

प्रयोगशाला के जानवरों के प्रजनन,
देखभाल, प्रबंधन और आवास के लिए कोड
भाग 1 प्रयोगशाला के चूहे और मूषक
(दूसरा पुनरीक्षण)

**Code for Breeding, Care,
Management and Housing of
Laboratory Animals**
Part 1 Laboratory Mice and Rats
(*Second Revision*)

ICS 65.020.30

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FOREWORD

This Indian Standard (Part 1) (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Animal Husbandry and Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

Laboratory animals bred and maintained scientifically are necessary to get comparable results in biological experiments. The present standard lays down guidelines for breeding, care, management and housing of laboratory rats and mice so that large number of animals of uniform quality are available. It is hoped that this would streamline and step-up facilities for pharmaceutical, pesticidal efficacy and biologically oriented research. Rats and mice are used extensively for biological research and in biomedical field. This standard is published in 10 parts, these parts are namely:

Part 2	Laboratory rabbits
Part 3	Laboratory guinea — Pigs
Part 4	Laboratory golden hamsters
Part 5	Laboratory snakes
Part 6	Laboratory cotton rats (<i>Sigmodon Hispidus</i> and <i>Sigmodon Hispidus Hispidus</i>)
Part 7	Laboratory frogs
Part 8	Laboratory chicks
Part 9	Laboratory pigeons
Part 10	Laboratory mosquitoes

This standard was first published in 1970 and subsequently revised in 1981 to incorporate the areas in percentages for different sections of animal house. In this revision, the standard has been comprehensively reviewed and aligned with *The Breeding of and Experiments on Animals (Control and Supervision) Rules, 1998* under *Prevention of Cruelty to Animals Act, 1960* and also with 'CPCSEA guidelines for Laboratory Animal Facility, 2015'. The major additions include:

- a) Types of mating and considerations to be followed for breeding of rats and mice;
- b) Details of disease control procedures to be followed;
- c) Types of records to be kept; and
- d) Conduct of painful and invasive procedures and humane ends.

The composition of the Committee responsible for the formulation of this standard is given in [Annex A](#).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***CODE FOR BREEDING, CARE, MANAGEMENT AND
HOUSING OF LABORATORY ANIMALS****PART 1 LABORATORY MICE AND RATS***(Second Revision)***1 SCOPE**

This standard (Part 1) prescribes optimum conditions for housing, sanitation, personnel hygiene, feeding, watering, disease control, etc about care, breeding and management of laboratory mice and rats.

2 REFERENCE

This standard given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated was valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of this standard:

<i>IS No.</i>	<i>Title</i>
IS 5654 (Part 1) : 1970	Specification for feeds for laboratory animals: Part 1 Rats and mice

3 TERMINOLOGY

Following terminology shall be used for the purpose of this standard:

3.1 Laboratory Animal Facility — A place where laboratory animals are scientifically reared or kept for breeding, maintenance, or experimentation.

4 LOCATION AND HOUSING

4.1 Laboratory animal facilities should be situated in dry and well-drained areas free from smoke, obnoxious fumes, dust, noise, and extremes of temperatures.

4.2 Laboratory animal facilities should have secured access for the animal users, uninterrupted water and electricity supply and it should be away from residential areas and have a good source of fresh air.

4.3 Careful planning should be done to place laboratory animal facility areas near research

laboratories but separated from them by barriers, such as entry locks, corridors, or floors.

4.4 Laboratory animal facility should have the following areas:

- a) Animal rooms for breeding, holding experimentation, quarantine, isolation, etc;
- b) Service areas for cage sanitation, sterilization, washing, stores (feed, bedding, cages, and general facility storage);
- c) Space for waste handling and storage including refrigerated/cold storage for dead animal wastes before disposal and areas for service corridors to facilitate the movements of equipment and personnel;
- d) Disease diagnostic laboratory, procedure room, necropsy room;
- e) Office and support areas for staff and others; and
- f) Mechanical, electrical, heating, ventilation and air-conditioning (HVAC), building monitoring system (BMS), etc.

4.5 The area for each category depends on the number of animals, species housed, and the type of facility (conventional or barrier).

4.6 There should be adequate separation between clean and dirty areas/operations to avoid cross contamination. A 'dirty' operation should not be proximate to 'clean' areas.

4.7 Group housing should be considered for rats and mice.

5 CONSTRUCTIONAL REQUIREMENTS**5.1 Walls**

The walls should be fire-resistant, vermin-proof, moisture-resistant, and easily cleanable, with high-build coating (HBC) or solid panels. Walls in high-altitude areas should be thermally insulated.

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5.2 Interior

The inner surface of the walls should be waterproof, smooth and easy to clean.

5.3 Roof

A concrete roof with adequate insulation is preferable. If the roof is constructed of sheets or tiles, a false ceiling with moisture-resistant gypsum board, latex paint or HBC, and sealant at the intersection should be used to achieve air and water tightness.

5.4 Floor

5.4.1 The floor shall be constructed of concrete base with monolithic or having a minimal number of joints.

5.4.2 The floor should be relatively smooth for easy cleaning, skid-proof, and waterproof.

5.4.3 The floor should be resistant to wear and tear, disinfectant wash, high-temperature water, acids, and solvents.

5.4.4 The floor should be free from cracks and crevices. The junctions of the floor, ceiling, and walls of the rooms should be covered to avoid the accumulation of dirt and dust and for effective cleaning and disinfection.

5.4.5 The floor should be capable of withstanding 6 kPa (125.3 psf) live load to dampen vibration.

5.4.6 Vitrified tiles, seamless epoxy, or resinous floor coatings are preferred.

5.4.7 In the washing and sanitation area, ceramic tiles with non-slippery flooring shall be utilized.

5.5 Doors

5.5.1 The doors shall be designed with a seamless surface and frame, be unable to carry bacteria, and will not warp when in contact with disinfectants.

5.5.2 The door should have automatic door closure mechanisms along with shielded handles, door seals, kick plates, jamb guards, etc.

5.5.3 Doors should be opened inwards towards animals.

5.5.4 The door should also have a viewing panel for observation and safety reasons.

5.5.5 Adequate latches and locking arrangements should be provided.

5.5.6 Doors should be large enough to allow the easy passage of racks and equipment.

5.5.7 Doors should fit tightly within their frames and door seals should be placed to control air movement and to prevent vermin entry.

5.6 Windows

Exterior windows inside the mice and rat rooms are not advised, as they will affect the photoperiod of mice and rats.

5.7 Openings and Exhaust

5.7.1 Each animal room should have adequate air-exhaust provisions and the openings should be vermin proof and sealed.

5.7.2 There should be a balanced exhaust air system relative to the air handling unit (AHU) supply.

5.7.3 Exhaust air should be cleared outdoors without recirculation inside the room.

5.7.4 There should be a separate exhaust system for the quarantine/isolation room, sanitation and washing area, and necropsy rooms.

5.8 Corridors

5.8.1 Corridors should have adequate space for the movement of personnel and equipment inside the room.

5.8.2 Corners between floor and walls should be covered for easy and thorough cleaning.

5.9 Floor Drains

Floor drains and washbasin are not recommended in rodent rooms.

5.10 Airlock for Main Entrance

5.10.1 It is desirable to have an airlock followed by an air shower after wearing the necessary personal protective equipment (PPE) at the main entrance of the animal facility.

5.10.2 Change area and air shower facilities should be located near the personnel entrance to the facility.

5.11 Light

5.11.1 There should be adequate arrangements for lighting inside the rooms.

5.11.2 Standard fluorescent light or cool white LED light is preferred with an automatic timer system to

maintain the photoperiod of 12/12 h to 10/14 h light/dark with illumination less than 400 lux and preferably about 325 lux unit when measured approximately 1 m above the floor.

5.11.3 The lighting should be diffused throughout the animal room and fixed accordingly so that the bottom-most cages in the animal rooms also receive similar light intensity.

5.11.4 Lighting fixtures, switches, etc shall be designed and placed accordingly to prevent vermin/insects entry.

5.11.5 All the control switches should be kept, as far as possible, outside the rooms.

5.12 Ventilation and Temperature

5.12.1 An ideal temperature of 20 °C to 26 °C (depending on the species/strain used and lactating mother and pups) with 40 percent to 70 percent relative humidity should be maintained.

5.12.2 A 10 to 15 air change/hour with 100 percent fresh air is recommended in animal rooms. However, consideration should be given to possible heat loads and the number of animals involved.

5.12.3 The heating, ventilation, and air conditioning (HVAC) system of each room should control the temperature and relative humidity through the BMS.

5.12.3.1 In air-conditioned rooms, each animal room should have temperature and relative humidity gauges mounted on the outside wall.

5.12.3.2 When employing a room air conditioner system, necessary provisions should be provided for controlling temperature, relative humidity, and airflow.

5.12.3.3 The controls for lighting, air-conditioning, exhaust fans, etc should also be located outside the animal room.

5.12.3.4 Exhausts should be installed close to ground level when cages are placed parallel to walls.

5.12.3.5 Racks should be arranged accordingly in a room to optimize air exchange.

5.12.3.6 Ammonia content in an animal room shall not exceed 10 ppm and intra-cage ammonia levels should be kept to a minimum or absent.

5.12.3.7 Alternate or emergency power should be available in the event of power failure to maintain critical services like HVAC, lighting, and housing

equipment in animal rooms and other essential areas.

5.13 Vermin Control

5.13.1 All interior animal housing and support units must ensure that windows, doors, and exterior walls should be sealed to prevent the entrance of pests and predators. Interior walls, drains, and vents shall be checked for cracks and leaks and repaired as needed.

5.13.2 Effective vermin management procedures should be in place to ensure that the livestock facility is free of pest and rodent infestation.

5.14 Noise and Vibrations

It is recommended to control the noise and vibration in animal rooms to preferably less than 85 db.

6 HOUSING AND EQUIPMENT

6.1 Racks

6.1.1 The rooms should have suitable racks or shelves to hold the animal cages.

6.1.2 The racks should be made of corrosion-resistant material.

6.1.3 The racks should be impervious to liquid and moisture. There should be a possibility to clean and sanitize them easily.

6.1.4 Racks should be positioned in a room to optimize air exchange and avoid animals being exposed to draughts.

6.1.5 The racks should be minimal so that the topmost shelf is so placed that the inspection of the topmost cage is possible at any time.

6.1.6 The lowest shelf of the rack should be 30 cm above the ground and other shelves should be placed accordingly free circulation of air between cages.

6.1.7 Racks should be positioned in a room to optimize air exchange and avoid animals being exposed to draughts.

6.2 Cages

6.2.1 The cages should be made of smooth corrosion-resistant material that does not tear off or are gnawed away by the animal and preferably have rounded corners and bottoms made of a suitable noncorrosive material.

6.2.2 It is recommended to use cages made of

material such as polypropylene (opaque) or polycarbonate, polysulfone, and polyetherimide (transparent), with wire mesh tops or any other similar suitable material that is easy to clean and resistant to sterilization at 121 °C and chemical treatment.

6.2.3 The lid should provide a space for keeping the water bottle.

6.2.4 Wire lids for cages should be carefully selected to prevent toe injuries.

6.2.5 Each cage should be provided with proper enrichment and nesting material.

6.2.6 The cages should be impervious to liquids and moisture, easily cleaned and sanitized.

6.2.7 Static isolator cages must be cleaned once a week to avoid excessive ammonia and carbon dioxide levels.

6.2.8 The minimum floor area recommended for rats and mice in cages (based on their weight/size and behavioral activity) is as given in [Table 1](#).

6.3 Individual Ventilated Caging (IVC) System

6.3.1 The IVC system can be used for genetically modified strains and immuno-deficient strains or animals that require special care and housing.

6.3.2 An individual ventilated caging system is designed to maintain a clean supply of air using a HEPA filter.

6.3.3 This IVC system must provide 50 to 100 air changes per hour inside the cages with contaminated exhaust air directly connected to room exhaust preventing cross-contamination of the animal rooms.

6.3.4 Unlike 10 to 15 air changes per hour (ACH) recommended in conventional housing, a minimum of 5 ACH may be sufficient to maintain room air quality in case animals are housed in IVCs at room level.

However, this should be assessed based on engineering recommendations and estimated room procedures.

6.3.5 The choice between positive and negative pressure in ventilated cages should be based on requirements.

6.3.6 An alarm system must be provided in IVC when there is an interrupted power failure causing a defect in the supply air to cages.

6.3.7 Nesting material and enrichment devices should be provided in individual ventilated cages.

Table 1 Space Requirements

(Clause [6.2.8](#))

SI No.	Animals	Weight in, gm	Floor Area/Animal, inch ² /(cm ²)	Height, inch/(cm)
(1)	(2)	(3)	(4)	(5)
i)	Mice in groups	Less than 10	6/(38.7)	5 (12.7)
		Up to 15	8/(51.6)	5 (12.7)
		Up to 25	12/(77.4)	5 (12.7)
		25 and above	< 15 (< 96.7)	5 (12.7)
ii)	Female mice + litter	–	51 (330)	5 (12.7)
iii)	Rats in groups	Less than 100	17 (109.6)	7 (17.8)
		Up to 200	23 (148.35)	7 (17.8)
		Up to 300	29 (187.05)	7 (17.8)
		Up to 400	40 (258)	7 (17.8)
		Up to 500	60 (387)	7 (17.8)
		< 500	< 709 (< 451.5)	7 (17.8)
iv)	Female rat with litter	–	124 (800)	7 (17.8)

6.4 Water Supply

6.4.1 There should be an adequate supply of drinking water free from any type of contamination.

6.4.2 The water bottle should be of polypropylene, polycarbonate, polysulfone, or higher quality that can withstand autoclaving.

6.4.3 Water bottles should be provisioned with suitable nozzles.

6.4.4 The water shall be free from any contamination, and it can be treated with reverse osmosis, acidification, or steam sterilization before it is dispensed to the animals.

6.4.5 Water should be given ad libitum and periodic changing of the water bottles is necessary to prevent contamination.

7 FOOD AND BEDDING

7.1 Bedding

- a) Bedding should be non-toxic, and free of dust, microbial, parasitic, or chemical contaminants;
- b) The bedding material should be atraumatic, moisture absorbent, and ammonia binding that can absorb urine and other moisture of the cage;
- c) The bedding material should withstand steam sterilization;
- d) The depth of bedding should be at least a minimum of 2 cm above the floor of the cages; and
- e) Bedding shall be changed at least twice a week and as and when required.

7.2 Feeding

The feed shall conform to the requirements given in IS 5654 (Part 1).

8 CLEANING, STERILIZATION AND WASTE DISPOSAL

8.1 Cleaning of Laboratory Animal Facility

- a) The laboratory animal facility should have adequate sanitizing and washing facilities;
- b) Suitable detergents, and disinfectants, should be used in rotation for floor cleaning; and

- c) Deodorants designed to mask animal odors should not be used in housing.

8.2 Cleaning of Cages, Bottles, Tubes

- a) Cages should be sanitized before animals are placed in them. Generally, cages (including lids, food hoppers, etc) should be changed and sanitized at least once a week;
- b) However, a decision to change the frequency of such bedding changes or cage washing should be based on factors such as the concentration of ammonia, appearance of the cage, condition of the bedding, and number and size of the animals housed in the cage;
- c) The routine sterilization of drinking bottles and tubes should be done once a week;
- d) Suitable disinfectants based on the manufacturer's recommendation may be used for cage washing and water bottle washing; and
- e) Autoclaving of cages should preferably be done at 121 °C for 15 min at 1.05 kg/cm² (15 lb) pressure.

8.3 Waste Disposal

All wastes from the animal facility should be collected and disposed of as per the biosafety norms and categorized accordingly in respective color-coded bags as classified below and disposed accordingly safely and hygienically:

- a) Yellow bags — It shall handle following components:
 - 1) Animal anatomical waste: Experimental animal carcasses, body parts, organs, and tissues, including the waste generated from animals used in experiments or testing in laboratory animal facility, cytotoxic drugs and antibiotics with their vials;
 - 2) Liquid waste generated due to the use of chemicals in the production of biological and used or discarded disinfectants; and
 - 3) Discarded beddings contaminated with blood or body fluid.
- b) Red bags — To handle wastes generated from disposable items such as tubing,

- bottles, and syringes (without needles and fixed needle syringes) vacutainers with their needles cut) and gloves;
- c) White puncture-proof containers — To handle needles, syringes with fixed needles, needles from needle tip cutters or burners, scalpels, blades, or any other contaminated sharp object that may cause punctures and cuts. This includes both used, discarded, and contaminated metal sharps; and
 - d) Blue bags — To handle broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.

8.4 Storage and Transport

- a) Waste materials should be removed from the animal rooms at frequent intervals;
- b) If storage of waste materials before removal is necessary, the holding area should also be located in a place physically separate from the main animal rooms and free from flies, cockroaches, rodents, and other pests;
- c) The waste materials should be finally disposed of preferably by incineration or by other methods prescribed by local municipal or civic bodies;
- d) The duration of storage should not exceed 24 h;
- e) Each bag may be clearly labeled with details of the facility;
- f) The waste should be transported for treatment either in trolleys or in a covered wheelbarrow; and
- g) Manual loading should be avoided as far as possible. The bags/containers containing biomedical wastes should be tied/lidded before transportation or as suggested by local bodies.

9 BREEDING

9.1 General Characteristics of Mice and Rats

- a) Optimal reproductive age span: mice 2 to 10 months; rats 2 to 15 months;
- b) Estrous cycle: 4 to 5 days;
- c) Gestation: mice 18 to 21 days; rats 21 to 23 days;

- d) Weaning age: ≥ 19 days old, usually 21 days;
- e) Postpartum estrus: a period within 24 h after parturition when females are fertile and can conceive. Weaning age (usually ~ 21 days);
- f) Adult: defined as 6 weeks of age or older, based on the average age of sexual maturity; and
- g) Female rodents must be at least six weeks old to start breeding.

9.2 Types of Mating

9.2.1 *Homozygous Mutant (-/-) x Homozygous Mutant (-/-)*

This breeding scheme is used when homozygous mutants of both sexes are viable and fertile.

9.2.2 *Heterozygous Mutant (-/+) x Homozygous Mutant (-/-)*

This breeding scheme is used when only one gender of a mutant is a viable and fertile homozygote (the other gender may be infertile or have reduced fertility, embryonic lethal, die in utero, or die before reaching sexual maturity).

9.2.3 *Heterozygous Mutant (-/+) x Heterozygous Mutant (-/+)*

This breeding scheme is used when homozygous mutant mice are severely impaired, infertile, embryonic lethal, die in utero, or die before reaching sexual maturity.

9.3 Breeding cages should be regularly monitored to ensure the well-being of adults and neonates, appropriate cage environment, and colony breeding performance.

9.4 Appropriate animal usage records for each breeder should be maintained containing a mating number, male number, female number, date of mating, pedigree number (in case of inbreeding), litter number and size, litter birth date and weaned date, and final disposition (that is, euthanized, died, stock, used in the experiment, or retained for breeding). The pedigree record should be maintained when animals are maintained inbred.

9.5 Genetically modified mice require consistent genotyping and proper record details when maintained in hom X het or hemi X wild type or het x het.

9.6 It is encouraged to decrease litter size, by euthanizing undesired offspring, before day 14 of age.

9.7 Early culling of mice with undesired phenotypes, undesired sex, or undesired genotypes in genetically modified animals and breeding colonies is acceptable.

9.8 Genetic Monitoring

- a) Genetic monitoring needs to be done to maintain quality control when breeding inbred and genetically modified rodents. Any genetic contamination or genetic drift in the animals over time can alter research results and interpretation;
- b) This needs to be performed periodically in the facility housing inbred, transgenic, and knock out animals; and
- c) DNA-based molecular techniques, biochemical markers, or microsatellite markers are preferred in performing genotyping of these animals.

10 PERSONNEL

10.1 All persons recruited for work in laboratory animal facility should have a natural aptitude for handling animals and they should be given training for their particular duties before they are given independent charge of the work.

10.2 The persons required to handle animals should be of sound health and should not be suffering from infectious diseases communicable to animals or other fellow workers. Medical examination before recruitment and at periodical intervals should be arranged.

10.3 The workers before entering the animal premises, should wash their hands, feet, and face with soap and water. They should take a shower where necessary.

10.4 He/she should either completely change the street clothes with uniforms or apparel issued specifically for the purpose or at least cover his/her clothes, provided they are reasonably clean, with protective apparel. The protective apparel should consist of a cotton apron or coat that covers the body from neck to knees and arms up to elbows, hand gloves, a suitable cover for the head, a white cloth mask that covers the nose and mouth, and soft shoes or footwear or disposable shoe cover. These articles should be issued to individuals by name and should be stored when not in use in lockers or shelves where they shall not be contaminated with the clothes of others.

10.5 Before the workers leave the laboratory animal facility for the day, their apparel should be removed and placed in their proper place. In no case should the clothes, shoes, etc, be allowed to be taken out of the premises. Clothing should be laundered every day.

10.6 During work time, workers should be instructed to wash their hands with soap and water as often as necessary. Individual absorbent towels or other hygienic facilities for drying hands should be available near the washbasins.

10.7 Persons should be allotted work in such a manner that the same person handles the same batch of animals daily except in emergencies.

10.8 Access to the animal housing facilities by unauthorized personnel should be restricted.

10.9 No material other than those required for work should be permitted to be taken into the animal rooms.

10.10 Eating food, chewing pan, or smoking in the rooms should be prohibited.

10.11 Toilets for workers should be located outside the animal rooms and every time they visit the toilet rooms, they should follow all the procedures required while leaving or entering the laboratory animal facility.

10.12 Floor mats soaked in a suitable disinfectant may be placed at the entrance of each block of animal rooms/clean area so that the footwear may be wiped against them before entering or leaving the rooms.

10.13 There should be adequate contingency plans to cover such emergencies as flooding and fire, or the breakdown of lighting, heating, cooling, or ventilation.

10.14 Occupational Health Program

The occupational health program is voluntary but it should be highly encouraged for all members of any institute who work in laboratory animal facilities or have substantial animal contact. This includes animal resource personnel, research technicians, research investigators, faculty, and staff. The program consists of the following if deemed necessary by the occupational health physician.

10.15 Completion of Occupational Health Questionnaire

10.15.1 Review of the health questionnaire and risk assessment performed by the occupational health

physician who will determine which test will be performed on the individual.

10.15.2 These procedures shall be offered at no cost to the employee/staff and shall be conducted under the direction of a licensed healthcare professional.

10.15.3 Vaccination/medical records should be maintained in the employee's personnel folder and shall be provided upon written request for copying to the subject employee or anyone having written consent of the subject employee.

11 DISEASE CONTROL PROCEDURES

11.1 Adequate precautions, including quarantine, periodical inspection, and preventive measures, should be enforced to prevent infection of the animals by ectoparasites or infectious diseases.

11.2 All fresh batches of animals received should be quarantined for at least one week (preferably three weeks) in separate premises before being introduced into the regular stock.

11.3 Only healthy animals should be allowed to enter the premises.

11.4 Infections, if any are noticed, should be immediately eliminated by:

- a) Euthanizing the infected animals, if possible; and
- b) Locating and treating the source of infection.

11.5 All dead animals should be immediately removed and disposed off.

11.6 If any mortality occurs in the colony, the cause of death should be investigated and if traced, steps should be taken to prevent the spread of the infection.

11.7 Well-equipped disease diagnostic laboratory facilities should be provided in each animal facility.

11.8 Morbid/sick animals should be sent from breeding rooms for diagnosis and thereafter disposed of.

11.9 In the case of very small animal facilities, collaboration with competent laboratories may be arranged for such investigation.

11.10 Anesthesia and Euthanasia

11.10.1 The principles and guidelines for anesthesia and euthanasia should be followed as recommended

by CCSEA guidelines for anesthesia and euthanasia. However, if carbon dioxide is utilized to kill mice or rats, an inhalant anaesthetic must first be administered to the animals.

11.10.2 Procurement of anesthetic drugs and their custody and stocking and administration shall be done by a qualified veterinarian only.

11.11 Health Monitoring

11.11.1 Laboratory animal veterinarian shall be in charge of all animals housed and experimented and shall be responsible for ensuring their health and well-being, performing and documenting welfare assessments of all animals in the colony daily.

11.11.2 All animal cages must be checked once a day for signs of illness and/or injury, including weekends and holidays.

11.11.3 Any signs such as unable to eat or drink, diarrhea, lack of feces or any change in consistency or appearance, bloody urine, etc, or signs of injury must be reported to the veterinarian immediately.

11.11.4 The facility's veterinarian must take a call for treatment or euthanasia for animals.

11.11.5 When there is a sudden death and probable disease, a post-mortem examination should be performed and further diagnostic tests if the veterinarian deems it necessary and shall be documented.

11.11.6 The veterinarian may recommend histopathological evaluation and provide advice as needed to isolate the animal.

11.11.7 The entire colony shall be quarantined if tests are positive for infectious disease.

11.11.8 When a diseased colony (or a suspected disease) is removed, the animal room is disinfected/fumigated before the introduction of another batch of animals.

11.11.9 Organization should have its health-monitoring program based on the disease prevalence in that area.

11.11.10 An external contract laboratory or in-house laboratory should be used to perform a health monitoring program of various microorganisms.

11.11.11 The health monitoring reports shall be available in the facility from time to time using sentinel animals.

12 OFFICER-IN-CHARGE OF LABORATORY ANIMAL FACILITY

The person actually in charge of the laboratory animal facility should be a veterinarian.

13 RECORDS

Suitable records shall be maintained as mentioned below:

- a) Animal breeding and mating;
- b) Stock/census;
- c) Procurement, supply/sale;
- d) Culling;
- e) Feeding;
- f) Environmental variables (*Min/Max* temperature, RH, etc);
- g) Mortality and necropsy records;
- h) Health records of animals and staff;
- j) Laboratory animal facility plans including floor plan and all fixtures, etc; and
- k) CCTV footage register.

14 POTENTIALLY PAINFUL AND INVASIVE PROCEDURES AND HUMANE END POINTS

14.1 Potentially Painful and Invasive Procedures

Invasive procedures shall only be done under strict supervision and guidance of a veterinarian, under

general anesthesia and analgesia shall be offered in such cases.

14.2 Humane Endpoints

14.2.1 It shall be the responsibility of each investigator to ensure the avoidance of unnecessary suffering of laboratory animals during experimentation.

14.2.2 To ensure this, the determination and implementation of humane endpoints such as the ones based on weight loss, body temperature, activity, biochemical parameters, corticosteroid levels, etc shall be considered.

14.2.3 Death as an endpoint to a procedure should be avoided as far as possible.

14.2.4 It shall be the veterinarian's responsibility to observe and implement actions to alleviate the pain and suffering of experimental animals based on these humane endpoints.

14.2.5 Where ever the investigator and the veterinarian cannot reach a consensus to act based on humane endpoints to alleviate pain and suffering, the decision of veterinarian shall prevail and be the final.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

Animal Husbandry and Equipment Sectional Committee, FAD 32

<i>Organization</i>	<i>Representative(s)</i>
Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu, Jammu	DR BHUPENDRA NATH TRIPATHI (<i>Chairperson</i>)
All India Poultry Breeders Association, New Delhi	DR A. K. RAJPUT DR R. K. JAISWAL (<i>Alternate</i>)
Animal Welfare Board of India, Faridabad	MS PRACHI JAIN DR DEBALINA MITRA (<i>Alternate</i>)
Bihar Animal Sciences University, Patna	DR DEEP NARAYAN SINGH DR RANJANA SINHA (<i>Alternate</i>)
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This Indian Standard has been developed from Doc No.: FAD 32 (25869).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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