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## 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 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, some strains of male mice, 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 enrichment 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@msu.edu](mailto:carvets@msu.edu) with questions or for consultation.)**

**APPENDIX**

<b>Suggestions for Species-Specific Enrichment Items</b>
<b>AMPHIBIANS AND REPTILES</b>
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
<b>ARVICANTHIS (grass rat)</b>
Sunflower seeds, oats, rabbit pellets, wood blocks
Hay
Bedding, deep enough for burrowing
Shelter: metal huts, PVC tubes
<b>AXOLOTL</b>
PVC piping
<b>BIRDS/NON-FLIGHT</b>
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
<b>CAT</b>
Shelves & perches, placed at various heights throughout enclosure
Climbing frames & poles, raised walkways, ropes, and hammocks
Resting places (concealed and open areas)
Scratching post, wall mounted grooming pad
Hiding food inside cardboard boxes, in bedding, or inside rolling toys
Puzzle feeders
Balls, catnip toys, laser pens
<b>COW/CALF</b>
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 (ie. 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)
<b>DOG</b>
Daily exercise program, indoor or outdoor area
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
<b>FERRET</b>
Hammocks, towels, bed
Bedding substrate
Food treats
PVC tunnels
Plastic, or other sanitizable, balls, barbells, hanging toys
<b>FISH</b>
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
<b>GUINEA PIG</b>
Straw / hay supplement
Food treats
Shallow ramps
Plastic huts / PVC tunnels
Gnawing material: wood blocks, plastic toys
<b>HAMSTER</b>
Nesting material
Gnawing material: wood blocks, hay
PVC tubing, paper hut, for shelter
Exercise wheel / ball
<b>HORSE</b>
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)

<b>MOUSE</b>
Polycarbonate hut, PVC transfer tubing
Nesting material
Rodent treats
Resting pad/tile
Gnawing material: sunflower seeds, wood blocks, twisted paper
Perches, hammocks, shelves
Running wheel
<b>RABBIT</b>
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, wood gnawing sticks, plastic toys
Puzzle feeders
Treats (Rabbit Stix / Bunny Blocks, celery, carrots, hay, alfalfa cubes)
Balls, dumbbells, hanging rattles
<b>RAT</b>
Nesting material (parturient females)
Gnawing material: wood blocks, plastic toys, twisted paper
Rodent treats
Bedding, deep enough for burrowing
PVC tubes, polycarbonate huts, vertical barriers
<b>SHEEP / GOATS</b>
Food rewards, mineral blocks
Puzzle feeders
Forage substrates (hay) or opportunity to graze
Climbing structures (goats)
Mirrors
Pasture and feeders for grazing (sheep) and browsing (goats)
Suspended apple-scented plastic ball
<b>SWINE</b>
Suspended scented balls
Plastic milk crate, jugs, cloth strips, cardboard boxes, newspaper
Puzzle feeders
Mirrors
Rattles, dumbbells, sturdy dog toys
Forage Material; food treats
Dirt piles, grass flats, logs
Hanging chains, hanging ropes with unraveled ends
Music or talk radio (should be turned off at end of work day)