

Guidelines for General Species Environmental Enrichment

In accordance with the Guide for the Care and Use of Laboratory Animals (Guide), research facilities must provide appropriate environmental enrichment for all animals. The principal goal of this 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-typical behaviors and promote psychological wellbeing through physical exercise, manipulative activities, and cognitive challenges according to species-specific characteristics” (Guide; pg 52).

Environmental enrichment, should be provided in a consistent manner across the animal program. When discussing the humane care and use of animals, it is important to discuss a balance between animal well-being and the goals of the biomedical research at hand (Weed and Raber, 2005). According to The Guide, “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.” (Guide, Page 53). This document provides the NIH Intramural Animal Care and Use Programs with a generic environmental enrichment framework for developing their own plans. The examples included in this Guideline are only a starting point, and each Institute/Center (IC) should develop an individualized plan to address and balance the enrichment needs of their animal species with the unique requirements of their research programs. For USDA regulated species each IC will develop an individualized plan as specified in the Animal Welfare Act Regulations (AWAR).

Two supplemental documents, ‘Environmental Enrichment Strategies for Rodents in the Laboratory’, and ‘Behavioral Management of Nonhuman Primates’, accompany this document for additional specific guidance regarding enrichment recommendations for rodents or non-human primates.

Indicators of Well-being:

- 1) Physical Well-being
 - a) Minimal disease, illness and injury
 - b) Normal weight gain and food consumption
 - c) Quality hair coat
- 2) Psychological Well-being
 - a) Displaying a range of species-typical behavior
 - b) Low levels of aberrant behavior
 - c) Appropriate response to challenges or stressors
 - d) Ability to cope with daily changes in social and physical environment
 - e) Presence of balanced temperament
 - f) Absence of chronic signs of distress

An integrated approach to behavioral management should involve animal facility personnel including veterinary, animal care, facility management, and behavioral staffs. A behavioral management program should include environmental enrichment, socialization of social species, behavior assessment and positive reinforcement training. There is some overlap between these 4 components.

- 1) Environmental Enrichment
 - a) Promote species specific behavior
 - b) Promote psychologic well-being
 - c) Increases behavioral choice
- 2) Socialization of social species
 - a) Promote species specific behavior
 - b) Promote psychologic well-being
 - c) May increase ability to cope more easily
 - d) Reduces abnormal behaviors
 - e) Increases locomotion
- 3) Behavioral Assessment
 - a) Observing animal behaviors with people and cohorts
 - b) Identifying abnormal behaviors
 - c) Treating abnormal behaviors
- 4) Positive Reinforcement Training (PRT) - the Guide recommends including positive training techniques in husbandry and experimental procedures
 - a) Facilitates husbandry, veterinary and research procedures
 - b) Reduces behavioral problems
 - c) Increases efficiency
 - d) Reduces stress
 - e) Increasing choice and control
 - f) Improves well-being

Environmental Enrichment:

It is critical that an Enrichment Plan takes into account the natural histories and normal behavior of the species for which it is designed.

- 1) Foraging behavior
- 2) Territorial versus nomadic
- 3) Social system
- 4) Environmental Ecology

Types of Enrichment:

- 1) Social Enrichment
 - a) Types of Social Enrichment
 - i) Sensory contact (visual, auditory, olfactory)
 - ii) Partial contact with individuals (grooming panels, intermittent social access)
 - iii) Continuous unrestricted pair or group housing
 - iv) Positive interactions with humans where appropriate by species
 - b) Considerations for social enrichment
 - i) Species
 - ii) Individual animals' previous social histories
 - iii) Protocol limitations
 - iv) Housing limitations
 - v) Risk assessment
 - vi) Plan of action when fighting occurs

- 2) Physical Enrichment - enhances the animal's physical environment
 - a) Varied substrate bedding and foraging material
 - b) Raised surfaces
 - c) Visual blocks
 - d) Nest boxes, huts, tubes, gnawing devices
 - e) Swings
 - f) Changing size and complexity of the enclosure
 - g) Manipulanda, toys, puzzle feeders, grooming boards, climbing structures
- 3) Nutritional Enrichment
 - a) Novel delivery of food
 - b) Foraging opportunities - in their natural environments, most laboratory species spend a majority of their day foraging for a variety of foods
 - c) Types of Novel foods
 - i) Foods that are time consuming
 - ii) Foods that are highly desirable
- 4) Sensory Enrichment
 - a) Visual - television, windows, bubbles, people watching
 - b) Olfactory - scented sprays, herbs
 - c) Auditory - radio, people talking to the animals
 - d) Tactile – frozen treats, varied nesting or foraging material
- 5) Occupational Enrichment
 - a) Positive reinforcement training (PRT) - trains animals to cooperate in veterinary, husbandry and scientific procedures
 - i) Provides "options"
 - ii) Provides ways to cope with stressors
 - iii) Provides opportunity for the animal to have some control
 - iv) Provides the animal with a job
 - v) Promotes exercise
 - vi) Provides mental stimulation

Documentation of the Enrichment Program

The documentation requirements regarding plans for the appropriate exercise for dogs and provisions for environmental enhancements adequate to promote the psychological well-being of non-human primates are well described in the USDA Animal Welfare Act Regulations, Title 9 CFR, Chapter 1, Subchapter A – Animal Welfare. The relevant portions of the regulations are available on-line at:

https://www.ecfr.gov/cgi-bin/text-idx?SID=891e14e1125910a4ff614b3997fbfbda&c=ecfr&tpl=/ecfrbrowse/Title09/9cfrv1_02.tpl

Enrichment programs and plans for non-regulated species should be documented according to facility specific standard operating procedures.

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