CM SOP #405 – Manual Cage Washing

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I. Purpose & Scope

The purpose of this SOP is to establish standardized procedures for the manual cleaning and sanitation of rodent caging and related husbandry equipment in Comparative Medicine (CM) facilities at Florida Atlantic University (FAU).

Manual cage washing may be used when automated cage washing equipment is unavailable, when equipment requires pre-cleaning, when specialized equipment cannot be processed through automated washers, or during contingency operations.

Proper sanitation of animal housing equipment is critical to maintaining animal health, preventing disease transmission, and ensuring compliance with institutional policies and regulatory requirements.

This SOP applies to all CM personnel responsible for manual washing of cages, lids, water bottles, and related husbandry equipment

II. Roles & Responsibilities

Comparative Medicine Staff

- Performing manual cage washing procedures in accordance with this SOP.
- Maintaining separation between dirty and clean equipment areas.
- Removing gross debris from cages prior to washing.
- Ensuring proper detergent use and disinfectant contact times.
- Inspecting cages and accessories for cleanliness and structural integrity.
- Reporting damaged or defective equipment to supervisors.
- Documenting cage washing activities when required.

Research Staff, Students, Visitors

- Returning cages, water bottles, and enrichment devices to designated cage wash areas when required.
- Ensuring equipment originating from research laboratories is free of hazardous chemicals prior to submission to cage wash areas.
- Notifying CM staff if specialized equipment requires alternative sanitation procedures.
- Research personnel should not perform cage washing within CM cage wash areas unless authorized and trained.
- *Note: when described in an approved IACUC animal use protocol, researchers may change their own cages, but must comply with all CM standards and IACUC Policies.*

CM Management

- Ensuring adequate cage washing supplies and equipment are available.
- Ensuring staff receive appropriate training on cage washing procedures.

- Maintaining proper cage wash workflow and facility sanitation.
- Monitoring cage wash operations to ensure compliance with institutional standards.
- Ensuring detergents and disinfectants used are appropriate for animal housing sanitation.

CM Director and AV

- Providing oversight of sanitation procedures affecting animal housing.
- Approving detergents and disinfectants used for cage sanitation.
- Ensuring cage washing procedures support animal health and biosecurity.
- Modifying sanitation procedures if needed to address disease outbreaks or animal health concerns.

III. General Notes & Definitions

- **Dirty Area**
  - The dirty area refers to the cage wash space where used cages and equipment are received prior to washing.
  - This area may contain bedding, feces, food debris, and other contaminants.
- **Clean Area**
  - The clean area refers to the location where sanitized cages and equipment are stored after washing and drying.
  - Clean equipment must not be exposed to dirty equipment or contaminated surfaces.
- **Gross Debris**
  - Gross debris refers to bedding, feces, food residue, and other visible contaminants present on cages or equipment prior to washing.
  - Gross debris must be removed before detergent washing.
- **Detergent Cleaning**
  - Detergent cleaning refers to the use of an appropriate cleaning agent to remove organic material and debris.
  - Detergent cleaning must occur before disinfection to ensure effectiveness.
- **Disinfection**
  - Disinfection refers to the use of chemical agents to reduce microbial contamination on equipment surfaces.
  - Disinfectants must be used according to manufacturer instructions and required contact times.
- **ATP (Adenosine Triphosphate) Testing**
  - ATP testing is a rapid method used to assess cleanliness by detecting organic material on surfaces. ATP is present in living cells, including bacteria, animal waste, and food residue. ATP testing provides an objective measurement of sanitation effectiveness following cage and equipment cleaning.
  - When ATP testing should be performed:
    - As part of routine sanitation monitoring
    - After cleaning heavily soiled cages or equipment
    - After cleaning IVC rack components
    - During validation of cleaning procedures
    - During outbreak response or enhanced sanitation monitoring

    - When sanitation concerns are identified
    - At the direction of veterinary staff or management
  - Sampling Locations
    - Cage interior surfaces
    - Cage corners or seams
    - Cage lids
    - Food hoppers
    - Water bottles or sipper tubes
    - IVC rack shelves
    - Manifold or plenum surfaces
    - Sink or washing station surfaces
- **ATP Meter**
  - A handheld device used to measure ATP levels on surfaces using a swab-based sampling method. Results are reported as Relative Light Units (RLU).
- **ATP Swab**
  - A sterile, single-use sampling device used to collect material from a surface for ATP testing.
- **Relative Light Units (RLU)**
  - A numeric value generated by the ATP meter that indicates the amount of organic material present on a surface. Higher values indicate greater contamination. Acceptable RLU limits are defined in the Comparative Medicine sanitation monitoring program.

IV. Materials & Equipment

- **Cleaning Supplies**
  - Approved cage wash detergent
  - Approved disinfectant solution
  - Scrub brushes or cleaning pads
  - Hose with potable water supply
  - High-pressure sprayer (if available)
- **Sanitation Equipment**
  - Manual wash sinks or washing stations
  - Drying racks
  - Clean storage racks
- **Personal Protective Equipment (PPE)**
  - Disposable or reusable gloves
  - Waterproof apron or gown
  - Eye protection or face shield
  - Waterproof boots or shoe covers
- **ATP Testing Supplies**
  - ATP meter (approved model used by Comparative Medicine)
  - ATP test swabs compatible with the meter
  - Calibration control swabs (positive and negative controls, when applicable)
  - Disinfectant wipes for meter cleaning
  - ATP monitoring log sheet or electronic tracking system

V. Procedure

Manual cleaning of rodent caging

A. **Preparation**

Before beginning cage washing procedures:

1. Don appropriate PPE.
2. Ensure washing area is organized with separate dirty and clean workflow.
3. Confirm detergent and disinfectant solutions are prepared according to manufacturer instructions.

B. Removal of Gross Debris

1. Turn on dump station and dump all cages and feed in the opening, scraping off any remaining debris with a scraper. *Note: in the event of a power outage, employees who have been fit tested must wear an N95 face mask while dumping cages. Employees who have not been fit tested must wear a PAPR (see CM Management).*
2. Remove enrichment devices, water bottles, food hoppers, and cage lids.
3. Inspect cages for excessive debris before washing.
4. Gross debris should be removed prior to washing to improve cleaning effectiveness.

C. Detergent Washing

1. Rinse cages and accessories using potable water to remove remaining debris.
2. Apply approved detergent to all cage surfaces.
3. Scrub surfaces thoroughly, including corners and edges where debris may accumulate.
4. Ensure food hoppers, water bottles, and cage lids are cleaned separately.

D. Rinsing

1. Thoroughly rinse all items with potable water.
2. Ensure all detergent residue is removed.
3. Residual detergent can irritate animals and must be completely rinsed.

E. Disinfection

When required:

1. Apply approved disinfectant to cleaned surfaces.
2. Ensure surfaces remain wet for the manufacturer's required contact time.
3. Rinse if required by disinfectant manufacturer instructions.

Disinfection procedures may be required during disease outbreaks or when directed by veterinary staff.

F. Drying

1. Place washed cages and accessories on drying racks.
2. Allow equipment to air dry completely prior to reuse.
3. Ensure drying areas remain separate from dirty cage areas.

G. Inspection

Before returning cages to service:

1. Inspect cages for cleanliness.
2. Inspect for cracks, damaged edges, or defective components.
3. Remove damaged equipment from service and report to supervisors.

H. Storage

1. Clean cages and accessories should be stored in designated clean areas.
2. Clean equipment must not be exposed to contaminated surfaces or dirty cage wash areas

Manual cleaning of IVC rack components

Some Individually Ventilated Cage (IVC) rack components may require manual cleaning when automated cage washing is not appropriate.

A. Examples include:
- Air plenums
- Air manifolds
- Rack shelves
- Water lines and fittings
- Gaskets and seals

B. When cleaning IVC components manually:
1. Power down equipment
2. Remove loose debris: wipe or rinse surfaces to remove dust, bedding particles, and debris.
3. Clean surfaces with approved detergent and water using appropriate brushes or wipes.
4. Apply approved disinfectant according to manufacturer instructions when appropriate.
5. Allow components to fully dry before reassembly.
6. Inspect components for damage, loose fittings, or worn seals before returning equipment to service.

C. Follow manufacturer recommendations when cleaning specialized rack components.

ATP Testing for Verification of Sanitation

1. Don appropriate PPE.
2. Ensure the surface to be tested is clean and dry.
3. Turn on the ATP meter and confirm it is functioning properly.
4. Remove a sterile ATP swab from its packaging.
5. Swab a defined surface area using firm pressure.
6. Typical sampling area:
    a. approximately 10 cm x 10 cm
    b. or the entire surface of small items such as sipper tubes or cage corners
7. Insert the swab into the ATP meter according to manufacturer instructions.
8. Activate the test (see *CM SOP 113: Microbiological Monitoring of Sanitation* for complete instructions on meter use).
9. Record the RLU result according to the following guidance:
    a. Pass: 0-25
    b. Marginal: 26-50
    c. Fail: >50
10. Report any marginal or fail results to CM management for guidance on next steps in accordance with *CM SOP 113: Microbiological Monitoring of Sanitation.*

VI. Health & Safety

- Personnel performing manual cage washing may be exposed to:
    - Animal allergens
    - Waste materials
    - Cleaning chemicals

  - Wet or slippery surfaces
- To minimize risks:
  - Appropriate PPE must be worn at all times.
  - Hands must be washed after completing cage washing tasks.
  - Chemical disinfectants must be handled according to manufacturer safety guidelines.
  - Spills should be cleaned promptly to prevent slip hazards.
- Staff should report any injuries, chemical exposures, or equipment malfunctions to supervisors immediately.

VII. References & Attachments

- *Guide for the Care and Use of Laboratory Animals*
- AAALAC International
- Office of Laboratory Animal Welfare Public Health Service Policy on Humane Care and Use of Laboratory Animals

VIII. Revision History

Revision Date	Revision Number	Summary of Changes
11/09/2018	2	Added Rescue as a disinfectant
01/25/2022	3	Changed Rescue to Peroxigard, added shop vac/squeegee the cage washer if needed, added drying items on rack when possible
04/01/2026	4	Updated format, removed specific details about disinfectants (to be described in a different SOP to make changes more streamlined), added alternative use of a PAPR to an N95, added section on manually cleaning IVC rack components