



University of Maryland College Park Animal Care and Use Standard

Principal Investigator-Managed Animal Housing Areas

Purpose: This policy describes the requirements, responsibilities, and procedures for establishing and maintaining Principal Investigator (PI)-Managed Animal Housing Areas (PMHAs) in a manner compliant with federal regulations, national guidelines and University standards.

Background: The *Guide for the Care and Use of Laboratory Animals* (the *Guide*, NRC 2011) states: “Animals should be housed in facilities dedicated to or assigned for that purpose, not in laboratories merely for convenience. If animals must be maintained in a laboratory to satisfy the scientific aims of a protocol, that space should be appropriate to house and care for the animals and its use limited to the period during which it is required.” (p. 134). Dedicated, properly designed animal facilities, in concert with appropriate animal housing and management, provide the foundation for animal well-being; quality animal research, production, and other animal enterprises; and personnel health and safety. The University of Maryland, College Park (UMD) Institutional Animal Care and Use Committee (IACUC) considers the use of centrally-managed animal housing areas the primary option for housing university animals. Under compelling circumstances, the IACUC may consider authorizing animal housing areas outside the central animal facilities.

Definitions:

1. *Housing facility:* Any land, premises, shed, barn, building, trailer, or other structure or area housing or intended to house animals (USDA, 1985).
2. *Animal Housing Area:* Any area, including spaces in laboratories, where UMD research or teaching animals are housed for more than 12 hours¹.
3. *Centrally-managed Animal Housing Area (CMHA):* An IACUC-approved and inspected animal housing area managed by core professional animal care staff. (See Appendix 1 for currently approved CMHAs at UMD.)
4. *PI-Managed Animal Housing Area (PMHA):* An IACUC-approved and inspected animal housing area that is independently-operated, and that may occupy a space outside of a central facility (i.e., a satellite facility; see note 1 below), OR a confined space within a centrally-managed facility (e.g., a single room in a rodent facility). In such housing areas, animal monitoring, daily animal care, vivarium husbandry, and related animal facility and administrative/documentation tasks are performed solely by the PI and research staff and are not overseen or performed by core professional animal care staff.

Standards:

1. *Approval*

All animal housing and procedure areas must be inspected and approved by the IACUC prior to use. In order to ensure consistent and high-quality animal care, the use of CMHAs must be considered the first option for housing animals at UMD. If the housing needs of an animal species or protocol activities cannot be adequately met within a CMHA, and a PMHA is proposed, the Principal Investigator (PI) must submit, as part of their IACUC protocol, a written description of the distinct scientific or species-specific requirements and a full explanation of why a CMHA cannot support the work and/or the animals. The PI must also submit a written Animal Care Plan [and associated standard operating procedures (SOPs); see Appendix 2]. With compelling scientific or other justification, the IACUC may consider PMHAs separate from, or maintained within, CMHAs.

2. *Limitations*

In general, the following types of PMHA requests will not be approved:

- PMHA requests that are made on the basis of cost savings or convenience [of the PI, University Attending Veterinarian (UAV), support staff, etc.];
- Requests for standard rodent housing area (either outside of or inside CMHAs);
- Requests for USDA-regulated and other common mammalian laboratory animal species;
- Requests for a PMHA within a CMHA without scientific justification based on experimental requirements.

3. *Responsibilities*

Once the IACUC grants approval for the PMHA, the PI assumes responsibility for the area. The PI and research staff are solely responsible for performing all animal care, husbandry, and animal care-related facility and administrative tasks. This includes all applicable animal care program elements described in Appendix 2 and the below references. Animal care and husbandry must be performed and facilities must be maintained in a manner compliant with applicable federal regulations, national guidelines, and University standards or IACUC-approved exceptions. In addition, the UAV must be informed of all unexpected deaths; all injured, ill, or abnormal animals; and all facilities-related issues that have the potential to impact the animals and animal care operations. The UAV/designees will provide direct veterinary care for animals as required.

4. *Access*

The UAV and UAV-designees must have direct access (key, card reader, etc.) to **all animals** in the area. The IACUC must be granted access upon request.

5. *Oversight*

PI-managed animal housing areas are subject to the required semiannual inspections by the IACUC, and may be subject to more frequent inspections, depending on the nature of the animal housing area, the species/strain, and other issues that may require an elevated degree of IACUC attention. As applicable, PMHAs are included in regular veterinary rounds by the UAV/designees; inspections by the USDA-APHIS Veterinary Medical Officer; triannual visits by the AAALAC-International accreditation team; and other visits and inspections that are deemed necessary (other oversight/regulatory bodies, funding agencies, etc.). At any point in

time, the IACUC has the authority to rescind approval for PMHAs and stipulate that Department of Laboratory Animal Resources (DLAR) or other CMHA personnel assume responsibility for husbandry and daily care of the animals. The PI will be financially responsible for such care or that PMHA will be shut down.

6. *Training*

The PI and research staff must be properly trained, qualified and proficient in performing animal care and husbandry tasks in compliance with federal regulations, national guidelines, and University standards. To facilitate animal care and husbandry operations in an emergency situation, whenever possible, DLAR or other CMHA personnel should be cross-trained to perform animal care and husbandry tasks in the PMHA.

Methodology:

Coordination with the IACUC, the UAV, and other applicable University entities should begin as early as possible (i.e., prior to protocol submission) to facilitate PMHA approval. Once approval is granted, PIs and research staff must maintain PMHAs in accordance with the references below, applicable University standards, and/or campus-wide DLAR SOPs for the species/strain/activity. A written Animal Care Plan (including applicable SOPs) that addresses applicable elements of the University's animal care and use program must be submitted to the IACUC along with Section L of the protocol. The written Animal Care Plan should include, but is not limited to, components listed below. Additional details are included in Appendix 2.

For a PMHA within a CMHA (see Definitions, #4, above) standard, campus-wide DLAR SOPs must be followed unless there is an IACUC-approved deviation, or no applicable campus-wide SOP exists for the species/strain/activity.

1. *Steps for PMHA Request and Approval.*

Early communication and coordination with the Department Chair, IACUC, UAV, Environmental Safety, Sustainability and Risk (ESSR), Facilities Management and other University offices will help to ensure that the proposed PMHA is capable of supporting the animals and activities. A compelling justification must be submitted to the IACUC, ideally prior to protocol submission. Additional supporting documents (Section L, relevant PMHA SOPs, other documents to describe the PMHA Animal Care Plan) should be uploaded as part of the protocol submission package in IRBnet. Training documentation and demonstrated proficiency in proper animal care and husbandry procedures should be evaluated by the UAV (or designee).

2. *PMHA visits/inspections.*

The IACUC, University veterinarians, other campus groups/committees, and external oversight bodies (e.g., ESSR, USDA, AAALAC International, OLAW, other regulatory and funding agencies, etc.) will periodically visit or inspect PMHAs as required for the covered species and/or activities (see above: Standards: #4 *Oversight*). The IACUC will review the facility for compliance with federal regulations, federal and/or professional society guidelines, University standards and SOPs, and the facility's own SOPs. (See inspection checklist in Appendix 3.)

3. *Animal Care Plan*

The written Animal Care Plan (including campus-wide SOPs and PMHA-specific SOPs) must describe how animal care, husbandry, and animal care-related facility and administrative tasks will be performed to ensure animal health and welfare and to meet applicable housing and care standards in the PMHA. Applicable elements of the animal care and use program to be addressed in the Animal Care Plan should include, but are not limited to:

- Signage, Documentation, and Recordkeeping
- Personnel Training (Staff, Students, Volunteers, Faculty, etc.)
- Occupational Health Animal Handler Clearance
- Animal Acquisition and Transportation
- Animal Transportation, Acquisition, Disposition
- Animal Numbers and Tracking Procedures
- Acclimation and Stabilization of Animals
- Animal Identification
- Daily Care of Animals
- Environmental Monitoring of Temperature, Humidity and Ventilation
- Illumination
- Water, Feeding and Storage of Feed
- Space Requirements
- Social Housing and Environmental Enrichment
- Sanitation and Housekeeping
- Veterinary Care of Animals
- Pest Control
- Waste Disposal
- Sentinel/Disease Surveillance Program
- Emergency Information and Security

Note(s):

1. Although the PHS Policy defines Satellite Facility as an area outside a central housing area where animals are housed for >24 hours, the UMD IACUC considers any area outside a central housing area where animals are housed for >12 hours to be a Satellite Facility. Many PMHAs are satellite facilities.

References and Resources:

1. Institute for Laboratory Animal Research, National Research Council. (2011). Guide for the Care and Use of Laboratory Animals. Washington, DC: National Academy Press. Available at <https://grants.nih.gov/grants/olaw/guide-for-the-care-and-use-of-laboratory-animals.pdf>
2. Office of Laboratory Animal Welfare, National Institutes of Health. (2015). Public Health Service Policy on Humane Care and Use of Laboratory Animals. NIH Publication No. 15-8013. Bethesda, MD: National Institutes of Health. Available at <https://grants.nih.gov/grants/olaw/references/phspolicylabanimals.pdf>

3. USDA [US Department of Agriculture]. 1985. 9 CFR 1A. (Title 9, Chapter 1, Subchapter A): Animal Welfare. (USDA APHIS Animal Care “Blue Book” Available at https://www.aphis.usda.gov/animal_welfare/downloads/bluebook-ac-awa.pdf)
4. American Dairy Science Association® (ADSA®), the American Society of Animal Science, and the Poultry Science Association. Guide for the Care and Use of Agricultural Animals in Research and Teaching. (2020). Available for download as a pdf document at https://www.adsa.org/Portals/0/SiteContent/docs/AgGuide4th/Ag_Guide_4th_ed.pdf
5. Various wildlife and taxon-specific guidelines (see Appendix A, *Guide for the Care and Use of Laboratory Animals*)

Appendices:

Appendix 1: Approved Centrally-Managed Animal Housing Areas

Appendix 2: Animal Care and Use Program Elements/Animal Care Plan

Appendix 3: UMD IACUC Inspection Checklist

Centrally-Managed Animal Housing Areas (CMHAs)

The following vivaria, agriculture research and teaching locations, and aquaculture facilities are currently approved as Centrally-Managed Animal Housing Areas for the University of Maryland College Park:

A. James Clark Hall vivarium

Applied Poultry Research Laboratory

Biology-Psychology Building (BPS) vivarium

Central Animal Resources Facility (CARF)

Central Maryland Research and Education Center (CMREC)- Clarksville Dairy Cattle Facility

Crane Aquaculture Facility

Department of Animal and Avian Sciences Campus Farm

Department of Animal and Avian Sciences vivarium

Department of Veterinary Medicine vivarium

Institute for Bioscience and Biotechnology Research vivarium

Microbiology Building vivarium

Wye Research and Education Center (WyeREC)- Queenstown Beef Cattle Facility

Wye Research and Education Center (WyeREC)- Queenstown Aquatic Toxicology Facility

Animal Care and Use Program Elements and the Animal Care Plan

Federal regulations and policies, national guidelines, and local University and [IACUC standards](#) and campus-wide [DLAR SOPs](#) describe animal care and use program requirements to best ensure the health and welfare of animals in our facilities. A written Animal Care Plan is required for each PMHA. The Animal Care Plan must include standard operating procedures (SOPs) to address how animal care, husbandry, and related animal facility/administrative tasks will be performed in the PMHA to meet animal care requirements and standards. Where campus-wide DLAR SOPs exist, they will be utilized; PMHA-, species- or study-specific SOPs may be required in the absence of DLAR or other CMHA SOPs.

The following general considerations are applicable to all species and identify key items for each program element. Species-specific requirements and additional details for each category below may be found in the campus-wide DLAR SOPs and the references and resources listed in the IACUC Standard.

Signage, Documentation, and Recordkeeping (*Guide* pps 35, 75-6, 87-8, 106, 108, 115, 116)
The *Guide*, Ag Guide, and federal regulations have a number of explicit and implicit documentation and recordkeeping requirements. The signage, documents and records described below aid in ensuring that these requirements are met and help to validate proper animal care.

Signage-

- Required signage in PMHAs includes:
 - Veterinary and facility emergency contacts;
 - Trilingual animal welfare concerns reporting sign;
 - First aid and reporting injuries;
 - Animal allergy warning;
 - Bilingual safety concerns signs;
 - All applicable hazard related signs (must be kept ; and
 - Additional postings as required by the University.
- Emergency signage should include office and after-hours phone contact numbers for the PI, research staff, fire, ambulance and police. After-hours contact numbers for veterinarians and Facilities Management Customer Response Center are listed on signage provided by the IACUC/DLAR.
- Any signage required for existing chemical, biohazard and radiation hazards must be kept current. If the hazard status changes, the signage must be updated.

Documentation and Recordkeeping-

- Animal care and husbandry related documents include, but are not limited to:
 - SOPs for animal care and husbandry procedures not covered by campus-wide DLAR SOPs must be developed, submitted as part of the Animal Care Plan for IACUC/UAV approval, and accessible to PMHA and oversight personnel.
 - Husbandry forms and logs- When available, standardized forms and log sheets (e.g., SOP template, animal health reports, animal room husbandry log, monthly census sheet, single housing log, support area monitoring logs, etc.) should be used. Cage cards and identification records are not currently standardized but must

contain minimum information as described in the *Guide* (see Animal Identification below).

- Animal health and medical records, including surgery, anesthesia, post-op/post-procedural care, animal health reports or records, etc., must be completed comprehensively and contemporaneously, according to IACUC standards and DLAR SOPs, and must be available for review by oversight personnel. Contact DLAR for sample documents and templates.
- Breeding colony records, including genetic characteristics and pedigree information should be maintained to allow appropriate selection of breeding pairs and experimental animals that are either unrelated or of known relatedness. The use of breeding colony management software is strongly encouraged. Contact DLAR for information on ongoing initiatives related to genotyping and colony management.
- PMHA-specific Adverse Event and Disaster/Contingency Plan must be developed and submitted for approval by the IACUC and UAV (see Emergency Information and Security element below).
- Other documentation as required, such as Chemical Hygiene Plan, etc.

Personnel Training (Staff, Students, Volunteers, Faculty, etc.) (*Guide* pps 15, 20, 22, 53, 115-6)

- All required training must be completed and documented prior to assuming responsibility for animal care. Personnel providing animal care must be trained and proficient in care and husbandry of the species housed.
- PMHA animal care personnel require the following:
 - Initial/Refresher PI/Animal User Training
 - Training on the individualized Animal Care Plan for the housing area
 - Species-specific animal care and husbandry procedure training
 - Training on zoonotic diseases associated with the species
 - Safety training as mandated for animal use associated with use of a hazard
- Applicable training records must be available for review during inspections and oversight visits.
- Recommendation: DLAR animal care staff should be trained to perform basic animal care in the PMHA in the rare instance that emergency coverage is required.

Occupational Health Animal Handler Clearance (*Guide* pps 17, 170)

- Personnel working with animals must have a current animal handler clearance approved by the University Occupational Health Clinic.
- Documentation of approval must be available for review during inspections and oversight visits.
- Any change in species, hazards, or personal health status should be updated with Occ Health.

Daily Care of Animals/Periodic Tasks (*Guide* Chapter 3)

- All animals must be cared for and observed at least once **daily** (including weekends, holidays, inclement weather, etc.).

- Animals must be observed for general health/well-being and to ensure that their environment is clean with an appropriate amount of food and water provided.
- Daily animal care and observations must be recorded in ink on the Animal Room Husbandry Log (DLAR Form #1000A).
- At a minimum, **daily** animal husbandry log entries should document:
 - Animal health checks;
 - Max/min room temperatures and relative humidities for past 24 hours (reset each day);
 - That food and water levels were assessed (and additional provided as needed); and
 - That pest traps were checked.
- Each husbandry log entry should be initialed.
- Any exceptions to daily observation and care, routine husbandry, etc., must be documented in the animal study protocol and approved by the IACUC.
- Abnormal (ill, injured, or abnormal behavior) or deceased animals and facility issues that impact animal welfare identified during daily care must be promptly reported to the UAV.
 - For rodents, sick/found dead animals should be documented on the Animal Health Report (AHR) and a copy forwarded to the UAV at DLAR@umd.edu.
 - For large animals, animal health issues should be documented in the medical record with an email detailing the issues sent to the UAV at DLAR@umd.edu.
 - Consult with the UAV regarding reporting formats for other species.
 - If an animal is critically ill, (labored breathing, hunched posture, not moving, dystocia, etc.) phone the **veterinarian on call** at **(301) 458-5047**. If unable to reach the veterinarian on-call, call the **UAV** at **(301) 458-5082** or email DLAR (DLAR@umd.edu).
- Weekly, monthly, quarterly, biannually and yearly animal husbandry and facility tasks must also be documented and performed at a frequency indicated in the SOPs for the species being housed.

Veterinary Care of Animals (*Guide* Chapter 4)

Oversight of animal well-being and clinical care of animals used in research, testing, teaching and production, through all phases of their life and at all times during animal use, is the focus of the veterinary care program. Although some aspects of the veterinary care program will be conducted by other individuals, the veterinary care program is the responsibility of the UAV.

Emergency veterinary care is available 24/7 by calling the **veterinarian on call (301) 458-5047**. In PMHAs,

- The UAV/designees must have access to all animals in all facilities approved for animal housing and use.
- The UAV (or designee) will perform periodic, routine veterinary visits.
- The PI/research staff will perform daily animal health checks as part of daily animal care.
- There must be a mechanism for direct and frequent communication to ensure that timely and accurate information is conveyed to the responsible veterinarian about issues associated with animal health, behavior, and well-being, and that appropriate treatment or euthanasia is administered.
 - All abnormal, sick, moribund or deceased animals must be reported to the UAV as described above under Daily Animal Care.

- As part of daily animal care, PI/research staff may perform certain basic animal treatments as outlined in the Veterinary Treatment Guidelines and/or as prescribed by a veterinarian.
- Personnel involved in medical assessments and treatments should have documented training or experience and demonstrated proficiency through DLAR or other source approved by the UAV.
- All treatments must be documented on an AHR, in the medical record, or in colony records, as applicable for the species.

Water, Feeding and Storage of Feed (*Guide* pps 55, 60, 65-8, 84-5, 141)

Water and feed represent variables that may impact animal health or well-being and may impact experimental outcomes. Fresh water and feed must be provided to animals daily or according to their particular requirements *unless* the animal study protocol requires otherwise. Water is typically provided *ad lib*; food may be provided *ad lib* or limit fed, depending on the species. Any deviations from standard watering, feeding, and related husbandry practices must be documented in the animal study protocol and approved by the IACUC.

- Animals should have access to potable, non-contaminated drinking water as required by the species.
 - Watering devices should be checked routinely to ensure proper operation and water delivery.
- Feed animals a non-expired, palatable, non-contaminated, and nutritionally adequate feed daily or according to their species requirements.
 - Commercially available food typically expires 6 months after the mill date (located on the bag).
- The Animal Care Plan should include written SOPs with feeding/watering instructions including amount and frequency.
- Food must be handled and stored in a manner that ensures quality and nutritional content and prevents adulteration.
 - Upon receipt, inspect feed bags to ensure they are intact and unstained; damaged or stained bags of feed should be discarded.
 - Open bags of feed must be stored in enclosed, vermin-proof containers.
 - Label feed containers with type of feed and milling date (if feed is not milled, use the date of purchased/acquisition).
 - For agricultural animals & wildlife, feed should be stored to prevent chemical, water and vermin contamination and to limit microbial growth.
 - Environmentally controlled areas used for feed storage must be monitored using a minimum/maximum thermometer/hygrometer and documented daily.
 - Food storage areas should not be subject to prolonged periods of elevated temperature or relative humidity.
 - Natural ingredient diets should be stored at temperatures less than 70°F and less than 50% relative humidity.
 - Non-standard, purified, chemically-defined, irradiated and autoclaved diets may have altered (generally decreased) shelf life and special storage requirements. Consult with the vendor or DLAR regarding expiration and storage of non-standard diets.

Environmental Monitoring of Temperature, Humidity and Ventilation (*Guide* pps 143)

Environmental parameters (temperature, humidity, ventilation) are important variables that may have an impact on animal health and welfare and/or experimental results. For rodents, investigators should be aware of the effects of low relative humidity and appropriate mitigation. Parameters must be maintained within ranges specified by regulatory and guidance documents.

- The area where the animals are housed should be suitable for that species. Indoor climate-controlled housing areas must be monitored daily to ensure proper environmental parameters (i.e., temperature, humidity, ventilation, etc.) are being maintained.
 - A minimum/maximum thermometer & hygrometer should be placed in each animal housing area.
 - Temperature and humidity readings should be recorded daily.
 - Refer to *The Guide*, the Animal Welfare Act (AWA), the Animal Welfare Regulations (AWRs) or *the Ag Guide* for species-specific requirements on environmental parameters or contact DLAR.
- Ideally, centralized monitoring of environmental parameters and HVAC performance should be in place in the PMHA with emergency notification to the PI and research staff.
- The PI or research staff are responsible for contacting the Customer Response Center (CRC) at (301) 405-2222 to report any issues with animal environmental parameters (temperature, relative humidity, lighting, etc.) or the HVAC system.
- The UAV and the Facilities Management Animal Facility Liaison should be notified of any issues related to HVAC performance or temperature/humidity issues.
- Ventilation rates of indoor housing areas are measured as needed and at least every 3 years (aquatic species housing is typically excluded from monitoring).
- Documentation of environmental monitoring is not required for livestock and wildlife housed in barns, pastures and other outdoor housing locations but adequate ventilation and housing must be provided as described in *the Ag Guide*.

Illumination (*Guide* pps 47-9, 77, 81, 141)

Light levels and photoperiods are an important variable in animal housing areas. Excessive light exposure can cause adverse health effects (e.g., retinopathy in albino rodents) and light exposure during the dark cycle can cause physiologic effects (e.g., impact on tumor growth) that may adversely impact experimental results.

- Indoor animal housing areas should be equipped with controlled lighting systems that provide regular diurnal cycles.
 - System performance should be checked regularly to ensure proper cycling.
- Inadvertent light exposure during the dark cycle should be avoided.
- Illumination should be sufficient for the animal's well-being, while permitting for good housekeeping, adequate animal inspection, and safe working conditions.
- Exceptions to illumination standards in *The Guide*, the AWA and *the Ag Guide* must have prior approval by the IACUC
- Contact DLAR for species-specific recommendations and light measurements. Light levels are periodically measured (as needed; minimum of every 3 years) for all indoor housing areas.

Space Requirements (*Guide* pps 33, 55-63, 83, 156)

Animal housing space requirements are detailed in *The Guide*, the AWA and *the Ag Guide* and vary by species, number in a group and sizes of animals. Consideration of floor area alone may not be sufficient in determining adequate cage size.

- Space recommendations in these documents are considered the *minimum* floor space requirements for common laboratory animal species.
- Available animal housing space in the primary enclosures must meet or exceed that prescribed by the references and University standards.
- Exceptions to the space requirements must be detailed in the animal study protocol and approved by the IACUC.
- Consult with DLAR regarding space requirements for species not listed.

Social Housing and Environmental Enrichment (*Guide* pps 58, 82)

Standard animal housing practices include social housing and environmental enrichment. Exemptions for scientific reasons must be justified in the animal study protocol and approved by the IACUC. Unless specifically exempted by the IACUC-

- Social species should be socially housed in compatible groups or pairs.
- Every cage or housing unit should have at least one form of environmental enrichment.
 - Environmental enrichment is intended to enhance animal well-being and encourage species-specific behaviors.
 - If a social housing exception is approved by the IACUC, additional enrichment must be provided to singly-housed animals.
- Single housing of social species and environmental enrichment should be managed in accordance with [IACUC Standards D.2. and D.3. on Environmental Enrichment and Social Housing](#) and related DLAR SOPs.

Sanitation and Housekeeping (*Guide* pps 42-3, 45-6, 69-73, 78, 85-6, 142)

Sanitation programs are designed to maintain sufficiently clean and dry bedding, adequate air quality, and clean cage/enclosure surfaces and accessories to provide a healthy environment for the animal. Sanitation of the microenvironment involves bedding change (as appropriate), cleaning, and disinfection. The macroenvironment must also be periodically cleaned and disinfected. Methods and frequencies of sanitation will vary with many factors; see the *Guide* for details.

- The *Guide* standard states that enclosures and accessories should be sanitized at least once every 2 weeks.
 - *For rodents*, solid bottom caging, bottles and sipper tubes usually require sanitation at least once a week and forced ventilation rodent caging is typically sanitized every 2 weeks. Other circumstances may require more or less frequent sanitation.
 - Microenvironmental conditions, such as ammonia level, microbial load, temperature and humidity measurements, as well as animal behavior and appearance and the condition of bedding and cage surfaces can be used to help develop a sanitation schedule.
- If the PMHA is a laboratory or similar space, a specific location should be designated solely for animal housing and be free of clutter and hazards.
- Surfaces should be easily sanitized. These surfaces should be wiped clean daily and sanitized at least weekly.

- The effectiveness of the sanitation program should be assessed periodically. Methods may include visual inspection and microbiological, ATP, and water temperature monitoring. (The intensity of animal odors, e.g., ammonia, should not be used as the sole means of assessing sanitation program effectiveness.) The assessment method should fit the process and materials being cleaned. Consult with DLAR regarding recommended methods.
- The written Animal Care Plan should include the primary enclosure sanitation and room cleaning schedule as well as the for the location. Cleaning duties must be documented when performed (see Daily Animal Care above).

Pest Control (*Guide* pps 74, 87, 110)

- A regularly scheduled and documented program of control and monitoring should be implemented to prevent, control or eliminate the presence of or infestation by pests.
 - The program should (ideally) prevent access and eliminate harborage.
 - Non-toxic methods (e.g., insect growth regulators, silica gel, etc.) and humane pest traps should be used. Traps that catch non-insect pests alive require daily observation and humane euthanasia after capture.
 - Pesticides must be used with caution in an animal facility; consult with animal care management staff and University Pest Control specialists and coordinate with the PI to help ensure no toxic effects on animals or adverse impact on experimental procedures.
- For animals in outdoor facilities, consideration should be given to eliminating or minimizing the potential risk associated with pests and predators.

Carcass Storage and Waste Disposal (*Guide* pps 20, 73-4, 87, 138, 143)

- Investigators are responsible for proper disposal of conventional and hazardous waste.
 - Conventional, biologic and hazardous waste should be removed and disposed of regularly and safely.
 - Adequate numbers of properly labeled, waste receptacles should be available and leak-proof with tight-fitting lids.
 - Use of disposable liners is recommended; waste receptacles and implements should be washed/sanitized regularly.
 - Hazardous waste containers (sharps, biohazard, chemical, flammable, radioactive) must be leak proof and adequately labeled.
 - Refuse storage areas should be separated from other storage areas.
- If cold storage is used to hold material before disposal, a properly labeled, dedicated refrigerator, freezer, or cold room should be used that is readily sanitized.
 - Refrigerated storage, separated from other cold storage, is essential for storage of dead animals and animal tissue waste; this storage area should be kept below 7°C (44.6°F).
 - Temperatures should be monitored and documented at least weekly.
- Contact ESSR for information/assistance. For off-campus locations – waste disposal should be in accordance with local regulations, ordinances and policy.

Animal Procurement (*Guide* pps 106-7)

Visit the [DLAR Animal Procurement webpage](#) for information on animal ordering. Animal orders should be placed using the [Central Animal Procurement System \(CAPS\) form](#) available on this page. Animal Procurement should be addressed in the written Animal Care Plan.

- After the IACUC has approved animal use and an estimated number of animals on an animal study protocol, animal orders may be placed against that protocol.
- Prior to ordering animals, the PI/PMHA manager should confirm sufficient facility resources to house and manage the animals.
- Animals must be procured lawfully.
- To best ensure animal health and to minimize biological variables, commercially available animals should be acquired from quality vendors on the DLAR Approved Vendor list.
 - These vendors have an established health history.
- Animals ordered from Unapproved Sources (i.e., commercial or non-commercial sources with no UMD-established animal health history) will be quarantined for diagnostic testing to ensure animals are free of any murine pathogens that are excluded from campus.
- In general, animals used for scientific purposes should not be obtained from pet stores or pet distributors. Animals from these sources typically have unknown or uncontrolled backgrounds and have the potential for introducing health risks to personnel and other facility animals.
- Breeding colonies should be established based on need and managed according to principles of animal reduction such as cryopreservation for rodent stocks or strains.
 - Preservation of rare or valuable rodent lines in the event of emergency should be addressed in the written PMHA Disaster/Contingency Plan.

Animal Transportation (*Guide* pps 107-9)

Animal transportation processes should provide an appropriate level of animal biosecurity while minimizing zoonotic risks, protecting against environmental extremes, avoiding overcrowding, providing for the animals' physical, physiologic, or behavioral needs and comfort, and protecting the animals and personnel from physical trauma.

- Transportation of animals between rooms, between buildings, on-campus and off-campus should adhere to applicable federal, state, local and University requirements and to the guidelines established in IACUC standards and DLAR SOPs.
- University-owned, climate-controlled vehicles with appropriate transport capabilities (able to protect the animals and the people) must be used to transport animals. The IACUC will inspect these vehicles prior to first use and during semiannual facility inspections.
- Animal transportation should be described in the animal study protocol and in the written Animal Care Plan.

Animal Disposition

Animal study protocols must describe the disposition of animals remaining at the end of the protocol.

- Depending on their health status, behavior, and manipulations or exposures during the protocol, final disposition of animals remaining at the end of an approved animal study protocol may include the following:

- Transfer to another protocol,
- Transfer to another institution,
- Adoption,
- Euthanasia
- Transfer to another protocol, to another facility, or adoption will be coordinated through the IACUC and/or DLAR.
 - The IACUC office and DLAR will facilitate animal transfer to another protocol. Request an animal transfer by completing the [Animal Transfer Form](#).
 - The DLAR Animal Import/Export Coordinator will work with PIs to facilitate animal transfer to another institution.
 - Veterinarians will perform animal health assessments and work with PIs to facilitate adoption of suitable animals.
- Euthanasia must be performed in accordance with methods described in the IACUC-approved protocol.

Animal Numbers and Tracking Procedures (*Guide* pg 88, AWRs)

Institutions must account for animals used or produced (even if not used, e.g., wrong genotype) under an IACUC protocol.

- The animal study protocol must include an estimate of the number of animals required for experimental, breeding, training, and other purposes. [IACUC Standard A.3](#) provides additional information on accounting for animals in animal study protocols.
- Investigators and facility management must track the number of animals used by species and by USDA “pain category” B, C, D, or E).
- The IACUC office collects animal numbers from PMHAs quarterly.

Acclimation and Stabilization of Animals (*Guide* pps 109-111)

Newly received animals should be given a period for physiologic, behavioral, and nutritional acclimation before their use.

- The need for an acclimation period has been demonstrated in numerous species.
- The length of time for acclimation may vary with the type and duration of animal transportation, the species, and the intended use of the animals.
- If animals are quarantined upon arrival, acclimation periods may be shortened but typically follow release from quarantine.
- Animals not typically housed in research settings may benefit from a means to assist with their acclimation (e.g., shearing sheep before they are brought indoors).
- The written Animal Care Plan should address acclimation and stabilization periods. If an exemption is requested from standard DLAR acclimation times, the request must be documented in the protocol and approved by the IACUC.

Animal Identification (*Guide* pps 75, 87)

- Animals should be clearly identified, either individually or by group (see below). Room, rack, stall, pen, tank or cage cards may be used.
- There is currently no standardized identification/cage card format, but basic information must be provided as described in the *Guide*, IACUC standards and campus-wide DLAR SOPs.

- Identification cards should include the source of the animal, the strain or stock, names and contact information for the responsible investigator(s), pertinent dates (e.g., arrival date, birth date, wean date, surgery date, etc.), and protocol number when applicable. Genotype information, when applicable, should also be included. Additional information, such as number of rodents in a cage, may be helpful in performing animal care and colony management tasks.
- Fish, amphibians, reptiles, birds and rodents may be identified as a group at the chamber, cage or tank level.
 - A sign or notice may be posted in the room with all the common information (PI, protocol, species, etc.) then individual cage or tank identifiers should be linked to the respective common information.
- Individual animals may have additional means of identification, including collars, tags, ear punches, ear notches, tattoos, brands, leg bands, subcutaneous implants, etc.

Sentinel/Disease Surveillance Program (*Guide* pp 112-3)

Animal biosecurity includes all measures to control known or unknown infections in laboratory animals. The UMD animal biosecurity program approaches the identification and control of disease in animal facilities through a variety of methodologies, and in a species and/or facility-specific manner, as appropriate:

- PMHAs housing rodents are required, unless exempted by DLAR SOP or IACUC-approved departure, to participate in the rodent colony disease surveillance program, which currently uses sentinel animals and a dirty bedding exposure protocol.
- PMHAs housing other species (including aquatics) may or may not employ a sentinel animal approach to disease surveillance, depending on the species and type of housing in place. Alternative disease surveillance activities may include period physical exams or diagnostic testing.
- PMHAs will be charged back for sentinel/disease surveillance program costs incurred via DLAR processing.
- The DLAR Import/Export Coordinator will coordinate with PMHA personnel to place sentinel animals and to collect required samples.

Emergency Information, Security and Access Control (*Guide* pps 23, 35, 74-5, 114, 141,

- Emergency contact information must be prominently posted in the PMHA (see Signage above).
- Emergency procedures for handling special facilities or operations should be prominently posted and personnel trained in emergency procedures for these areas
- PMHA-specific Adverse Event and Disaster/Contingency Plan:
 - A PMHA must have a written Disaster/Contingency plan that addresses potential adverse events, emergencies and disasters specific to that housing area.
 - The plan should take into account both personnel and animals.
 - Disaster/contingency plans specific to the PMHA must be approved by the IACUC and UAV. A copy of the plan must be submitted with the protocol in IRBnet.
 - Individuals responsible for daily animal care must have access to and be trained on this plan.

- If the PMHA is located within a CMHA, the animal housing area may be incorporated into existing plans (this should be coordinated with the CMHA manager).
- The PMHA should be secure with restricted access.
 - Access should be restricted to authorized personnel only, i.e., those properly trained and with a legitimate need for access.
 - When possible, the PMHA should be located inside another structure with its own independent security features.
 - Vehicular access should be limited; if provided, it should be controlled and monitored.

Additional Information (as applicable to species/strain/activity)

- Husbandry practices which are exceptions to the standards described in the *Guide*, the AWA/AWRs, *the Ag Guide*, institutional standards and campus-wide DLAR SOPs must be described and approved in the animal study protocol.
- Guidance and assistance are available from the IACUC office or DLAR.
 - IACUC Office: iacuc@umd.edu, 301-405-3541/4792, [IACUC website](#)
 - DLAR: dlar@umd.edu, 301-405-4921, [DLAR website](#)
- Copies of the AWA/AWRs, the PHS Policy, the *Guide for the Care and Use of Laboratory Animals* and the *Guide for the Care and Use of Agricultural Animals in Research and Teaching* are available at the links provided in the References and Resources section of the IACUC PMHA Standard.

University of Maryland – IACUC Inspection check list

IACUC Reviewers _____ Escort _____ Signature _____

PI _____ Building _____ Room(s) _____ Date _____

Signage

- Allergy warning
- Safety Concerns (English/Spanish as needed)
- When Injury Happens
- Abuse and Neglect letter
- Emergency Veterinary Contact

Personnel Training and Documentation

- PI-Animal Users
- Occupational health program enrollment
- Lab Specific-training
- Other training (A/BSL2/3, Radiation, etc)
- Workers have knowledge of rules/regulations
- Workers have knowledge of/access to protocol and SOPs

Safety, Cleaning, and Sanitation

- General cleanliness of lab/lab surfaces
- Certification of BSCs, hoods, vaporizers within date
- Appropriate anesthetic gas scavenging
- Gas cylinders properly secured
- Eye wash station flushed, documented weekly and accessible
- Pest control visits performed and documented
- Refrigerators/microwaves marked for no human food
- No food or drink present in lab areas
- Sharps disposed of properly/not overfilled
- Extension cords not used as permanent fixtures (unless otherwise cleared by ESSR)
- Behavior apparatus clean and sanitizable
- Sanitation supplies (bleach, wipes, etc.,) within date
- Other reagents labeled w/date opened/mixed and within date

v. 2020

Storage and Disposal

- Carcasses/hazardous wastes properly contained, labeled & disposed of
- Items requiring refrigeration are stored at appropriate temperature (carcasses $\leq 7^{\circ}\text{C}$; special diets $\leq 4^{\circ}\text{C}$; medications as per manufacturer spec)
- Feed is rotated first in/first out
- Feed and bedding not stored against wall or on floor
- Feed stored in closed containers, labeled w/exp date
- Bin sanitation dates noted on bins
- Drugs and other medical supplies are within date
- Controlled substances within date and properly stored and documented

Animal Care & Documentation

- Sanitation complete on schedule and documented
- Temperature and RH checked and documented
- Status of food, water, and animal health checked & documented at least daily; reports submitted to AV
- Appropriate enrichment provided
- Cage cards clear & complete (including): PI, protocol number, pertinent dates (e.g., birth, arrival, surgery), animal source, species/strain & animal identification number (as applicable)
- Single housing rationale and resolution documented
- Animal health records available and complete
- Surgery/anesthesia/monitoring records available and complete
- Humane endpoint docs available and complete

Room Maintenance in Animal Facilities

- Animal areas are appropriately secured
- Animal room surfaces are all non-porous, sanitizable, and devoid of cracks and holes
- Light intensity appropriate for species and animal care/observation
- Light fixtures have covers
- Light timers checked regularly
- Outlets have covers to allow sanitation

v. 2020

Cagewash

- Convenient to animal areas/waste disposal
- Ease of access (including door size) facilitates use
- Sufficient space for staging and maneuvering appropriate clean cage storage
- Safety precautions in place and in use (e.g., waste disposal, SOPs, warning signs, ear protection)
- Safety features are in use (auto shutoffs, egress)
- Traffic flow clean to dirty with no cross contamination (with appropriate air pressure differential)
- Utilities are appropriate for operation
- Ventilation meets heat and humidity load
- Functioning safety devices to prevent entrapment in washer/sterilizers
- Cage wash temperatures are monitored and records are available

Surgical Suite/Surgical Space

- Anesthesia/perioperative care records appropriate
- Effective contamination control procedures
- Effective cleaning procedures/dedicated equipment
- Surgical surfaces smooth and impervious to moisture
- HVAC system meets Guide requirements (air pressure in operating room is positive relative to adjacent areas)
- Lighting outlets and other fixtures safe and appropriate
- Facility for washing, sterilizing, storing instruments and supplies
- Storage of autoclaved materials maintains sterility
- Postoperative Recovery: allows adequate observation, easily cleaned, supports physiologic functions, minimizes risk of animal injury
- Appropriate anesthetic gas scavenging

Autoclave

- Autoclave monitoring procedures are implemented and records complete
- Safety mechanisms in place, including appropriate signage and training