

Policies and Procedures

SECTION: Research and Compliance	NUMBER: R&C-ARF-2.0			
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1. ANIMAL HEALTH AND CARE

The Guide states, “Proper management of animal facilities is essential to the welfare of animals, validity of research data, and health and safety of the ARF Personnel. A good animal care program provides a system of housing and care that permits animals to grow, mature, reproduce (where appropriate under the protocol) and maintain good health. Good animal care minimizes variations that can modify an animal’s response to experimentation.” Animals shall only be housed in facilities or locations approved by IACUC. A location that is housing animals is defined as any area where live animals are kept for 12 or more hours.

2. CAGING AND HOUSING OF ANIMALS

2.1. Structure – All Animals

Rodents are housed in either standard static microisolator caging or in individually ventilated caging systems. Animal procedures for rodents, such as cage change and experimental manipulation, are recommended to be performed under HEPA-filtered laminar flow hoods or biosafety cabinets if available. Mouse rooms are equipped with biosafety cabinets.

The ARF provides cages for animal housing. Principal Investigators should notify the ARF Manager of any unusual or special need for caging; otherwise, animals will be housed per the information below, in accordance with *The Guide*. No cages for mice and small animals may be placed on the floor. All small animal cages must be placed on a securely anchored nonporous surface. Such cages shall not be stacked on top of each other when housing animals. Housing requirements are as follows:

Figure 1: Housing Requirements

Microisolator Type	Cage Size (in.) WxDxH	Sq. In.	Maximum Capacity	Composition	Flooring
Mice:					
Ventilated	5 x 12.1 x 5.6	51.7	3	Polycarbonate	Solid
Ventilated	12.1 x 12.1 x 5.6	112.9	7	Polycarbonate	Solid
Static	7.5 x 11.5 x 5.5	67.0	4	Polycarbonate	Solid
Static	7.5 x 11.5 x 5.5	75.0	5	Polycarbonate	Solid
Static	10.5 x 19 x 6	153.0	10	Polycarbonate	Solid
Rats:					

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Static	10.5 x 19 x 8	143.0	2	Polycarbonate	Solid
*Wire Bottom	7 x 10 x 8	70.0	1	Stainless Steel	Wire
*Wire Bottom	16 x 10 x 8	160.0	2	Stainless Steel	Wire
*Wire Bottom	25 x 10 x 8	250.0	3	Stainless Steel	Wire

* Use of suspended wire bottom caging requires prior approval by IACUC based upon experimental goals.

- 2.1.1. **Guinea pigs** – Six animals or less in 29”W x 21”D x 10”H plastic cage unit.
- 2.1.2. **Hamsters** – Six animals or less in 12.13”W x 12.13”D x 7.37”H polycarbonate ventilated microisolator caging.
- 2.1.3. **Gerbils** – Six animals or less in 10.5”W x 19”D x 6.5”H or 10.25”W x 16.5”D x 6”H polycarbonate static Microisolator caging.
- 2.1.4. **Rabbits** – Individually housed in 24”W x 30”D x 15.5”H stainless steel caging utilizing water bottles and “J” type feeders. Racks are located on opposite walls of the room when possible. Flooring is a 1/8” flat stainless steel grid.
- 2.1.5. **Dogs** – Primary enclosures consisting of galvanized runs and provided with a coated wire resting panel. Primary enclosures provide at least two times the required floor space of a dog measuring up to 38 inches, as calculated using the formula provided in the Code of Federal Regulations 9 CFR 1.1 section 3.6. Feed and water are provided in stainless steel receptacles attached to the front of the run.
- 2.1.6. **Swine** – Group housed in a room/pen when possible. Individual housing in galvanized runs measuring 24 square feet are utilized for short-term perioperative care in the surgical suite. Pens are 60” x 60” and can house a maximum of four mini-swine or three farm swine. Water is provided in a stainless steel pan. Feed is provided in heavyweight livestock feeders.
- 2.1.7. **Goats** – Group housed in a room/pen when possible. Individual housing in galvanized runs measuring 24 square feet, with coated wire resting panel, are utilized for short-term perioperative care in the surgical suite. Water is provided via automatic watering troughs or a stainless steel bucket. Feed is provided in heavyweight livestock feed pans.

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2.1.8. **Lizards** – Housed individually in fiberglass terraria of approximately 100-liter volume with a removable clear plexiglass panel forming one wall. A heat lamp is on five hours per day, and a retreat provided. Water is provided in a heavy glass dish, and food is placed in a stainless steel bowl.

2.1.9. **Frogs** – Housed in a variety of enclosures depending on the size and number of individuals and the amount of time they will be maintained; glass aquaria, large plastic tubs, and specialized stainless steel enclosures are all used. Frogs are provided with a shallow pool of water, dry area, and refuge.

2.1.10. **Fish** – Larger fish are housed in glass aquaria of 20 to 80 liters, while smaller fish may be housed individually in 1-liter aquaria. Water chemistry is appropriate to the species, as is a suitable refuge.

2.2. Animal Safety – All Animals

2.2.1. **Ventilation and Animal Access** – All cages or areas of animal confinement have adequate ventilation. Food and water are provided *ad libitum* unless stated in an approved IACUC protocol;

2.2.2. **Inspection** – All cages or enclosures are routinely inspected by ARF Personnel or other individuals approved by IACUC and/or the Attending Veterinarian to ensure security of animal confinement as well as animal safety. Under no circumstances may an individual interfere with these inspections;

2.2.3. **Social Environment** – Every effort is made to house rodents in compatible groups unless it is in conflict with the scientific goals of the approved IACUC protocol. This allows for mutual grooming and other social interactions among cage mates. If possible, the caging of all species is arranged to allow for visual contact between adjacent cages as well as visual contact with room activities. In addition, species-specific environmental enrichment is provided that allows the animals to express normal behavior such as digging, burrowing, and gnawing;

2.2.4. **Security in the ARF and Animal Holding Rooms** – Entry into the Animal Resource Facility is controlled utilizing key access at the elevator level, proximity reader at the Facility level, and designated sub-master keys at the room level. Ingress is limited to one elevator and one stairwell (contact the ARF Manager for specific locations). Exit may be accomplished through one stairwell or any of the five elevators located throughout the Facility (contact the ARF Manager for specific locations). Access to the ARF is granted upon formal request from the

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Principal Investigator after IACUC Certification has been completed. The proximity readers will be programmed to allow entry only to personnel with IACUC Certification. Personnel who have not completed the IACUC Certification may not enter the ARF unless accompanied by an individual who has completed all animal-related training in order to gain access to the ARF. All animal rooms remain locked at all times. Each animal room has its own sub-master lock so that each key issued to an Investigator, allows entry only into a specific animal room. Keys are issued only for specific rooms for which the Principal Investigator needs access. In general, the Principal Investigator is issued only one key for access to the ARF and rooms that must be utilized by all the Principal Investigator's staff. These keys must be kept in a secure place at all times. All ARF keys must be returned to the ARF Manager or ARF Director upon termination of employment. In addition, the proximity readers may be programmed to allow entry by Public Safety, Facilities Management, and personnel whose duties require entrance into the ARF. Emergency contact information, including telephone numbers and/or beeper numbers of the Principal Investigator and other designated project personnel, is located inside each animal room. The ARF Manager is listed as the final contact. If the primary emergency contact personnel cannot be reached, the ARF Manager will be called.

- 2.2.5. **Animal Security in IACUC-Approved Animal Rooms Outside the ARF** – ARF personnel shall adequately secure rooms housing animals to prevent access by unauthorized individuals. Emergency contact information, including telephone numbers and/or beeper numbers of the Principal Investigator and other designated project personnel, shall be posted inside each animal room, with the ARF Manager listed as the final contact. If the primary emergency contact personnel cannot be reached, the ARF Manager will be called.

2.3. Environment of Animals Housed in the ARF

Environmental parameters in the ARF are maintained as follows, unless otherwise allowed under an IACUC-approved protocol:

- 2.3.1. **Temperature** – Each room where animals are confined is set at a temperature appropriate for the housed species. The temperature of each animal room is monitored and recorded daily. The Principal Investigator will be notified promptly if the temperature deviates greater than ± 5 degrees Fahrenheit from either the animal-specific norms or the temperatures designated in the IACUC-approved protocol. Animal rooms are kept at 70 ± 2 . Room temperature is monitored and recorded daily by Animal Resource Facility staff. In addition,

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temperature is controlled and monitored by Facilities Management via a state-of-the-art computerized control system. This system allows for the immediate notification of designated personnel should room temperature fall outside the specified parameters.

2.3.2. **Noise** – Noise levels are species-appropriate. Species that are sensitive to noises are housed as far as possible from species that are more vocal. Animal room doors are kept closed to minimize noise pollution.

2.3.3. **Lighting** – All animal rooms have timed lighting devices with a 12-hour light and 12-hour dark cycle, unless otherwise required by the species or as allowed under an IACUC-approved protocol.

2.3.4. **Pest Control** – See Policy R&C-ARF-4.0 section 4 under ARF Maintenance.

2.3.5. **Failures in Environmental Control Systems** – The ARF HVAC systems are controlled and monitored by Facilities Management via a computerized control system. Designated personnel are immediately notified in the event of failure in the HVAC system. ARF Personnel shall take reasonable and necessary steps to address any failures in environmental control systems to ensure that the animals are maintained at an acceptable temperature and receive an appropriate lighting schedule. The Principal Investigator will be promptly notified of any environmental control system failures affecting his/her animals.

2.4. Environment of Animals Housed in IACUC-Approved Animal Rooms outside the ARF

In those rare situations where IACUC approves housing of animals outdoors, IACUC and the Attending Veterinarian shall ensure that, through the approved protocol, animals are provided appropriate shelter from the weather and are housed in a secure structure.

The Principal Investigator is responsible for maintenance of environmental parameters outside the ARF, unless otherwise allowed under an IACUC-approved protocol, as follows:

2.4.1. **Temperature** – The room where animals are housed must be maintained at a temperature appropriate for the species. Room temperature is monitored and recorded daily by Research staff. In addition, most Satellite facilities have temperature controlled and monitored by Facilities Management via a state-of-the-art computerized control system. This system allows for the immediate

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notification of designated personnel should room temperature fall outside the specified parameters.

2.4.2. **Noise** – Noise levels must be species-appropriate.

2.4.3. **Lighting** – Species-appropriate light/dark cycles must be established (typically 12 hours light/12 hours dark), unless otherwise allowed under an IACUC-approved protocol.

2.4.4. **Pest Control** – Adequate pest control must be in place.

2.4.5. **Failures in Environmental Control Systems** – Most Satellite Facilities' HVAC systems are controlled and monitored by Facilities Management via a computerized control system. Designated personnel are immediately notified in the event of failure in the HVAC system. The Attending Veterinarian, ARF Manager, and designated ARF Personnel perform random checks of any outside facility, to ensure compliance with Standard Operating Procedure (SOP) protocols and guidelines. Twice each year, IACUC inspects all facilities where animals are housed as part of its semiannual program and facility inspection, as required by the OLAW.

3. RECORDS AND IDENTIFICATION

3.1. Records

The ARF Manager is responsible for maintaining a record of all animals in the ARF. These records include noting the acquisition of dogs, cats, guinea pigs, gerbils, hamsters, rabbits, and other animal species (including farm animals) as required by the U.S. Department of Agriculture (USDA).

3.2. Identification of Animal Rooms and Animals in the ARF

All doors to individual animal rooms have signs describing the species housed and any special precautions that must be taken or considered prior to entry, including protective clothing that may be needed and the type, if any, of hazardous materials in use.

3.2.1. Rodents

Cages of small animals, including mice, rats, gerbils, guinea pigs, and hamsters, are identified via the use of cage cards. ARF Personnel place pre-printed white standard

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animal cage cards, as shown below, on each small-animal cage at the time of delivery, containing the following information:

- Name of the Principal Investigator,
- IACUC Protocol Number,
- Date animals were received,
- Animal species/strain,
- Vendor, gender, weight, and age of animals upon arrival,
- Number of animals initially placed in the cage (this information will be revised by the Principal Investigator/Research Personnel or ARF Personnel as animals are permanently removed from or added to the cage), and
- Any other pertinent information.

Figure 2: Cage Card Example

Creighton University				
Investigator Name:			Protocol # :	
Date Rec'd:	Date Bred:	Date Weaned:	Species/Strain:	
Vendor:	Weight:	Age:	Gender:	# Housed
# Euthanized	Date Euthanized		# Remaining	

The Principal Investigator may identify individual animals within a cage as long as such marking is consistent with methods approved in *The Guide*. Approved methods of animal identification include ear notches and tags, tattoos, and subcutaneous transponders. Toe-clipping is allowed only when no other alternative is available. Individuals wishing to toe-clip rodents must obtain IACUC approval for this procedure.

It is the responsibility of both the Principal Investigator and ARF Personnel to record dates of euthanasia and natural deaths on the cage card. When the last animal in a cage is euthanized or otherwise dies, the card is returned to the ARF Office with the date of euthanasia or death. If some but not all of the animals are euthanized or die, the number

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of animals noted on the card is revised to reflect the euthanasia date and new number of animals.

Individuals performing procedures or injections on rodents should note the date of such manipulations on the card. This assists the Attending Veterinarian and ARF Personnel in performing their rounds. In addition, group medical records are utilized for rodents or cages of rodents that undergo interventions requiring the use of anesthetic or analgesic agents. Peri-surgical and peri-anesthetic care is documented on the dark purple Rodent Post-Procedure Monitoring Veterinary Alert Card. If questions arise regarding the information contained on the cage cards, ARF Personnel will notify the Principal Investigator.

VETERINARY ALERT		
RODENT		
POST-PROCEDURE MONITORING		
For use by Principal Investigator/Research Personnel		
PI:		IACUC #:
SPECIES:		
<input type="checkbox"/> Animal	<input type="checkbox"/> ID # _____	<input type="checkbox"/> Cage
Date & description of procedure/surgery:		
Medication/dose:		
Medication/dose:		
Date & follow-up (for example, staple removal)		
<u>TREATMENT</u>		
Medication	Date/time	Initials_____
Return this card to ARF Office when complete		

Figure 3: Veterinary Alert Card

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Cards are utilized to track animals that are used for breeding purposes, as well as the offspring that are generated. This involves a two-card system. The two cards, yellow and blue, are designed to help identify breeding cages, as well as track the date of birth and expected weaning date of the pups generated.

The yellow breeding box card is placed on breeding cages in place of the standard white cage card. It contains the identical information as the standard white cage card. This card assists in identifying breeders for ARF Personnel, Principal Investigators, and Research Personnel.

Figure 4: Breeding Box Card

Creighton University <i>Breeding Box</i>				
Investigator name:			Protocol # :	
Date Rec'd:	Date Bred:	Date Weaned:	Species/Strain:	
Vendor:	Weight:	Age:	Gender:	# Housed
# Euthanized	Date Euthanized		# Remaining	

When establishing breeding cages, it is recommended to place no more than one pair (1M/1F) in a small static Microisolator cage. Larger breeding groups may be established (1M/2F, 1M/3F when using large static Microisolator caging or 1M/2F when housing in the Thoren ventilated racks).

The blue card is used to track dates of birth and weaning dates for pups generated by the cage of breeders and is placed behind the yellow cage card so that, if possible, it is visible. The blue card is used *only* to document all pup information to keep the primary cage card easier to read. A summary of the cage card system can be found in Policy R&C-ARF-7.1.

3.2.2. Non-Rodent Mammals

Cages of non-rodent mammals, including rabbits, dogs, and farm animals, are also identified via the use of cage cards containing the same information as described for rodents. In addition, an individual Animal Medical Record will be maintained on these

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animals (see Policy R&C-ARF-7.0). The Animal Medical Record documents information including the Principal Investigator, IACUC Protocol Number, species, and animal identification, such as USDA animal number and/or tattoo/other identification number as applicable. In addition, all movement to other areas is documented on the Animal Medical Record. The Animal Medical Record is utilized to document any deviation from normal in the health of the animal or any procedure, with the exception of a procedure involving anesthesia, that is performed on the animal. The Animal Medical Record is used to record SOAP (subjective, objective, assessment, plan) notes for animals that are experiencing deviations from normal health. In addition, daily rounds are to be recorded on the Animal Medical Record. A further, more detailed discussion of the use of Animal Medical Records is found in Policy R&C-ARF-70

3.2.3. Large Animals

These may be identified by the following means:

- 3.2.3.1. **Dogs** – Each dog is identified via individual ear tattoo or may be fitted with a collar with an identification tag or number. Individual dogs may also be identified using methods consistent with *The Guide*; and
- 3.2.3.2. **Farm Animals** – Numbered ear tags identify pigs. Other farm animals may be identified by numbered ear tag or in another humane manner consistent with *The Guide*.

3.3. Identification of Animals and Rooms in IACUC-Approved Animal Rooms Outside the ARF

The Principal Investigator is responsible for providing current and accurate information to the ARF Manager to ensure that animal rooms are appropriately identified. This includes, at a minimum, emergency contact information; protective clothing required, if above and beyond that required by Policy R&C-ARF-7.2; identification of any biohazardous material; and any appropriate biohazard markings. The Principal Investigator is responsible for adequately identifying individual animals in the room. Identification methods must be consistent with methods approved in *The Guide*. The Attending Veterinarian and ARF Manager provide oversight and monitoring of this process.

4. ANIMAL RESOURCE FACILITY PERSONNEL

Copies of the USDA regulations, the National Institutes of Health (NIH) Policy, and *The Guide* are available to all ARF Personnel. ARF Personnel are required to know and understand these

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guidelines.

4.1. Animal Resource Facility Director

The ARF Director has general responsibility for the overall administrative and fiscal operation of the ARF, including, but not limited to, the following:

- 4.1.1. Overseeing the day-to-day activities (including holidays and weekends) to ensure a safe, clean, and efficient environment is provided and maintained for housed animals and users of the ARF.
- 4.1.2. Supervising personnel, as appropriate.
- 4.1.3. Interacting with the Attending Veterinarian, IACUC, Principal Investigators, and the Office of Research and Compliance.
- 4.1.4. Leading the ARF toward higher standards of operation in support of Creighton University's animal research goals and maintaining accreditation by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

4.2. Animal Resource Facility Manager

The ARF has one ARF Manager who reports to the ARF Director. The ARF Manager's duties include, but are not limited to, the following:

- 4.2.1. Ensuring that daily rounds are made at random times on weekdays and that weekend and holiday coverage is prescheduled to ensure that all tasks are being performed properly. ARF personnel make rounds in the following order: 1) Large, USDA-regulated species; 2) Nude mice rooms; 3) Non-quarantined rat/mice rooms; 4) Quarantined rat/mice rooms; 5) All other non-quarantined animal rooms; and 6) All other quarantined animal rooms. The ARF Manager's observations include bedding changes, evidence of proper feeding and watering, and evidence that personnel, technicians, and Principal Investigators use protective clothing. ARF Personnel are randomly observed to ensure animals are handled properly, SOPs are followed, and time is spent efficiently. The ARF Manager may appoint a designee to assist in this process.
- 4.2.2. Distributing the responsibility for care of animals and maintenance of rooms to specific technicians during each weekday and on weekends and holidays.

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- 4.2.3. Notifying Principal Investigators if any of their animals are sick, injured, or die.
- 4.2.4. Coordinating care of any sick animals by informing technicians of the proper procedures and checking to ensure that the prescribed care is carried out.
- 4.2.5. Assigning animal housing space in the ARF.
- 4.2.6. Issuing Animal Procedure Records.
- 4.2.7. Providing ARF orientation to new users of the ARF.
- 4.2.8. Coordinating the training of technicians, including the administration of the Purina Mills Exams, and providing study materials for American Association for Laboratory Animal Science (AALAS) technician certification examinations.
- 4.2.9. Working with the Principal Investigator to resolve any issues of noncompliance. All instances of noncompliance are to be reported to the ARF Director. Depending on the nature of the noncompliance, the ARF Manager may also contact the Attending Veterinarian, the IACUC Chair, and/or the Research and Compliance Officer. Issues related to inhumane treatment of animals will be reported to all of the above-mentioned individuals.
- 4.2.10. Reporting to the Principal Investigator any known lapses in animal care that may compromise the health of the Principal Investigator's animal(s) or the research. These issues include, but are not limited to, loss of or confusion regarding cage cards, lapses in feeding or watering of animals, and failure of or abnormal environmental controls (for example, temperature fluctuations).
- 4.2.11. Ensuring that appropriate animal care procedures are followed, including any special instructions for animal care required by a Principal Investigator.
- 4.2.12. Ensuring that adequate supplies of clean cages, water bottles, food, and bedding are available for the care of the animals.
- 4.2.13. Taking appropriate disciplinary action, in conjunction with the ARF Director, the Attending Veterinarian, and/or the Office of Research and Compliance, when Creighton University's Personnel Policy or ARF SOPs are not followed by ARF Personnel.

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4.2.14. Communicating with the Principal Investigators to ensure that the needs of the research protocols are being met.

4.2.15. Consulting with the ARF Director and Attending Veterinarian as appropriate.

4.3. Animal Care Technicians

The ARF has and will maintain an appropriate number of full-time Animal Care Technicians. Training and certification for Animal Care Technicians includes one or more of the following:

- 4.3.1. **Purina Mills, Inc. (PMI) Exam** – All new ARF Animal Care Technicians must complete the self-study PMI Laboratory Animal Care Course and meet passing criteria within the first 90 days of employment (the probationary period).
- 4.3.2. **AALAS Certifications** – Animal Care Technicians are encouraged to further their knowledge by seeking certification through AALAS. The three levels of certification are Assistant Laboratory Animal Technician (ALAT), Laboratory Animal Technician (LAT), and Laboratory Animal Technologist (LATg). The ARF will pay for one test per year per technician. Furthermore, an incentive program is in effect to recognize and reward Animal Care Technicians for obtaining AALAS certification. The ARF subscribes to the AALAS Learning Library (ALL). This resource provides training that emphasizes the appropriate handling, care, and use of animals and is designed to assist in studying for AALAS certification. ALL subscriptions include access to the Animal Care and Use Library and The Contemporary Topics Continuing Education Unit Test Library. The Animal Care and Use Library offers courses on certification, regulatory mandates, bioethics, bi methodologies, biosafety, and management. The Contemporary Topics Continuing Education Unit Test Library offers the opportunity to earn continuing education units by taking the self-administered test based on the scientific articles in *Contemporary Topics* online. Following completion of a unit, a transcript is provided for documentation. In addition, AALAS training material is available from the ARF.
- 4.3.3. **Species-Specific Training** – Animal Care Technicians must be trained in handling the specific species housed in the ARF. In addition, species-specific educational videos available from the ARF are used to train technicians as needed. If a new species is brought to the ARF that the ARF Manager or Attending Veterinarian is not trained to work with, the ARF Manager orders the appropriate training video, if available, and arranges for technicians to receive

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training from someone experienced in handling the species. All ARF personnel handling mice are required to complete microisolator training.

- 4.3.4. **CITI Training** – All Animal Care Technicians are required to complete the species-specific modules for all animals housed in the ARF.
- 4.3.5. **Animal Occupational Health and Safety Training** – All Animal Care Technicians receive Animal Occupational Health and Safety Training through Creighton University in order to address specific concerns related to working with animals. This program is described in Policy R&C-ARF-5.0 and in further detail in the Animal Occupational Health and Safety Program.
- 4.3.6. **Tuition Remission** – Full-time employees are eligible to receive tuition remission for up to two Creighton University classes per semester, to be scheduled outside of regular working hours.

Animal Care Technician Responsibilities – Animal Care Technicians’ responsibilities include, but are not limited to, the following:

- 4.3.7. Observing all animals daily on weekdays and as scheduled on weekends and holidays. Concerns are reported to the ARF Manager, who will contact the Principal Investigator, ARF Director, Attending Veterinarian, Facilities Management, and/or the IACUC Chair as warranted.
- 4.3.8. Changing and cleaning animal cages, cleaning ARF rooms, and performing other tasks related to the care of animals as requested by the ARF Manager and/or Principal Investigator.
- 4.3.9. Attending technician meetings to communicate special care needs in individual animal rooms.
- 4.3.10. Reporting sick, injured, or dead animals to the ARF Manager.
- 4.3.11. Assisting the Attending Veterinarian as appropriate.
- 4.3.12. Emptying food and bedding from dirty cages.
- 4.3.13. Autoclaving dirty cages as appropriate.
- 4.3.14. Washing cages.

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4.3.15. Assembling clean cages and water bottles for autoclaving.

4.3.16. Ensuring that sufficient levels of clean, autoclaved caging and water bottles are available.

4.3.17. Reporting possible instances of noncompliance by the Principal Investigator/Research Personnel or other ARF Personnel to the ARF Manager, Attending Veterinarian, and/or ARF Director. ARF Personnel may report issues of noncompliance anonymously to the Creighton University by calling the dedicated telephone hotline 855-256-0478. The web intake form can be found at [EthicsPoint](#). Ethics Point at 855-256-0478.

5. ANIMAL CARE – GENERAL

Animals are housed on the Creighton University campus in the ARF and IACUC-approved areas outside the ARF. In those rare situations where IACUC approves housing of animals off campus, IACUC and the Attending Veterinarian shall ensure, through the approved protocol that animals are provided appropriate shelter from the weather and are housed in a secure structure.

The Principal Investigator is responsible for maintenance of environmental parameters outside the ARF, unless otherwise allowed under an IACUC-approved protocol, as follows:

- **Temperature** – The room where animals are housed must be maintained at a temperature appropriate for the species. Temperature must be recorded on a daily basis.
- **Noise** – Noise levels must be species-appropriate.
- **Lighting** – Species-appropriate light/dark cycles must be established (typically 12 hours light/12 hours dark), unless otherwise allowed under an IACUC-approved protocol.
- **Pest Control** – Adequate pest control must be in place.
- **Failures in Environmental Control Systems** – Any failures in environmental control systems must be remedied to ensure the animals have acceptable temperature levels and lighting schedules. ARF Personnel will respond to any environmental control problems observed by ARF Personnel or reported by the Principal Investigator. The Attending Veterinarian, ARF Manager, and designated ARF Personnel make random checks of any outside facility, at least once monthly, to ensure compliance with SOP protocols and guidelines. Twice each year, as required by OLAW, IACUC inspects all facilities where

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animals are housed as part of its semiannual program and facility inspection.

The Attending Veterinarian makes rounds at the ARF at least once a week to ensure that all animals are in good health and to check for any possible deviations from the animal care protocol. Designated ARF Personnel perform rounds on all animal rooms in the facility on a daily basis, including weekends and holidays.

5.1. Care of Animals in IACUC-Approved Animal Rooms outside the Animal Resource Facility

Principal Investigators with animals housed in IACUC-approved animal rooms outside the ARF are responsible for the following:

- 5.1.1. Arranging for adequate health checks of animals housed outside the ARF.
- 5.1.2. Implementing adequate disease- and parasite-prevention plans for all animals housed outside the ARF.
- 5.1.3. Maintaining appropriate environmental parameters (see Policy R&C-ARF-2.0 section 2.4).
- 5.1.4. Providing humane animal care in accordance with *The Guide*, including the following:
 - 5.1.4.1. Appropriate feeding and watering schedules,
 - 5.1.4.2. Species-appropriate feed,
 - 5.1.4.3. Appropriate checks of food and water during the weekdays, as well as appropriate weekend and holiday care,
 - 5.1.4.4. Adequate storage and maintenance of animal feed and bedding,
 - 5.1.4.5. Species-specific environmental enrichment,
 - 5.1.4.6. Maintaining records documenting daily temperatures, and
 - 5.1.4.7. Notifying the ARF Manager or Attending Veterinarian of any problems.

5.2. Feed and Bedding

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- 5.2.1. **General** – Animals maintained by ARF Personnel are fed a complete nutritional diet and provided species-appropriate bedding. Some animals may be fed specialized diets provided by the Principal Investigator, as approved in the IACUC protocol.
- 5.2.2. **Storage** – The primary storage area is in a dedicated, climate-controlled feed and bedding area. Unopened bags of feed and bedding are stored on raised stainless steel pallets. Feedbags are not to be placed directly on the floor. Bedding is dispensed from a hopper in the clean cage preparation area. Open bags of feed may be stored in appropriately marked containers either *inside* the room for small animals or in designated clean caging preparation rooms and in a designated location *outside* the room for large animals. Feed and bedding containers must remain in their designated areas unless they are being transported to the cage washer for cleaning. Autoclaved or irradiated rodent chow is available within animal rooms in an autoclaved cage. This container should only be opened in the biosafety hood. All containers with animal feed or bedding are clearly labeled, without abbreviations. Animal Care Personnel are trained to regularly check the mill date and calculate expiration dates of the feed. Animal feed may be used up to six months after the mill date. Expired feed is discarded in the nearest waste container; if feed contains biohazardous materials, it is discarded in a red biohazard waste container.
- 5.2.3. **Transportation** – Feed and bedding are either transported to the ARF in the departmental van or delivered to the ARF in a dedicated vendor-owned truck. Feed is transported on a flatbed cart that has been sprayed with Clidox cold sterilizer and wiped dry with clean paper towels by an Animal Care Technician prior to transportation. The outer surface of all feed and bedding bags are disinfected with Clidox prior to entering the facility. The inner surface of the van is disinfected with Clidox after each use. The outside of the van is washed routinely.
- 5.2.4. **Feed** – Commercially available laboratory animal diets are obtained from Harlan Teklad. Each diet is selected for its high palatability and consistent formulation to minimize nutritional variables. Special diets, as required to meet the scientific goals of the study, are purchased by the Principal Investigator. The following is the current list of feed products by species:

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- 5.2.4.1. **Rodents** – Teklad #2018 Global Rodent Diet; Teklad #2018S Global Rodent Diet (Sterilizable); Teklad #2018 SX Global Rodent Diet (Sterilizable, Extruded); Teklad #2918 Irradiated Global Rodent Diet
- 5.2.4.2. **Guinea Pig** – Teklad #2040 Guinea Pig Diet
- 5.2.4.3. **Rabbit** – Teklad #2031 Global High Fiber Rabbit Diet
- 5.2.4.4. **Dog** – Purina Dog Chow Adult formula
- 5.2.4.5. **Swine** – Teklad #8753 Mini Pig Diet
- 5.2.5. **Bedding** – Contact bedding used in the ARF includes Harlan Teklad #7097 ¼” Corn Cob Bedding; Teklad #7092 1/8” Corn Cob Bedding; #7907 Irradiated ¼” Corn Cob Bedding; #7990 Irradiated Sani Chip Bedding; #7086 Pelleted Hardwood Bedding; and #7093 Shredded Aspen Bedding. Non-contact bedding includes Harlan Teklad #7086 Pelleted Hardwood Bedding and pan liners.
- 5.2.6. **Water** – The Metropolitan Utilities District, in Omaha, Nebraska, provides water to the ARF. Autoclaved water is provided when requested by the Principal Investigator. All animals except dogs, swine, and goats are watered with bottles. Dogs are watered with stainless steel pans, swine and goats are watered with stainless steel receptacles.

6. ANIMAL CARE DAILY PROCEDURES

The following animal care procedures apply to the ARF during regular weekdays. This schedule may vary for holidays and weekends, as noted in section 6.1. Principal Investigators are responsible for instructing ARF Personnel in the proper precautions that must be employed to care for their housed animals. ARF Personnel are responsible for ensuring that these instructions are implemented. ARF Personnel perform all animal care procedures, except in those cases where the Principal Investigator and ARF Director and/or ARF Manager and/or the IACUC have agreed upon other arrangements.

6.1. Weekend and Holiday Care

Designated members of ARF Personnel report each Saturday, Sunday, and weekday holiday, as prescheduled. All animals are observed to ensure they are healthy and clean.

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6.1.1. **Large Animals (Including Dogs)** – Large-animal rooms, including dog runs, are cleaned, and animals are fed and watered.

6.1.2. **Small Animals** – Animals are given adequate water and food. Bedding is checked, and cages are replaced if bedding has been excessively wetted.

6.2. Daily Care of Farm Animals

6.2.1. **Food and Water** – Large animals are fed daily and provided with water via a species-appropriate receptacle.

6.2.2. **Socialization** – Animals are placed in social groups as appropriate to the species to allow for physical and social contact.

6.2.3. **Environmental Enrichment** – Species-specific toys, such as basketballs and Kong® toys, are provided as a means for animals, such as swine, to practice normal rooting behavior.

6.2.4. **Cage Cleaning** – Cage floors are sprayed with hot water, washed with disinfectant, and rinsed with clean water daily. Monthly, or as indicated, acidic foam is used to clean and disinfect the runs in use.

6.3. Daily Care of Dogs

6.3.1. **Food and Water** – Water is provided *ad libitum* either through an automatic system or through manual watering. Fresh food and water are provided during cleaning of the dog cages.

6.3.2. **Socialization** – Dogs are housed in primary enclosures consisting of galvanized runs, and are provided a resting panel. These runs allow them visual, auditory, and olfactory contact with other dogs. When compatible, dogs are released together within the room during daily cleaning to provide additional exercise and social interaction;

6.3.3. **Environment Enrichment and Exercise** – Environmental enrichment devices including, but are not limited to, Nylabones®, Kong® toys, and rawhide chews, are provided to all animals unless otherwise prohibited as outlined in an IACUC-approved protocol. In some instances, a radio may be used to provide environmental enrichment for dogs, per veterinary directives. Creighton University, as required by the Department of Agriculture, APHIS, Animal

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Welfare, Standards; Final Rule, published in the *Federal Register*, February 15, 1991, maintains a dog exercise program as follows:

- 6.3.3.1. Dogs over 12 weeks of age housed individually in enclosures that provide less than two times the required floor space per dog will be provided additional opportunities for exercise.
- 6.3.3.2. Opportunity for additional exercise will be provided to each dog as follows: Dogs will be individually placed in an open enclosure (run). All animals are allowed to exercise for a minimum of 2 hours per session four days a week. A log will be kept in the animal room indicating how much exercise a dog receives. Dogs that are not candidates for exercise will be so noted by the Attending Veterinarian.
- 6.3.3.3. Dogs will be removed from their cages and released individually into a run with an area no less than twice the required housing space.
- 6.3.3.4. One or more technicians will physically interact with the dogs during the opportunity for exercise.
- 6.3.3.5. To minimize disease transmission, the exercise pen will be hosed, cleaned, and sanitized between occupancy by animals.
- 6.3.3.6. **Exceptions** – Dogs are not exercised under the following conditions: 1) If the Attending Veterinarian deems that exercising will cause the animal to injure itself or other dogs; 2) If the animal is diagnosed with a contagious disease or parasite or treated with any substance that would harm other animals; or 3) If the animal is quarantined. All exceptions are reviewed by the Attending Veterinarian after 30 days.
- 6.3.4. **Cage and Run Cleaning** – Dog runs are cleaned daily. Run floors are sprayed with hot water, washed with disinfectant, and rinsed with clean water. Monthly, or as indicated, acidic foam is used to clean and disinfect the runs in use. Exercise runs are cleaned with a disinfectant and rinsed with clear water after the dogs have been returned to their cages for the day. The exercise area is disinfected monthly from ceiling to floor with a high-pressure tank using hot water and disinfectant.

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6.4. Daily Care of Cats

- 6.4.1. **Food and Water** – Water and fresh food are provided daily.
- 6.4.2. **Socialization** – Cats are group housed whenever possible. If the animals are group housed, cats are placed in cages that provide visual contact with other animals in the room.
- 6.4.3. **Environmental Enrichment/Exercise** – Whenever possible, cats are group housed. When group housed, cats are allowed free access inside the animal room and provided devices on which to climb and play and in which to hide. Species-appropriate enrichment devices, such as balls, are also provided. If individual housing is required, cats are provided resting panels and species-specific enrichment devices, such as balls.
- 6.4.4. **Cage Cleaning** – Group housed cat rooms are cleaned twice per week. Floors are sprayed with hot water, washed with a disinfectant, and rinsed with clean water. The room is disinfected monthly from ceiling to floor with a high-pressure tank using hot water and disinfectant. Litter pans in group housing rooms are cleaned daily. Individually housed cats have their litter pans changed three times per week. Cages are changed every other week.

6.5. Daily Care of Rabbits

- 6.5.1. **Food and Water** – Fresh water and food are given daily.
- 6.5.2. **Socialization** – Rabbits are housed in cage banks that allow them auditory and olfactory contact with other rabbits. When more than one bank of cages is in a room, they are placed, if possible, opposite each other in order to provide visual contact with other rabbits within the room.
- 6.5.3. **Environmental Enrichment** – Rabbits are provided with alfalfa blocks for gnawing and species-appropriate toys, such as dumbbells, stainless steel rattles, canning jar rings, and balls.
- 6.5.4. **Cage Cleaning** – Non-contact bedding excreta pans and pan liners are changed twice each week. The rabbits are transferred into clean caging weekly.

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6.6. Daily Care of Guinea Pigs

- 6.6.1. **Food and Water** – Guinea pigs are given food *ad libitum* and fresh water daily. Clean water bottles are provided weekly.
- 6.6.2. **Socialization** – Guinea pigs are group housed in solid bottom caging on contact bedding. Every effort is made to house guinea pigs in compatible groups unless it is in conflict with the scientific goals of the approved IACUC protocol. This allows for mutual grooming and other social interactions among cage mates.
- 6.6.3. **Environmental Enrichment** – The use of contact bedding in guinea pig caging allows them to express normal behavior such as digging and burrowing. In addition, guinea pigs are provided with species-appropriate devices, such as shower curtain rings attached to the front of the cage, dumbbells, balls, and chew sticks for gnawing. In addition, cages may also be equipped with transparent plexiglass huts that allow guinea pigs to control further their environment.
- 6.6.4. **Cage Cleaning** – Bedding and clean caging is provided twice weekly.

6.7. Daily Care of Gerbils

- 6.7.1. **Food, Water, and Bedding** – Sterile caging, food, water, and bedding are provided to all gerbils. Food and water are provided *ad libitum*. Fresh food and water provided twice weekly, and/or as otherwise needed.
- 6.7.2. **Socialization** – Gerbils are normally housed in solid bottom caging on contact bedding. Every effort is made to house gerbils in compatible groups unless it is in conflict with the scientific goals of the approved IACUC protocol. This allows for mutual grooming and other social interactions among cage mates.
- 6.7.3. **Environmental Enrichment** – The use of contact bedding in gerbil caging allows them to express normal behavior such as digging and burrowing. Gerbils are also provided with nesting squares to use in constructing nests.
- 6.7.4. **Cage Cleaning** - Bedding and caging are changed twice weekly.
- 6.7.5. **Handling** – Gerbils are handled by grasping with the hand at the base of the tail.

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6.8. Daily Care of Hamsters

- 6.8.1. **Food, Water, and Bedding** – Sterile caging, food, water, and bedding are provided to all hamsters. Food and water are provided *ad libitum*. Fresh food and water are provided once weekly, and/or as otherwise needed.
- 6.8.2. **Socialization** – Hamsters are normally housed in solid bottom caging on contact bedding. Every effort is made to house hamsters in compatible groups unless it is in conflict with the scientific goals of the approved IACUC protocol. This allows for mutual grooming and other social interactions among cage mates.
- 6.8.3. **Environmental Enrichment** – The use of contact bedding in hamster caging allows them to express normal behavior, such as digging and burrowing. Hamsters are not provided nesting squares due to their tendency to impact them into their cheek pouches.
- 6.8.4. **Cage Cleaning** - Bedding and caging are changed twice weekly.

6.9. Daily Care of Rats and Mice (Including Nude Mice)

All ARF personnel are trained to recognize overcrowded cages of small animals. Using *The Guide* as a resource, they are able to weigh animals and calculate how many should occupy a given cage. The maximum number of animals per cage is determined by species (see Policy R&C-ARF-2.0 section 2.1).

- 6.9.1. **Animal Room Sequence** – To protect the health and well-being of rats and mice, rooms are entered by ARF Personnel in the following order: 1) nude mice rooms, 2) non-quarantined rat/mice rooms, and 3) quarantined rat/mice rooms. All procedures and experimental manipulations on mice within the ARF housing areas, including cages changes, are performed under HEPA-filtered laminar flow hoods or biosafety cabinets utilizing Microisolator technique. Disinfection, both prior to and after use of Biosafety cabinets, is required to decrease the likelihood of cross-contamination between cages and/or Principal Investigators. The disinfection instructions are posted on each Biosafety cabinet.
- 6.9.2. **Food, Water, and Bedding** – Sterile caging, food, water, and bedding are provided to all mice. Rats are provided sterile caging, water, and bedding. Food and water are provided *ad libitum*. Fresh food and water are provided twice weekly for rats, and once weekly for mice, and/or as otherwise needed. Food and water levels are observed daily and replenished as needed. Clean water bottles are

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provided during the second cage change. Food is replenished as needed during the second cage cleaning, unless indicated in an IACUC-approved protocol.

- 6.9.3. **Socialization** – Mice and rats are normally housed in solid bottom caging on contact bedding, unless in conflict with the scientific goals of an IACUC-approved study. Every effort is made to house rats and mice in compatible groups unless it is in conflict with the scientific goals of the approved IACUC protocol. This allows for mutual grooming and other social interactions among cage mates.

6.9.4. Environmental Enrichment

- 6.9.4.1. **Mice** – The use of contact bedding in mouse caging allows them to express normal behavior, such as digging and burrowing. Mice are also provided with nesting squares to use in constructing nests. In addition, at the Principal Investigator's request, mice may be provided transparent plexiglass igloos that further allow them to control their environment.
- 6.9.4.2. **Rats** – The use of contact bedding in rat caging allows them to express normal behavior, such as digging and burrowing. Nylabones® are provided to individually housed rats, where not in conflict with the IACUC-approved protocol.
- 6.9.5. **Cage Cleaning** – Sterile cages and bedding are provided for all rats and mice housed in solid bottom caging. Bedding and caging are changed twice weekly for both rats and mice that are housed in static Microisolator caging. Mice housed in ventilated rack systems are provided bedding and cage changes weekly. Non-contact bedding excreta pans and pan liners are changed twice weekly in the event rats must be housed in suspended wire bottom caging in order to meet the scientific goals of the study.
- 6.9.6. **Handling** – Forceps dipped in 1:5 Clidox are used to handle mice. There are two forceps in each room where mice are housed. One pair is used and returned to its Clidox bath, and then the other is used, alternating between forceps after each use. Alternatively, mice may also be handled using gloved hands that are wet with Clidox.