UNIVERSITY OF CALIFORNIA SANTA CRUZ

Institutional Animal Care and Use Committee

Policy on Vivarium Animal Housing and Enrichment

Date Reviewed: 12/11/19

GUIDELINE: The primary aim of environmental enrichment is to enhance animal well-being by providing animals with sensory and motor stimulation, through structures and resources that facilitate the expression of species-specific behaviors and promote psychological well-being through physical exercise, manipulative activities, and cognitive challenges according to species-specific characteristics

Environmental enrichment refers to additions to an animal's environment with which it can interact. The goal is to allow animals to express a range of species-typical behaviors which may enhance their well-being. Examples of environmental enrichment include:

- Group housing of compatible animals
- Providing animals with a means for control over their environment (e.g., nest-building materials, hiding places)
- Novel items (e.g., toys, special food treats)
- Opportunity for exercise (e.g., running wheels, climbing structures)

The appropriateness of specific environmental enrichment is determined by the species used, type of housing, space available, research needs, standard husbandry practices and other operational issues.

Social Housing

The *Guide* states that single housing of social species should be the exception. Social housing will be considered by the IACUC as the default method of housing unless otherwise justified based on social incompatibility resulting from inappropriate behavior, veterinary concerns regarding animal well-being, or scientific necessity approved by the IACUC. Social species maintained at the UCSC Vivarium include all mice and rats. When necessary, single housing of social animals should be limited to the minimum period necessary. Common exceptions to social housing are:

- Any animal that has demonstrated aggression/fighting behavior, or animals known to have a propensity for fighting (e.g., male mice).
- Breeders not currently in use.
- When a companion animal is not available (e.g., a single animal of a sex at weaning, or the last animal remaining in an experimental cohort.
- Animals in the immediate post-surgical period (i.e., when sutures are present); however, animals must be returned to social housing again after suture removal.
- Scientific necessity as reviewed and approved by the IACUC.

Environmental Enrichment

To provide for the physical and social needs of research animals, the IACUC requires that appropriate environmental enrichment be provided as part of standard animal housing unless there is scientific justification, approved by the IACUC that precludes the use of environmental enrichment materials or practices. This policy outlines the types of standard housing used for laboratory animal species at UCSC and the types of environmental enrichment materials or practices that may be used to enhance species-specific behavior and reduce distress and anxiety in laboratory animals.

Implementation

- All animals housed for use in research, teaching or testing purposes at UCSC must be housed in an animal facility or other space approved by the IACUC.
- Each animal housing room (or alternative housing unit) will contain a single species unless special housing arrangements have been made with the Animal Care Facility for compatible species.
- Standard housing is provided by the Animal Care Facility on a recharge basis, unless the IACUC has approved that housing can be provided and maintained by the research group. For certain species of animals that are not currently or routinely housed at UCSC, research groups may be responsible for set-up costs to provide specialized equipment for maintaining the animals.
- Changes to the standard housing and environmental enrichment described in Table 1 below are not permitted except under the following circumstances:
  - Changes are described in the animal use protocol and approved by the UCSC IACUC.
  - Changes are prescribed by the Animal Care Facility Veterinarian for animal health or welfare reasons.
- Enrichment materials or practices should not significantly alter the species-appropriate standards for husbandry, nutrient requirements or housing, as described in The Guide, unless these deviations are described and approved by the IACUC in the animal use protocol.
- Provision of environmental enrichment other than the Standard or Allowed Environmental Enrichment described in Table 1 must be described in the IACUC protocol. If the standard housing and enrichment for the species cannot be used, a justification must be submitted and approved by the IACUC.

Table of Standard and Additional Enrichment

Species (common name)	Standard Housing	Standard Environmental Enrichment Required (ANIMAL CARE FACILITY -Provided)	Additional Enrichment Allowed/Recommended Research Group <u>May Provide</u>
Mice	• Solid-bottom plastic cage with a wire bar lid that serves as a food hopper and water bottle holder. • Filter top (microisolator lid). • Cages may be placed on ventilated racks providing filtered air directly to the cage, or placed on static racks. • Water bottle or Lixit • Contact bedding consisting of commercially-available corn cob particles, wood chips, cotton, or paper products specifically made for laboratory animals. • Commercially-available laboratory rodent diets approved by the Animal Care Facility.	• Group-housed if compatible (e.g. adult males from different litters cannot be housed together). • Nesting material made from paper or cotton fibers. (e.g. Nestlets). • AlphaDri folded paper • Chemwipes	• Disposable cardboard mouse houses ("Shepherd Shacks") • *Igloo with Wheel* • *Mouse Houses/Igloos* • Sunflower Seeds (irradiated):

Rats	• Solid-bottom plastic cage with a wire bar lid that serves as a food hopper and water bottle holder. • Filter top (microisolator lid) may be used. • Cages may be placed on ventilated racks providing filtered air directly to the cage, or placed on static racks. • Water bottle or Lixit • Contact bedding consisting of commercially-available corn cob particles, wood chips, cotton, or paper products specifically made for laboratory animals. • Commercially-available laboratory rodent diets approved by the Animal Care Facility.	• Group-housed if compatible. • Nesting material	• Sterilized wooden tongue depressors for chewing. • Sterilized Nyla bones for chewing. • Red plastic Tunnel Houses

Ground Squirrels	• Solid-bottom plastic cage with a wire bar lid that serves as a food hopper and water bottle holder. • Filter top (microisolator lid) may be used. • Cages may be placed on ventilated racks providing filtered air directly to the cage, or placed on static racks. • Water bottle or Hydropac • Contact bedding consisting of commercially-available corn cob particles, wood chips, cotton, or paper products specifically made for laboratory animals. • Commercially-available laboratory rodent diets approved by the Animal Care Facility plus dry dog food	• Enviropacs paper bedding • Schedule 80 PVC pipe section for “burrow”
Birds	• Sanitizable wire cages or large flight cages. • Perches. • Fresh water in water bottle or sanitizable bowls.	• Group-housed if compatible. • Nesting materials and enclosures for breeding.

	• Food containers and water bottles should be designed and positioned to minimize fecal contamination. • Shelter from sun, rain and extreme weather conditions if housed in outdoor aviaries. • Nutritionally-complete food appropriate for the species. • Dietary supplements appropriate for the species (e.g. cuttlefish bones, shell grit, fresh greens).	
Fish	• Aquaria made of sanitizable materials. • Static or flow-through water system. • Water filtered or conditioned to remove/inactivate chlorine and chloramine. • Nutritionally-complete fish food appropriate for the species.	• Group housed if compatible.