

	UCSD INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE POLICY MANUAL	POLICY # 12.05 Originally Issued: 10/19/05 Revised: 5/15/13 Revised: 5/20/15 Revised: 10/2/19 Revised: 12/11/19
	Housing and Environmental Enrichment for Laboratory Animals	

I. Background and Purpose

Enrichment programs should be reviewed by the IACUC, researchers, and veterinarian on a regular basis to ensure that they are beneficial to animal well-being and consistent with the goals of animal use. They should be updated as needed to ensure that they reflect current knowledge. Personnel responsible for animal care and husbandry should receive training in the behavioral biology of the species they work with to appropriately monitor the effects of enrichment as well as identify the development of adverse or abnormal behaviors.

Like other environmental factors (such as space, light, noise, temperature, and animal care procedures), enrichment affects animal phenotype and may affect the experimental outcome. It should therefore be considered an independent variable and appropriately controlled.

It is therefore a requirement of the institution that we base our animal management program on these and other factors. This document is prepared to assist the institutional faculty and staff in designing the most appropriate housing, care, and enrichment program for the species they are using in research, teaching, or training.

II. Who Should Read This Policy

All UCSD animal users and animal care staff.

III. Definitions

Standard Housing	Housing conditions as provided to animals by default as per standard procedures.
Group Housing	More than a single animal within a cage or primary enclosure.
Enrichment	The delivery of husbandry practices and a physical environment that facilitates the expression of species-typical behaviors and promotes well-being through physical exercise, manipulative activities, and/or cognitive challenges according to species-specific characteristics.
Social Contact	Visual, auditory, olfactory, or tactile contact with others of the same species.
Isolated	Housed individually in room without visual, auditory, olfactory, or tactile contact with others of the same species.

IV. Policy

- All animals housed for research, teaching or testing purposes at UCSD must be housed in a vivarium approved by the IACUC.
- Each animal housing room maintains a single species at any given time unless special housing arrangements have been made for compatible species.
- Enrichment and appropriate social contact must be provided according to the table below.
- Social species must be group-housed unless:
 - a) social incompatibility has been determined,
 - b) death or removal of cage-mates has occurred,
 - c) experimental requirements have been justified in the animal use protocol, or
 - d) the health or welfare of the animal dictates single housing.
- Changes from the standards listed below are not allowed except under the following two circumstances:
 - Changes are described in the applicable animal use protocol approved by the UCSD IACUC.
 - The UCSD Animal Care Program Veterinary Health Unit prescribes the change.
- Provision of enrichment must be provided so as not to cause undue stress or otherwise harm the animal or alter the species appropriate standards for husbandry, nutritional requirements or housing.
- Physical materials used for enrichment must be easily sanitizable to the level of the building SOPs.
- Materials and labor costs associated with optional enrichment will be the responsibility of the principal investigator.

UCSD Standard Housing / Enrichment Requirements

Species	Standard Housing and Enrichment	Singly Housed Animals
	<i>Changes from these standards are not allowed except by IACUC or ACP Veterinary approval.</i>	<p>Standard housing and enrichment conditions will apply in addition to the below requirements.</p> <p><i>Changes from these standards are not allowed except by IACUC or ACP Veterinary approval.</i></p>
Mice	Group housed whenever possible. ACP approved polystyrene, polycarbonate, or other high temp solid bottom plastic cage fitted with a functioning filter-top or polyethylene disposable cages. Cages may be connected to racks providing filtered air. Commercially available paper, wood chip or Corn Cob type bedding. Wire bar lid or box feeder, with or without resting lofts. Water pouch, bottle or lixit for automatic watering. ACP approved paper nesting material and feed.	No additional requirements

Rats	Group housed whenever possible. ACP approved polystyrene, polycarbonate, or other high temp solid bottom plastic cage fitted with a cage-appropriate top or polyethylene disposable cages. Cages may be connected to racks providing filtered air. Commercially available paper, wood chip or Corn Cob type bedding. Wire bar lid. Water bottle or lixit for automatic watering. ACP approved feed.	Provision of ACP approved paper or plastic tube.
Hamsters & Gerbils	Group housed whenever possible. ACP approved polystyrene, polycarbonate, or other high temp solid bottom plastic cage fitted with a functioning filter top. Cages may be connected to racks providing filtered air. Commercially available paper, wood chip or Corn Cob type bedding. Wire bar lid. Water bottle or lixit for automatic watering. ACP approved feed and plastic enclosures.	Provision of ACP approved plastic enclosures.
Guinea Pigs	Group housed whenever possible. ACP approved suspended housing system or other high temp solid bottom plastic cage fitted with a functioning filter top. Commercially available paper, wood chip or Corn Cob type bedding. Wire bar lid or J-type feeder. Water bottle or lixit for automatic watering. ACP approved feed and plastic tubes or enclosures.	Provision of ACP approved plastic tubes or enclosures.
Jerboas	Pair housed for breeding or singly housed with social contact. Glass terrarium enclosure with removable screen lid. Commercially available corn cob type bedding. Two chambered nestbox with hinged lid. Hay and cotton nestlets inside nestbox. Dust bath containing pulverized rock. Fresh produce mixture and small seeds as feed. No water provided.	No additional requirements.
Chinchillas	Pair or group housed whenever possible. ACP approved suspended housing system. No bedding substrate. Dust bath containing pulverized rock. Water bottle or lixit for automatic watering. J-type feeder. ACP approved feed. Wood for chewing.	No additional requirements.
Rabbits	Group housed or individually housed, but with social contact with conspecifics whenever possible. ACP approved suspended housing system. No bedding substrate. Water bottle or lixit for automatic watering. J-type feeder. ACP approved feed. Nestbox for pregnant animals. Enrichment materials: hard balls, plastic chains, PVC pieces, nylabones. Small portions of hay or fresh produce. Water bottle postoperatively.	Single <u>isolated</u> animals will have positive human interaction daily.
Ruminants	Group house or social contact with conspecifics whenever possible. Sheltered outdoor coral – secure chain link or pipe fencing, or indoor area supplied with dry straw for resting. Water source, ACP approved feed plus hay supplement.	Single <u>isolated</u> animals will have positive human interaction daily.
Swine	Group housed or individually housed, but with social contact with conspecifics whenever possible. Indoor or sheltered outdoor housing. Water source, ACP approved feed. Enrichment (hard balls, plastic chains, PVC pieces, nylabones).	Single <u>isolated</u> animals will have positive human interaction daily.

Cats	Group housed or social contact with conspecifics whenever possible. Indoor caging of appropriate size, with litter box. Open room access. Water bowl. Feed bowl. ACP approved feed. Beds, scratch posts, automated laser pointer, toys - balls, hanging toys or other ACP approved toys. Positive human interaction daily.	Single <u>isolated</u> animals will have positive human interaction daily.
Dogs	Group house or social contact with conspecifics whenever possible. ACP approved housing systems consisting of indoor or outdoor runs. Commercially available bedding. Raised resting board. Water source available at all times, water bowl or lixit for automatic watering. ACP approved feed. Bowl or J-type feeder. Enrichment materials: balls, nylabones or compressed rawhide, hooves, thread ropes, and other objects. Positive human interaction daily. Where applicable, animals are allowed out of primary cages to exercise and explore.	Single <u>isolated</u> animals will have positive human interaction daily.
Non-Human Primates	Group house or social contact with conspecifics whenever possible. Indoor primate caging with perch, and hammock. Water source, ACP approved feed. Food treats, novel food items such as fruit, nuts, meal worms or vegetables provided as rewards for positive human interaction, behavioral modification, or as forage or browse. Enrichment materials (balls, Nylabones) or compressed rawhide, hooves, thread ropes, and other objects. Positive human interaction daily.	Singly <u>isolated</u> animals will have positive human interaction daily.
Reptiles / Other Amphibian	Group housed whenever possible in enclosures with a safe heating device located in such a way to allow animal to thermo-regulate appropriately. Fresh water (dechlorinated for amphibian species), ACP approved feed. Hiding tubes, boxes and perches of appropriate size.	No additional requirements
Xenopus	Group housed in water tanks or tubs with PVC pipe or a floating device. De-chlorinated water, temp appropriate for species, ACP approved feed.	No additional requirements.
Fish / Zebrafish	Group housed whenever possible in water-tight enclosures made from fiberglass, plastic and glass. Treated water, temp and water quality monitoring appropriate for species. ACP approved feed.	No additional requirements.
Birds	Group housed whenever possible in smooth wire cages adequate for the species. Flight cages if possible and perches. Water source, ACP approved feed, cuttlebone.	No additional requirements

V. Related Documents

The Guide for the Care and Use of Laboratory Animals	http://grants1.nih.gov/grants/olaw/Guide-for-the-Care-and-Use-of-Laboratory-Animals.pdf
UCSD Cage Size Reference	http://iacuc.ucsd.edu/policies/CageSizes.pdf

VI. Additional information

- Optional Enrichment
 - These options are not required to be addressed in the IACUC protocol.
 - PI must decide which animals receive and arrange for the provision of this enrichment.

Species	Optional Enrichment
Mice	Provision of ACP-approved additional nesting material, paper or plastic tubes/enclosures.
Rats	Provision of ACP-approved paper or plastic tubes, paper or plastic enclosures, paper towel.
Hamsters and Gerbils	Provision of ACP-approved paper or plastic tube, paper or plastic enclosures, paper towel.
Guinea Pigs	Provision of ACP-approved paper or plastic tube, paper or plastic enclosures.
Jerboas	None.
Chinchillas	None.
Rabbits	Positive human interaction.
Ruminants	Positive human interaction.
Swine	Small portions of vegetables or fruit or other commercially available food, not to interfere with primary diet. Positive human interaction.
Cats	Positive human interaction.
Dogs	Positive human interaction.
Non-Human Primates	Food treats not to interfere with primary diet. Novel toys or other devices, such as radio or television. Positive human interaction.
Reptiles/Other Amphibian	None
Xenopus	None
Fish/Zebrafish	Placing floating devices is encouraged in tanks of zebrafish with low density.
Birds	None

- Enrichment must be conducted in such a way to not interfere with the research results or must be controlled appropriately.
- ACP-approved, species-appropriate enrichment items may include:
 - Paper nesting material
 - Cotton nesting material
 - Paper tubes
 - Paper enclosures
 - Plastic tubes
 - Plastic enclosures
 - Wood blocks or sticks
 - Nylabones

- Plastic chains
- Hard balls – rubber or plastic
- PVC pieces
- Compressed rawhide
- Hooves
- Thread ropes
- Wood or plastic hiding boxes
- Wood or plastic perches
- Alternative feed items
- Floating devices
- Other toys