
1. PURPOSE

This Standard Operating Procedure (SOP) describes the basic procedures for routine care and husbandry of macaques.

2. RESPONSIBILITY

Animal care staff, facility manager

3. MATERIALS

3.1. Personal protective equipment:

- 3.1.1. Shoe covers
- 3.1.2. Laboratory gown
- 3.1.3. Hair bonnet
- 3.1.4. Fit-tested N95 respirator
- 3.1.5. 2 pairs of examination grade gloves
- 3.1.6. Disposable face shield
- 3.1.7. Protective Kevlar® sleeves (optional)

3.2. Diet:

- 3.2.1. Appropriate animal diet
- 3.2.2. Fresh vegetables and fruits, nuts, seeds, dried fruits, etc.

3.3. Clean water bottles

3.4. Clean environmental enrichment devices

3.5. Hardwood shavings or chips

3.6. Cage cards

3.7. Disinfectant solution

4. PROCEDURES

4.1. Observation of animals and environment:

- 4.1.1. Observe all animals daily for illness, injury, general condition, food and water intake, and abnormal behavior.
- 4.1.2. Observe environmental conditions at room and caging level (temperature, humidity, light, noise, hazard, etc.). Report any abnormal environmental conditions.
- 4.1.3. Animals found dead are to be reported to veterinary care staff. Carcasses should be removed from the enclosure promptly, identified, and placed in the refrigerator.
- 4.1.4. Maintain a daily log of observations, environmental parameters, husbandry, and maintenance procedures.

4.2. Emergency and holiday care:

- 4.2.1. Provide routine care and husbandry for all animals on weekends and holidays.

4.3. Animal identification methods:

- 4.3.1. Identify all cages or enclosures with a cage card. Include, at a minimum, the following information:
 - 4.3.1.1. Investigator
 - 4.3.1.2. Protocol number

- 4.3.1.3. Species
- 4.3.1.4. Source
- 4.3.1.5. Strain
- 4.3.1.6. Sex
- 4.3.2. Individual animals may be identified using various methods such as tattoos and micro-chips.
- 4.4. Caging:
 - 4.4.1. Provide cages that are appropriate in size for the species, number, and weight of the animals housed in them. Refer to CCAC recommendations.
 - 4.4.2. All macaque cage doors and cage dividers are locked with a padlock to prevent accidental opening and escape of the animal.
- 4.5. Food and water:
 - 4.5.1. Feed animals to meet current National Research Council (NRC, 2003a) guidelines for primate nutrition.
 - 4.5.2. Implement a feeding strategy which increases the amount of time spent foraging and eating, without increasing the animals' caloric intake.
 - 4.5.3. Food storage:
 - 4.5.3.1. Store feed on plastic pallets or shelves off the floor and 4-6 inches away from walls, in a vermin-proof storeroom.
 - 4.5.3.2. Store open feed bags in leak-proof containers with tightly fitting lids.
 - 4.5.3.3. Maintain temperature and humidity controls in the storeroom. Avoid temperatures above 21°C and extremes in humidity.
 - 4.5.3.4. Use feed prior to the manufacturer's expiration date.
 - 4.5.3.5. Stack feed in a manner that allows easy reading of the milling date.
 - 4.5.4. Check automatic watering devices and flush them weekly for proper operation.
 - 4.5.5. Provide water *ad libitum*, unless otherwise specified in an approved Animal Use Protocol. Empty water bottles, rinse and fill with fresh water daily. Change bottles weekly.
 - 4.5.6. Monitor water quality routinely. Refer to Microbiological Monitoring SOP.
- 4.6. Social and environmental enrichment:
 - 4.6.1. Group-house animals whenever possible.
 - 4.6.2. Provide environmental enrichment devices for all macaques.
 - 4.6.3. Refer to Environmental Enrichment Program for NHPs SOP.
- 4.7. Quarantine procedures:
 - 4.7.1. Refer to Non-Human Primate Quarantine SOP.
- 4.8. Vermin control:
 - 4.8.1. Refer to Vermin Control SOP for a description of the vermin control program.
- 4.9. Environment and environmental control:
 - 4.9.1. Maintain room temperatures between 18 and 29° C.
 - 4.9.2. Maintain relative humidity between 40% and 70%.
 - 4.9.3. Maintain a daily log of room temperature and humidity.
- 4.10. Lighting:
 - 4.10.1. Provide a regular diurnal lighting cycle
 - 4.10.2. Check the timer performance routinely.
- 4.11. Space requirements:
 - 4.11.1. Follow the Canadian Council on Animal Care (CCAC) recommendations for space requirements.

- 4.12. Bedding
 - 4.12.1. Provide approved bedding in enclosures, e.g., hardwood shavings or chips.
 - 4.12.2. Use a sufficient quantity of bedding to keep the animals clean and dry.
 - 4.12.3. Store the bedding off the floor on pallets or shelves, and in such a manner to prevent contamination.
- 4.13. Cleaning and sanitation of cages and enclosures:
 - 4.13.1. Cages and enclosures should be spot cleaned frequently and sanitized regularly to keep the environment dry and comfortable for the animals.
 - 4.13.2. Frequency of sanitizing may vary depending on factors such as the number, age, and type of animals, the type of bedding, and the size of the enclosure.
 - 4.13.3. Cages are commonly sanitized every two weeks and enclosures every four weeks.
 - 4.13.4. Objects within cages and pens should be sanitized at least monthly.
 - 4.13.5. Foraging treats can be added to the clean bedding.
- 4.14. Cleaning and sanitation of housing room and equipment:
 - 4.14.1. Clean walls surrounding the cages as needed.
 - 4.14.2. Daily:
 - 4.14.2.1. Wash the floors with disinfectant solution.
 - 4.14.2.2. Bring waste to compactor.
 - 4.14.3. Weekly:
 - 4.14.3.1. Flush the floor drains.
 - 4.14.4. Monthly:
 - 4.14.4.1. Wipe down all surfaces such as sinks, doors, door jams and doorknobs, windows, cart tops, shelves, etc. with the disinfectant solution.
 - 4.14.4.2. Sanitize garbage containers.
- 4.15. Transportation:
 - 4.15.1. Transport animals as per SOP.
- 4.16. Waste Management:
 - 4.16.1. Deposit non-regulated or non-infectious medical waste and soiled materials in dumpsters.
 - 4.16.2. Regulated or infectious Medical Waste is processed by McGill University's Waste Management program.

5. SAFETY

- 5.1. Always wear appropriate PPE.
- 5.2. Observe Macaque-Related Injury SOP.
- 5.3. Preparation of disinfecting solution.
 - 5.3.1. Wear personal protective equipment as directed by the manufacturer when preparing and using disinfectant solution.
 - 5.3.2. Use metering tool to dilute disinfectant according to manufacturer's recommendation.
 - 5.3.3. Clean surfaces prior to disinfection to remove any organic material.
 - 5.3.4. Apply disinfectant and allow for adequate contact time.

6. REFERENCES

- 6.1. Canadian Council on Animal Care ([CCAC](#)) [guidelines: Nonhuman primates](#), April 2019.
- 6.2. National Research Council. 2003. *Nutrient Requirements of Nonhuman Primates: Second Revised Edition*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/9826>.

SOP REVISION HISTORY

DATE	NEW VERSION
2023.07.28	2. RESPONSIBILITY Animal care staff, facility supervisor, facilities manager
2023.07.28	3.1.4. Fit-tested N95 Mask respirator 3.1.5. 2 pairs of examination grade gloves 3.1.6. Disposable face shield
2023.07.28	3.2.1. Appropriate animal diet (within six months of the milling date) 3.2.2. Fresh vegetables and fruits and other special treats (appropriate for human consumption), nuts, seeds, dried fruits, etc.
2023.07.28	3.4. Clean cage trays with bedding
2023.07.28	3.5. Bedding Hardwood shavings or chips
2023.07.28	3.6. Clean cages
2023.07.28	4.1. Observation of animals and environment: 4.1.1. Observe all animals daily for illness, injury, and general condition, including weekends and holidays food and water intake, and abnormal behavior. 4.1.2. Observe environmental conditions at room and caging level (temperature, humidity, light, noise, hazard, etc.). Report any abnormal environmental conditions. 4.1.3. Animals found dead are to be reported to veterinary care staff. Carcasses should be removed from the enclosure promptly, identified, and placed in the refrigerator. 4.1.4. Maintain a daily log of observations, environmental parameters, husbandry and maintenance procedures.
2023.07.28	4.2.2. Make provisions for emergency care by providing both work and after hours contact information for Principal Investigators (PI's) and their staff. Provide special requests or instructions if needed.
2023.07.28	4.3.1.4. Source
2023.07.28	4.3.2. Identify Individual animals as needed in accordance with SOP. Examples of individual identification may be identified using various methods include: such as tattoos and micro-chips.
2023.07.28	4.5.1. Feed animals to meet current National Research Council (USA) recommendations (NRC, 2003a) guidelines for primate nutrition.
2023.07.28	4.5.2. Implement a feeding strategy which increases the amount of time spent foraging and eating, without increasing the animals' caloric intake.
2023.07.28	4.5.2.1. Store feed on plastic pallets or shelves off the floor and 4-6 inches away from walls, in a vermin-proof storeroom. 4.5.2.4. Use feed within 6 months of milling date prior to the manufacturer's expiration date.
2023.07.28	4.5.4. Provide water <i>ad libitum</i> , unless otherwise specified in an approved Animal Use Protocol. Empty water bottles, rinse and fill with fresh water daily. Change bottles weekly.
2023.07.28	4.5.5. Monitor water quality routinely to ensure that it is free of contaminants that could potentially expose animals to chemical or infectious agents. Refer to Microbiological Monitoring SOP for water quality monitoring requirements.
2023.07.28	4.7.1. Refer to Non-Human Primate Quarantine SOP.
2023.07.28	4.8. Euthanasia and disposal of dead animals: 4.8.1. Euthanize animals by overdose of anesthetics. Refer to Large Animal Euthanasia SOP. 4.8.2. Ensure that euthanasia is conducted by trained and experienced staff. 4.8.3. Dispose of dead animals by incineration.
2023.07.28	4.11.2. Note: Lights are controlled by timers set at a photoperiod of 12 to 14 hours of light. Check the timer performance routinely.
2023.07.28	4.13.1 Provide approved bedding in enclosures, e.g., hardwood shavings. Cedar shavings are not recommended, due to the presence of aromatic hydrocarbons.
2023.07.28	4.14.1. Cage pans are cleaned three times per week, at a minimum. 4.14.2. Change cages once every two weeks, at a minimum: 4.14.2.1. Cover cage and bring to cage wash area. 4.14.2.2. Environmental enrichment devices are cleaned and replaced at the time the cages are changed. 4.15. Cleaning and sanitation of enclosures: 4.15.1. Enclosures are washed every two weeks, at a minimum: 4.15.1.1. Remove soiled bedding. 4.15.1.2. Clean the soiled cage thoroughly by hosing down and removing debris. 4.15.1.3. Spray with disinfectant and let sit. Remove debris using a brush if necessary. 4.15.1.4. Rinse cage thoroughly then add clean bedding. 4.15.2. Environmental enrichment devices are cleaned and replaced at the time the enclosures are cleaned. 4.14.1. Cages and enclosures should be spot cleaned frequently and sanitized regularly to keep the environment dry and comfortable for the animals. 4.14.2. Frequency of sanitizing may vary depending on factors such as the number, age, and type of animals, the type of bedding, and the size of the enclosure. 4.14.3. Cages are commonly sanitized every two weeks and enclosures every four weeks. 4.14.4. Objects within cages and pens should be sanitized at least monthly. 4.14.5. Foraging treats can be added to the clean bedding before returning animals to the enclosure.
2023.07.28	4.16.1.5. 4.15.1. Clean walls surrounding the cages if necessary as needed.
2023.07.28	4.15.2.2 Restock supplies (mask, gloves, feed, bedding, etc.) 4.15.2.3. Launder lab coats, Kevlar® sleeves. 4.15.2.4. Clean face shields.
2023.07.28	4.15.4.1. Clean the walls with disinfectant solution 4.15.4.3. Run Sanitize garbage containers through cage washer.
2023.07.28	4.17.1. Wear personal protective equipment when preparing and using disinfectant solution, as per manufacturer's recommendation.

2023.07.28	<p>5.1. Always wear appropriate PPE.</p> <p>5.2. Observe Macaque-Related Injury SOP.</p> <p>5.3. Preparation of disinfecting solution.</p> <p>5.3.1. Wear personal protective equipment as directed by the manufacturer when preparing and using disinfectant solution.</p> <p>5.3.2. Use metering tool to dilute disinfectant according to manufacturer's recommendation.</p> <p>5.3.3. Clean surfaces prior to disinfection to remove any organic material.</p> <p>5.3.4. Apply disinfectant and allow for adequate contact time.</p>
2023.07.28	<p>6. REFERENCES</p> <p>6.1. Canadian Council on Animal Care (CCAC) guidelines: Nonhuman primates, April 2019.</p> <p>6.2. National Research Council. 2003. Nutrient Requirements of Nonhuman Primates: Second Revised Edition. Washington, DC: The National Academies Press. https://doi.org/10.17226/9826.</p>