FLORIDA ATLANTIC UNIVERSITY

Division of Research

SUBJECT:	**Effective Date:**	**Policy Number:**
Sanitization of Housing and Experimental Equipment by Research Laboratories and Comparative Medicine	8/25/2023	10.4.7
	Supersedes:	**Page** **of**
	8/28/2020	**1** **7**
	Responsible Authorities:	
	Principal Investigator Vice President, Research Institutional Animal Care and Use Committee Assistant Vice President for Research, Research Integrity Assistant Vice President for Research, Comparative Medicine	

I. Background

The Guide for the Care and Use of Laboratory Animals (*Guide*) indicates that "testing equipment should be designed in such a way as to allow surface disinfection between studies. Components that cannot be cleaned or disinfected, such as computers and recording equipment, should be located in areas where contact with animals is unlikely and should be covered when not in use (the use of computer keyboard covers may also be beneficial)" (p. 150).

The *Guide* provides specific information and requirements for sanitization frequencies of terrestrial animal housing and equipment. Sanitization guidelines for primary enclosures as well as cage components are standardized at once weekly for static, solid bottom caging, and once every two weeks for individually ventilated cages. Cage components should be sanitized every two weeks as well.

Sanitization measures for aquatic systems differ as much of the nitrogenous wastes and respiratory output are dissolved in the water. Properly functioning life support systems are required to maintain these animals. Solid wastes are often removed by siphoning or filtering.

The *Guide* also provides information on assessing the effectiveness of sanitization. This must be done on a regular basis. Assessment is performed by visual confirmation of removal of contaminants before washing and evaluating sanitized material for the detection of organic material via adenosine triphosphate (ATP) bioluminescence and/or microbiologic culture.

II. Purpose

To establish a policy that will provide guidance to Comparative Medicine and Research Staff to ensure primary and secondary enclosures as well as research equipment used with animals is properly sanitized and that sanitization efficacy is monitored in order to maintain the health of the animals used in research.

III. General Statement

1. This policy affects all vertebrate animal housing and experimental equipment that comes in contact with animals and/or could influence health of animals that are part of vertebrate animal models utilized by researchers at Florida Atlantic University.
2. The scope of this policy applies to:
    1. Comparative Medicine (CM) vivaria facilities including primary and secondary enclosures, procedural rooms, surgical facilities and equipment or any other CM maintained area
    2. Satellite housing facilities including primary and secondary housing as well as equipment used and procedural areas
    3. Core facilities
        1. Behavioral devices and equipment
        2. Scales
    4. Surgery rooms
        1. Sterilization of equipment/Instruments
        2. Anesthetic devices touching the animal (endotracheal tubes, nose cones, induction chambers, etc.…
        3. Cleaning and sanitization of surfaces and room itself
    5. Restraint and identification equipment
        1. Restrainers
        2. Ear punchers, ear taggers, ear tags, etc…
        3. Microchips or other implanted devices
    6. Research laboratories or testing rooms where research animals are taken for manipulation/testing/training, etc…
        1. Equipment used directly on the animals or housing the animals
        2. Behavioral testing equipment maintained by researchers within CM vivaria
    7. Field research
        1. Equipment that comes into direct contact with animals (e.g. traps, fishing devices, testing devices, seines, nets, etc…
        2. Boots of individuals in the environment
3. For all satellite facilities, frequency and methods of disinfection of primary and secondary enclosures must be described by the researcher managing the satellite facility and approved by the IACUC in the Satellite Animal Facility Description and/or the Satellite Facility SOPs.
4. For all major experimental equipment, sanitation and disinfection procedures should be described in SOPs and approved by the IACUC.
5. In addition, Florida Atlantic University Environmental Health and Safety provides safe laboratory practices and procedures in the **Biological Safety Manual,** which should be reviewed and utilized by all research personnel as applicable to the studies.

IV. Policy

1. All animal housing equipment and facilities must be sanitized at the frequency and in manner that is following regulatory requirements, conducive to the health and well-

being of animals, appropriate for the species involved, and consistent as to reduce variability in the research conducted.

2. All portable and fixed equipment as well as surfaces that come into direct contact with animals must be cleaned and disinfected and/or sanitized prior to initial use and after each subsequent use (between animals or cohorts of animals) by the personnel using the equipment and/or procedural area. Disinfection is made most effective when proceeded by effective mechanical cleaning. Therefore, all dirt, debris and excrement must be removed prior to sanitization/disinfection.
3. Disinfectants must be used according to manufacturer's guidelines to ensure appropriate dilution and contact time for disinfection.
4. Personnel should wear appropriate PPE for use of any cleaner/disinfectant as indicated by the manufacturer and FAU Environmental Health and Safety.
5. Investigator managed satellite facilities must follow IACUC approved cleaning/disinfection/sanitization SOPs for all animal housing and equipment. The frequency of cleaning/disinfection/sanitization of equipment must be included in the IACUC approved satellite facility description or associated SOP and followed.
6. Equipment that can withstand cycling through the cage wash should be sanitized in this manner.
7. Surgical supplies and equipment used for survival surgical procedures must be sterilized in accordance to this policy. Surgical instruments and supplies should be autoclaved for sterility when materials can withstand this method. Supplies and devices can also be purchased sterilized. For surgeries in all species, the IACUC Policy 10.4.6 and associated SOP regarding Anesthesia, Surgery and Analgesia must be followed.
8. Anesthetic equipment that comes into direct contact with the animal (e.g. induction chambers, nose cone, heating pad surfaces) must be cleaned and sanitized before initial use and after each subsequent use.
9. Any direct or indirect contact bedding, sand, or other substrate used in testing chambers must be removed prior to sanitization and replaced with fresh, clean substrate following testing. Direct contact bedding changes and sanitation procedures are required between test subjects where a chamber may be used sequentially.
10. Water maze equipment should be maintained free from debris/excrement. Water maze should be emptied, disinfected and allowed to dry at the end of the day or between different groups of animals.
11. Capture devices, holding devices and restrainers must be cleaned, disinfected and/or sanitized after each use. Nets used in capture of aquatic animals should be treated with "Net Soak" or flushed copiously with water and allowed to dry between animals/groups of animals.
12. Traps should be disinfected following each use to reduce the accumulation of stress hormones.
13. Fishing lines/equipment should be cleaned, disinfected and allowed to dry at the end of the day or more often if changing fishing locations during the day.
14. Disinfection/sanitization of equipment for aquatic species must be done with care to prevent the presence of residual toxic by-products. Use disinfectants appropriate for aquatics and/or flush equipment after disinfection.
15. Boots worn by researchers in the field should be decontaminated after each excursion using a brush and disinfectant, and/or when entering a different field/area.
16. Sanitization procedures should be monitored and evaluated by use of ATP bioluminescence or by microbiologic culture of the sanitized equipment. The frequency and results of the monitoring must be recorded. The frequency of monitoring should be

based upon a risk analysis but no less than twice annually, depending upon frequency of usage.

17. Risk Analysis of Sanitization Frequency and Monitoring: A risk analysis is the process of evaluating and identifying the sources of potential risks or threats as well as assessing the consequences of their impacts on the overall objective of sanitization and direct contact with the animals. Risk analyses should consider (but are not limited to) the following criteria:
    1. Specie(s) of animal(s) affected
    2. Individual animal use
    3. Group animal use
    4. Potential for spread of pathogens
    5. Frequency of use of equipment
    6. Expected level of soiling of equipment
    7. Environmental conditions of use
    8. Potential to spread contaminants from one population to a subsequent population of animals
    9. Susceptibility of animals to pathogens or opportunistic infections associated with repeated use of potentially soiled equipment.
    10. Use of natural versus artificial materials
    11. Field setting versus laboratory settings
18. Equipment that cannot be properly sanitized must be replaced at appropriate intervals, which is again dependent on material and particular circumstances around its use. Include replacement and frequency in the risk analysis.
19. Equipment that can be sanitized in the cage washer or sterilized in the autoclave is afforded the benefit of the existing quality assurance measures (e.g. temperature-time monitoring, microbiologic monitoring) and does not require additional verification of sanitization. However, monitoring of the individual autoclave's effectiveness should be based upon the FAU Environmental Health and Safety's Biological Safety Manual which specifies that at a minimum, autoclaves are monitored by.
    1. Temperature Monitoring to ensure attainment of (250° F) or (121° C) for 30 minutes or longer
    2. Heat Sensitive Tape Monitoring with each load. This only recognizes temperature attainment and does not indicate duration.
    3. Biological Indicator Monitoring placed at the center of the load.
        a. If autoclaves are run weekly or more often, then indicators should be performed monthly.
        b. If frequency is less than monthly, run an indicator with each load, or at the very least quarterly.
20. Phones, cameras and other electronic devices brought into an animal facility should be appropriately disinfected. Disinfectant wipes are available for use. If there are questions about appropriate disinfection methods for sensitive equipment, contact the facility manager or a veterinarian. Alternatively, cell phones may be placed in a Ziploc bag upon entry into the facility.
21. The use of Ultraviolet light for sanitization/sterilization must be approved by the IACUC. UV light provides only surface sterilization. Ultraviolet light sterilization is hindered by dust, debris and curvature of the object to be sterilized. The use of UV light is often used in addition to another form of decontamination to enhance its effectiveness. Ultraviolet light is not an acceptable method of sterilization for surgical instruments or implanted devices. Note, the use of ultraviolet light for water filtration and purification is not covered by this policy.

22. Risk Analysis should be developed by each party responsible for maintaining equipment and facilities as described in Section III Part 2.
23. Risk analysis must be included in an SOP or within the approved protocol and include timeline for implementation for Core Facilities
24. The risk analyses must be described in relation to how they are performed and the interval in which they are regularly reevaluated, but the interval must be no less than every three years.
25. Veterinary staff may be able to help assess risks in a particular area and determine the expectations and/or outcome measures, as they must perform the same for Comparative Medicine. It is recommended to meet with the veterinary staff for help with risk analysis.
26. Risk Analyses should include outcome measures (as applicable) and be specific to the lab: These could be visual assessment of soiling, measurement and reduction of ATP, microbiological monitoring methods, etc…
27. Laboratories with behavioral equipment used in association with animals should develop internal Standard Operating Procedures for equipment sanitization.
28. Satellite Facilities should include sanitization information within their IACUC Satellite Facility Program Description and/or SOPs.
29. Research laboratories using autoclaves maintained by the laboratory, department or college must abide by guidelines defined by Environmental Health and Safety regarding the use assessment of efficacy of sterilization.

V. Procedures

1. As outlined in the *Guide*, hand sanitization of equipment is less reliable, and the efficacy of this method must be monitored. Equipment requiring monitoring of sanitization includes but is not necessarily limited to: Research devices, behavioral apparati, anesthetic chambers, and housing/transport cages. Refer to IACUC SOP on Monitoring the Effectiveness of Sanitization for specific information.
2. Risk analysis has to occur no less than every three years.
3. Monitoring of effectiveness frequency is based in risk analysis but no less than every 6 months unless not used for a prolonged period of time (e.g. the preceding 6 months).
4. The SOPs describing risk analysis and monitoring of effectiveness are specific to laboratories and/or housing facilities and must be regularly evaluated at least every 3 years or when there are major changes in equipment and/or research. It should consider species, whether devices are switched between species and/or locations, expected level of soiling, pathogens, opportunistic environments amongst others.
5. These SOPs need to be reviewed by the IACUC q 3 years or when there are potential major changes described.
6. Assessment of the effectiveness of sanitization may be performed by multiple methods including visual detection of organic material, ATP bioluminescence or microbiological culture. Evaluating sanitized material for the detection of organic material via adenosine triphosphate (ATP) bioluminescence and by visual confirmation of removal of contaminants before washing is one of the most effective methods and should be used in most facilities. The addition of microbial cultures should be added for aquatic systems/housing.

VI. Definitions

1. **Cleaning –** The removal of excess amounts of excrement, dirt and debris.
2. **Disinfection –** Process to reduce or eliminate unacceptable concentrations of microorganisms.

3. **Sanitization –** Is defined as the maintenance of environmental conditions that facilitate health by involving both cleaning and disinfection.
4. **Sterilization –** A process or procedure that destroys, deactivates and/or kills all microorganisms including dormant forms like spores.
5. **Cleaning agent –** A chemical agent, that when used in conjunction with some form of agitation will aid in the effective removal of soils from inanimate surfaces.
6. **Sanitizer –** An agent that reduces the number of bacterial contaminants on inanimate surfaces to levels prescribed by the Public Health Service's rules and regulations.
7. **Disinfectant –** An agent that destroys or eliminates specific infectious agents from a surface.

VII. Accountability

The Principal Investigator (PI) will be responsible for:

- Assuring that equipment maintained by their laboratory is properly cleaned/disinfected and sanitized as per this policy and appropriate IACUC SOP.
- Monitoring the effectiveness of the sanitization or working with Comparative Medicine to ensure this done according to this policy and appropriate IACUC SOP.
- Assuring that common use equipment provided in the animal facility procedure room is cleaned/disinfected prior to and after each use.
- Ensuring appropriate cleaning, disinfection, sanitization (and monitoring of sanitization efficacy) of primary housing and equipment used in their IACUC approved satellite facility.
- Ensuring equipment and boots for IACUC approved field studies are adequately sanitized, and efficacy is determined.

The IACUC will be responsible for:

- Reviewing and approving investigator managed satellite program descriptions to ensure inclusion of appropriate sanitization methods, frequencies and monitoring of sanitization effectiveness.
- Reviewing records of sanitization and sanitization effectiveness
- Providing oversight to ensure all animal procedures conducted are in compliance with local, state, and federal guidelines/recommendations.
- Approving alternative methods of sanitization or sanitization frequency of equipment.

The Research Integrity office will be responsible for:

- Providing administrative support of the IACUC members to facilitate their regulatory function.
- Maintaining policy and assuring regular review and update as necessary by the IACUC.
- Keeping relevant training records and providing them to the IACUC for review.

The Office of Comparative Medicine (CM) will be responsible for:

- Ensuring that Comparative Medicine personnel abide to this policy.
- Assuring that animal housing and equipment maintained by CM is properly cleaned/disinfected and sanitized as per this policy and appropriate IACUC SOP and in conjunction with all regulatory guidance.
- Providing pre-arranged sanitization of items that can be cycled through cage wash.

- Aiding the research laboratories with recommendations/services regarding appropriate sanitization and methods to monitor the effectiveness of the sanitization.

VIII. Policy Renewal Date
8/25/2026

IX. References
1. Animal Welfare Regulations, 9 CFR
2. Guide for the Care and Use of Laboratory Animals, 8th edition, 2011

POLICY APPROVAL

Initiating Authority: Vice President for Research and Institutional Official

Signature_____ Date: _____

Name: Gregg B. Fields, Ph.D., Interim Vice President for Research

Executed signature pages are available in the Initiating Authority Office(s)