements, each new employee fitting into one of the above categories is required to complete the general regulations training (GRT). This training focuses on animal care and regulations for using animals. A minimum of two GRT training sessions will be conducted each year. Other sessions will be scheduled as needed.

Videotapes describing the proper care, use and handling of different species of animals are available at the IACP office. Contact IACP for a list or to view these tapes.

A record will be kept so IACP can verify that appropriate training has been provided before approval will be granted for requests where those students, technicians or graduate students are listed as part of the project. When training is provided by the principle investigator (PI) or other qualified personnel, a letter to IACP indicating who was trained and what subjects were covered would help the IACUC confirm that adequate training has taken place.

If a program or investigator continually has deficiencies in compliance with the guidelines as set forth in this document, the IACUC will make requests for associated personnel to have additional training and may discontinue the project if deficiencies are not removed or corrected.

In compliance with Drug Enforcement Agency laws: "Investigators must ensure that all anesthetic and tranquilizing drugs which are listed in schedules I-V of the Controlled Substance Act are kept locked within a drug cabinet. Usage of certain scheduled drugs must always be written in a log book by the investigator." (Controlled Substance Act of 1970; Public Law 91-513; Revised Jan 1979).

### *Personal Protective Equipment (PPE)*

It is essential for those who use and care for animals to maintain a high standard of **personal cleanliness** to reduce the chance of transmission of pathogens, parasites, disease, allergens or toxins to themselves or their families. Animal dander has been shown to stimulate allergic reactions and the dandruff can be carried on clothing to family members and co-workers.

Street clothing must not be worn in animal rooms unless they are covered with a laboratory coat or some other means of protection. In general, clean, dedicated facility apparel that covers or replaces street clothes and shoes should be worn whenever entering an animal facility. Protective clothing or laboratory coats should be left in the animal rooms. Hands should be washed as soon as you leave the room. Employees working with animals, livestock, poultry or wildlife **should not wear shorts or open shoes while in the animal facility or leave the animal**



**premises wearing the same outer clothing they wore to care for the animals.**

Guidelines for personnel clothing may be unique for some animal units and activities. Facilities and supplies for meeting personal hygiene requirements should include the availability of suitable clothing and laundering services. Disposable items such as gloves, masks, head covers, coats, coveralls and shoe covers are acceptable. Containers must be provided for disposal or collection for laundering

**Personnel must not eat, drink, smoke or apply cosmetics in animal rooms.**

### **Submission of University of Nebraska-Lincoln Application to Use Animals Form (AUAF)**

The AUAF must be submitted to the IACUC for review in any teaching, research or extension proposal involving the use of vertebrate animals. The AUAF **should be filled out completely and all questions answered** to avoid unnecessary delays in processing. Additionally, if funded by extramural support, the protocol must match the grant proposal with which it is submitted.

The AUAF and other required documents (TDF, OHSP, etc.) are available electronically at <http://research.unl.edu/orr/qa.shtml>.

Once forms are completed, they should be sent to the department head/chair for their signature and routed to the IACP Office for appropriate review and approval from the IACUC. All projects involving the use of animals **must be reviewed and approved by the IACUC before work on the project begins.**

#### *Review Process*

All applications will be reviewed by the IACUC and must be complete and accurate in their description of proposed animal use. The descriptions should be written in lay terminology and with enough detail to allow a non-scientist to understand and make a reasonable judgment regarding the appropriateness of what will be done with the animal(s).

#### *Time Frame for Approval of the Application*

The time frame varies and depends upon the nature of the study. If forms are filled out properly, initial review is usually completed in 10 days. The whole IACUC is asked to review an AUAF once it is submitted and decide within five days if a “full committee review” (FCR) is needed. Any one member can call for a FCR. If the IACUC waives FCR, the IACUC chair appoints two “designated reviewers” to conduct the review. They may approve, ask for additional information or revisions, or call for a FCR. The FCR occurs at a monthly meeting of the IACUC. AUAFs that are given an “E” classification or include death as an endpoint automatically require FCR. Principal investigators are invited to be present when the IACUC conducts a FCR to facilitate information exchange. Lack of clarity, inadequate descriptions, failure to include supporting documents (TDF, GRT, OHSP, etc.) and inadequate justification may delay the approval process. A minimum of 30 days should be allowed to complete the review process.

#### *Animal Use Protocols*

The IACUC reviews AUAFs with regard to the safety and welfare of the animals used at UNL. The IACUC will accept projects reviewed and approved by another institution’s IACUC, provided that institution has an assurance statement approved by OLAW. If an investigator from UNL is conducting work at another institution, copies of the approval of that institution’s IACUC, along with copies of the project protocol, must be on file with UNL IACUC when the UNL Office of Sponsored Programs is handling the funds for the project.

A completed application form should be submitted no later than the date on which the proposal is submitted to the potential funding agency. In those cases where potential sponsoring agencies require completion of review prior to the submission of the proposal, the investigator must submit an AUAF 30 days prior to anticipated submission date in order to assure ample time for the completion of the review.

Before making changes in personnel, animal care or use, the number of animals to be used, or

location of the animals, etc., a modification form must be submitted to the IACUC for review and approval. The modification must be approved before the changes are implemented.

Upon completion of the review process by the IACUC, the originator of the AUAF will be notified of IACUC action. A signed and numbered copy of the approved AUAF will be returned to the investigator. This number should be used as a reference for all internal correspondence. IACUC approvals can be effective for up to three years from the date of approval. An **annual review** is required for each year the project is active, including the final year, **before** the approval date anniversary.

Faculty, student researchers, staff or other representatives of the UNL research community are cautioned that **any use of animals without prior approval of the IACUC is a violation of UNL policy.**

### *Reporting Deficiencies in Animal Care and Treatment*

Deficiencies or concerns about how animals are cared for in any of the facilities on campus or in any of the projects should be reported to the IACP office, the IACP director, AV, or any member of the IACUC. Posters providing contact information to be used in these situations must be displayed in each animal facility.

The concern will be immediately investigated. The animal caretaker, principal investigator, or department administrator will be notified and an investigation will be conducted. Corrective action will be taken if a legitimate concern exists. Any concerns or actions taken will be reviewed and approved by the IACUC; final action will be determined in consultation with the IO. The identity of the person reporting the incident will be protected to the best of our ability. Sometimes this is not possible due to the nature of the problem.

## **ANIMAL AQUISITION AND MANAGEMENT**

### **Procurement of Animals**

Procurement of animals will be done in accordance with state and federal laws. Most states, including Nebraska, have laws requiring health certificates for animals being shipped into the state. The purchaser and the animal vendor must be aware of the requirements or call the State Veterinarian (402) 471-2351 prior to shipment or prior to procurement of animals.

When approval is requested for the purchase/acquisition of animals, a specific number to be used in the project is provided by the applicant. In order for the IACP to have a record of how many animals have been ordered for a project, the requisitions must be approved by the IACP **before laboratory animals can be purchased.** Laboratory animals consist of rats, mice, hamsters, rabbits and other caged animals.

### *Receiving Laboratory Animals*

It is especially important for the employee receiving animals from vendors to be alert to signs of mishandling. Precautions should be taken to minimize the amount of stress and disease subsequent to receiving the animals.

Accurate receiving records are important to ensure prompt payment and retrieval of information about a particular shipment. The USDA regulations require receiving records to be kept for at least one year beyond actual purchase and use of dogs or cats. Information to be recorded includes date received, source, species, the person who placed the order, the person who received the animals and individual animal identification comments, if available.

Signs of mishandling may include damage to the shipping container, wet containers or unusual orientation of the containers. Obvious mishandling should be noted on the handler's receiving slip. Next, the person receiving the animals should check the animals for signs of

illness, look for dead animals and record any abnormal animal appearance. Excessively wet bedding may cause hypothermia and should be noted. The AV should be contacted if the animals appear to have been mishandled in shipment or the animals do not appear healthy. The AV should immediately contact the shipper and the transportation company concerning the condition of the animals. Appropriate action should be taken to care for the animals as soon as an adverse condition is noted.

Once animals are accepted, they should be put into a proper environment. Condition and health should be evaluated before assignment to experiments, and this is best achieved by use of appropriate quarantine procedures (see below). Over-stressed or sick animals are of questionable value for a research project.

Laboratory animals must be purchased from USDA licensed reputable dealers. Vendors must be approved by IACP. Wildlife should be acquired in accordance with local, state and federal laws.

Separation of animals based on species is required. Separation by source of purchase is advisable because they may differ in health status, disease susceptibility and microbial flora. Animals from other facilities or newly purchased must not be mixed with animals that are already present until health status has been established indicating the colonies/herds are compatible.

Pets or animals other than service dogs and those owned by the university **will not be permitted in any IACUC approved animal facility without approval from the IACUC.** This includes animals owned by UNL employees and students or others not affiliated with the university. Cats used for vermin control (barn cats) will be identified and approved by IACUC.

### *Quarantine*

The goals of quarantining newly arrived animals are to: 1) give the animals sufficient time to acclimate to new surroundings and recover from transportation stress; 2) evaluate the health of the new arrivals; and 3) prevent them from transmitting diseases to animals in existing colonies/herds. Proper quarantine facilities and

procedures are the responsibility of the facility administrator.

Animals received from commercial animal breeders may not need to be quarantined, this is at the discretion of the AV. Animals that are received from other research facilities require at least 30 days quarantine and have a serological check for antibodies or polymerase chain reaction screen for pathogens and a parasite evaluation before release from quarantine.

The quarantine period will be determined by the AV, in cooperation with the investigator. This period will be based on knowledge of possible diseases and experience with the vendors of the animals. Quality control by the vendor and knowledge of the history of the animals are acceptable parts of an institution's quarantine protocol. This information may limit the quarantine period for rodents to the time necessary for inspection on arrival; however, all newly received animals should be allowed an acclimation or stabilization period appropriate to the situation prior to their use.

## **Animal Management**

Feeding, care and cleaning are the only activities to be performed within the animal rooms except with IACUC approval. Once these duties have been completed, entry into these rooms should be kept to a minimum.

Access to the animal facilities will be limited to authorized personnel. All visitors to the facilities must be accompanied by authorized personnel.

- ◆ Laboratory animal facilities shall remain locked at all times.
- ◆ Signs should not be posted that identify an area or building as housing animals.
- ◆ Authorized personnel entering the animal facilities should wear protective clothing and equipment that reduce exposure to allergens and excreta and prevent spread of parasites or disease.
- ◆ Environmental problems in any animal room, (i.e., temperature, humidity, ventilation, etc.)

should be reported to the IACP if assistance in solving the problems is necessary.

- ◆ Excess illumination on the top shelf of animal cage racks may cause blindness in albino rats and mice and should be avoided. Illumination at cage level should be 325 lux or 30 ft. candles one meter above the floor. The quality of the light is also important.

Proper management of animal facilities is essential for the welfare of animals, validity of research data, and health and safety of the animal care staff. A good husbandry program provides a system of housing and care permitting animals to grow, mature, reproduce and maintain good health. Good husbandry minimizes variations that can modify an animal's response to experimentation. Specific operating practices depend on many objective and subjective factors that may be unique to individual institutions. Well-trained and motivated personnel help to ensure provision of high quality animal care, even in less than optimal conditions.

### *Security*

Security issues are important for the welfare of animals and the people using or caring for them. Animal care personnel are the best security system. New persons being hired should be screened very closely. Past work history can be very important. Suspicious activity and unfamiliar individuals in or around an animal or research facility, as well as those asking questions about the animals should be directed to the animal unit manager first, then reported to the IACP, the department head/chair and UNL Police as soon as possible.

Personnel should be on the lookout for individuals taking photographs, using video recorders or making sketches. Unauthorized photography or videography should not be allowed. Animal care personnel should **not engage individuals who exhibit anti-animal use activism, vandalism or interference with IACUC-approved animal use**. They should call UNL Campus Police at **472-2222** and move to a safe location if risk of confrontation or personal

injury is apparent. The IACP office or the AV also should be notified.

**Doors leading to animal facilities shall be locked when unattended and should be controlled by electronic access devices or keyed on high security keys.** All personnel should promote security awareness and faithfully practice use of security systems and equipment, including cell phones or other personal communication devices. Make care staff aware of safe havens within the facility. No signs should identify laboratory animal facilities or animal housing areas.

Animal care personnel who receive threats of break-ins or discover a break-in has occurred should notify UNL Police and IACP immediately. The area should not be disturbed until the police give permission.

### *Sanitation*

Sanitation is essential in the maintenance of healthy animals. In areas where animals are confined, resulting in build-up of excretory materials, cleaning is necessary on a daily basis. This includes areas where animals are managed in close confinement, in buildings allowing for partial confinement and total confinement buildings. Animal rooms, corridors, storage spaces and other support areas must be cleaned regularly.

The sanitation program should involve cleaning and either sanitizing or disinfecting where appropriate. This should be done frequently enough to avoid buildup of excreta, debris and disease agents to the extent that it would be detrimental to the well-being of the animals.

Cleaning equipment such as mops, pails and brooms should be kept clean and used only in their designated animal rooms. They must be hung on the wall to dry, not set on the floor. In situations where bedding might be used, it should be changed often enough to keep the animals clean and dry to keep odors in the room at an acceptable level. For routine maintenance of laboratory rodents, one bedding change per week should be adequate. For larger animals such as dogs and cats, soiled litter material should be

removed daily. Animal waste removed by hosing or flushing should be done at least daily. Animals should be kept dry during such procedures.

Extraneous equipment and supplies, including clean cages, metabolism crates and unused cage racks must not be stored in animal rooms unless covered with a plastic sheet. Likewise, if stored in the animal room, daily animal care sheets, animal use logs, data books or information sheets and other paper goods should be laminated or stored in moisture proof containers. Cages should be cleaned as soon as they are emptied. In some instances fresh bedding may be put in the cage and the same animals put back in the cage if approved in the AUAF. Otherwise, the cages should be washed and sanitized before animals are put back into them.

Litter must be emptied from cages and pans in an area other than the animal rooms and in a manner minimizing exposure of personnel to airborne particles. If frequent cage cleaning is counterproductive, such as when pheromones are essential for reproduction or when research objectives may be compromised, exceptions to the regular cage-cleaning schedule may be instituted if approved by the IACUC as part of the protocol.

Extra cages should be available at all times so a systematic cage washing schedule can be maintained. Cages can be disinfected by rinsing at 82 °C (180 °F) for at least three minutes. Disinfection also can be accomplished with appropriate chemicals. Accumulations of detergents, acid-cleaning solutions, volatile decontamination vapors and other cleaning and disinfection agents may be harmful to animals, personnel and the environment. Adherence to proper use procedures and/or appropriate protective measures should be followed.

Water bottles, drinking tubes, stoppers and other watering equipment should be washed and disinfected by rinsing with hot water 82 °C (180 °F) for three minutes, by use of appropriate chemical agents or by autoclaving to destroy pathogenic organisms.

Some means for sterilizing equipment and supplies, such as an autoclave or gas sterilizer, is essential when pathogenic organisms are present or when sterile equipment is needed for some

specialized animal care facilities. Routine sterilization of food and bedding is not essential if care is taken to use clean materials from reliable sources. Where hazardous biological, chemical or physical agents are used, a system of equipment monitoring is appropriate.

Deodorizers or chemical agents should not be used to mask animal odors. Such products are not a substitute for cleaning, sanitation or disinfection.

Ammonia or animal odors in a room can be prevented by more frequent cleaning of cages and equipment, increasing air flow or reducing the number of animals in the room.

Waste containers and cleaning implements must be cleaned frequently. All waste containers used for animal disposal or animal bedding disposal should have disposable liners and tight fitting lids. They should be washed after each use with a disinfectant and stored outside the animal rooms.

### *Vermin Control*

Programs should be instituted to control, eliminate or prevent infestation by pests such as cockroaches, flies and feral or escaped rodents. The most effective program prevents entry of vermin into the facility by screening openings, sealing cracks and eliminating breeding and refuge sites. **Proper sanitation is very important in control measures.**

Adequate control of a pest problem requires thorough knowledge of the pest and the available methods of control. The method(s) selected should be the most effective in controlling the pest with the least effect on humans, the environment and especially the animals. Users, including technicians or supervisors, must have a thorough understanding of the control substance, proper application and the relevant state and federal regulations. The Federal Environmental Pesticide Control Act (FEPCA) specifies that anyone applying restricted-use pesticides must be certified by the state in which he/she lives.

### *Housing*

Laboratory and biomedical research animal housing will meet the standards set forth in the *Guide*. Housing for farm animals used in non-biomedical research will meet the standards in the *Ag Guide*.

### *Isolation Cage Sizes*

The IACUC has established the following guidelines for cage sizes for animals in isolators.

For pigs, the cage must be at least one inch wider than the pig is tall; three inches (exclusive of feeder space) longer than the length of the pig from the end of the nose to the base of the tail; and two inches taller than the pig in its normal standing posture.

For calves, the cage must be at least six inches wider than the calf at the widest point of the pelvic bones; 10 inches longer than the calf from the tip of its nose to the base of its tail; and six inches taller than the calf in normal standing posture.

For lambs, the cage must be at least three inches wider than the lamb at the widest point; six inches longer than the lamb from the tip of its nose to the base of its tail; and four inches taller than the lamb in normal standing posture.

Ventilation must be adequate to provide circulation within the cage. The temperature and humidity within the cage must follow the ranges found in the *Ag Guide*.

If animals will be kept in a restricted environment for more than three weeks, justification must be presented to the IACUC for approval for each project.

### *Bedding*

In general, bedding should be used in amounts sufficient to keep animals clean and dry between periods of cleaning.

Bedding type should be appropriate for the animal species and research protocol. Bedding should be absorbent, free of toxic chemicals or materials that could injure personnel or animals and of a type not readily eaten by animals.

Cedar and pine bedding materials are a source of aromatic hydrocarbons that can cause damage to the liver enzymes in animals. Their use should be avoided.

Bedding should be stored in a clean room on pallets and up off the floor and at least three to six inches from a wall or supporting structure. Vermin should not have access to stored bedding. Bedding may not be required for animals in facilities with appropriate design.

### *Ventilation*

The *Guide* and the *Ag Guide* will be used to help determine ventilation requirements for animal facilities.

A strong animal or ammonia odor in an animal room indicates inadequate ventilation. Correction may require a reduction in the number of animals, more frequent cleaning of cages, or increased ventilation.

### *Feed For Animals Used in Research and Teaching*

Animals should be fed a palatable, nutritionally adequate diet according to their particular requirements, unless the research protocol requires otherwise and is approved by the IACUC. Feeders or other feeding equipment shall allow easy access to feed, while minimizing contamination by urine and feces. Feeding methods should be appropriate to the species of animal and the conditions under which the animal is maintained. For instance, pigs on concrete may be fed on the floor if the area is kept clean and free of fecal material.

Feed should be available in quantities and quality sufficient to ensure normal growth in immature animals and maintenance of normal body weight, reproduction and lactation in adults. The choice of diet will depend on animal requirements and experimental objectives. Feed for animals housed in confinement must be maintained in enclosed storage containers or remain in the original bags or containers and stored off the floor and away from the wall or supporting structures.

Numerous factors are involved in supplying feed containing adequate nutrients. These should include formulation, preparation, quality assurance, freedom from chemical and microbial contaminants, bioavailability of nutrients, palatability, methods of milling, storing and transporting. Managers of animal facilities must be judicious in purchasing, transporting, storing and handling feed to ensure that diseases, parasites, potential disease vectors or chemical contaminants are not introduced into the feed supply.

In general, animal diets should not be manufactured or stored in facilities used for storing any products containing additives such as pesticides, medications, cleaning and sanitizing agents, fumigants or other potential toxicants. Areas in which diets are processed or stored should be kept clean and enclosed to prevent entry of insects or other animals. Additional precautions should be taken with perishable items because they are potential sources of biological and chemical contamination.

Certain precautions should be taken to avoid receiving unsatisfactory feed shipments. Reliable manufacturers put the milling date on each bag, either directly or in codes. Codes should be requested from the feed supplier in order to identify and reject any stale feed. Diets for rabbits, rats, mice and hamsters should not be used after 150 days from milling. Since vitamin C deteriorates rapidly, guinea pig feed should not be used after 90 days from the milling date. If feed is transferred from the original bags or containers, the milling date should be put on the new container. Shipments received in damaged condition, such as with a torn bag or with signs of stains or discoloration, should be rejected. Food not consumed may be collected, stored in separate containers from the original storage source, and may be offered for consumption by animals in the same room if it is not contaminated and is appropriate for the animals to which it is fed.

Feed must be rotated in orderly fashion to allow older material to be used first. Shelf life is not determined by time alone; handling and storage conditions are also factors to be considered. In general, feed should be used within 6 months of milling or prior to printed expiration

date. Stale feed or feed transported and stored inappropriately can become deficient in nutrients or unpalatable. Exposure to temperatures above 21 °C (70 °F), extremes in relative humidity, unsanitary conditions, light, oxygen and insects hasten the deterioration of feed. Refrigeration preserves nutritional quality and lengthens shelf life; nonetheless, feed storage time must be reduced to the lowest practical minimum and recommendations of the manufacturer heeded. Purified and chemically defined diets are less stable than natural ingredient diets and may have a short shelf life. These diets should be stored at 4 °C or colder.

Autoclavable diets require adjustments in nutrient concentrations, kinds of ingredients and methods of preparation to withstand degradation during sterilization. The date of sterilization must be recorded and the diet used accordingly.

Bulk feed supplies should be stored in designated, restricted-access areas that are cool, dry, clean and free of vermin and potential contaminants. Feed in bags must be stored off the floor and at least three to six inches away from the wall or supporting structures. Perishable items must be refrigerated. Feed containers must be stored in a way to prevent entry of vermin. Feed containers should not be moved from room to room, and should be cleaned and disinfected regularly.

## *Water*

According to their particular requirements, animals should have continuous access to fresh, potable drinking water. Water may be restricted for short periods (up to 12 hours) prior to surgery, or to facilitate experimental procedures, if necessary. Generally, tap water will suffice. Some research protocols may require highly purified water. Water systems may need to be checked for bacteria and algae contamination, chlorine and fluoride levels.

Watering devices, such as drinking tubes and automatic waterers, should be examined routinely to ensure proper operation. Automatic waterers should be flushed daily to prevent water from becoming stagnant. It is better to replace water bottles with sanitized bottles rather than to refill

them; if bottles are refilled, care must be taken to replace each bottle in the same cage from which it was removed.

Sometimes it is necessary to train animals to use automatic watering devices.

## **Identification of Animals, Projects and Facilities**

The summary page of the “approved” AUAF identifying the project and the animals in the room should be displayed on the door of the animal room or near the animal housing facility. If animals from more than one project are housed in one room, the summary page from each “approved” application should be displayed on the door and each cage should be identified with the IACUC protocol number on the cage card.

A daily checklist of cleaning, care and observation of the animals also should be displayed at the room or where it is readily available. This checklist should be initialed by the person performing the duties each day. At the end of each month, the checklist from each room or production facility should be forwarded to the IACP office to be filed. These records can be on a clipboard or in a plastic container to protect from moisture. The approved application or checklist will not replace cage cards and animal identification. Cage cards need to be kept current and should include such things as IACUC protocol number (if more than one project is represented in a room), investigator’s name, date of arrival or birth of animals and other relevant information.

In production facilities (i.e. pasture, feedlot, confinement feeding, etc.), the summary page of the approved form can be held in the facility office.

A schedule with names of personnel caring for the animals and contact information for those personnel should be posted in a location close to the entrance of the animal facility or in the facility management office. Emergency contact information should be posted in each anteroom or on the door to each animal room.

### *Animal Identification*

The Animal Welfare Act and *The Guide* require certain information on all animal cages for identification purposes. Cage cards should be designed to satisfy these requirements. Research or other data may be placed on the back of this card or on a second card in the holder behind the identification card. The completed cage card must be visible on all animal cages at all times.

The Animal Welfare Act requires that individual dogs and cats be identified either by tattoo or tag on a chain around the animal’s neck. When USDA tags are used, the tag must be retained by animal facilities for a period of two years after the animal’s death. Records of the animals with tattoo must be kept for two years.

### *Record Keeping*

The university is responsible for maintaining records that document efforts to avoid animal pain and distress during the research or educational procedure. If surgery is performed, anesthetic records should be maintained on all species except rodents. These records must be maintained for three years and are subject to inspection by the USDA, NIH, AAALAC-I and the IACUC. Records for individual farm animals, dogs, cats, experimental groups of rabbits, and other small animals should include the following: (1) the source and gender of the animal; (2) date of experimental procedure; (3) procedure performed; (4) person(s) performing procedure; (5) pre-surgical drugs, anesthetics and post-surgical care; (6) illnesses or injuries; (7) medical treatment during the course of the experiment; (8) date of death or euthanasia and (9) disposition. Occasionally, it may be appropriate to keep such information on individual rodents as well.

## **Veterinary Care/Medical Surveillance Programs**

The emphasis of the veterinary care/medical surveillance programs is on preventative medicine rather than curative medicine. It is important for researchers to use animals that are free of disease and complicating conditions. **The quality of the research is no better than the quality of animals used.** Rodent health surveillance is



conducted by the IACP through use of sentinel animals placed among all groups housed for the purposes of managing a breeding colony or housed for a period exceeding 30 days. Sentinel sampling is conducted on a quarterly basis unless circumstances require an alternative schedule.

All animals must be individually observed by animal caretakers daily. A thorough examination will be done by AV periodically or as requested by the animal caretakers or investigators.

If animals exhibit signs of disease in any of the facilities (even sick animals on disease research), the IACP office must be notified immediately. The AV or the veterinarian approved by the IACP should be available and will assist in treating or obtaining treatment for the animals. In most cases the animal care personnel should report the sick animal to the appropriate veterinarian. A diagnostic procedure, treatment regime or preventative program may be outlined by the veterinarian. Follow-up treatments may be the responsibility of the facility manager or animal care personnel as appropriate. **The IACP must be notified of sick animals**, even if the investigator is the AV or the approved veterinarian for that facility.

If an animal dies, a necropsy may be required unless a specific cause of death is known. The UNL Veterinary Diagnostic Center or other laboratories will be utilized for assistance in diagnosis as needed. Unless requested by the AV, diagnostic fees are the responsibility of the department supporting the project. Project Veterinarians who provide clinical care for animals at out-state facilities or specific on-campus facilities should be responsible for decisions regarding whether or not a necropsy should be conducted. Medical records for the animal must be submitted to the IACP.

### **Emergency, Weekend and Holiday Care**

In an emergency, institutional security personnel or fire or police officials must be able to contact the people responsible for the animals. This shall be accomplished by supplying security officers and the university telephone operator with

a list of personnel responsible for the facility and their telephone numbers.

Animals must be observed and cared for by qualified personnel every day, including weekends and holidays, both to safeguard their well-being and to satisfy research requirements. Veterinary care after normal work hours and on weekends and holidays will be available to all units where animals used for research and teaching are maintained. A copy of the weekend or holiday schedule of personnel caring for the animals will be posted in a visible location close to the entrance of the facility.

In case of an emergency, caretakers should call (402) 472-6958, leave a phone number and remain where they can be contacted.

### **Disposal of Dead Animals and Animal Wastes**

The attending veterinarian or his/her designee should be notified if an animal dies. A necropsy may not be required on all animals. If a necropsy is requested, the carcass should be taken to the UNL Veterinary Diagnostic Center as soon after death as possible. Tissue begins to deteriorate at death and even a one-to two-hour delay may cause an erroneous report.

A night deposit cooler located on the east side of the UNL Veterinary Diagnostic Center will accommodate larger animals. The person who deposits an animal carcass in this cooler should fill out the information sheet on the clipboard located on the east wall. Information needed on this sheet includes the following: investigator's name, address, contact information, animal identification number, species, age of animal, history of treatment and the individual who took the animal to the VDC laboratory. The forms should be placed in the plastic holder inside the cooler next to the information sheet clipboard. Deposited samples (such as a biopsy) should be placed in the plastic tub with appropriate diagnostic forms attached. If hazardous agents have been used in animals, this should be noted on the history sheet.

The best method of disposing of laboratory animals and waste is incineration. Dead animals

must be kept in plastic bags in a cold storage area away from live animals until incineration. Dead animals **must not** be put in dumpsters or the regular garbage for disposal.

Wastes such as feces, bedding and feed are to be removed on a regular, frequent basis and disposed of in a safe and sanitary manner, such as by incineration.

In situations where waste cans are utilized, the cans shall be made of metal or plastic, be leak-proof and equipped with tight fitting lids. The containers should be washed with a disinfectant after each use. If waste must be stored before removal, the waste storage area should be separated from animal housing and other storage facilities and free of vermin. A cold storage unit will reduce decomposition of biological wastes.

Infectious waste such as feces, bedding and feed that have been exposed to animals treated with infectious materials must be sterilized or adequately contained before removal from the facility.

If animals are to be exposed to carcinogens, contact the UNL Department of Environmental Health and Safety (402-472-4925) for disposal methods of animals, animal wastes and bedding. If they are to be exposed to radioactive isotopes, contact the UNL Radiation Safety Officer (402-472-2157) for assistance in disposal methods. (See page 30 for additional information>)

## **Special Considerations**

Brief physical restraint of animals for examination, collection of samples and a variety of other clinical and experimental manipulations can be accomplished with devices such as restraint boxes, squeeze chutes or catch pens. Such devices shall be suitable in size and design for the animal being restrained and operated properly to minimize stress and avoid injury to the animal and personnel. Any animal injured during restraint must be reported to the IACP at once. Likewise, personal injuries must be promptly reported.

Prolonged restraint of animals, or restraint for periods longer than required for a simple procedure, shall be avoided unless essential for

research or teaching objectives and approved by the IACUC. Less restrictive restraint systems should be used when compatible with research objectives. Animals placed in restraint equipment for prolonged periods should be conditioned to such equipment prior to initiation of the project objectives. This conditioning can be as simple as putting the animal in the restraint device for short periods of time before the research is started.

Attention must be given to the possible development of lesions or illness associated with restraint, including contusions, decubital ulcers, dependent edema and weight loss. If these problems occur, veterinary care must be provided for the animal, and the animal shall be removed from the device immediately upon the AV's recommendation.

## **Surgery**

### *Multiple Major Surgical Procedures*

Multiple surgical procedures on a single surviving animal are discouraged. Multiple surgical procedures will be approved only when justified and related to specific components of a research project. This practice will be evaluated on an individual project basis by the IACUC. Cost savings alone is not an adequate reason for performing multiple surgical procedures on an animal.

For rodents (rats and mice), a clean uncluttered area will suffice as a surgery area. This area must be capable of being wiped down with a sanitizing agent and kept clean.

A surgery suite for non-rodent vertebrate animals must be capable of maintaining aseptic surroundings in which to do surgery. The surgery suite must consist of an induction preparation area, surgeon scrub area, the surgery room proper and recovery area. The induction preparation area may be used as the recovery area if space is limited. An aseptic surgery room should be locked with no activities or passage through the room except by personnel who are in the proper attire. All personnel allowed in an aseptic surgery room must be gowned and gloved with shoe covers and masks.

The surgery facility must have a gas scavenger system in operation before inhalation anesthetics are used.

A standard operating procedure (SOP) may be written and approved for the surgery, or details must be included in the AUAF. There are many good tapes and books on operation of an aseptic surgery. These should be used as reference material.

### *Anesthesia/ Analgesics*

Exposure to inhalation anesthetics constitutes a human health hazard; therefore, human exposure levels should be less than 75 ppm TWA for isoflurane, and less than 25 ppm (over the time exposed) for nitrous oxide. These levels are derived from ACGIH recommendations since OSHA has not established PELs for these compounds. . Effective procedures must be employed to protect personnel from anesthetic vapors. *Guidelines for Anesthesia in Research and Teaching Animals* is available from IACP.

### **Use of Adjuvants**

Use of Freund's Complete Adjuvant (FCA) causes inflammation, induration or necrosis of tissue in animals. The IACUC has adopted the following guidelines intended to eliminate, or reduce to a minimum, animal discomfort associated with the use of this agent in research. Departure from these guidelines will require justification and approval by the IACUC.

- ◆ Before using FCA, consider the use of Freund's Incomplete Adjuvant (FIA) or preferably another adjuvant.
- ◆ FCA should be used only for the first (priming) antigenic dose. Use of two or more doses of the complete adjuvant must be justified and is rarely warranted. If more than one dose must be used, an interval of at least three weeks should be allowed between doses.
- ◆ Injections containing FCA should be given subcutaneously or intraperitoneally rather than interdermally, intramuscularly or intravenously. Interdermal injections may result in skin necrosis and sloughing. Intramuscular injections may result in

temporary or permanent lameness or abscesses. Intravenous injections can damage the lungs by rapid embolism formation.

- ◆ Use of footpad injections will not be approved unless the IACUC is convinced that is the only way to immunize the animals.
- ◆ For subcutaneous injections, the inoculum containing the adjuvant should be divided into fractions so that no more than 0.1 ml is injected per site for rabbits and 0.05 ml for mice.
- ◆ Injection sites should be clean and free of debris and contamination likely to result in infection.
- ◆ Use of FCA requires IACUC approval.

### **Ascites Production**

Ascites production must be justified by providing evidence that the specific antibodies are not available commercially.

High doses of FCA or pristine injected intraperitoneally to induce peritoneal fluid production are associated with weight loss, hunched appearance and lethargy. When clinical signs are observed, the volume injected should be reduced to the minimum necessary to produce ascites.

The rate of ascites fluid production is variable. Animals must be observed daily and the peritoneal fluid drained as necessary to prevent excessive accumulation and resultant pain or distress.

The following general guidelines should be followed: 1) ascites fluid should be collected before the abdomen reaches the size of a near-term pregnant animal; 2) no more than two collections be made per animal prior to euthanization; 3) the fluid should be withdrawn using a 21g or smaller needle, preferably on an anesthetized animal; and 4) an individual animal must be euthanized if its condition begins to deteriorate (piloerection, emaciation, lethargy or restricted movements) or prior to the third collection. Phosphate buffered saline administered subcutaneously or intraperitoneally after collection of ascites may help prevent shock.

## Death as an Experimental Endpoint

Death is not an acceptable experimental endpoint. In studies where death would be the anticipated outcome of an experimental treatment, investigators are **strongly encouraged** to define a point short of death where the animal may be humanely terminated, prior to its experiencing severe distress. Investigators must clearly justify and document any protocol in which animals must die as a direct result of experimental treatment, other than euthanasia. The written statement should include, but not be limited to, an explanation of why an alternative experimental design could not be used. Procedures that will be followed to ascertain whether animals are in serious distress and steps taken to alleviate this condition, including possible euthanasia should be

included. Documentation might include appropriate journal articles, letters from knowledgeable colleagues, editorial reviews, etc.

## Euthanasia of Animals Used in Teaching and Research

For the purpose of this document, euthanasia is the procedure of killing animals rapidly and painlessly. It should be carried out by trained personnel using acceptable techniques in accordance with institutional policies and regulations. Techniques for euthanasia should follow current guidelines established by the AVMA Panel on Euthanasia (JAVMA, June 2010). For animals not included in the AVMA guidelines or for more detail on euthanasia, contact the IACP.

# OCCUPATIONAL HEALTH AND SAFETY PROGRAM

The goal of the Occupational Health and Safety Program (OHSP) is to ensure the protection of all UNL employees, their families, and the university as a whole, against diseases and illnesses resulting from exposure to animals. Departments utilizing animals in research, teaching, or extension education programs at UNL must ensure that the health of their employees who work with animals is monitored as part of their jobs, as required with the university's federal assurance.

The university has entered into an agreement with Nebraska Occupational Health Center in Lincoln to conduct this health monitoring. The contract physician will work with the IACP and IACUC to provide an appropriate medical monitoring program for all employees who have contact with animals.

### Personnel to be Included in the OHSP

All UNL faculty and staff employees and students who work with animals or may regularly work in the rooms where animals are held or manipulated are included in the OHSP. All such employees and students should fill out the

Occupational Health and Safety Form (OHSP Animal Risk Questionnaire), found on the IACUC Website under Quality Assurance, Forms at <http://research.unl.edu/orr/qa.shtml>. **The form should be returned to the appropriate office listed on the form.** All medical information is confidential and will be reviewed by the OHSP physician, but **not** the IACUC or IACP office staff. This enrollment and review is funded by the employing department or the department for which a student conducts animal contact activities, and requires the department cost account/code on the submitted form. If the cost code is not included, the form will be returned to the employee or student for completion.

### Program Monitoring

This program will be monitored at three levels. Departments, schools or colleges with animal facilities and personnel working with animals will be responsible for ensuring that all employees with animal contact are enrolled in the program. The contract provider, Nebraska Occupational Health Center, will review the

submitted forms and notify employees of their medical clearance to work with animals or whether required subsequent testing is necessary. Nebraska Occupational Health Center also will notify the UNL IACUC about all personnel participating in the program, so that the UNL IACUC can maintain a list of employees participating in the program.

### **Record Keeping/Verification**

Each month the contract provider, Nebraska Occupational Health Center, will report to the IACUC the names of each individual enrolling in the program during the previous month. The medical records generated will be maintained as private medical records at Nebraska Occupational Health Center. These records will not be transferred to UNL. Each month, department chairs/heads shall submit to the IACP and IACUC a list of employees recently hired who will be working with animals and are required to be enrolled in the OHSP. The IACP staff will contact these individuals and ensure that they have obtained the forms required for enrollment into the OHSP. The copies of enrollment received in the IACUC office from the Nebraska Occupational Health Center or personal physicians will serve as records that individuals are enrolled in the OHSP. If an individual has their personal physician certify that they are cleared medically to work with animals, then the employee must request that their personal physician send Form 5 to the IACAC to confirm enrollment in the OHSP.

### **Oversight and Funding of the OHSP**

The UNL IACUC will oversee this program and persons not enrolled will not be able to work with animals in association with their employment. The IACUC will inform the department chair/head/director of employees who have not complied with the mandatory program enrollment.

Individual departments are responsible for the cost associated with the review by the Nebraska Occupational Health Center for OHSP participation. Employees are responsible for the costs if they choose to utilize their personal physicians.

### **Injury Reporting**

Personnel working with, handling or providing care for animals should be trained in proper methods of handling each species of animals used. To promote safety and well-being of both the animals and employees, proactive measures should be used to decrease the incidence of animal bites, scratches and kick/crush injuries that can be inflicted on employees while ensuring safe handling and manipulation of animals. Facility managers shall send the IACUC a monthly listing of all employee job-related injuries. Training of personnel on proper handling techniques is available through the IACUC from the professional personnel in the IACP Office. Injuries should be reported as soon as they occur by submitting all completed Workers Compensation forms to the Benefits Office.

## **OCCUPATIONAL SAFETY GUIDELINES**

Research using animals may involve the use of infectious agents, hazardous chemicals and/or ionizing radiation. Use of infectious agents must be authorized by the Institutional Biosafety Committee. Use of ionizing radiation must be authorized by the Radiation Safety Committee. Use of hazardous chemicals must be discussed

with EHS to assist in determining the proper exposure controls.

### **Protective Clothing/Equipment**

All personnel involved in the care and use of animals shall be instructed on the proper protective items to be worn. Protective clothing

and equipment is primarily for the protection of the employees, their families and the animals.

Employees working with animals in laboratory rooms should wear protective outer clothing or appropriate clothing to replace or cover street clothes and shoes. These garments should not be worn outside the facilities unless to transport the animal back to the animal holding facility. Employees should never wear protective laboratory clothing home or to public places or gatherings, as they may expose other people to hazards associated with animal work. Examples of personal protective equipment (PPE) include laboratory coats, shoe covers, safety boots, masks, face shields, goggles, gloves, scrub suits, coveralls, pant and shirt uniforms, hearing protectors and respirators.

All potentially hazardous areas or equipment within an animal holding facility should be labeled as potentially hazardous (e.g., radioactive material caution tape, carcinogen alert signage, etc.) to prevent accidental exposure. Employees should never be exposed to animals without proper protective clothing and gear and should always wear protective gear when working with known disease-infected animals to help avoid disease transmission.(see page 16)

### **Inhalation Anesthesia Hazard**

Inhalation anesthesia achieved by use of other than a re-circulating anesthesia machine should be accomplished only in fume hoods that are exhausted to the outside of the building. Anesthetic vaporizer machines must be equipped with anesthesia scavenger systems that remove anesthetic vapor from the exhaust air. When these are used they must be removed when the anesthetic procedure is finished and placed in an exhausted chemical fume hood as the anesthetic gas is off gassed over the next 24 hours. When canisters increase in weight by 50gms they must be replaced as they are full and no longer effective in absorbing anesthetic gas vapor.

### **Exposure to Biological Hazards**

It is the responsibility of the departments / schools to ensure their employees are adequately

trained in the use of infectious agents they may be working with. The training received should be verified on the AUAF when submitted to the IACUC for approval. Use of infectious agents must be approved by the Institutional Biosafety Committee (IBC). Additionally, use of transgenic animals or animals containing recombinant DNA must be approved by the IBC.

### **Animal Experimentation Involving Hazardous Agents**

Cages housing animals exposed to hazardous substances should have a solid bottom and sides, including the front, and be fitted with a filter top. The cages should be opened only under a hood that is approved for that substance. Appropriate protective clothing should be worn during handling this material. Personnel caring for or examining animals exposed to hazardous agents must be aware of the material and properly trained to handle it. Personnel should wash their hands after the task has been completed and before entering another room. Clean-up procedures and cleaning agents should be available.

### **Special Qualifications for Personnel Using Hazardous Agents**

Professional staff conducting projects with hazardous biological, chemical or physical agents should be qualified to assess dangers associated with these programs and capable of selecting safeguards appropriate to the dangers of using hazardous agents. Animal care staff will be informed of safeguard procedures and become proficient in implementing the required safeguards before they are asked to care for those animals. In some cases, procedures will be developed in consultation with UNL EHS.

The use of animals in studies conducted with hazardous agents requires special considerations that must be reviewed by the IACUC and in some cases, by the IBC and/or RSC. Animal experiments with hazardous agents will have formal safety programs, safeguards for control of the agent, ensure that the staff is competent (as discussed above) and have adequate facilities to carry out the research. The use of certain

hazardous agents necessitates compliance with federal, state and local regulations and with guidelines issued by granting institutions. Publications containing regulations and guidelines include the following:

- ◆ Nebraska Title 180, Control of Radiation. 29 CFR 1910. General Industry Occupational Safety and Health Standards:
- ◆ Title 128, Nebraska Hazardous Waste Regulations.
- ◆ Centers for Disease Control and National Institute of Health. Biosafety in Microbiological and Biomedical Laboratories. National Institutes of Health, 1979. Laboratory Safety Monograph. A Supplement to the NIH Guidelines for Recombinant DNA Research. Washington, DC: US Department of Health, Education and Welfare. 227pp. <http://orf.od.nih.gov/PoliciesAndGuidelines/Safety+Standards+and+Operating+Procedures+%28+SSOPs+%29.htm>
- ◆ National Institutes of Health, Guidelines for Research Involving Recombinant DNA Molecules. <http://oba.od.nih.gov/rdna/rdna.html>
- ◆ Subcommittee on Arbovirus Laboratory Safety, American Committee on Arthropod-Borne Viruses. 1980. Laboratory Safety for Arboviruses and Certain Other Viruses of Vertebrates. American Journal of Tropical Medicine and Hygiene 29:1359-1381.

## **Hazardous Material and Waste Handling and Disposal**

Hazardous materials and waste shall be handled, stored and used according to the Department of Environmental Health and Safety published policies and procedures. Before handling any potentially infectious, hazardous or radioactive material or waste, all employees at risk of coming into contact with such material shall be trained in the proper safe handling procedures and disposal considerations.

### **Disposal of Sharps**

Sharps, including syringes and needles, lancets, razor blades, surgical blades, capillary tubes, broken blood tubes and other similar items, are commonly used in UNL research, academic and clinical areas.

Incorrect disposal of sharps has caused injury to other UNL employees, including service employees handling and transporting them for disposal. It is often impossible to trace the source of the sharp items to determine if the employee has been exposed to an infectious agent. Good laboratory procedure includes care that others are not placed at risk of injury.

**For disposal, sharps waste must be deposited in labeled, leak-proof, rigid, puncture-resistant, break-resistant containers that have fitted lids.** If sharps are used in collecting diagnostic samples, care or treatment of human patients or animals infected with zoonotic disease, the sharps disposal containers must be autoclaved before placing them in the regular UNL waste container for disposal. Those sharps containers not requiring autoclaving may be placed directly in the waste container for disposal. Approved sharps disposal containers may be purchased from scientific equipment vendors. Refer to the EHS web site for additional guidance and requirements pertaining to collection and disposal of infectious and non-infectious sharps.

Safe needle systems must be used when available.

**Needles must not be recapped after use. If needles are used, they MUST NOT be recapped before putting them in the sharps container. See the EHS web site for additional requirements for safe needle alternatives and systems.**

Similarly, broken glass must be contained separately from the normal waste. Broken glass must be placed in a box, carton or similar container to provide rigidity and protection, and appropriately sealed and labeled before placing it in the regular waste container. As with sharps, if the broken glass container requires autoclaving, it can be placed in an autoclave bag and autoclaved before being placed in the regular waste container for disposal.

For additional information or questions regarding procedures, please call the Department of Environmental Health and Safety, at (402) 472-4925.

## Engineering Controls

In all rooms where animals are housed or where research is conducted, there must be an adequately functioning heating, ventilation and air conditioning (HVAC) system. In facilities where animals are anesthetized with a volatile anesthetic agent, residual gasses must be completely exhausted away from the PI or research technician. In most cases it will be necessary to conduct anesthetic procedures in a chemical fume hood or with equipment with an operational scavenger system installed and working properly. Proper safety showers, eyewashes, fire detectors, fire suppressors and chemical storage areas must be available.

All hoods and engineering controls must be approved by Facilities Management and Planning or certified by an acceptable contracted vendor. Biological Safety Cabinets must be recertified once a year and records of recertification should be maintained and available.

## Working In Outside Areas

Precautions should always be taken to avoid contact with biting or stinging insects and other creatures that may be found outside. Some people are extremely sensitive to insect bites and stings and can have life threatening reactions. New employees should be asked to report any such hypersensitivity in writing to their immediate supervisor at the time of hiring.

## HELPFUL LINKS

IACP website: <http://research.unl.edu/orr/iacp.shtml>

IACUC website: <http://research.unl.edu/orr/iacuccomp.shtml>

AVMA Panel on Euthanasia: <http://www.avma.org/issues/animalwelfare/euthanasia.pdf>

OHSP Animal Risk Questionnaire form:

<http://research.unl.edu/orr/Occupational%20Health%20and%20Safety.pdf>

UNL Office of Research Responsibility: [http://research.unl.edu/orr/orr\\_intro.shtml](http://research.unl.edu/orr/orr_intro.shtml)

US Government Principles: <http://www.nal.usda.gov/awic/pubs/IACUC/vert.htm>

OLAW: <http://grants.nih.gov/grants/olaw/olaw.htm>

This document was updated by the IACP staff. It has been reviewed by faculty, animal unit managers, and staff responsible for animal care and(or) involved in IACUC approved projects. It was subsequently reviewed and approved by the UNL IACUC, and UNL deans, directors, department heads and department chairs who have faculty members that use animals in their research, teaching or extension education programs. Final approval was given by the IACUC on August 10, 2012.