

IACUC POLICIES, PROCEDURES, AND GUIDELINES
Housing Biomedical Research Animals Outside of DLAR
or College of Agriculture Facilities

PURPOSE:

Often an Investigator requests housing of research animals in a laboratory or other facility not under direct DLAR oversight. In order to provide the humane standard of care that is acceptable to University of Kentucky IACUC, this document will address conditions that need to be fulfilled and the documentation used to maintain AAALAC accreditation and continued PHS Assurance for the University of Kentucky. The basis of these guidelines can be found in the referenced texts.

Investigators using agricultural animals in research or teaching need to follow guidance given by the *GUIDE For the Care and Use of Agricultural Animals in Agricultural Research and Teaching* and the University of Kentucky IACUC. Some types of agricultural animal use are specifically referred to by the Animal Welfare Act and are required to follow the same practices for these animals as those established for nonagricultural species used in similar experiments. Should questions arise concerning these types of use and planning housing during protocol development, the Investigator is encouraged to contact a DLAR veterinarian or IACUC.

This document pertains to University of Kentucky research animals housed in University of Kentucky owned or controlled facilities.

RESPONSIBILITIES:

The Investigator is responsible for the adequate performance of these guidelines. When housing research animals, the IACUC will ensure that the recommended housing conditions are adequately met through initial protocol review, periodic site inspection and continuing protocol review including document review.

GENERAL GUIDELINES:

1. Veterinary Medical Care

- Adequate veterinary care must be provided, **including access to all animals** for evaluation of their health and well-being.
- All animals should be observed for signs of illness, injury, or abnormal behavior by a person trained to recognize such signs. This should occur at a minimum daily. Animals appearing abnormal in any way shall be reported to the DLAR Veterinary staff. DLAR

staff may also check the animals on a more frequent basis as requested by the Attending Veterinarian, PI, research staff or IACUC.

- The attending veterinarian has the authority to oversee the adequacy of other aspects of animal care and use. These can include health monitoring, animal husbandry and nutrition, sanitation practices, zoonosis control, and hazard containment.
- Appropriate methods must be in place for disease surveillance, diagnosis, control, and treatment. Participation in DLAR sentinel program is suggested for surveillance and control of rodent disease.

2. Qualifications and Training

- Personnel caring for animals should be appropriately trained. Formal or on-the job training should be provided.

3. Occupational Health and Safety of Personnel

- An occupational health and safety program must be part of the overall animal care and use program. The program should focus on maintaining a safe and healthy workplace. Operational and day-to-day responsibility for safety in the workplace resides with the laboratory or facility supervisor.

4. Animal Environment, Housing, and Management

- Programs designed to prevent, control, or eliminate pests are an essential part of proper animal environment. A regularly scheduled and documented program of control and monitoring should be implemented.
- Factors which should be considered in planning for adequate and appropriate physical and social environment, housing, space, and management include:
 - species, strain, breed of animal
 - sex, age, size, and health of the animal
 - design and construction of housing
 - presence of hazardous or disease-causing material
 - availability and suitability of enrichment
 - duration of the holding period
 - project goals and experimental design
 - intensity of animal manipulation and invasiveness of the procedures conducted.

- Proper housing and management of animal facilities are essential to animal well-being as well as research data reliability.
- The *microenvironment* of an animal is the physical environment immediately surrounding it (the primary enclosure with its own temperature, humidity, and gaseous and particulate composition of the air); i.e., the cage, stall or pen. The physical environment of the secondary enclosure (such as a room, barn or pasture) constitutes the *macroenvironment*.
- Primary enclosures should be constructed with materials that balance the needs of the animal with the ability to provide for sanitation. They should have smooth, impervious surfaces with minimal ledges, angles, corners, and overlapping surfaces so that accumulation of dirt, debris, and moisture is reduced and satisfactory cleaning and disinfecting are possible. They should be constructed of durable materials that resist corrosion and withstand rough handling without chipping, cracking, or rusting.
- Recommended Space for Group-Housed Mice and Rats (for more details see IACUC POLICIES, PROCEDURES, and GUIDELINES 110). Space allocations might need to be increased or decreased on advice from the AV and with approval of the IACUC. For other animals, see the appropriate "Guide".

Animal	Weight, grams	Floor area/animal Sq in	Height in
Mice	Up to 25	12	5
Mice	Over 25	15	5
Rats	Up to 300	29	7
Rats	Up to 500	60	7
Rats	Over 500	70	7

- Animal-colony managers should be judicious in purchasing, transporting, storing, and handling food to minimize the introduction of diseases, parasites, potential disease vectors (e.g., insects and other vermin), and chemical contaminants into animal colonies.
- Soiled bedding should be removed and replaced with fresh materials as often as is necessary to keep the animals clean and dry. The frequency is a matter of professional judgment of animal care personnel based on consultation with the investigator and depends on such factors as the number and size of the animals in the primary enclosure, the size of the enclosure, urinary and fecal output, the appearance and wetness of the bedding, and experimental conditions, such as those of surgery or debilitation, that might

limit an animal's movement or access to areas of the cage that have not been soiled with urine and feces. There is no absolute minimal frequency of changing bedding, but it typically varies from daily to weekly.

- All components of the animal facility, including animal rooms and support spaces (such as storage areas, cage-washing facilities, corridors, and procedure rooms) should be cleaned regularly and disinfected as appropriate to the circumstances and at a frequency based on the use of the area and the nature of likely contamination.
- Sheltered or outdoor housing—such as barns, corrals, pastures, and islands—is a common primary housing method for some species and is acceptable for some situations. When animals are maintained in outdoor runs, pens, or other large enclosures, there must be protection from extremes in temperature or other harsh weather conditions and adequate protective and escape mechanisms for submissive animals. Shelters should be accessible to all animals, have sufficient ventilation, and be designed to prevent buildup of waste materials and excessive moisture. Houses, dens, boxes, shelves, perches, and other furnishings should be constructed in a manner and made of materials that allow cleaning or replacement in accord with generally accepted husbandry practices when the furnishings are excessively soiled or worn. Floors or ground-level surfaces of outdoor housing facilities can be covered with dirt, absorbent bedding, sand, gravel, grass, or similar material that can be removed or replaced when that is needed to ensure appropriate sanitation. Excessive buildup of animal waste and stagnant water should be avoided.

5. Physical Plant

- If animals must be maintained in a laboratory area to satisfy a protocol, the area should be appropriate to house and care for the animals: if needed, measures should be taken to minimize occupational hazards related to exposure to animals.
- Durable, moisture proof, fire-resistant, seamless materials are most desirable for interior of animal housing areas or the macroenvironment.
- Photoperiod is a critical regulator of reproductive behavior in many species of animals and can also alter body weight gain and feed intake. Inadvertent light exposure during the dark cycle should be minimized or avoided. Because some species will not eat in low light or darkness, such illumination schedules should be limited to a duration that will not compromise the wellbeing of the animals. A time-controlled lighting system should be used to ensure a regular diurnal cycle, and timer performance should be checked periodically to ensure proper cycling.
- The guideline of 10-15 fresh air changes per hour has been used for secondary enclosures for many years and is considered an acceptable general standard. can be used to determine minimal ventilation needed to prevent heat buildup, other factors-such as odor control, allergen control, particle generation, and control of metabolically generated gases-might necessitate ventilation beyond the calculated minimum. Filtered isolation caging

without forced ventilation, such as that used in some types of rodent housing, restricts ventilation. To compensate, it might be necessary to adjust husbandry practices-including sanitation frequency, placement of cages in the secondary enclosure, and cage densities-to improve the microenvironment and heat dissipation.

To assure animal air supply quality the following guidelines are recommended:

- Room air is mixed with at least 50% fresh air (that is, the supply air does not exceed 50% recycled air).
 - Husbandry practices, such as bedding-change and cage-washing frequency, and the preparation of recycled air used are sufficient to minimize toxic gases, allergens and odors. Frequent bedding changes and cage-cleaning coupled with husbandry practices, such as low animal density within the room and lower environmental temperature and humidity, can also reduce the concentration of toxic or odor-causing gases in animal-room air.
 - Recycled air is appropriately conditioned and mixed with sufficient fresh air to address the thermal and humidity requirements of animals in that space.
- Regulation of body temperature within normal variation is necessary for the well-being of laboratory animals. The mouse and rat recommended environmental temperature range is 64 to 79 degrees Fahrenheit (18-26 Celsius). The acceptable range of relative humidity is 30-70%.
 - Temperature and humidity control minimizes variations due either to changing climatic conditions or to differences in the number and kind of animals in a room. Cycling off of a heating or cooling system on weekends or holidays can be detrimental to housed animals.
 - A system should be capable of adjustments in temperatures of +1°C (+2°F). Temperature is best regulated by having thermostatic control for each room. Use of a zonal control for multiple rooms can result in temperature variations between the "master-control" animal room and the other rooms in the zone because of differences in animal densities within the rooms and heat gain or loss in ventilation ducts and other surfaces within the zone.
 - Regular monitoring of the HVAC system is important and is best done at the individual-room level.
 - Brief and infrequent, moderate fluctuations in temperature and relative humidity outside the suggested ranges are well tolerated by most species commonly used in research. When extremes in conditions that are beyond animal specifications occur, provisions should be in place to minimize the magnitude and duration of fluctuations in temperature and relative humidity outside the recommended ranges. Such measures can include partial redundancy, altered ventilation rates, or the use of auxiliary equipment. In the event of a partial HVAC system failure, systems should be designed to supply animal facility needs. It is essential that life threatening heat accumulation or loss be prevented during mechanical failure.

Daily observation by research staff should monitor appearance of the animals, adequate food and water, and lights, temperature, humidity (if indoors) as is appropriate for the species and experimental goals. IACUC will verify that the investigative staffs properly maintain records.

Contact any DLAR Veterinarian for further details on accomplishing the objectives set forth in this document or for help in the development of a monitoring record.

REFERENCES:

1. *Guide for the Care and Use of Laboratory Animals*, Institute of Laboratory Animal Resources, National Academy Press, Washington, D.C., 1996.
2. *Public Health Service Policy on Humane Care and Use of Laboratory Animals*, Office of Laboratory Animal Welfare, National Institutes of Health, Public Health Service, 2002.
3. *Animal Welfare Act*, United States Code, Title 7, Chapter 54.
4. *Animal Welfare Regulations*, Code of Federal Regulations, Title 9, Chapter 1, Subchapter A, Parts 1-4.
5. *GUIDE For the Care and Use of Agricultural Animals in Agricultural Research and Teaching*, Federation of Animal Science Societies, Illinois, 1999.

Approved and Adopted by the
Institutional Animal Care and Use Committee
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