

Taif University

Deanship Of The Scientific Research

Animal Research Facility



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**This Policy and Procedures was approved in the
1st board meeting for the Deanship of Scientific
Research Council for the year 40-1441 AH**

MISSION

The mission of the Deanship of scientific research at Taif University (Animal research Facility, ARF) is to provide the highest level of animal care possible with the resources available.

GOALS

The goal of these standard of procedure (SOP) is to promote the humane care of animals used in education and biomedical research with the basic objective of providing a detailed description that will enhance animal well-being, quality in the quest of advancement of biological knowledge that is relevant to humans and animals.

AUTHORIZED ACCESS

Only authorized personnel can enter to the ARF. Each authorization will last for a maximum of two years. To be eligible for access, the personnel must fulfill the following:

1. Staff working with animals must have induction in the animal handling and the Responsible Care.
2. Staff working with animals must have a protocol or part of the researchers in the protocol that is approved by the ARF Institutional Care and Use Committee.
3. Staff must submit a security access application form to the ARF Manager.
4. Staff working with rodents must be tetanus-vaccinated and Hepatitis B-vaccinated. Visitors must seek approval from the ARF Manager before entry. The ARF management reserves the right to decline entry without proper approval. All personnel who will be working in the facility must undergo the Safety Induction conducted and facility orientation by the ARF management or staff before commencing work. Visitors are allowed entry only with accompaniment of authorized staff at all times.

ENTRY

All staff should have Protective Equipment (PPE) and covered shoes must be worn upon entering the facility. PPE are available on ARF.

Staff and investigators are allowed to bring a small set of tools and reagents for their procedures. For large equipment/devices, prior approval must be sought. These must

be decontaminated. Personal belongings such as backpacks, food and water are not allowed into the facility. No children under the age of 12 are allowed.

HOUSE RULES AND SAFETY

All staff must complete the Safety Induction for Lab Users course before commencing laboratory work in the ARF.

All tools must be labeled with the either staff or investigators name. Reagents must bear the Globally Harmonized System Classification and Labeling of Chemicals (GHS), and include the either staff or investigators name, date of generation and content name. Tools and reagents should always be removed from the ARF after every experiment, as it is a shared facility. However, the staff may leave it in the procedure room for the day at their own risk if they are returning to continue their work the next day.

The ARF does not bear the responsibility for lost items.

ANIMAL ETHICS AND CARE

All animals used for scientific purposes must be approved by the ARF, and performed according to Taif University's Ethics Committee guidelines. The ARF provides provisions that are basic essentials for the animals. These include sterile cages with corncob bedding, autoclaved water. All cages and animals are observed once daily by the animal staff. Each cage is changed once every week, or as needed. Diet and water are provided ad libitum unless otherwise stated by the researcher. All animal holding rooms follows a 12 hour light-dark cycle.

All researchers are responsible for the wellbeing of their animals. All cages must be labelled with the researcher name, strain, gender, birth date and other valid information on the cage cards provided.

CHARGES

Please refer to the deanship of scientific research.

DOCUMENTATION

Staff and researchers should monitor (health/ food and water levels / numbers of ingoing and outgoing animal) and properly document all procedure. These records will be reviewed and checked by ARF staff. Please refer to the forms.

USE OF PROCEDURE ROOMS AND EQUIPMENT

All researchers should keep the shared procedure rooms neat and tidy to create a safe working environment for all users. Researchers who fail to do so may be banned from the facility, especially if it compromises the safety of other researchers and/or animals. BSL1 work can be conducted on the bench top while work involving risk group 2 agents, i.e. BSL2 work should be conducted in Biological Safety Cabinets. Provisions such as L-fold paper, 70% ethanol, trash bags, PPE are provided in all rooms.

The procedure rooms and equipment in ARF can be booked online via the Central Equipment Booking System.

Researchers should email the ARF Manager to request for booking access. Researchers should use the rooms and equipment only within the reserved time. The equipment which aid in the operations of the facility includes:

- Autoclave
- Fume Hood
- Cage Changing Station
- Laminar Flow Hood
- Rack Washer
- Bottle Washer
- Isoflurane Vaporizer / Anesthetics Machine
- Intracerebroventricular (ICV) injection
- Bedding Disposal Station
- Carbon Dioxide
- Chamber

All equipment is serviced at least once a year. All users must inform the lab staff if the equipment is faulty.

ANIMAL EUTHANASIA

Depending on the protocol, the animals may be euthanized using different methods that are recommended in the Guidelines approved by Taif University's Ethics Committee. Carbon dioxide is provided in Procedure Room.

WASTE AND CARCASS DISPOSAL

Waste must be discarded properly in the appropriate receptacle. Biohazard waste, including blood stained tissues, must be discarded as biohazard waste. Glass and sharps must be discarded in the sharps bin located in all procedure rooms. General waste bins are also provided at various locations for other non-biohazard waste such as torn gloves, tissue used for cleaning the table etc.

Researchers are responsible for liquid wastes. Liquid wastes, whether chemical or biohazard, must be contained in a carboy with secondary containment. Proper GHS labels should be used and include information such as name and mixture. Researchers must arrange disposal of liquid waste when about 80% full.

Carcasses must be disposed in a separate biohazard bag. Biohazard bags with carcasses should be double-bagged and sealed with autoclave tape, then stored in the freezer located in the dirty area.

REPORTING ANIMAL WELFARE CONCERNS

If there are concerns related to issues with the care and use of animals for scientific research or animal husbandry, persons may contact the ARF (dsr@tu.edu.sa). Confidentiality of informant will be protected.

CONTACT INFORMATION

The address of the facility and contact information can be found below:

Address: Animal Research Facility

Email: dsr@tu.edu.sa

Office No: 5 (male building)

Emergency No: 0557970333

Policies and Programs

Animal Care Policy

As a general guide, the following points should be adhered to at all times when using animals for scientific purposes at the ARF:

1. Compliance to the Guidelines.
2. Avoidance of sudden or loud noise in the facility.
3. Minimal / avoidance of discomfort, distress and pain to the animals.
4. Use of appropriate sedation, analgesia and anesthesia.
5. Provision of sufficient veterinary care.
6. Provision of diet and water should be ad libitum, unless otherwise specified and justified in the approved protocol.
7. Provision of sterile cages with bedding and enrichment.
8. Adherence to the approved animal use protocol at all times.

Animal and Cage Identification System

The ARF allows the researchers to identify the animals using their own system. However, all animals housed at the ARF must be identified. To manage this, the ARF management utilizes a standard set of cage cards, which should be used by all researchers, who houses their animals here. The following information must be included on the cage card (refer to the cards at the ARF):

- (a) PI's name
- (b) Ethics approval No.
- (c) Strain
- (d) No. of animals in the cage

Occupational Health and Safety Program

All personnel who have to handle animals must be Tetanus-vaccinated. All ARF staff members must be fully vaccinated.

Each protocol requires the PI to conduct risk assessments and declare any hazardous agents and materials that may potentially cause harm to animals and/or humans. PIs possess Safety Data Sheets of all materials used.

Standard Operating Procedures

1. SOP for Entry and Exit of ARF

Audience: staff, investigators and visitors.

1.1. SCOPE AND PURPOSE

- 1.1.1. This document describes the procedure to enter and exit the ARF, including the proper steps to don and doff PPE.
- 1.1.2. The purpose of this SOP is to minimize the risk of the spread of pathogens that can spread from or to the external environment by all staff.

1.2. GENERAL INFORMATION

- 1.2.1. Access to the ARF is restricted to authorize persons only. All personnel who wish to work in the ARF must first obtain access from the ARF Manager.
- 1.2.2. Researchers who will be working with animals in the ARF must be certified.
- 1.2.3. Covered shoes must be worn at all times in the facility.
- 1.2.4. All visitors/researchers are advised to not bring valuables to the facility. The ARF should not be responsible for any lost items.
- 1.2.5. PPE that has been contaminated or torn should be discarded and replaced with a new piece.
- 1.2.6. All researchers are required to record their names, PI/organization, date, entry and exit times for each access.

1.3. RESPONSIBILITIES

- 1.3.1. Research Animal Facility Manager
- 1.3.2. Animal Caretakers
- 1.3.3. Researchers
- 1.3.4. Visitors

1.4. PROCEDURE

- 1.4.1. ARF Entry Procedure
 - 1.4.1.1. Before entering ARF, the researchers should sign into the access logbook provided at the entrance, stating the name, PI / organization, time in and date.
 - 1.4.1.2. At the entrance, the person should step onto the sticky mat with both shoes flat on it, and take a few steps on the mat before stepping forward into the locker room. This should remove most dust particles from the shoes.

- 1.4.1.3. The staff can place their personal belongings into one of the provided lockers in the area. The staff should then keep the keys with him/her at all times and collect the belongings later.
- 1.4.1.4. The staff should follow the visual instructions on the wall to don on the PPE.
- 1.4.1.5. The PPE required are: isolation gown, latex/nitrile gloves, bouffant caps, anti slip shoe covers and face mask.
- 1.4.1.6. The staff should put on the PPE in the following sequence: isolation gown, bouffant cap, and face mask then gloves.
- 1.4.1.7. If the staff have items to bring into the facility, these items should be transferred into the provided boxes in the locker room. Each item should be decontaminated with 70% ethanol before placing them into the box. The box should then be decontaminated in the same manner. The transfer box/basket can be left in a corner of the locker room.
- 1.4.1.8. The staff should then bring a pair of shoe covers to the barrier. With the back facing the entrance to the door, the staff should sit on the barrier and put on a shoe cover to the left shoe, disinfect the sole of the shoe cover with the 70% ethanol, then cross over the barrier with the left leg first. The same should be done for the right leg. Stepping on the barrier is not allowed.
- 1.4.1.9. After crossing over with both legs, disinfect both gloves with 70% ethanol before entering the premise.

1.4.2. ARF Exit Procedure

- 1.4.2.1. Staffs that have completed work for the day can choose to exit through the dirty corridor. This is encouraged if the personnel have big loads of carcass, or dirty cages to transport to the dirty area for disposal.
- 1.4.2.2. The staff should enter the dirty corridor via their respective animal holding room's exit.
- 1.4.2.3. The staff should enter the dirty area through the door at the end of the dirty corridor.
- 1.4.2.4. The staff should proceed to the lift area to remove the PPE.
- 1.4.2.5. The staff is now ready to exit the dirty area and will not be allowed to return for the day.
- 1.4.2.6. The personnel should wash their hands thoroughly with soap and water before exiting the facility.
- 1.4.2.7. The staff should return to main entrance to sign out in the access log book, indicating the time of the exit.

2. SOP for Daily Care of Animals and Monitoring of Animal Holding and Breeding Environment

Audience: Laboratory Animal Facility Manager, Animal Caretakers

2.1. SCOPES AND PURPOSE

- 2.1.1. This document describes the procedures for the daily care of the animals housed at the ARF. It also describes the procedure for monitoring the animal holding and breeding rooms.
- 2.1.2. The purpose is to ensure that the well being of the animals is properly taken care of by the animal caretakers.

2.2. ASSOCIATED DOCUMENTS/FORMS

- 2.2.1. Room Monitoring Checklist
- 2.2.2. Vet Check Form

2.3. GENERAL INFORMATION

- 2.3.1. The animals housed in the ARF are checked once daily, including weekends and public holidays.
- 2.3.2. The animal holding and breeding room conditions are checked and recorded in the same checklist.
- 2.3.3. For any procedure that requires the cage to be opened, it must be done in the cage changing station in the respective animal holding rooms.
- 2.3.4. Weekend and public holiday rosters should be scheduled by the senior animal caretaker. At least 2 technicians should be assigned to perform routine checks according to this SOP on those days.

2.4. RESPONSIBILITIES

- 2.4.1. Laboratory Animal Facility Manager
- 2.4.2. Animal Caretakers/technicians

2.5. PROCEDURE

- 2.5.1. The technicians should observe all animals daily for clinical signs of illness, injury or abnormal behavior, including weekends and public holidays.
- 2.5.2. The technicians should observe each cage and check for the following:

- i. Sufficient food and water
 - ii. Cage cleanliness
 - iii. Animal well-being
 - iv. Dead animals
 - v. Overcrowding
- 2.5.3. If the cage is found to have insufficient food and water, the technician must top-up the appropriate diet and water.
- 2.5.4. The technician should do a cage change if the cage is too dirty to last until the next scheduled cage change.
- 2.5.5. If an animal is found sick, injured or exhibiting abnormal behavior, the technician must record this in the Vet Check Form and hand it to the facility manager. The attending veterinarian and PI of the animals must be informed and they should decide the fate of the animal.
- 2.5.6. If an animal is found dead, the technician should pick up the carcass and place it in a biohazard bag. This bag should be labeled with the date found dead, approval number and PI's name. The technician should place this bag in the refrigerator designated for carcass only.
- 2.5.7. The technician should record the room temperature, room humidity, IVC System's temperature and humidity onto the Room Monitoring Checklist.
- 2.5.8. All rooms should be swept and mopped once a week with disinfectant. The racks and doors should be wiped with disinfectant once a month.
- 2.5.9. If the room is due for sweeping, mopping, rack cleaning, these should also be indicated on the Room Monitoring Checklist.
- 2.5.10. Any abnormal observations should be recorded in the Room Monitoring Checklist and the technician must inform the facility manager.

2.6. APPENDICES

2.6.1 Appendix I: Room Monitoring Checklist

3. SOP for Animal Quarantine and Acclimatization

Audience: Laboratory Animal Facility Manager, Animal Caretakers, Attending veterinarian, Researchers / PI

3.1. SCOPE AND PURPOSE

- 3.1.1. This document describes the procedures for quarantine and acclimatization of rodents admitted into the ARF.
- 3.1.2. The purpose of the document is to ensure that all animals that enter the facility do not carry pathogens that may spread diseases to the other animals.

3.2. ASSOCIATED DOCUMENTS/FORMS

- 3.2.1. Stock Card

3.3. GENERAL INFORMATION

- 3.3.1. Animals that come from overseas or non-approved sources have to be quarantined. Animals that are in quarantine are isolated from the rest of the facility for at least 7 days until they appear to be free of infectious diseases or pathogens.
- 3.3.2. Animals acquired by the Animal Research Facility have to acclimatize for a period of 5 days to the environment before being used after quarantine or if it they originate from an approved local source.
- 3.3.3. If the Rodent(s) received are sick/unwell/injured, they will also be quarantined for inspection by the Attending veterinarian during his next visit.
- 3.3.4. The Attending veterinarian, on his next visit, will inspect the affected rodent(s) in the quarantine room and come up with a diagnosis and action plan, if any.
- 3.3.5. Rodent(s) due for acclimatization will be housed normally in their respective holding rooms. However, they will not be used for any experiment or procedure until the acclimatization period of 5 days.
- 3.3.6. The Attending veterinarian will suggest rodent(s) for quarantine if required, such as rodent(s) coming from a local source, which had a disease outbreak recently in their facility.

3.4. RESPONSIBILITIES

- 3.4.1. Laboratory Animal Facility Manager
- 3.4.2. Attending veterinarian
- 3.4.3. Animal Caretakers
- 3.4.4. Principal Investigators/Researchers

3.5. PROCEDURE

- 3.5.1. The technicians should receive the animals from the quarantine room of the ARF.
- 3.5.2. The technicians should transfer the animals from each section of the crate to an autoclaved clean cage. The autoclaved corn cob, diet and water bottle will be provided with the cage inside the quarantine room. Details of the animals must be written on the Stock Card such that the PI/researcher can identify the animals later on.
- 3.5.3. The technicians should transfer the animals to be quarantined to the Isolator and they are observed for a period of 7 days.
- 3.5.4. Rodent(s) originating from local sources other than approved vendors should be placed directly into the holding rooms and acclimatized for 5 days.
- 3.5.5. The animal technicians should transfer the quarantined animals that appear to be well to their respective animal holding rooms.
- 3.5.6. If a rodent is found to be sick/unwell/injured when received, they will be quarantined and inspected by the Attending veterinarian on his next visit.
- 3.5.7. PIs/Researchers should locate the cages of the rodents from the cage cards and will be allowed to use the animals after the quarantine/acclimatization period.

3.6. APPENDICES

- 3.6.1. Appendix I: Animal Stock Card

4. SOP for Cage Changing for Rodent Cages

Audience: Animal Caretakers

4.1. SCOPE AND PURPOSE

- 4.1.1. This document describes the procedure of changing soiled individually ventilated cages to new autoclaved cages for the laboratory rodents.
- 4.1.2. The purpose is to protect the staff and the environment from potential pathogens, which may be carried by the research animals and vice versa.

4.2. GENERAL INFORMATION

- 4.2.1. All rats housed in IVCs room 2 while mice are housed in IVCs room 4.
- 4.2.2. All IVCs must be opened using the cage changing stations in animal holding rooms.
- 4.2.3. All cages are changed every 7 days, or as often as required.
- 4.2.4. Autoclaved cages containing a layer of corn cob bedding and covers with filters are prepared and placed at the clean areas.
- 4.2.5. Autoclaved water bottles with acidified water are also prepared and placed in the clean area.
- 4.2.6. Bags of irradiated diet are located in the feed storage room, as well as in the animal holding rooms. There are 2 types of diet: maintenance diet and breeding diet.
- 4.2.7. Transport of cages, water bottles and diet must be done using steel trolleys that are available in the animal holding rooms or along the corridors.
- 4.2.8. Full PPE must be worn at all times while doing cage changing.

4.3. RESPONSIBILITIES

- 4.3.1. Animal Caretakers

4.4. MATERIALS

- i. Autoclaved cages with corn cob, 2 nestlets, cage grill and covers with filters
- ii. Autoclaved water bottles containing acidified water
- iii. Autoclaved cage cardholders
- iv. Irradiated maintenance or breeding diet
- v. Long forceps – to transfer rodents from one cage to another
- vi. Scoop – for scooping dirty bedding to sentinel cage
- vii. Plastic container for soaking of forceps
- viii. 70% ethanol
- ix. Paper towels

- x. Small brush with dustpan
- xi. Steel trolley

4.5. PROCEDURE

4.5.1. Cage Changing for IVCs

- 4.5.1.1. The animal caretaker should switch on the cage changing station in the animal holding room to allow the air flow to balance for about 10 minutes.
- 4.5.1.2. The animal caretaker should count the number of cages to change in the room and proceed to gather that number of autoclaved cages and autoclaved water bottles into the room.
- 4.5.1.3. The animal caretaker should sanitize the changing station surface with 70% ethanol and tissue. The gloves should also be sanitized with 70% ethanol between every cage.
- 4.5.1.4. 70% ethanol should be poured into a rectangular container until it is enough to soak the tip of the large forceps.
- 4.5.1.5. The animal caretaker should proceed to the first rack to obtain a dirty cage. Place this cage into the sanitized surface of the changing station and remove the water bottle. The cover should be opened and placed next to the cage, with the internal surface facing upwards. The same should be done for the clean cage.
- 4.5.1.6. The cage grill should be lifted with one hand, and the other hand should flick the forceps to ensure that it is not dripping wet with the 70% ethanol. Alternatively, dry the forceps with a tissue.
- 4.5.1.7. The animal caretaker should pick each rodent by the base of their tail using the forceps and transfer them carefully into the new cage. The diet from the soiled cage should also be transferred to the new grill, and topped up with fresh maintenance diet or breeding diet. For rat cages, transfer the rats by holding them by the base of their tail with hands.
- 4.5.1.8. If dead animals are found, animal care taker should follow the SOP for disposal of animal carcasses. If sick animals are found, this should be recorded onto the vet check form and on the cage card itself.
- 4.5.1.9. The animal caretaker should take another new cage, place it in the hood and open it.
- 4.5.1.10. Using the scoop, a handful of dirty bedding should be scooped from the dirty cage into the new cage. The same should be done for the diet. This cage should be the cage for the sentinels.
- 4.5.1.11. When all the animals have been transferred, the new cage must be covered, locked. The cage card should be transferred to a new cage cardholder. The new cage should be given a new water bottle and placed back to the original slot on the rack.
- 4.5.1.12. The animal caretaker should cover the dirty cage with its original water bottle and placed onto a steel trolley.
- 4.5.1.13. This should be continued until all the cages in the room have been changed.
- 4.5.1.14. The animal caretaker should push the trolley of dirty cages into the dirty area carefully, without stepping into the corridor.
- 4.5.1.15. The animal caretaker should check that all cages are slotted into the racks securely.

- 4.5.1.16. Using the small brush and dustpan, the animal caretaker should sweep the hood to remove all debris, followed by sanitization with 70% ethanol.
- 4.5.1.17. The room floor should be swept. The animal care taker should also update the daily log sheet to record that cage changing was done.

6. SOP for Euthanasia of Rodents

Audience: Animal Caretakers, Animal Researchers

6.1. SCOPE AND PURPOSE

6.1.1. The scope of this document describes the different acceptable methods for humane euthanasia of rodents. It is intended for all staff trained in euthanasia of rodents.

6.2. GENERAL INFORMATION

6.2.1. Euthanasia means “good death” and refers to the intentionally ending a life with the purpose of relieving pain and suffering.

6.2.2. Euthanasia techniques should result in rapid loss of consciousness and quickly followed by cardiac or respiratory arrest with the final loss of brain function.

6.2.3. Euthanasia techniques should minimize distress and anxiety experienced by the animal before loss of consciousness.

6.2.4. The euthanasia techniques described in this document are approved by the ARF. They include but are not limited to the following:

- I. Non-physical Methods
 - i. CO₂ administration
 - ii. Overdose of inhalant anesthetic
 - iii. Overdose of injectable barbiturate

- II. Physical Methods
 - i. Cervical dislocation
 - ii. Exsanguination

6.2.5. For decapitation and exsanguination, prior approval from the ARF must be sought and they should be properly described and justified in the Animal Use Protocol.

6.2.6. All animal carcasses should be disposed according to the Standard Operation Procedure for Animal Carcass Disposal.

6.3. RESPONSIBILITIES

6.3.1. All personnel performing euthanasia on rodents

6.4. 5.6 MATERIALS

- i. Euthanasia chamber
- ii. CO₂ gas cylinder
- iii. Isoflurane machine
- iv. Isoflurane
- v. Euthanasia solution

- vi. Needles and syringes
- vii. Decapitation device
- viii. Sharps container
- ix. Biohazard bag to contain animal carcass

6.5. PROCEDURE

6.5.1. CO2 Administration

- 6.5.1.1. The staff should ensure that the CO₂ gas cylinder contains sufficient amount of CO₂ to complete the euthanasia procedure.
- 6.5.1.2. The staff should place the animal(s) in the dedicated euthanasia chamber or cage. The chamber should not be overcrowded, i.e. each animal has ample space to stand on the floor of the chamber/cage with all four feet, and is able to turn around with normal posture.
- 6.5.1.3. The staff should connect the compressed CO₂ gas to the chamber via a hose and ensure that the chamber/cage is properly closed.
- 6.5.1.4. The tank valve should be turned on and the CO₂ should induce rapid unconsciousness to the animals. The rodent should immediately collapse to the floor of the chamber and begin to pant.
- 6.5.1.5. The gas flow should sustain for a minimum of 1 minute until respirations have stopped.
- 6.5.1.6. The staff should ensure that the animal(s) is/are dead before removing them from the chamber. No respiratory movement must be observed for at least 2 minutes.
- 6.5.1.7. If the animal is not dead, quickly cervical dislocate the animal.

6.5.2. Overdose of inhalant anesthetic

- 6.5.2.1. The animal(s) should be placed into a euthanasia chamber/cage.
- 6.5.2.2. The staff should connect the isoflurane machine to the chamber and ensure that the chamber/cage is properly closed.
- 6.5.2.3. The animal(s) should be exposed to the vaporized isoflurane until respiration stops for at least 2 minutes.
- 6.5.2.4. If the animal is not dead, quickly cervical dislocate the animal.

6.5.3. Overdose of injectable barbiturate

- 6.5.3.1. Staff can obtain Valabarb (sodium pentobarbitone 300mg/ml) from the Animal Facility Manager.
- 6.5.3.2. 120mg/kg of the solution is recommended for intraperitoneal (IP) injection.
- 6.5.3.3. The staff should scruff/secure the animal by hand or using an animal restrainer securely when injecting the euthanasia solution into the animal.
- 6.5.3.4. Respiration should cease for at least 2 minutes to ensure the death of the animal.
- 6.5.3.5. If the animal is not dead, quickly cervical dislocate the animal.

6.5.4. Cervical dislocation

- 6.5.4.1. The staff should hold the base of the rodent's tail and place it on a surface, ideally the grill of the cage such that the rodent can grip onto it if it is still conscious. The rodent should face away from the staff.
- 6.5.4.2. The staff should place the thumb and index finger on the neck or base of the skull. Alternatively, use a rod to place at the base of the skull, perpendicular to the body.
- 6.5.4.3. The staff should quickly pull the base of the tail while pressing the rod or thumb/index finger on the neck, causing the separation of the cervical vertebra from the skull.
- 6.5.4.4. Crushing of the skull is normal.

7. SOP for General Maintenance of Cleanliness at ARF

Audience: Animal Caretakers

7.1.SCOPE AND PURPOSE

- 7.1.1.This document describes the steps taken to maintain cleanliness and the health status of the animals at the ARF.
- 7.1.2.The purpose is to ensure that all animal caretakers do the same procedures to effectively maintain the ARF.

7.2. ASSOCIATED DOCUMENTS/FORMS

- 7.2.1.Room Check Sheet

7.3. GENERAL INFORMATION

- 7.3.1.All animals are checked at least once daily, including weekends and public holidays.
- 7.3.2.Weekend and public holiday duties are done on a rotational basis. The rosters are planned by one of the senior animal caretakers
- 7.3.3.All cages must be handled in the cage changing station.
- 7.3.4.The animal caretakers should sanitize the gloves with 70% ethanol or hand sanitizer between cages. For cages suspected of a contamination, a change of gloves should be done before and after handling the cage.
- 7.3.5.Diets and corn cob are stored at (room 6).
- 7.3.6.Detergents are stored in (room 7)
- 7.3.7.no cardboard boxes are allowed in ARF, with the exception of glove and face mask boxes. These should be discarded during routine housekeeping.

7.4. RESPONSIBILITIES

- 7.4.1. Animal Caretakers

7.5. PROCEDURE

- 7.5.1. Animal Room Maintenance
 - 7.5.1.1. All animals should be checked at least once daily, including weekends and public holidays.
 - 7.5.1.2. Each cage should be observed by visual inspection for sufficient diet pellets and water in the water bottles. If necessary, open the cage in the cage changing station to check for injured or distressed animals, new born pups or dead animals.

- 7.5.1.3. The animal caretaker should replace the water bottle with a fresh one and top up the diet in the cage if either is found to be insufficient. All cages should be given the maintenance diet unless it has a breeding cage card, or as specified by the researcher.
- 7.5.1.4. The bottles that are replaced should be placed on a trolley for dirty cages. This trolley should be pushed in to the dirty area when full.
- 7.5.1.5. The animal caretaker should record any actions taken or observations in the daily log sheet. If a sick/injured/distressed animal was observed, the animal caretaker should fill up a vet check form and hand it to the ARF manager. In addition, the animal caretaker should write the observation on a post it and paste it on the cage card to keep the researcher informed.
- 7.5.1.6. The room humidity and temperatures should also be recorded by reading the room's thermostat and hygrometer. The same should be done for the IVC systems.
- 7.5.1.7. The animal caretaker should clean and sanitize the cage changing station after each use.

7.5.2. Procedure Room Maintenance

- 7.5.2.1. The procedure benches and worktables should be sanitized daily and/or after each use.
- 7.5.2.2. The animal caretakers and researchers should keep the rooms neat and tidy as they are shared between users.

7.5.3. General Maintenance

- 7.5.3.1. All floors, including animal rooms, procedure rooms, and corridors and changing areas, should be swept daily and mopped with detergent once a week, usually on a Thursday.
- 7.5.3.2. All door handles should be sanitized weekly.
- 7.5.3.3. All general waste bins should be checked daily. When full, the trash bag should be removed and replaced with a new trash bag. The full trash bag should be tied and disposed into the garbage bin located at unloading area.
- 7.5.3.4. All rooms, including animal holding and procedure rooms, should be well-supplied with gloves, face masks, M-fold papers and 70% ethanol.
- 7.5.3.5. All animal holding rooms should be well-supplied with the essential diets, cage cards, and vet check forms.
- 7.5.3.6. All procedure rooms should be well-supplied with sanitizing wipes and biohazard bags.
- 7.5.3.7. The changing area should be well-supplied with sanitizers, 70% ethanol, M-fold papers, face masks, bouffant caps, gloves, isolation gowns and non-slip shoe covers.
- 7.5.3.8. The sticky mat at the entrance of the changing area should be changed daily.

7.5.4. Logistics

- 7.5.4.1. All supplies should be available to last for at least another month. The animal caretakers should inform the ARF manager as soon as the supplies fall below the amount required for another month's use.
- 7.5.4.2. All animal caretakers should ensure that the supplies used are not expired, unless specified to be safe by the supplier. This must be justified with a letter from the manufacturer.

8. SOP for Animal Bites, Scratches and other Animal-Related Injuries

Audience: All animal handlers.

8.1. SCOPE AND PURPOSE

8.1.1. This document describes the management of animal bites, scratches and animal-related injuries. It is intended for all staff who has to handle animals, or who may be exposed to animal bodily materials.

8.1.2. All Principal Investigators are responsible for ensuring that their staff members are aware of the risks involved with working with animals. This SOP applies to all users of the ARF.

8.1.3. Only rodent-related injuries are covered in this protocol.

8.2. ASSOCIATED DOCUMENTS/FORMS

8.2.1. Emergency Response Plan for deanship of scientific research, Taif University.

8.3. GENERAL INFORMATION

8.3.1. An animal bite is defined as having ones skin punctured by the animal's teeth and having the animal saliva coming in contact with the exposed skin. The animal's claws may also puncture one's skin and come into contact with human tissue, eyes or mucous membranes. Bites and scratches are considered as physical injuries, and carry the potential of contracting zoonotic diseases and/or allergic reactions.

8.3.2. Only mice and rats are housed at the ARF.

8.3.3. All staff and animal caretakers must be vaccinated with tetanus and Hepatitis B.

There are first-aid kits located in the building:

- a) Animal Facility Manager's Office
- b) General Store
- c) Dirty Corridor

8.3.4. In case of medical emergencies caused by animal-related injuries, the list of SBS

ARF Emergency contact information can be found below:

ARF Emergency Response Team.....	tel:+966553717211
Major Emergency: ODFM (24hr)	tel: +966553717211
Taif University Medical Centre..... (1583)	tel: +966127272020
Fire and Ambulance.....	tel: 911

8.4. PROCEDURE

- 8.4.1. Immediately flush a bite or scratch wound with plenty of soap and water.
- 8.4.2. Locate the First-Aid kit. If the injured staffs are trained in first-aid and able to apply it onto themselves, he or she should proceed to do so. Otherwise, contact for assistance if the incident happened during office hours.
- 8.4.3. If the incident happened after office hours, apply first-aid if the injured staffs are trained and if it is a small wound. If further medical assistance is required, the injured staff should call the University Medical Centre or ambulance.
- 8.4.4. The injured staff should report the incident to the ARF manager as soon as possible.
- 8.4.5. The ARF manager will complete an incident report which will be reviewed and determine if further actions should be taken. The follow-up actions may include review of SOP, retraining or review of risk assessments.

8.5. DOCUMENTATION

- 8.5.1. All associated documents to do with the export should be kept a minimum of 3 years.

9. SOP for Preparation of Acidified Drinking Water for Laboratory Rodents

Audience: Animal Caretakers

9.1. SCOPE AND PURPOSE

- 9.1.1. This document describes the procedure for the safe preparation of acidified drinking water for the laboratory rodents at ARF.
- 9.1.2. The purpose of this is to ensure that the animal caretakers are aware of the hazards and risks involved in handling hydrochloric acid, and the safety measures to take.

9.2. ASSOCIATED DOCUMENTS/FORMS

- 9.2.1. Safety Data Sheet for Hydrochloric Acid, 37%, Fuming

9.3. GENERAL INFORMATION

- 9.3.1. The purpose of acidifying the laboratory animal drinking water continuously is for disinfection. Acidified water has a bactericidal effect, against *Pseudomonas aeruginosa* and a few other Gram-negative bacteria. This prevents the spread of opportunistic pathogens between animals.
- 9.3.2. Merck's Hydrochloric acid fuming 37% is added into the drinking water for the rodents.
- 9.3.3. The pH of the acidified drinking water is approximately pH 2.5 – pH 3.
- 9.3.4. Some microorganisms may still grow in the water but may not multiply.
- 9.3.5. The animal caretakers must be familiar with the Safety Data Sheet of the HCl.
- 9.3.6. Full PPE, safety goggles and covered shoes must be worn at all times while working with HCl.
- 9.3.7. The dispensing of HCl must be done in the fume hood with absorbent material in the vicinity. The spill kit must be in the same room.
- 9.3.8. Concentrated HCl must only be handled in the fume hood.
- 9.3.9. HCl is stored in the acid cabinet, located below the fume hood at Procedure Room 2.
- 9.3.10. Always add acid into water, and not water into acid!

9.4. RESPONSIBILITIES

9.4.1. Laboratory Animal Facility Manager

9.4.2. Animal Caretakers

9.5. MATERIALS

9.5.1. Hydrochloric Acid, 37%, Fuming

9.5.2. Automatic pipette pump

9.5.3. Serological Glass Pipette, 25 mL

9.5.4. 1 L of water in Nalgene glass bottle

9.5.5. Water tub

9.5.6. Cleaned water bottles with sipper tubes

9.6. PROCEDURE

9.6.1. Switch on the fume hood and ensure that it is working.

9.6.2. Place a piece of absorbent tissue paper on the working surface of the fume hood.

9.6.3. Place the bottle of water, glass pipette and pump in the hood.

9.6.4. Using both hands, retrieve the bottle of HCl from the acid cabinet located below the fume hood and place it on the working surface.

9.6.5. Using the pump and pipette, aliquot the acid slowly and carefully dispense it into the bottle of water in similar motion. The amount of acid to aliquot are as follows:

HCl	Water
1.5 mL	5 L
9.0 mL	30 L
21.0 mL	70 L

- 9.6.6. For a final volume of 70L, aliquot 21.0 mL of acid into the 1L bottle of water. A pH of about 2.5 – 3.0 is achieved.
- 9.6.7. Screw the cap securely onto the glass bottle and bring it to the water preparation area.
- 9.6.8. With the water tub placed on a trolley, fill the water tub with tap water to the desired level and pour the acidified bottle of water into the tub slowly and in a circular motion.
- 9.6.9. Arrange clean, empty water bottles on a trolley.
- 9.6.10. Dunk the water bottles into the water tub and fill them with the acidified water, carefully to avoid splashing.
- 9.6.11. Dry them on a towel and place them on another trolley.
- 9.6.12. Cap the filled water bottles with the sipper tubes and place the bottles in the box for autoclaving later.
- 9.6.13. Repeat until all the boxes are filled with water bottles.
- 9.6.14. Cover the boxes and transport them to the autoclave area using a trolley.
- 9.6.15. Push them into the autoclave and start the autoclave cycle.
- 9.6.16. After the autoclave cycle, remove the box and allow it to cool. These water bottles are now ready for use.

9.7. DOCUMENTATION

- 9.7.1. All associated documents to do with the export should be kept a minimum of 3 years.