The purpose of environmental enrichment is to provide animals the opportunity to express basic behavior needs, promote species-typical, non-injurious behavior and promote physical and mental health thus enhancing animal welfare. The environmental enrichment provided should be biologically relevant (e.g., hiding, socializing, searching) so that it does not lose its enriching value over time. For social species such as mice and rats, social housing should be the default housing arrangement when possible.

Exceptions to Social Housing/Enrichment Policy Requiring PACUC Protocol Approval:

Instances will arise when social grouping or enrichment items may be inappropriate for the scientific goals of the study. If an investigator believes that social grouping or providing cage enrichment would have a negative impact on the study or be detrimental to their animals, an exception to the policy for such social housing or addition of enrichment items may be granted by the PACUC at the time of protocol review. For AAALAC's position statement on Social Grouping, see the last page of this document.

Exceptions to Social Housing Not Requiring PACUC Protocol Approval:

Social animals may need to be singly housed for a variety of reasons. The following include general categories of exceptions to social housing not requiring PACUC protocol approval. Examples of such situations include:

- separation of aggressive or incompatible conspecifics—for example: male rabbits. However, females that demonstrate to be aggressive or socially incompatible will be housed individually.
- individual housing due to attrition of cage/pen mates or uneven number of animals
- animals used for PACUC approved rodent breeding and is either a breeder male between mating, a pregnant female that is near delivery, or a juvenile that has just been weaned and is the sole male or female in the litter.
- individual housing in preparation for pending parturition
- quarantine prior to entering or reentering a facility
- animals housed singly for short term recovery post-operatively; single housing must be for the minimum amount of time post-operatively necessary for recovery and/or healing as determined by the PI in consultation with LAP veterinarians
- individual housing when an animal is considered a danger to other animals, to itself or personnel

For farm animal / agricultural species housed in an agricultural setting, the Guide for the Care and Use of Agricultural Animals in Research and Teaching, Chapter 4, Environmental Enrichment, should be followed.

Clinical reasons: LAP veterinary staff may require individual housing of animals when it is for medical concerns. In such cases, PACUC approval is not required. The responsible veterinarian will record the period of single housing and the frequency of re-evaluation in the animal’s medical record, will monitor the animal as noted and re-house the animal when the clinical concern is resolved. These cases will be reported to the PACUC at the discretion of the Attending Veterinarian.

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If an animal falls under one of these exceptions, a sticker or a tag will be placed on the cage card indicating the corresponding exception.

**Social Group Housing & Cage Enrichment**

**Mice:** Mice should be group-housed in breeding or compatible unisex groups on contact bedding with nesting material. Unfamiliar males or animals separated due to fighting should be housed singly on contact bedding with nesting material. It is not required that mice housed on Tek-Fresh bedding have nesting material provided. A portion of the nesting material will be transferred to the clean cage with the animals at time of cage change, with additional nesting material provided as necessary. Examples of nesting material: nestlets; crinkle paper, tissues, paper towel.

**Rats:** Rats should be socially housed on contact bedding. When single housing is required by the investigator, enhanced environmental enrichment meeting the needs of retreat space must be provided. For rats, a PVC pipe section of appropriate diameter or other equivalent shelter or retreat equivalent will suffice. For wire housing, see the PACUC Policy on Wire Bottom Caging for Rodents. When housed on wire, enrichment should be provided. One recommendation is the provision of a small nylabone chew toy if it would not interfere with the research being conducted.

**Guinea Pigs:** Guinea pigs should be kept in social groups and provided shelter space sufficient to contain all of the pen inhabitants simultaneously. The use of PVC tubes for group housed guinea pigs is not recommended as crowding of animals into such tubes could constrict animals’ movements/respirations.

**Rabbits:** Animals >4 months of age should be housed singly with the ability for visual, auditory and olfactory association with conspecifics. Rabbits housed singly must be provided a toy or other manipulanda on the outside/inside of the cage on a regular basis to allow for exploratory behavior.

**Chinchillas:** Animals housed singly should have the ability for visual, auditory and olfactory association with conspecifics. Chinchillas housed singly must be provided a retreat structure and toy or other manipulanda on the outside/inside of the cage on a regular basis to allow for exploratory behavior. Sand baths should also be provided as well as and food treats if the latter would not interfere with the research being conducted.

**Dogs:** Canines may be housed in compatible pairs or small groups. Dogs housed individually must be within sight of other dogs. Each dog should have access to at least one toy when in their home enclosure. These toys should be rotated to maintain interest. If dogs cannot be compatibly housed continuously, intermittent social activity of 30 minutes per day, 5 days per week is allowable, e.g., during pen sanitation or walking. Dogs should be given human interaction including petting, soothing speech, playing, and grooming.

**Cats:** Behaviorally compatible cats should be socially housed. Group enclosures must have sufficient resting places off the floor to accommodate every cat. Scratching posts and visual barriers should be considered for group housed cats. Multiple litter boxes, feed and water bowls should be distributed around the enclosure with at least one station for every two to three cats. If a cat is to be housed singly because of social incompatibility or is post-operative, it should be given a hiding place and opportunities for increased human interaction. Cats housed singly for scientific purposes should be within sight and sound of other cats and given toys, other manipulanda and opportunities for increased human interaction.

**Sheep:** Sheep should be socially housed in compatible pairs or small groups, unless exempted for experimental reasons by the PACUC, or for health or behavioral reasons by the attending veterinarian. If sheep must be individually housed, position them in such a way that they can see at least one conspecific, because visual isolation is stressful for sheep. Stressful research manipulations (e.g., venipuncture, drug application) should be accomplished within the presence of a familiar conspecific. Where there is likelihood of a single sheep remaining on census at a single site, experimental plans should account for the timely use of the remaining animal. Sheep should be provided a diet high in roughage, to allow species typical feeding and rumination, and to reduce the likelihood of stereotyped behaviors.

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Swine: Behaviorally compatible pigs should be socially housed including, if necessary, combining pigs of compatible size and disposition to meet this need. Substrates should be provided to enable rooting behavior. Examples of such substrates could include plastic or bowling balls loose on the cage floor. Swine should be provided manipulanda suspended from the pen side, such as hanging ropes, chains, tires or rubber tubes, for play and exploration.

Songbirds: Songbirds should be housed in socially compatible groups with perches, feeders, watering devices, and cuttlebone as appropriate for the species.

African Clawed Frogs: Frogs should be housed in tanks with a population density not exceeding one per 2 liters tank water volume and as otherwise stipulated by facility SOP. With respect to the latter, water treatment, circulation and quality may stipulate that greater volumes be accorded per head. For animals housed with direct exposure to room light, refuges or retreats should be provided in the form of pipes, flower pots, or submerged plastic boxes unless the environment is already sufficiently dark.

Pigeons: Individually caged birds should have ability for visual, auditory and olfactory contact to allow for some social interaction with conspecifics. Behavioral training and associated staff interaction is encouraged.

Other Enrichment Devices: The following is a list of other devices that have been successfully used on various species.

Mice: Chew sticks/blocks, paper rolls, paper shacks, PVC tubes, Nylabones®, corn husks, plastic pipette boxes, wheels, and critter cubes.
Rats: Paper rolls, Nylabones®, PVC tubes, plastic huts.
Rabbits: Retreats/hiding shelters, baby rattles/keys, corn husks, Bunny Blocks®, Jingle Ball®
Frogs: Ramps, perches, PVC tubes, “J” feeders, floating leaves (made from trash bags).
Fish: PVC tubes, floating leaves.
Chickens: Perches, red marbles in food, red marbles in water, mirrors, plastic chain links.
Chicks: Astro™ turf covered with feed.
Birds: Perches

AAALAC Position Statement on Social Housing
The Guide states that single housing of social species should be the exception. Social housing will be considered by AAALAC International 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 (or comparable oversight body). When necessary, single housing of social animals should be limited to the minimum period necessary and, where possible, visual, auditory, olfactory and, depending on the species, protected tactile contact with compatible conspecifics should be provided. In the absence of other animals, additional enrichment should be offered, such as safe and positive interaction with the animal care staff, as appropriate to the species of concern; periodic release into larger enclosures; supplemental enrichment items; and/or the addition of a companion animal in the room or housing area. The institution's policy and exceptions for single housing should be reviewed on a regular basis and approved by the IACUC (or comparable oversight body) and/or veterinarian.

References

A. Guide for the Care and use of Laboratory Animals-8th edition, NRC
B. http://www.aaalac.org/accreditation/positionstatements.cfm#social

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C.  Guide for the Care and Use of Agricultural Animals in Research and Teaching; 3rd edition, Federation of Animal Science Societies, Savoy, IL. 2010
D.  Cornell University, IACUC Policy # 550: Exemptions to Social Housing of Animals

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