105.1 Purpose

An investigator may request housing of research animals in a laboratory or other facility not approved by the IACUC as a designated animal housing facility in cases where such housing is essential for the conduct of the research. Due to the risks of zoonosis or allergen exposure of personnel along with the additional oversight responsibilities placed upon the University, the burden of proof regarding the necessity for housing animals outside of the specifically designed and approved animal facilities is on the requestor. This justification must be based on documented scientific needs that cannot be met in an approved animal housing facility. The convenience of the investigator or laboratory staff is not an acceptable justification. It is the responsibility of the IACUC to carefully review these requests and approve only those instances where the scientific goals cannot be accomplished without such an exception. If such housing is approved by the IACUC, this document establishes the standard of care that is acceptable to and required by the University of Kentucky IACUC. This document also addresses conditions that must be fulfilled and the documentation required 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.

Animals used in biomedical research, testing, and teaching are subject to the requirements of the *Guide of the Care and Use of Laboratory Animals*, 8th edition, 2011. The Animal Welfare Act and Animal Welfare Regulations additionally apply to warm-blooded animals used in research, teaching, and testing with specific exceptions as defined in the regulations. The use of amphibians, fish, reptiles or other non-mammalian and non-avian animals in biomedical research, testing and teaching is also subject to the requirements of the Guide for the Care and Use of Laboratory Animals. However there may be some physical plant and housing requirement differences. Should questions arise concerning these types of animals and housing planning during protocol development, the Investigator is encouraged to contact the Attending Veterinarian, a DLAR Veterinarian, or the IACUC. Investigators using agricultural animals in research or teaching must comply with the guidance in the *Guide for the Care and Use of Agricultural Animals in Research and Teaching* and the University of Kentucky IACUC. Some types of agricultural animal use are specifically regulated 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 the Attending Veterinarian, a DLAR veterinarian, or the IACUC.

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

105.2 Definitions

105.2.1 Animal Housing Facilities are areas maintained by the Division of Laboratory Animal Resources (DLAR), by Colleges, or by Departments. AHFs vary from quite large in size with multiple employees to small facilities maintained by several employees or students. The AHFs may house classical laboratory animals (rodents, rabbits, dogs, cats, etc.), typical agricultural species, avians, amphibians, reptiles, and fish. The respective Director, Dean, or Chairperson retains responsibility for the AHF though operational oversight and management may be delegated to other named individuals.

105.2.2 Temporary Study-Specific Housing (TSSH) Facilities, are areas generally small, typically house a single species, and are designed to support specific scientific studies. Animals are typically housed in TSSH facilities for a limited duration of time and the facilities are not continuously used to house animals. TSSH facilities are established through IACUC approval of an animal use protocol requesting the establishment or use of such a facility.

105.3 Responsibilities

The Investigator is responsible for compliance with these guidelines. When housing research animals in a facility not designated for such, the IACUC will ensure that the housing conditions fully comply with the appropriate regulatory requirements through initial protocol review, periodic site inspection and continuing protocol review including document review.

105.4 General Guidelines

105.4.1 Veterinary Medical Care

105.4.1.1 The Attending Veterinarian has the authority to oversee the adequacy of other aspects of animal care and use. These can include but are not limited to health monitoring, animal husbandry and nutrition, sanitation practices, zoonosis control, and hazard containment.

105.4.1.2 Adequate veterinary care must be provided, including access to all animals for evaluation of their health and well-being. Establishing a mechanism for providing adequate clinical veterinary care is the responsibility of the investigator. The veterinary care program can be arranged with the existing University of Kentucky veterinary staff or with outside clinical veterinary
practitioners. In the latter case, the specifics of the program (routine visits, response times, availability for off-hour emergency calls, disease surveillance programs, etc.) must be documented and approved by the Attending Veterinarian.

105.4.1.3 All animals must be observed for signs of illness, injury, or abnormal behavior by a person trained to recognize such signs. This must occur at least daily and the observation must be documented in a readily available room log. Animals appearing abnormal must be reported to the appropriate clinical veterinary staff. The clinical veterinary staff may also check the animals on a more frequent basis as requested by the Attending Veterinarian, PI, research staff or IACUC.

105.4.1.4 Appropriate methods must be in place for disease surveillance, diagnosis, control, and treatment. These methods are a component of the veterinary care program and must be documented in the program.

105.4.2 Qualifications and Training

Personnel caring for animals must be appropriately trained. Formal or on-the job task-specific training must be provided and documented. Additionally, all personnel must complete the required IACUC training.

105.4.3 Occupational Health and Safety of Personnel

105.4.3.1 An Occupational Health and Safety Program (OHSP) 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.

105.4.3.2 Reducing Non Research Personnel exposure – i.e. Housekeeping, PPD, Security, etc.

- Protection of non-research personnel from exposure to allergens or diseases from research animals is the responsibility of the Principal Investigator of the laboratory housing the animals.
- Animal housing should be segregated from the general lab as much as possible. Examples are holding rooms, fume hoods, and biosafety cabinets.
- Place signs on the door of areas housing animals, alerting housekeeping that services are not required during times when animal are housed in the laboratory for more than 24 hours. Laminated signs for this purpose have been approved and are available from the Office of Research Integrity.
• Use alternative bedding when possible, such as corn cob bedding, to reduce dust. Any other alternative bedding will need to be approved by Attending Veterinarian or husbandry supervisor.
• Clean surfaces that came in contact with animals or animal cages after animals are removed from area. Use soap and water. If animals were in contact with any biological agents then, surfaces must be cleaned with a 10% bleach solution.
• Clean any excessive bedding that has fallen on the floor. Minimize the generation of dust by cleaning methods. If necessary, wet mopping may be used to clean the floor.

105.4.4 Animal Environment, Housing, and Management

105.4.4.1 Programs designed to prevent, control, or eliminate pests are an essential part of proper animal environment. A regularly scheduled and documented program of pest control and monitoring should be implemented and documented.

105.4.4.2 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 sanitation are possible. They should be constructed of durable materials that resist corrosion and withstand rough handling without chipping, cracking, or rusting.

- Space allocations for animal housing must comply with the applicable “Guide” unless an exception is approved by the IACUC. Space allocations may need to be increased for animals considerably above the weight ranges listed in the applicable “Guide” on advice from the Attending Veterinarian. For additional information, see the appropriate “Guide”.

- 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. The Guide for the Care and Use of Laboratory Animals, 8th edition, 2011 states that solid caging, water bottles, and sipper tubes should be sanitized at least weekly unless there is evidence that the animal's microenvironment is not compromised by the decreased frequency of sanitation. 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—are common primary housing method for some species and 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 needed to ensure appropriate sanitation. Excessive buildup of animal waste and stagnant
water should be avoided.

105.4.5 Physical Plant

- If animals must be maintained in a laboratory area to satisfy the scientific aims of a protocol, the area should be appropriate to house and care for the animals and its use limited to the period during which it is required. Measures must be employed to minimize occupational hazards related to exposure to animals both in the research area and during transport to and from the area.

- 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. This guideline 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.

- Husbandry practices, such as bedding-change and cage-washing frequency help minimize toxic gases, allergens and odors. Frequent bedding changes and cage-cleaning coupled with husbandry practices can reduce the concentration of toxic or odor-causing gases in animal-room air.

- Recirculation of exhaust air from animal housing areas is not recommended due to the potential of allergen dispersal with personnel exposure and the transmission of airborne pathogens. When recycled air is used to supply the animal facility, it is best to appropriately treat air from human occupancy areas and not recycle exhaust air from the animal housing areas. When recycled or recirculated air is used it must be appropriately conditioned, filtered, at a minimum with 85-95% ASHRAE efficient filters to remove particulates, and mixed with sufficient fresh air to address the thermal and humidity requirements of animals housed in the space.
Regulation of body temperature within normal variation is necessary for the well-being of laboratory animals. The environmental temperature range must be appropriate for the species. The acceptable range of relative humidity for common laboratory animal species is 30-70%. The provision of nesting and burrowing materials permits some level of micro environmental self-regulation.

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. The daily observations must be documented. The IACUC will verify that the investigative staffs properly maintain records of the daily observations.

105.4.6 Security Considerations

Research animal facilities shall be at a minimum securely locked to prevent unauthorized entry. Ideally master keys will be available to essential personnel while sub-master keys can be available to other personnel for specific areas as needed based on job requirements.
• Keys should be tracked and recovered when personnel no longer need them.
• Electronic based security systems with dual controls (e.g. card swipe and challenge) are preferred and should be the default for any new animal facility.
• Electronic based security systems must be compatible with UK existing platforms to allow for integration, expansion, monitoring and maintenance as needed.
• It is the responsibility of the PI to notify UK Police to make them aware of the presence of research animals in a specific location. UK Police should also be informed as to whether or not it is safe to enter the facility, should the need arise.
• PIs with satellite animal facilities where hazardous agents are used should contact UK Crisis Management and Preparedness (http://www.uky.edu/EM/hazardous-material-emergency.html) to discuss specific emergency response needs.

105.5 References


3. Animal Welfare Act, United States Code, Title 7, Chapter 54

