

Enrichment Committee

Have you ever walked through a pet store and been amazed at the quantity of bones, balls and other items available for our pets today? Many pet owners recognize the rewards of providing our pets with stimulating activities. This idea is also used for wild animals in captivity. Visitors at a zoo may see a polar bear licking at a block of ice with frozen fish inside, or a chimp using a stick to remove food hidden inside a log. Zoo visitors may not realize that as they watch animals interacting on exhibit, they are likely witnessing the zoos carefully designed animal enrichment efforts.

What Is Enrichment?

The Random House College Dictionary defines enrich as “*to add greater value or significance to.*”

Environmental or behavioral enrichment is achieved by adding to a captive animal’s environment or by modifying that environment to stimulate behaviors resembling those of a healthy wild animal (Shepherdson, 1992a.) Enrichment is intended to encourage behaviors that are appropriate for the species, and that satisfy an animal’s physical and psychological needs. For example, improvements in exhibit structure, feeding schedule or social grouping may reduce stereotypical behaviors, such as pacing or over-grooming, as well as promote behaviors which resemble those observed in the wild. An enriched environment should also offer a captive animal some sense of control, resulting from its ability to make choices for itself, such as whether or not to hide, what kind of temperature and weather to experience and when and how to acquire food, etc.

An added benefit is that provision of novel stimulus may help captive animals maintain their ability to adapt to change and stress in their environment. Wild counterparts daily make choices in their reactions to stressors, such as predators, lack of food and inclement weather. Animals that do not cope well with stress are less likely to make appropriate choices. Enrichment can provide a controlled method of exposing animals to stress and maintaining their ability to adapt to new situations.

History of Environmental Enrichment

In the 1920’s, Robert Yerkes, a pioneer in the field of primate research, introduced the concept of enrichment, when designing play items for the primates in his lab. These items furnished physical and behavioral stimulation in an otherwise limited environment. At the Zurich Zoo, in the 1940’s, Heini Hediger studied the psychological needs of captive animals. Dr. Hediger stressed the importance of housing social animals in groups and also suggested that animals be housed in exhibits that encourage natural behaviors (Luoma, 1987.) Since then, numerous others have recognized and documented this need for sensory stimulation in captive animals (Bloomsmith et. al, 1991; Forthman and Ogden, 1992; Shepherdson, 1992b.) In addition, before the term enrichment was even coined, keepers worldwide provided zoo animals with a variety of items in their exhibits to stimulate activity.

Why Is Enrichment Important?

Wild animals expend considerable time and energy finding and processing food (Reinhardt, 1993, Brigham, 1997 and Poole, 1997), building nests and defending their territories. Most of their waking hours may be spent meeting these needs. The high quality of care provided in a captive environment significantly reduces the time an animal must spend in these pursuits, but does not address the behavioral needs associated with these activities (Shepherdson et al., 1993.) It has become necessary to provide alternative methods of stimulating natural foraging behavior (Brigham, 1997) to meet both the mental and physical needs of the captive animal.

Enrichment can promote species-typical behavior by providing animals with a complex and unpredictable environment. That environment may include activities that are both challenging and time-consuming and may serve several functions (Forthman-Quick, 1984; Shepherdson, 1992a), such as:

- improving animal well being by increasing exercise, satisfying behavioral needs and optimizing the level of stimulation animals receive, while also attempting to reduce abnormal behavior patterns;
- educating both animal caretakers and zoo visitors by increasing natural behaviors, visibility and activity levels;
- assisting in the conservation of endangered species by improving the success of captive breeding and reintroduction programs through improvements in social group composition, the promotion of normal physiological and psychological development, and the maintenance of behaviors that may be required for survival in the wild.

To achieve the continued benefits of enrichment, care must be taken to ensure that novelty is maintained. A random or rotating schedule of enrichment is needed to keep the animal's interest. The natural world constantly changes, forcing animals to adapt to new situations. Novel enrichment can stimulate the same flexibility.

CATEGORIES OF ENRICHMENT

As closely as possible, a captive environment should mimic an animal's natural habitat (Forthman-Quick, 1984; Forthman and Ogden, 1992.) This can be accomplished using knowledge of a species' native habitat and natural history. Various components of an exhibit may be modified to provide its occupants with opportunities for stimulation and species-typical behavior. There are several ways to categorize different types of enrichment, including physical environment, routine husbandry, social groupings and sensory stimulation.

Physical Environment

Modifications to physical elements of the exhibit and the addition of novel items to animal habitats may stimulate natural behaviors, as the following examples illustrate.

- pools for swimming or mud holes for wallowing;
- live and artificial plants for shade or visual barriers;
- furniture (ropes, branches, etc.) moved, added or removed from an exhibit to create new locomotive pathways and encourage exploratory behaviors;
- non-stationary furniture to add unpredictability to locomotion;

- novel objects changed frequently to stimulate investigative behaviors;
- a variety of substrates for tactile stimulation or digging opportunities;
- utilization of vertical as well as horizontal dimensions, when appropriate, to increase or enhance limited space.

Routine Husbandry

Variable methods of food delivery can be an effective means of enrichment. Examples include:

- food smeared, scattered and hidden throughout the exhibit;
- degree of processing required by the animal (e.g. whole food versus chopped);
- timing of food delivery varied, random or triggered by a behavior or event;
- puzzle feeders that offer animals a challenging and time-consuming method of obtaining their diet (i.e. tubes with holes drilled throughout and stuffed with small food, food placed in a box within a box within a box or artificial termite mounds.)

Animals that have adopted stereotypical behaviors (those that are fixed, invariant and do not serve a known function, typically manifested when animals are stressed or bored) may benefit from enrichment. For example, by scattering food or spreading scents throughout a pacing animal's exhibit, keepers may encourage the use of natural exploratory behaviors. These animals may investigate areas not utilized in their pacing routine, thereby competing with and potentially decreasing the undesirable behavior.

Animal training programs can also play a valuable role in enrichment programs. Using operant conditioning techniques, keepers can condition animals to voluntarily participate in physical exams, thereby eliminating the need for manual and chemical restraint. Training not only improves options for physical care, but it may provide animals with choices and mental challenges. Complex training sessions may encourage animals to problem solve and determine potentially rewarding consequences of their actions. Keeper interaction associated with a training session may also be beneficial, especially for singly housed animals.

Social Groupings

Captive social groupings should resemble those observed in wild counterparts (Forthman-Quick, 1984; Tudge, 1992.) Many species groom, play and court according to a social hierarchy (Tudge, 1992.) Even when not involved in these actions, animals within a social group are often interacting in some fashion, whether feeding, marking territory or engaging in social behaviors. In the zoo, animal caregivers and managers must recognize the importance of natural social groupings to animal welfare and take the normal social structure of each species into account when designing and maintaining exhibits. Examples of social enrichment include:

- housing social animals with appropriate members of their species;
- adding visual barriers (vegetation, furniture) to the exhibit to allow animals to retreat from both conspecifics and public;
- creating mixed species exhibits that may provide symbiotic or complementary activities between the species, or merely provide diversion.

Sensory Stimulation

Wild animals rely on survival skills (Tudge, 1992), whether they live on or under the ground, in trees, or in the water. Sensory abilities and specializations come into play. Many predators visually identify prey items (Bekoff, 1989.) Other creatures may depend on acute hearing. For example, several species of moths developed specialized hearing as an evolutionary response to heavy bat predation (Edmunds and Edmunds, 1989.) Acute hearing allows the moths to avoid areas of bat activity and escape predation. Other animals use their sense of taste for bonding with young; after giving birth, a ewe will lick her lamb to familiarize herself with its taste and smell. Sensory enrichment can be provided by various means:

- spices, herbs, perfumes and animal scents (lure, feces, skins) applied around an exhibit to add an olfactory dimension;
- playing recordings of vocalizations from conspecifics, predators or other naturally encountered sounds to elicit natural behavioral responses;
- placing elevated platforms and perches to allow visual access to other exhibits, animals and activities;
- incorporating simulated prey items into predator exhibits to encourage stalk-and-chase behaviors.

An innovative and well-planned environmental enrichment program may be one of the most powerful and cost effective tools available to maintain physically and psychologically healthy animals in a captive environment. Benefits may include increases in breeding success, visitor interest and staff motivation, as well as a decrease in observed stereotypical behaviors. Enrichment can positively impact all of the animals and people involved with it.

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