IG046: GUIDELINE ON ANIMAL ENRICHMENT

The Campus Animal Resources Enrichment Guidelines provide recommendations with regards to provision of enrichment to all MSU-owned animals used in research, testing and teaching. These guidelines are based on the Guide for the Care and Use of Laboratory Animals (ILAR, 2011) and the Guide for the Care and Use of Agricultural Animals in Research and Teaching (FASS, 2010). Enrichment provides an environment which attends to the animals’ physical, physiologic, cognitive, and social needs and provides the opportunity for the animals to express species-typical behaviors. As a result, enrichment promotes animal well-being and biological functioning and likely results in improved models for use in scientific research and teaching.

Enrichment is considered a standard component of animal care, and will be provided by each facility unless exempted for scientific or veterinary reasons. The enrichment program described in this document is reviewed by the IACUC, researchers, farm managers, and veterinarians on a regular basis to ensure it is beneficial to animal well-being and consistent with the goals of animal use.

The basic tenets of this program are as follows:

1) For social species*, all animals should be housed in compatible pairs or groups unless exempted as described under Social Housing. Species-specific enrichments, as per biomedical or agricultural practice standards, should be provided.
   *A social species is one which is highly interactive with other members of its species, to the point of having a recognizable and distinct society in its natural habitat; most of the commonly used research species are classified as social, including mice, rats, cats, dogs, guinea pigs, birds, sheep, pigs, etc.

2) In those instances in which social species are exempted from social housing and individuals are singly housed, the duration should be limited to the minimum period necessary and, where possible, visual, auditory, olfactory, gustatory and/or tactile contact with compatible conspecifics shall be provided.

3) Additional enrichment should be provided for all singly-housed social animals unless exempted for scientific or veterinary reasons or for those group-housed agricultural animals managed using Standard Agricultural Practices.

The following species are NOT considered to be social when housed at MSU research and teaching facilities and will necessitate differing enrichment expectations: adult boars, bulls, some cases of adult male rabbits, female hamsters, adult male gerbils, some strains of male mice, adult mink, and stallions.

For non-social species (which are singly housed), at least one form of enrichment should be provided unless exempted for scientific or veterinary reasons. Consideration should be given to periodically changing enrichment devices such as toys, when consistent with the research project, to prevent loss of effectiveness.

Social Housing
Housing in compatible pairs or groups enables social animals to exhibit social behaviors and to receive visual, olfactory, auditory, gustatory, and tactile stimulation. Additionally, social housing encourages
physical exercise and may provide some cognitive challenge. Thus, the primary emphasis of our enrollment program is to house social species in compatible pairs or groups unless:

- Scientific justification is provided in an IACUC-approved Protocol
- A CAR or Farms Veterinarian exempts an animal for health or behavioral reasons
- It is a normal agricultural husbandry procedure
- The animal is incompatible as documented in its record
- The animal is recovering from surgery, up to 72 hours, unless extended by a CAR or Farms Veterinarian for clinical reasons
- Research/teaching/testing protocols require this practice, which must be justified in an approved Protocol
- Multiple female rodents housed with one male - the pregnant female may be singly housed when overtly pregnant
- Males of the species are used in multiple breeding scenarios (generally they cannot be integrated back into group housing)
- Animals are housed in groups and then sequentially removed, leaving one singly-housed animal prior to the study endpoint

Additional Types of Enrichment

Examples of general enrichment types include but are not limited to:

- Sensory - provision of devices that enhance visual, auditory, tactile, olfactory and gustatory stimulation
- Physical - altering the complexity of the animal's enclosure
- Occupational - provision of devices that provide challenges or encourage movement
- Nutritional - provision of new or varied food types or modification of how food is delivered
- Positive reinforcement interactions – provision of regular positive interactions with humans

Suggestions for species-specific enrichment items can be found in the Appendix.

Any alternations to the Appendix must be approved by a CAR Veterinarian or farm manager (please contact carvets@ora.msu.edu with questions or for consultation.)
## APPENDIX

### Suggestions for Species-Specific Enrichment Items

<table>
<thead>
<tr>
<th>Category</th>
<th>Items</th>
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<tbody>
<tr>
<td><strong>AMPHIBIANS AND REPTILES</strong></td>
<td>Perches for tree dwelling species, Live foliage plants, Plastic foliage plants for cover, sanitizable, but should be avoided with herbivores, Plastic PVC tubes/fittings for cover, Opaque plastic boxes with smooth entry holes for cover, Rough objects for ecdysis (shedding) - brick or rocks, Rocks or slate for basking, resting islands, cover, Shredded paper for burrowing species, Astroturf™ for moist, sanitizable cage bottom, Heat lamp, Water drippers</td>
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<tr>
<td><strong>ARVICANTHIS (grass rat)</strong></td>
<td>Sunflower seeds, oats, rabbit pellets, Hay, Bedding, deep enough for burrowing, PVC tubes, shelter</td>
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<td><strong>AXOLOTL</strong></td>
<td>PVC piping</td>
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<tr>
<td><strong>BIRDS/NON-FLIGHT</strong></td>
<td>Dust baths (sand box with quartz sand), Colored objects / Pecking targets (white or yellow string or bells suspended from fishing line), Balls (leather, rubber, plastic, or tennis) suspended from cage roof, Enable birds to forage (e.g., scatter food in aspen chip or shavings), Mirrors (for singly-housed birds), Bedding or litter substrates (aspen chip or shavings, straw, shredded paper, cocoa or oat husks), Space for exercise or flight activity, Perches / Roosting shelves for resting (chickens prefer to roost on higher square or round softwood perches, at least 5cm diameter), Commercially available bird toys, Treats (fruit, grass, straw, hay suspended in racks or baskets), Nest boxes and nesting material</td>
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<tr>
<td><strong>CAT</strong></td>
<td>Shelves &amp; perches, placed at various heights throughout enclosure, Climbing frames &amp; poles, raised walkways, ropes, and hammocks, Resting places (concealed and open areas), Scratching posts, Hiding food inside cardboard boxes, in bedding, or inside rolling toys, Puzzle feeders, Remote control mice, Balls, catnip toys, laser pens</td>
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### COW/CALF
- Forage substrates (hay) or opportunity to graze
- Straw bedding, as feeding enrichment (i.e., helps prepare rumen for hay and increases time spent eating, so less likely to develop abnormal oral behaviors)
- Braden Bottle with nipple (contains calf starter feed, mounted in pen)
- Calf Lollie (i.e., A PVC pipe capped at both ends with drilled holes, suspended from wall with food substrates)
- Suspended scratching post / Rubbing arch or moveable scratching / rubbing device
- Suspended smooth chain or rope
- Suspended plastic balls (can be scented)
- Large or small kongs (fastened to wall)

### DOG
- Daily exercise program, indoor or outdoor area
- Platform or shelves
- Cage doors / walls that allow open viewing of conspecifics
- Refuge or sheltered area
- Bedding substrate
- Hammock bed
- Suspended toys hung a few inches above floor
- Edible and interactive toys and treats

### FERRET
- Hammocks, towels, bed
- Food treats
- PVC tunnels
- Plastic, or other sanitizable, balls, barbells, hanging toys

### FISH
- Plastic PVC tubes / fittings for cover
- Plastic foliage plants for cover, sanitizable, but should be avoided with herbivores
- Slate for cover or spawning substrates
- Smooth clay flower pots for cover or spawning substrates
- White or black plastic table covers for visual barriers to surround glass tanks
- Shade cloth (screening) or opaque tank cover materials

### GERBIL
- Plastic plumbing pipe (at least 2 inches in diameter)
- Material to gnaw (hay, straw)
- Rough surface material for marking behavior and to wear down claws (bottom surface of bathroom tile)
- Substrates deep enough for burrowing (bedding, sand, woodchips)
- Sand bath

### GUINEA PIG
- Straw / hay supplement
- Food treats
- Shallow ramps
- Plastic huts / PVC tunnels
- Wood for chewing
<table>
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<tr>
<th>Animal</th>
<th>Needs and Enrichments</th>
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</table>
| **HAMSTER** | PVC tubing  
Nesting material  
Soft wood for gnawing  
Supplemental foods  
Paper huts  
Mason jar, PVC pipe, paper towel  
Exercise wheel / ball |
| **HORSE** | Mirrors or poster images  
Pasture housing to allow for exercise, grazing  
Forage substrates (hay) or opportunity to graze  
Food dispensing balls, suspended apple-scented balls  
Radio / music (should be turned off at the end of the work day) |
| **MOUSE** | Polycarbonate or paper hut  
Nesting material: Nestlet, Enviro-Dry, cotton padding, paper towel  
Rodent treats  
Resting pad/tile |
| **RABBIT** | Cardboard boxes, plastic crates, or nest boxes  
Shelves or platforms in cages  
Alternate from cage to floor housing system for variety  
Physical substrate for digging and burrowing; of sufficient depth to allow exhibited behaviors  
Gnawing material (wood blocks / fir-wood gnawing sticks)  
Treats (Rabbit Stix / Bunny Blocks, celery, carrots, hay, alfalfa cubes)  
Stainless steel rabbit rattles on spring clip  
Balls  
Dumbbells |
| **RAT** | Nesting material (parturient females) Enviro dry, paper towels  
Gnawing material: Nylabone®, softwoods (aspen blocks), Diamond Twists  
Rodent treats  
Bedding (corn-cob, woodchips) deep enough for burrowing  
PVC tubes, vertical barriers  
Plastic pallets for housing on floors, with shavings |
| **SHEEP / GOATS** | Food rewards, treats (sugar cubes)  
Forage substrates (hay) or opportunity to graze  
Climbing structures (rocks or wood structures)  
Teeter-totters  
Mirrors  
Pasture and feeders for grazing and browsing (grasses, legumes, weeds, twigs, sprouts)  
Suspended apple-scented plastic ball |
<table>
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<tr>
<th>SWINE</th>
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<tr>
<td>Suspended scented balls (with rope or chain)</td>
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<tr>
<td>Plastic milk crate, jugs, cloth strips, Rubbermaid barrel, cardboard boxes, Newspaper</td>
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<tr>
<td>Nylabone® products, Foodballs / Boomer Balls® with drilled holes to place food inside</td>
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<tr>
<td>Stainless steel mirror</td>
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<td>Rattles / Dumbbells</td>
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<tr>
<td>Forage Material (oat hulls / straw); food treats</td>
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<td>Dirt piles / grass flats / logs</td>
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<tr>
<td>Hanging chains, hanging ropes with unraveled ends</td>
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<td>Music / talk radio (should be turned off at end of work day)</td>
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