Information Resources for Animal Facility
Sanitation and Cage Wash

AWIC Resource Series No. 19 - February 2003

Prepared for USUHS Lab Animal Medicine Residency Program
CMO 504
Facility Sanitation Program

Also see: Laboratory Animal Facilities and Management, 1995

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Animal Welfare Information Center
National Agricultural Library
U.S. Department of Agriculture

Published by:

U. S. Department of Agriculture
Agricultural Research Service
National Agricultural Library
Animal Welfare Information Center
Beltsville, Maryland 20705
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Policies and Links

CONTENTS

Management
Ventilation and Air Quality
Health, Safety and Ergonomics
Cleaning and Sterilization
Cage Cleaning and Animal Health/Behavior Effects

Selected World Wide Websites

Information on how to request materials that are included in the collection of the National Agricultural Library (NAL) may be found on the Collection Services website at http://www.nal.usda.gov/borrow-materials. Please read carefully as there are certain restrictions on media and document types.

MANAGEMENT

NAL call no.: QL55.A1L33
Descriptors: animal housing; materials; laboratories.

NAL Call Number: QL55.A1L33
Descriptors: laboratory animals; facilities; design; management; cages; washers; maintenance; operations; energy conservation.

NAL call no.: QL55.A1L33
Descriptors: laboratories; floors; design.

NAL call no.: QL55.A1L33
Descriptors: laboratory animals; animal housing; laboratory rearing; design; finishes; resins; floors; floor type; walls; ceilings.

Descriptors: computer system; housing experimental animal; information processing; practice guideline; health care facility; data base; computer program; computer terminal; laboratory personnel; documentation; control system; animal welfare; breeding; storage; cost benefit analysis; calculation; automation; management; nonhuman; mouse; rat; animal experiment; controlled study.

Descriptors: laboratory animal; environmental management; breeding machine and tool; rearing box; microorganism contamination; prevention of pollution; cleaning device; air cleaning; dust; indoor air pollution; dung processing machine; automatic control; waste water treatment; research and development; water intake (organism); laboratory organism; organism; management; rearing facilities; pollution; environmental pollution control; countermeasure; preclusion (protection); equipment; cleaning (purification); pollutant; matter; environmental pollution; processing equipment; control; sewage treatment; water and sewage treatment; treatment; development; feeding (food intake); animal behavior.

NAL Call Number: QL55.A1L33
Descriptors: laboratory animals; animal housing; laboratory rearing; design; cleaning and sterilization; cleaning equipment; cages.

NAL Call Number: QL55.A1L33
Descriptors: laboratory workers; laboratory animals; cages; washing; animal wastes; litter; ergonomics; safety at work; cost analysis; labor costs; productivity; automation; decision making.

NAL Call Number: QL55.A1L33
Descriptors: laboratories; laboratory animals; laboratory workers; cages; washing; power washers; automation; vacuum; robots; cleaning and sterilization; animal wastes; litter; dust control; labor productivity; occupational hazards; planning; design.

NAL Call Number: QL55.A1L33
Descriptors: laboratory animals; animal housing; cages; cleaning and sterilization; design; decontamination; work flow; equipment.

Return to Contents

VENTILATION and AIR QUALITY

Descriptors: air pollutants, occupational analysis; indoor air pollution; allergens analysis; ammonia analysis; laboratory animals; hydrocarbons analysis; mice; animal technicians; occupational Exposure, prevention and control; ventilation.

Descriptors: airborne allergens; air UV germicidal irradiation, air treatment method; air filtration, air treatment method; dilution ventilation, air treatment method; pressurization, air treatment method.

Descriptors: indoor air pollution analysis; allergens analysis; allergens urine; evaluation studies; health surveys; methods; mice; mice, inbred BALB C; rats; rats, Sprague-Dawley; Sweden.

Descriptors: air conditioning; air sampling; animal care facility; bacteria carrying particle; bacterial toxins; cage washing; endotoxin; endotoxin carrying particle; miscellaneous method; organic dust dispersal; pollution; ventilation.

HEALTH, SAFETY, and ERGONOMICS

Descriptors: asthma, immune system disease; respiratory system disease; atopy, immune system disease; laboratory animal allergy, allergy skin testing, diagnostic method; laminar flow caging, laboratory equipment; wet washings.

NAL Call Number: QL55.A1L33
Descriptors: laboratory animals; laboratories; noise abatement; acoustic properties; power washers; cages; panels; cost analysis; noise pollution; laboratory workers; laboratory hazards; occupational health; animal welfare, animal use refinement.

Descriptors: laboratory animals; containment of biohazards, instrumentation; animal housing; ventilation; air pollutants, occupational; air pressure; laboratory animals, microbiology; communicable disease control; environmental monitoring; animal housing, legislation and jurisprudence; lighting; mice; sound.

Descriptors: air pollutants, occupational analysis; allergens analysis; laboratory animals, immunology; asthma immunology; immunoglobulin E immunology; laboratory personnel; occupational diseases immunology; adult; occupational air pollutants, adverse effects; allergens adverse effects; asthma diagnosis; asthma physiopathology; bronchial hyperreactivity immunology; bronchial provocation tests; dose-response relationship, immunologic; occupational diseases diagnosis; occupational diseases physiopathology; radioallergosorbent test; rats; rats, Sprague-Dawley immunology; skin tests.

NAL Call Number: RB152.J6
Descriptors: carcinogens analysis; detergents; animal housing; surface active agents; 9,10-Dimethyl-1,2-benzanthracene analysis; aflatoxin-B1; aflatoxins analysis; chemistry; chromatography; high-pressure-liquid.

Descriptors: allergens; asthma prevention and control; animal housing; occupational exposure, prevention and control; ventilation; alpha-globulins immunology; containment of biohazards methods; laboratory animal science instrumentation; mice.
*Descriptors*: humans; laboratory workers; laboratory work; rodents; biochemical analysis; dust analysis; occupational exposure; air sampling; exposure levels; airborne particles; laboratory animals.

*Descriptors*: indoor air pollution, prevention and control; allergens, urine; laboratory animal science methods; air analysis; allergens analysis; asthma immunology; asthma prevention and control; hypersensitivity immunology; hypersensitivity prevention and control; laboratory animal science instrumentation; laboratory personnel; occupational diseases immunology; occupational diseases prevention and control; population density; rats; rats, inbred strains.

*Descriptors*: air pollutants, occupational analysis; allergens analysis; animal technicians; laboratory animals; hypersensitivity prevention and control; occupational air pollutants, adverse effects; allergens, adverse effects; animal husbandry instrumentation; hypersensitivity etiology; mice; rats; safety; ventilation.

*Descriptors*: environmental air pollutants analysis; allergens analysis; mice immunology; rats immunology; Allergens, urine; detergents pharmacology; immunoassay; rabbits.

*Descriptors*: indoor air pollution analysis; laboratory animals urine; environmental monitoring methods; laboratory personnel; occupational diseases immunology; occupational exposure analysis; allergens, adverse effects; analysis of variance; animal housing standards; mice; Netherlands; occupational diseases epidemiology; occupational diseases etiology; particle size; prevalence; rats; regression analysis; risk factors; ventilation.

*Descriptors*: animal experimentation; human engineering; musculoskeletal diseases etiology; occupational health; safety; workplace; biomechanics; musculoskeletal diseases, prevention and control; organizational policy; posture; risk assessment.

*Descriptors*: occupational accidents, statistics and numerical data; animal husbandry, statistics and numerical data; animal technicians, statistics and numerical data; bites and stings epidemiology; bites and stings etiology; occupational health; veterinarians, statistics and numerical data; wounds and injuries epidemiology; wounds and injuries etiology; bites and stings prevention and control; population surveillance; risk factors; United States epidemiology; wounds and injuries prevention and control.

Lieutier-Colas, F.; Meyer, P.; Larsson, P.; Malmberg, P.; Frossard, N.; Pauli, G.; de Blay, F. (2001). **Difference in exposure to airborne major rat allergen (Rat n 1) and to endotoxin in rat quarters according to tasks.** *Clinical and Experimental Allergy: Journal of the British Society for Allergy and Clinical Immunology* 31(9): 1449-1456.  
*Descriptors*: occupational air pollutants, adverse effects; air pollutants, occupation analysis; allergens adverse effects; allergens analysis; endotoxins adverse effects; endotoxins analysis; occupational exposure, adverse effects; occupational exposure analysis; rats immunology; respiratory hypersensitivity immunology; animal husbandry methods; animal technicians; France; animal housing; laboratory personnel; task performance and analysis; workplace.
*Descriptors*: glasswool, surgery mask, three-sheet synthetic fiber mask, charcoal single-sheet synthetic fiber mask, gauze mask, gas mask.

NAL call no.: QL55.A1L33
*Descriptors*: laboratories; ergonomics.

NAL call no.: QL55.A1L33
*Descriptors*: allergies; laboratory animals.

NAL call no.: QL55.A1L33
*Descriptors*: mice; design; laboratory infections; disease control; barrier husbandry; allergens; occupational disorders; stress; safety at work; ergonomics.

NAL call no.: QL55.A1L33
*Descriptors*: laboratory equipment; bottles; maintenance; ergonomics.

NAL call no.: QL55.A1L3
*Descriptors*: mice; laboratory mammals; cages; design; artificial ventilation; animal husbandry; allergens; occupational hazards; laboratory hazards; laboratory workers; safety at work; ergonomics.

*Descriptors*: environmental exposure; organic dust worker; air conditioning; room ventilation; fungus identification; bacterium identification; fungus culture; bacterium culture; fungus spore; gravimetry; parameter; lung lavage; cage; atmospheric dispersion; indoor air pollution; air quality; Basidiomycetes; Ascomycetes; bed; cell count; airborne particle; human; nonhuman; rat; controlled study; review.

*Descriptors*: laboratory animals; health survey; chemical manufacturing industry; chemical processing; inhalants; skin exposure; occupational exposure.

*Descriptors*: air pollutants, occupation analysis; allergens analysis; laboratory animals; hypersensitivity prevention and control; occupational exposure prevention and control; immunoglobulin E, blood; laboratory personnel; mice; questionnaires; ventilation.
CLEANING and STERILIZATION


Descriptors: cages; hygiene; quality controls; washing; animal housing; laboratory animals; detergents.


Descriptors: animal diseases; disease prevention; disinfectants; animal housing; hygiene; cages; laboratory animals.


NAL call no.: SF405.5.A23

Descriptors: water quality; bacterial count; microbial contamination; testing; automation; culture techniques; reverse osmosis.


NAL call no.: SF405.5.A23

Descriptors: laboratory animals; animal housing; monitoring; cleaning and sterilization; plate count; rapid methods; atp; detection; luminescence; correlation; cost analysis.


Descriptors: abstract; laboratory animals; sanitation.


NAL call no.: SF405.5.A23

Descriptors: laboratory equipment; microbial contamination; cleaning and sterilization; storage; duration; animal experiments.


NAL Call Number: QL55.A1L33

Descriptors: cages; rodents; robots; washing; waste treatment.


Descriptors: laboratory animals; animals, local anti-infective agents, pharmacology; decontamination methods; animal housing; hydrogen peroxide pharmacology; ventilation; Bacillus stearothermophilus isolation and purification; heat; laboratories; volatilization. M

Descriptors: eye injury epidemiology; nose irritation epidemiology; risk assessment; occupational exposure; rubber industry; laundry; textile industry; occupational hazard; carcinogenicity; human; nonhuman.


Sebesteny, A.; Milite, G.; Martelossi, P. (1992). Microbiologically monitored fumigation of a newly built SPF laboratory rodent facility. Laboratory Animals 26(2): 132-139. NAL call no.: QL55.A1L3 Descriptors: rats; mice; laboratories; fumigation; gnotobiotic animals; sterilizing; methyl bromide; monitoring; specific pathogen free laboratories.

Smith, M.D. (4 Jan 2000). Britz-Heidbrink Inc. Mini-CRADA, Powder Coating of Animal Enclosures. Kansas City Plant, Kansas City, MO (US). Sponsor: Department of Energy, Washington, DC. Report Number: KCP-613-6196; CRADA 96-KCP-1040 9p. Journal Announcement: USGRDR0124 Order this product from NTIS by: phone at 1-800-553-NTIS (U.S. customers); (703)605-6000 (other countries); fax at (703)605-6900; and email at orders@ntis.gov NTIS is located at 5285 Port Royal Road, Springfield, VA, 22161, USA. NTIS Prices: PC A02/MF A01 Country of Publication: United States Contract Number: AC04-76DP00613 Descriptors: animal enclosures; coatings; animals; phosphoric acid; stainless steels; testing; powder coatings.

CAGE CLEANING and ANIMAL HEALTH / BEHAVIOR EFFECTS

NAL Call Number: QL55.I5
Descriptors: rats; laboratory animals; litter; cleaning; frequency; ventilation; ammonia; air flow; epithelium; nose; respiratory system; membrane potential; cilia; activity.

NAL Call Number: QL55.A1L33
Descriptors: rabbits; laboratory animals; appetite; feed intake; feed dispensers; pelleted feeds; alfalfa meal; anorexia; animal husbandry; cage cleaning.

NAL Call Number: SF405.5.A23
Descriptors: rats; laboratory mammals; animal husbandry; cleaning; blood pressure; heart rate; telemetry; data collection; physical activity; animal behavior; duration; frequency; fearfulness; stress, arousal behavior.

NAL Call Number: 410.9 P94
Descriptors: sanitation; animal feed.

NAL call no.: 410 B77
Descriptors: mice; aggressive behavior; cages; cleaning; odors; male animals

NAL Call Number: HV4701.A557
Descriptors: mice; male animals; laboratory animals; age differences; fighting; odors; litter; sawdust; nests; social dominance; body weight; testes; testosterone; adrenal cortex; territoriality; cages; cleaning; animal welfare; urine, group housing, nesting material.

Descriptors: animal welfare; laboratory animals; arousal; noise; social environment; callithrix; cats; circadian rhythm; ferrets; loudness perception; mice; pitch perception; psychoacoustics; rabbits; rats; sound spectrography; species specificity; ultrasonics.

Descriptors: behavior; biosynchronization; physiology; sense organs (sensory reception); Cricetidae; Rodentia; Syrian hamster; cage cleaning; lighting conditions; phase response curve.

NAL call no.: QL55.A1L3
Descriptors: liveweight gain; bites; mice; laboratory mammals; cages; animal husbandry; air pollution; ammonia; carbon dioxide; animal health; artificial ventilation; reproductive performance; weaning weight; blood plasma; corticosterone; relative humidity; air temperature; litter size; mortality; nose; epithelium; histopathology; lesions; growth curve; leukocyte count;

NAL call no.: QL55.A1L3
Descriptors: rats; activity sampling; diurnal activity; animal husbandry

Descriptors: animal welfare; laboratory animal environment; laboratory noise; sound sources.

NAL Call Number: QL55.A1L3
Descriptors: laboratory animals; animal experiments; animal welfare; animal housing; laboratories; ultrasound; environment.

Return to Contents

SELECTED WORLD WIDE WEBSITES

Biosafety in Biomedical and Microbiological Laboratories

Cage Wash Caustic Odor Exhaust. A Case Study.

Cleaning Mickey’s Mess–How do you clean house for 130,000 mice? Article on cage cleaning robots.
http://www.emory.edu/WHSC/HSNEWS/PUB/Momentum/Spring02/lastword.html
**Detach Robotic Cage Wash System** (Steris Corporation USA)--The system utilizes robots, one at each end of the cage washer. The robot with its interchangeable mechanical gripper is programmed to handle different cage types, baskets containing bottles or cage lids, and the pallets on which the cages are transported.

http://www.steris.com/

**IWT Cage and Rack Washers, Cabinet Washers, Bottle Washers and Fillers, Kronos, Tunnel Washers** [IWT is part of the Techniplast Group]

http://www.tecniplast.it/en-us/

**Lab Animal Buyers' Guide–Husbandry**

http://guide.labanimal.com/guide/product2.jsp?a=4

**NIH Policies Related to Occupational Safety and Health in the Care and Use Laboratory Animals**

http://oacu.od.nih.gov/safety/program_sum.htm

**Pharmacal Research Laboratories Alkaline Detergents, Urine Scale Removers, Disinfectants, Neutralizers-Floor Cleaners -Foam Boosters -Deodorants, Antimicrobial Skin Care, Monitoring Products, Material Safety Data Sheets, Automatic Chemical Dispensing Systems for Rack, Tunnel and Bottle Washing Machines, Drum Handling Equipment, Spill Containment Pallets**

http://www.pharmacal.com/chemicaldiv.htm


http://www.roebiomed.com/

**Steris Cage and Rack Washing Cleaners, Cage and Rack Washing-Bedding Equipment, Chemical Indicators, Biological Indicators**

http://www.steris.com/

**Tecniplast Washing Division Introduces Kronos Bottle Automation Technologies**

http://www.tecniplastusa.com/washkronos.html

**Tecniplast Waste Disposal and Cage Changing Units**

http://www.tecniplast.it/laminar.php

**SANITATION SOPS**

University of California at San Francisco–Occupational Health and Safety
Return to Contents

Updated May 13, 2005