

AEC STANDARD OPERATING PROCEDURES

SOP No:	17	
SOP	Rats	
Scientific Name:	<i>Rattus norvegicus</i>	
Category:	2 or 3 only	
Approved activities:	Activity	Category
	a. Capture, restraint and handling	2
	b. The appropriate care of classroom pet rats	2
	c. Breeding of rats in the classroom	2
	d. Measurement of body weight	2
	e. Measurement of body condition, growth and body proportions	2
	f. Measurement of mild dietary effects including palatability	3
Approval Level:	Where an activity is not listed in this SOP, approval must be sought from the Animal Ethics Committee and confirmed before it can be undertaken.	
Authority:	Government Schools – Department for Education and Childhood Development Animal Ethics Committee Independent and Catholic Schools – Non-Government Schools Animal Ethics Committee	
Authority Approval Date:	1 August 2010	
Last update	21 April 2020	
Disclaimer:	<i>This document may be updated at any time. You should check the web site regularly to ensure that you are meeting the most recent recommendations. If you note any concerns with the information provided (inadequate, incorrect) please contact the relevant AEC</i>	
Licensing Requirement:	Not applicable	
Compliance Requirement:	The keeping of this species requires approval from the School Principal. It is recommended that this Standard Operating Procedure be followed as a minimum in the provision of appropriate care and housing for this species.	

General Information: Rats are rodents and have sharp teeth for gnawing that grow continuously throughout their life. Rats are not native to Australia and came on the sailing ships from Europe. They are now wild in much of Australia particularly in cities and towns and are a pest and threat to native species due to their prolific breeding and feeding capabilities. Wild rats should never be caught and kept as pets. Rats, *Rattus rattus* - Black or Ship rat are those which are used in laboratories and should not be confused with *Rattus norvegicus* - Brown, Sewer or Norway rat. The rats used extensively in laboratory trials are domesticated animals related to the common sewer rat. However, many years of selective breeding have developed very tame animals. They are very intelligent and make affectionate pets. Colours vary from pure white (albino) to hooded rats (coloured head) to solid colourings of black, brown or creamy grey. A group of rats is referred to as a mischief.

- Physical Attributes:**
- **Size (adult):** Average length nose to tail 25-35cm.
 - **Weight (adult):** Male 200g – 600g, female 250g – 400g.
 - **Life span:** 2-4 years.
 - **Sexual maturity:** At 3 months
 - **Gestation period:** 20 – 22 days.
 - **Number of offspring:** 6-12 pups.

Behaviour: **Normal:** They are nocturnal and therefore more active during the night, early morning and late afternoon and will be resting more during the day. Running, jumping, climbing and standing up on their hind legs are all considered normal behaviours if provided with adequate cage space. Rats will huddle together when sleeping to keep warm. The foetal position is the normal sleeping position for a rat.

Socialisation: They are used to being in colonies but must be kept according to the need to breed or not, but cannot be kept alone. Rats are communal animals and readily accept new arrivals. However, when new animals are added they should be observed for a while to ensure acceptance. It is not advisable to introduce an adult male to a cage of more adult males. Females accept other

AEC STANDARD OPERATING PROCEDURES

females readily at any age but males will fight to the stage of drawing blood and inflicting nasty wounds. Males should be introduced from birth. Therefore, it is recommended to keep single sex groups if not breeding.

Male rats are territorial and 'mark' their territories. For this reason, in small cages only house one male rat. If more males are to be kept, then a larger cage must be supplied. They can also smell other predators such as dogs and cats and should out of view and reach of such animals to avoid stressing the rats.

Activity levels (hibernation etc.): As young rats they will play a lot but as they get older, rats have a reduced activity level. They do enjoy socialising with others and with humans when very tame. Rats are intelligent and enjoy environmental enrichment such as boxes and mazes.

Environment:

Remember over-crowding places undue stress on the rats and may lead to fighting and injury. Housing should provide areas for rats to rest and withdraw from each other, areas to socialise and to exhibit normal behaviours.

Housing/Space: The following cage aspects are required to provide basic housing for one or two rats. An area of 500sq cms per small rat (<250gms) and the minimum recommended cage size should be 60 x 30 x 25 cm. The space between the bars of a cage should be no more than 1 -1.25cm as otherwise they can escape. For larger rats 800 sq. cms (i.e. 550g or more) of area is required and group size should be decreased or cage floor area increased, on the basis that as rats grow, while play behaviour decreases, cage floor area must accommodate other behaviours including social interaction. Rats should be able to turn around and stand up on their hind legs freely in the cage so cage height may need to be taller for larger sized rats. A part solid and part wire lid for security and ventilation is ideal and wire mesh should be woven or flat mesh with very small squares. Alternatively use an enclosure made from glass or a material not easily chewed. Rats will chew through exposed areas of wood or plastic. Sawdust/wood shavings can be used for the cage base and bedding with a minimum depth of 2cms. It should be absorbent and free from dust and splinters, non-toxic and edible. Shredded paper, paper towel, cardboard boxes and tissues for sleeping areas, nesting and to play in, as well as dark sleeping areas and varied floor levels are required. A water sipper with metal tubing and a basket made from approximately 10mm wire suspended from the side of the cage is suitable for pellets. Adequate ventilation reduces cage odours, as does regular cage cleaning. Rats should be protected from draughts, fumes and direct sunlight. If indoors they should be kept away from direct cooling and heating appliances.

Movement: Rats do like some activity but do not need a lot of activity to maintain muscles or reduce fat. Young small rats will like exercise wheels. Boxes, ladders, ropes, hollow logs, tubes and ramps assist with movement and provide for enrichment.

Water: Fresh water must be provided daily through sipper bottles. Sipper bottles are preferred as water bowls are often contaminated with faeces and cage materials.

Temperature: Optimum temperatures are between 18-23°C. They should have adequate bedding and shelter to protect them from weather extremes.

Lighting: A natural source of light is essential but they should not be placed in direct hot sun or near windows or glass doors. An artificial light (45 – 60 lux) can be used but must be on for no more than 12 hours during the day. Albino rats are particularly sensitive to light due to a lack of pigmentation so prefer low light areas.

Covering: There must be a cover over the cage to protect rats from external harms and to prevent them from escaping. Mesh top or part solid/ part mesh are good and help with ventilation.

Shelter: The cage must provide areas to shelter from the weather, retreats and hiding places. Cardboard boxes, wooden boxes, large pipes are items that can be used. They need creative items to stimulate them – roots and twigs for gnawing, toys, straw, newspaper or peat moss for bedding and chewing. Depending on the size of the cage landscape and play materials such as branches, leaves, flowers, hollow logs, cardboard tubes, large rocks, banksias or pine cones, mallee roots, pieces of native cherry can be provided which allow them to shelter and hide. Rats are sensitive to loud noise and should be placed in a quiet area. People should not bang on the glass.

Cleaning: As faecal and urine production can be high, cages must be cleaned weekly or more often if required. Covering the cage floor with absorbent material

AEC STANDARD OPERATING PROCEDURES

can ease cleaning. Rats should be removed prior to cleaning. Cages can be scrubbed with hot water and dishwashing detergent. Let the cage dry prior to returning the rat/s to it. Talk to your local pet shop or Vet clinic if you wish to clean with alternative products as some are toxic. Rats are dependent on smell but are also sensitive to smell so avoid exposure to chemicals, perfumes and deodorisers.

Feeding:

Diet: Rats are omnivores and commercially developed pellets are available that provide sufficient protein, vitamins and minerals ensuring a balanced diet. Plenty of fresh clean water should be available at all times. Rats will foul their food and water so these should be kept in dishes off the floor (e.g. water sipper bottle). Rats can become overweight if not fed appropriate amounts. As rats teeth continue to grow they need hard foods and other items such as nuts or untreated wood to chew on to prevent their teeth from overgrowing.

Daily requirements: A generous handful of rat pellets every day. Greens can be fed 2 to 3 times per week. Ensure that rats are fed according to their life stage (e.g. Lactating females need four times the daily amount of food and water).

Supplementary feeding: Seeds, fruit, insects, occasional boiled egg and vegetables may be added. Wash the fruit and vegetable first before feeding. Never feed insects that have been killed with insecticide spray.

Equipment: Water sipper bottle with metal tubing, bowls.

Breeding:

- **Gestation period:** 21 – 23 days
- **Weaning :** 4 – 5 weeks of age
- **Litter size:** 6 – 12 pups

Mating: Rats of good temperament should be chosen when breeding. Female rats come into heat every 4-5 days unless they are bred. Females are receptive to males usually at night for a 12-hour period. After giving birth, female rats can come back into heat cycles between 2 to 5 days later. Males may nibble at the female's head or body or examine her ano-genital area prior to mating. Offspring should be separated into single sex groups at weaning to prevent inbreeding and unwanted pregnancies.

Pregnancy: Weaning age varies with size and health of litters. Young rats are completely independent from 6 weeks of age. Female rats should not be bred before 65 days of age. Pregnant females will show nesting behaviour prior to giving birth and when lactating. Female rats can become more aggressive in the first few weeks of pregnancy so care should be taken when housed with other rats. They should also not be stressed in the first few days after giving birth.

Male rats should be removed from the cage just prior to the female giving birth as males can injure the new pups after they are born.

The breeding of rats for the purpose of dissection or feeding to reptiles is not permitted.


Handling:

Humans: Children should be seated with a towel in their lap and should only handle rats under adult supervision with petting preferable to holding. Rats should never be touched on the head area. Be aware of biting risks. Before handling rats, wash hands before handling the rats as fingers that have been touching food smell like food and may be bitten by mistake. Rats are often easy to handle but may bite if frightened, provoked or driven into a corner. It is best to let the rat come forward to the cage opening if possible rather than reaching in to catch the rat. Well-designed cages with nest boxes can make catching of rats easier if they are shy. Avoid loud noises and voices when handling rats. Rats should be picked up using two hands. One hand goes under the rat's chest and the other under the tail base and hind legs supporting the back end. Hold the rat firmly but not too tight when being handled. Lower the rat onto the cage floor to return it to its enclosure. Never pick rats up by the base of the tail. (See video link in the Resources section) Even very young rats can be moved for cage cleaning if the adults are tame. Always remove the mother before her young and watch her when replacing young.

Equipment: Make sure they are handled in an enclosed area to avoid losing the rats. Towels can be used to aid holding rats

Transport: Use the cage or small-ventilated carry cages with appropriate sized holes so they cannot escape. Provide bedding or other materials in the cage for the rats to hide in during travel. Do not leave for long periods in hot or cold conditions. Travel should be avoided during hot weather particularly.

AEC STANDARD OPERATING PROCEDURES

- Hygiene:** Thoroughly wash hands with soap and running water for at least 15 seconds after working with or handling rats. Dry hands with clean paper towel or air dryer. Turn off the tap with the paper towel if possible. Follow first aid procedures should a bite occur.
- Signs of illness:** Indicators:
- Stretched out rather than foetal curling to rest.
 - Hunched, not moving
 - Problems with or little movement.
 - Discharges from nose, eyes or mouth including drooling.
 - Coughing or sneezing.
 - Excessive scratching.
 - Lack of balance.
 - Weight loss
 - Raised fur or lumps and swellings
 - Infections.
 - Sores, scabs, fur loss, and excessive grooming.
- Treatments:** Schools are encouraged to develop relationships with Veterinarians and Animal industry representatives (e.g. pet shop staff) familiar with rats. These contacts can be used for disease diagnoses, treatment options and dietary, husbandry and welfare advice. Veterinarians can also assist with emergencies, particularly where euthanasia is needed. Treatments must be documented in the appropriate records.'
- Rats can produce secretions from the Harderian glands that sit behind their tear ducts in the eyes in times of stress. These glands produce red pigment that turns tears red. This may give the rat an appearance like the rat is crying bloody tears but it is actually a pigment called porphyrin mixing with the tears. These porphyrins will fluoresce under ultraviolet light and so can be readily differentiated from blood. If any schools have rats seen to produce red tears, staff are advised to contact their local Veterinarian to discuss possible causes of stress. Respiratory issues from poor husbandry practices, obesity from overfeeding and dental issues from poor diets are also commonly seen with pet rats.
- Euthanasia:** When an illness or injury is such that recovery is unlikely then the rat must be euthanised by a Veterinarian. Schools should contact their local Veterinarian to discuss emergency treatment options prior to an event occurring when keeping rats. Any adverse event including death must be reported to the AEC using the ADVERSE EVENTS form. Forms must be returned to the AEC within 7 days of the event occurring.
- Disposal/fate planning:** When no longer required rats must be rehomed. As an introduced species they must NEVER be released into the environment. It is not acceptable to kill animals as a form of disposal if too many animals have been bred. Bodies must be disposed of correctly in accordance with local council regulations. It is not acceptable to feed rats to reptiles. **Please remember it is against the Animal Welfare Act 1985 for live mice and rats to be fed to reptiles** 
- Holiday and weekend care:** Rats can be sent home for weekends or holiday care with students providing consent is received from the school Principal and the parents. Staff should provide carers with animal care and record-keeping instructions, emergency contacts and provide appropriate equipment and food. Rats must be checked daily, records kept and any problems reported to the school immediately whether kept onsite or taken offsite.
- Approved activities:** **Where an activity is not listed in this SOP, approval must be sought from the Animal Ethics Committee and confirmed before it can be undertaken.**

AEC STANDARD OPERATING PROCEDURES

Activity: **a. CAPTURE, RESTRAINT AND HANDLING OF RATS**

Category: Category 2

Objective: To instruct students in the capture, restraint and handling of rats

Only rats that are accustomed to handling should be used for measurements. Handling should be kept to only short time periods. Female rats tend to be less aggressive than male rats. Take care when handling as rats may bite if scared.

Activity: **b. THE APPROPRIATE CARE OF CLASSROOM PET RATS**

Category: Category 2

Objective: To demonstrate the appropriate care of rats in the classroom

Handling should be kept to a minimum and cleaning and feeding regimes followed and all records kept as required.

Activity: **c. BREEDING OF RATS IN THE CLASSROOM**

Category: Category 2

Objective: To demonstrate methods for breeding rats to students

If a school wishes to undertake breeding of rats as an activity, sufficient care, facilities, housing and space must be available for the additional rats. There must be a need for extra animals or an appropriate plan for the disposal of surplus animals in place prior to beginning this activity. If killing is the only disposal option, then the breeding program is not permissible. See the breeding section of this SOP for more specific breeding information.

Activity: **d. MEASUREMENT OF BODY WEIGHT (INVASIVE) OF RATS**

Category: Category 2

Objective: To instruct students in the measurement of body weight of rats

Students should be able to capture, restrain and handle rats before trying to take any weight measurement. Rats must be restrained for the shortest possible period. Towels or small boxes can be used to assist with weighing. All equipment should be ready to use before catching any rats for weighing. Take care so as not to be bitten when handling rats.

Activity: **e. MEASUREMENT OF BODY CONDITION, GROWTH AND BODY PROPORTIONS (NON-INVASIVE)**

Category: Category 2

Objective: To instruct students on the measurements of body condition, growth and body proportions of rats

Students should be able to capture, restrain and handle rats before trying to take any weight measurements. Rats must be restrained for the shortest possible period. Towels or small boxes can be used to assist with weighing. All equipment should be ready to use before catching any rats for weighing. Take care so as not to be bitten when handling rats.

AEC STANDARD OPERATING PROCEDURES

Activity: f. MEASUREMENT OF MILD DIETARY EFFECTS INCLUDING PALATABILITY

Category

Category 3

Objective:

To demonstrate the impacts of mild dietary effects including palatability on rats

For rats, the only dietary effect that should be investigated is the palatability of different foods. As rats are small in size, it is unacceptable to vary or restrict the quantity or quality of the feed provided.

Resources:

Guidelines for the Housing of Rats in Scientific Institutions

www.animaethics.org.au/__data/assets/pdf_file/0014/222512/housing-rats-scientific-institutions.pdf

Code of practice for housing and care of Laboratory Mice, Rats, Guinea pigs and Rabbits - Victoria

www.deakin.edu.au/__data/assets/pdf_file/0003/536628/620-codeofpractice-housing-and-care.pdf

Comfortable Quarters for Laboratory Animals

Guide for laboratory animal care personnel on the humane housing and handling of individual animal species in research facilities.

awionline.org/store/catalog/animal-welfare-publications/animals-laboratories/comfortable-quarters-laboratory

Laboratory Rats - Wikipedia

https://en.wikipedia.org/wiki/Laboratory_rat

Cage size and Pet rat guide – Australian Rat Fanciers Society

www.ausrfs.org.au/cages

docs.wixstatic.com/ugd/220737_171f3224fb164fbd8f738b44d58d39c9.pdf

Holding and restraining your pet rat video – the Centre for Avian and Exotic medicine

<https://www.youtube.com/watch?v=UsevdwXzNfo>

Unusual Pet Vets

Rat Care sheet

www.unusualpetvets.com.au/wp-content/uploads/2018/05/Rat-Care-Sheet.pdf

Rats and Mice Feeding Guide

www.unusualpetvets.com.au/wp-content/uploads/2018/05/Rats-and-Mice-Feeding-Guide.pdf

How to sex your pet rat video

www.unusualpetvets.com.au/vets-list/rat-mouse/

Rat health guide including transport, nutrition, behaviour and disease information, gnawing behaviour – RSPCA UK

www.rspca.org.uk/adviceandwelfare/pets/rodents/rats/health

Pet care – Rats– Sydney Exotics and Rabbit Vets

www.exoticvet.com.au/pet-care

Bleeding from the eyes in Rats (Red tears) – Gladesville Vet Clinic

<https://www.gladesvillevet.com.au/bleeding-from-the-eyes-in-rats/>