The University of Pennsylvania Institutional Animal Care and Use Committee (IACUC) has developed the following policy to provide guidance to Principal Investigators (PI) and other components of the animal program regarding the requirements for establishing and maintaining animal facilities in a manner compliant with federal regulations and expectations.

The design of animal facilities combined with appropriate animal housing and management are essential contributors to animal well-being, the quality of animal research and production, teaching or testing programs involving animals, and the health and safety of personnel. (Guide 2011)

The Animal Welfare Act Regulations defines study area (“satellite”) as “any building room, area, enclosure, or other containment outside of a [main] facility or centrally designated or managed area in which animals are housed for more than 12 hours.” (AWAR § 1.1 Definitions)

The housing areas will be inspected by the IACUC at least once every six months as per federal regulations. These inspections may or may not be announced.

This policy is based on the Guide for Care and Use of Laboratory Animals (Guide 2011), as well as federal regulations and standards. Defining a “facility” and a “satellite” is a combination of location relative to a vivarium and the functional practice of who performs daily observations. It is the responsibility of each party to fulfill our collective institutional requirements. Specific questions regarding housing should be referred to University Laboratory Animal Resources (ULAR) and questions regarding general animal use practices should be referred to the Office of Animal Welfare (OAW).

This policy will cover the following topics:
- Main Animal Facility
- Satellite Facility
- Basic Requirements of all facilities
- Standard Operating Procedures
- Testing Chambers
- Exemptions

**MAIN ANIMAL FACILITY**

A main animal facility consists of any room(s) or area within the footprint of the vivarium and ULAR performs daily observations. This oversight by the AV/ULAR will include daily observations of all animals (7 days a week, 365 days a year), in addition to providing daily husbandry services—including, but might not be limited to, assurance of appropriate food and water, a general health assessment, and suitable environmental parameters (AWR 2.33(b)(3)).

Special Requirements within the Main Animal Facility

Most studies should be able to be performed within a room in the main animal facility. If the research requires that laboratory staff perform some aspects of the husbandry procedures, cages must be
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labeled with a “Special Requirement” card and complete any appropriate form as required by ULAR
Husbandry (see ULAR SOPs 6.20 “Animal Feeding Policy” and 6.25 “Animal Watering Policy” for details).

For complex arrangements, a written “Special Husbandry Agreement” may be necessary to clearly
delineate the responsibilities which have been divided between the research laboratory and ULAR
husbandry services. Such an agreement must be signed and maintained by both the PI and a senior
representative from ULAR prior to initiating any special husbandry practices. These agreements must be
filed with the OAW and are subject to review by the IACUC as part of the semiannual program review
process.

The items described as “daily observations” (please see below under “Basic Requirements”) will not be
delegated to research staff in a main animal facility.

SATELLITE FACILITY

“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.” (Guide
2011)

A satellite facility is a room or area where animals are kept for more than 12 hours and where ULAR
does not perform daily observations, regardless of the room’s inclusion in or proximity to the
vivarium. IACUC-approved satellite housing may be necessary if (1) main facilities have been proven to
be inadequate in providing appropriate housing conditions for the research or (2) the research
conducted precludes daily observations being performed by ULAR.

Prior to housing animals in a satellite facility, the IACUC must review the justification of the need for
satellite housing and inspect and approve that specific site (see “Satellite Housing” policy for specific
information). IACUC approval may be granted to house in a specific location and to perform IACUC-
approved procedures in that specific location—it does not include any exception to the requirements
regarding oversight by the AV/ULAR or the IACUC/OAW.

- ULAR will provide health assessments at least twice per week.
- The IACUC will inspection the area at least semiannually.
- OAW compliance staff will conduct post-approval monitoring as necessary.

All satellite facilities must meet the requirements of the Animal Welfare Regulations and PHS Policy as
well as the standards of the Guide for the Care and Use of Laboratory Animals (Guide)—see “Basic
Requirements” below.

Please see the “Satellite Housing” IACUC policy for details regarding review of satellite housing by the
IACUC, maintenance by the PI and research staff, and ULAR’s involvement in daily observations.

BASIC REQUIREMENTS OF ALL FACILITIES
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Regardless of the type of facility in which animals are housed (main or satellite), the following topics describe the basic requirements of any animal facility. The following requirements are standard practice in ULAR-managed facilities.

Daily Observations
Regardless of the type of facility in which animals are housed, all animals must be observed daily for (1) general assessment of health, including reporting “sick” animals to the institutional Attending Veterinarian (AV) or designees (ULAR staff), (2) appropriate type and amount of food and potable water, and (3) environmental parameters within the range of federal regulations or guidance (e.g. temperature, humidity, ventilation and lighting) (AWR 2.33(b)(3), Guide 2011).

Veterinary Care
To assure the provision of appropriate veterinary care, all “sick” animals must be reported, in a timely fashion (immediately is preferred, same day is required), to the AV (ULAR veterinary staff). This reporting mechanism must follow appropriate ULAR standard operating procedures (e.g. SOP 4.00 Animal Health Observation Procedures). So that general colony health may be monitored by ULAR veterinary staff, all animals “found dead” must be appropriately documented (e.g. daily husbandry log, etc.), regardless of where animals are housed (e.g. main or satellite facilities).

Husbandry Care
All animals must be provided food, water, clean bedding, and an appropriate environment. This may be performed by a variety of individuals, based on the type of facility. In addition to “daily observations”, other husbandry-related tasks must be performed and documented (e.g. sanitation of floors and walls, cage changing, etc.), with ULAR SOPs being the standard. ULAR’s husbandry log may be used as a template in order to document daily tasks and other routine activities that are performed weekly or monthly.

Daily husbandry logs must be posted or otherwise be readily available to ULAR, IACUC, or OAW personnel. The logs must include at least the following information, documented daily:

- Health assessments
- Availability of adequate food and potable water
- High/low temperatures in the last 24-hour period
- High/low humidity in the last 24-hour period
- Any deviations or issues noted (e.g. temperature fluctuations, fan failure, etc.)
- Cage cleaning (documented as per SOP, usually weekly)
- Room/area cleaning and sanitizing (documented as per SOP, usually weekly to monthly)

Standardized environmental parameters
To assure the provision of a stable environment and the minimization of variables the animals may experience, environmental parameters must be controlled and documented. This includes at least:

- **Time controlled lighting** on standard 12:12 light:dark cycles, unless approved in the IACUC protocol for any study-related adjustments. Control may be achieved by either as part of a central monitoring system (preferred) or via plug-in light timers (minimum accepted). It is not acceptable to turn light on when personnel arrive for the day and turn lights off when personnel leave. Standard lighting must be in place 7 days a week.
- **Temperature and humidity** must be checked daily to assure these parameters are consistent with ranges described in the Guide (2011). Because fluctuations in temperature and humidity
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should be minimized in animal housing areas, minimum and maximum readings should be documented. Humidity is required to be checked in housing areas for aquatic species housing as well, to assure the comfort and safety of the staff and to minimize condensation which may support microbial growth and rust formation (Guide 2011).

- Ventilation in areas housing animals should be maintained at approximately 10-15 air changes per hour—although some flexibility is permitted for large rooms with low populations. “The successful operation of any HVAC system requires regular preventive maintenance and evaluation, including measurement of its function ... supply and exhaust air volumes, fluctuation in temperature and relative humidity, and air pressure differentials between spaces as well as critical mechanical operating parameters” (Guide 2011).

- Emergency power should be provided for any activity that may directly impact the well-being and normal behavior of the animals (e.g. housing, lighting, temperature control, etc.). This may include direct linkage to a central system or by outfitting the area with emergency power outlets. Notification systems may be sufficient in individual cases. Audible alarms should be avoided in animal housing areas.

Environmental-monitoring alarm systems should feed into a central monitoring system or office or provide direct communication by pager or cell phone to a senior person in the laboratory. Any significant or chronic environmental parameters that routinely fall outside of the ranges in the Guide should be reported to the Schools’ facilities or operations offices for correction, as these deviations may affect animal well-being. These offices may also be able to assist in validating ventilation or availability of emergency power supply.

Windows create problems with temperature control of the area and prevent strict control of the photoperiod, especially for rodents—windows in rodent housing rooms are prohibited. Outdoor housing may have limited control over these parameters, but appropriate shelter must be provided in all cases of outdoor housing to protect the animals from extreme temperatures and inclement weather.

Identification

All animals must be properly identified in all types of housing areas. This may be by group designation for some species (e.g. a cage of mice or a tank of fish) or must be individually identified for non-rat USDA species. The ULAR Polaris “cage card” should be the standard mean of identification, except in unique circumstances. Polaris cage cards should not be reused, but must be deactivated after the animal is euthanized in satellite facilities, just as in main animal facilities.

Satellite facilities must maintain the active cage card from the home facility, so this may continue to be scanned for animal tracking purposes. Cage cards that originated from main animal facilities must include at least (1) the protocol number on which the animals are assigned, (2) the PI of that protocol, and (3) emergency contact name and number (cell phone or pager only). Genotype information may also be included, as this could be relevant to emergency clinical intervention. Cage cards must be either attached to the cage or be clearly visible adjacent to the cages.

Sanitation and Sanitizable Surfaces

There should be no clutter in the animal housing area, only equipment related to housing should be in the immediate proximity to the animals. All surfaces in the housing area (e.g. shelves, tables, floors, walls) including the primary enclosure and other equipment associated with animal housing must be able to be cleaned and sanitized. Impervious surfaces should be used, e.g. plastics, stainless steel, etc.
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If any equipment must be constructed of wood, this must be treated with an appropriate paint or coating to allow for proper sanitization and maintenance.

Pest Control
The housing area should be designed to prevent the entry of insects and vermin. A pest control program should include regularly scheduled and documented visits by a certified professional. The specific quarterly school/building standard procedures for pest control in other laboratory areas may be sufficient. Use of pesticides should be minimized, but when utilized, their use must be documented and coordinated with the animal care management staff and be in compliance with regulations. Whenever possible, nontoxic means of pest control should be used.

- Insect monitoring stations should be present in every housing facility; secured a few inches up on a wall (not on the floor).
- Rodent housing facilities also require humane rodent traps. Humane traps must have documented checks daily in SHEPHERD.
- If rodent or insect pests are noted in the animal housing area, then please call the University contracted pest control vendor (Aardvark Pest Management; 215-333-4442) to arrange for additional oversight.
- If live rodents are captured in the laboratory during normal work hours, then please contact ULAR Diagnostic Services (ular-dx@lists.upenn.edu) for any follow-up (e.g. necropsy, serology). If live rodent a captured after hours or on weekends, then please call the University contracted pest control vendor.

For animals in outdoor facilities, consideration should be given to eliminating or minimizing the potential risk associated with pests and predators (proper storage of food, etc.). (Guide 2011)

Occupational Health
“Measures should be taken to minimize occupational hazards related to exposure to animals both in the research area and during transport to and from the area.” (Guide 2011) When performing husbandry tasks (e.g. cage changing), the standard practices described in ULAR SOPs must be performed. This includes, but may not be limited to changing rodent cages in an appropriate change station or “hood” and use of PPE appropriate for the species and task (e.g. disposable gowns, mask, gloves, etc.), regardless of the type of facility. Soiled cages must be covered for transport through public corridors.

Security
All facilities are required to maintain controlled access. Animals must be maintained behind at least one locked barrier/door, separated from public areas—facility doors must be equipped with locks or electronic security devices. Security features such as card-key systems or electronic surveillance should be considered. Outdoor housing must have adequate security via at least a perimeter fence and other programmatic means in lieu of key-lock access.

Training
“Personnel caring for animals should be appropriately trained, and the institution should provide for formal and/or on-the-job training” (Guide 2011). The institutional training program will include standardized training (consistent with ULAR training) for all individuals performing various duties associated with this policy. This includes husbandry training for those non-ULAR personnel who are providing daily wellness checks and/or husbandry care for animals outside of a main animal facility.

Access to animals
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Access will be granted to all authorized individuals, regardless of the type of facility—main or satellite facilities. Just as in ULAR-managed main animal facilities, ULAR veterinarians and authorized ULAR staff (AV designees), the IACUC and the OAW staff must have access to all animal housing areas. Access may vary depending on the type of facility and may be scheduled with and escorted by the PI and research staff if the animals have special requirements.

If access is complicated by unique housing environments (e.g. altered light cycle), then laboratory SOPs must describe the procedures that every person must follow to access the animals (research staff or otherwise) and appropriate training must be provided by the PI to ULAR veterinary and husbandry staff and the IACUC and OAW staff to assure that those personnel with access to the animals are all appropriately trained. Limitations will be addressed by the full IACUC on a case-by-case basis.

Emergencies and contingency plans
Emergency procedures for handling special facilities or operations should be prominently posted and personnel trained in emergency procedures for these areas. A contingency plan should take into account both personnel and animals as part of the overall safety plan for animals housed in any facility at the institution. Satellite facilities must have a written disaster/contingency plan or must be incorporated into ULAR’s institutional plan. Guidance regarding disaster planning and response is offered by OLAW.

STANDARD OPERATING PROCEDURES
To assure the provision of consistent practices within facilities, SOPs must be approved and maintained for all facility-related practices involving animals. Non-ULAR areas may follow applicable ULAR SOPs as written or maintain a library of their own. All personnel associated with housing procedures must have received documented training for all applicable SOPs.

At a minimum, a collection of facility SOPs must describe at least the following topics (parentheticals are references to ULAR SOPs):

- Species specific husbandry procedures (7.xx)
- Sanitation (7.xx)
- Personal protective equipment in housing areas (3.05)
- Wellness check and reporting animal health issues (4.00)
- Identification of animals (6.05)
- Provision of food and water (6.20, 6.25)
- Provision of weekend care (4.00, 7.xx)
- Pest control (10.65)
- Storage of food and bedding (6.10)
- Documentation of environmental conditions and reporting out-of-range parameters (7.xx)
- Emergency plan

All SOPs should be reviewed as often as necessary by the facility; any change in practice should be reflected in an update to the SOP. SOPs must be filed with the OAW and are subject to review by the IACUC every 6 months as part of the semiannual program review process.

TESTING CHAMBERS
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In many cases, testing chambers can be maintained within a main animal facility, without the need for the creation of a satellite facility. This may require modified racks or alternate room arrangements. This may also require access and training for ULAR staff to perform daily observations. The following requirements regarding use of testing chambers are valid regardless of the type of facility in which they are located.

- Animals must be able to be viewed at any time upon request. This may be accomplished by clear chambers (e.g. Plexiglas), standard practices to open a chamber (e.g. red light if in the dark cycle), or by video monitoring (if there is a restriction to opening the testing chamber). Any video monitoring must be of sufficient resolution, quality, and proximity to all animals in the testing chamber to adequately assess the animal’s general well-being.
- If animals must be kept within a cage in a chamber where the environmental conditions are modified as part of the study (e.g. constant light/darkness, high/low temperature, etc.), then the specifically modified environmental parameters (e.g. humidity, lighting, temperature and/or ventilation) within the chamber must be documented daily, as it is the immediate macroenvironment. These parameters may be different in the chamber than in the surrounding room. Testing chambers under ambient room conditions do not require daily environmental monitoring, as this will be accomplished by the whole room logs.
- If the animals are housed in a testing chamber with its own ventilation, the functioning of the fan or other apparatus must be checked daily, when the daily observations are conducted.
- If the testing chambers rely on electricity to function, they should be included in the facility’s emergency power supply.
- Emergency procedures must be in place to preserve animal welfare if the testing chamber fails (e.g. an alarm or an auto-open feature for hypoxia chambers if the gas mixture fails).
- Routine husbandry practices may be performed by the laboratory with prior arrangement with ULAR, but ULAR should continue to provide daily health assessments at least twice per week.

If it is not possible for ULAR to perform daily health assessments, then a satellite housing application must be submitted, reviewed, and approved by the IACUC prior to the using the testing chambers. Please see the “Satellite Housing” policy for specific guidance.

EXEMPTIONS

Exemption to the policy may be requested to the IACUC Chair or OAW Director for consideration by the Satellite Housing Subcommittee or the full IACUC membership at a convened meeting.