

Enhancing the welfare of caged cats through environmental management:

The importance of routine and cage environment

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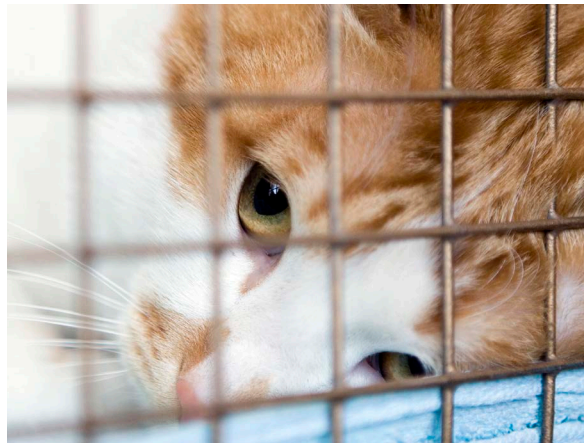
Cats are routinely housed singly in cages in shelters, veterinary hospitals, and laboratories. An estimated 3.4 million cats enter shelters each year, and 40-78% of them are euthanized for illness, poor adaptation to confinement, and lack of space. Fifty-five percent of the 95.5 million owned cats visit a veterinarian each year, and some will be housed in a veterinary clinic for medical care. Further, 13,000 cats are used in biomedical research annually to investigate cat-specific illnesses and as models for human disease. Confinement is a certainty for millions of cats. But the housing environments vary widely — and that matters to cats as well as those who care for and about them.

For cats, benefits of environmental management include decreased incidence of disease, improved immune function, shorter time to adoption, and decreased likelihood of abnormal brain development, behavior, and hormonal responses (Gourkow and Fraser, 2006; Poole, 1997). Additionally, cats that are less fearful are easier to care for, which can improve the work experiences of their caretakers.

Three areas are relevant to improving cat welfare through environmental management: daily routines, the cage environment, and the housing room environment. This paper will address daily routines and the cage environment.

The importance of routine

For cats in confinement, establishing and maintaining a husbandry routine is essential for good welfare. Daily feeding, cage cleaning, and handling should be provided



at a consistent time and manner. Many studies have shown that an unpredictable environment can increase distress and result in increased hiding, decreased food intake and other unwanted behaviors in cats (Carlstead et al., 1993; Gourkow and Fraser, 2006; Stella et al., 2013, 2014). As reviewed in Morgan and Tromberg (2007,) routine

husbandry has been associated with physiological and behavioral signs of distress and is thought to be aversive to many animals in captivity. Predictability of aversive stimuli is especially important to captive animals. For example, rats subjected to unpredictable, aversive events exhibit increased plasma corticosterone concentration, weight loss, decreased food and water intake, and more severe stomach ulceration, than those subjected to an identical but predictable aversive event (Weiss, 1970).

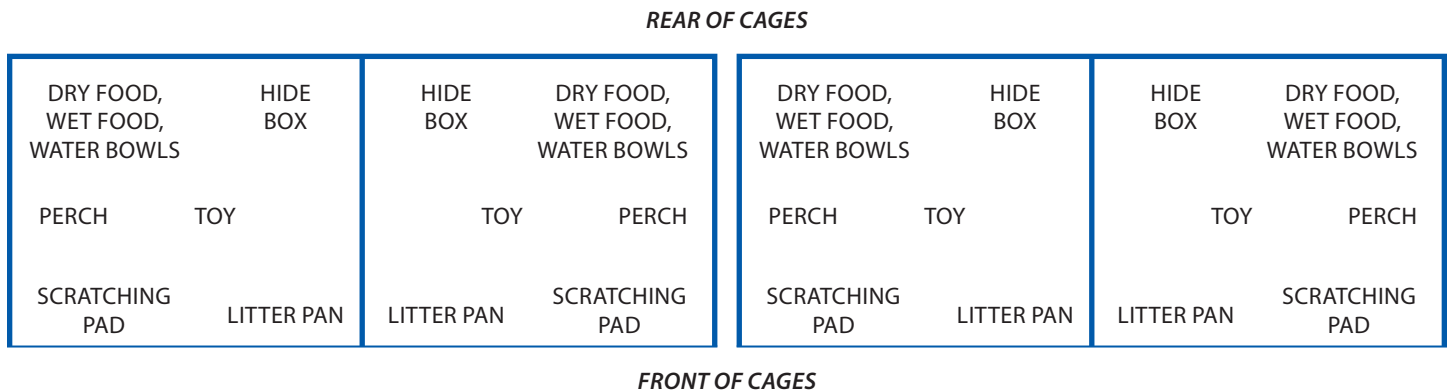
Improving the quality of the cat's cage environment

Hiding opportunities:

For cats, hiding is a normal, adaptive response to threat, an aversive stimuli or a novel environment. Therefore, all attempts should be made to provide caged cats with hiding opportunities. Hide boxes should be placed in the back of the cage, with the opening turned to the side. To further assist hiding attempts and a feeling of security, the roof and three sides of the cage should be solid or covered (Figure 1). This will allow the cat to view what is happening outside its cage through the door, while feeling physically protected. If the cage is



Figure 1: Diagram of optimal cage setup of resources. The solid lines indicate solid cage walls; the thin line indicates a wire front.



too small to provide a hide box, draping a towel over a shelf or partially covering the cage door can be good alternatives.

Several studies have reported beneficial outcomes to cats provided hide boxes. For example, a reduction in behaviors associated with distress has been reported in cats provided a hide box compared to cats with no hide box, especially when first placed in a cage (Gourkow and Fraser, 2006; Kry and Casey, 2007; Stella et al., 2014). If a hide box is not provided, many fearful cats will attempt to hide behind or in their litter pans. In shelters, the idea that providing cats with hiding opportunities will decrease adoptability often overrides this welfare concern. Yet no effect on time to adoption or adoption rates has been found when hide boxes are provided; in fact, providing a hide box may increase people’s perceptions of positive states associated with adoption, such as “happy,” “relaxed,” and “playful” (Gourkow and Fraser, 2006; Kry and Casey, 2007).

Perches:

Cats are a prey as well as a predator species, so climbing for observation and safe vantage is an important feline behavior. Cats prefer elevated locations, presumably because it increases their sense of safety and security (Rochlitz, 2013). Providing a perch, or a box the cat can sit on, can meet this need as well as increase the amount of usable space within the cage. Perches also allow cats an opportunity to engage in active behaviors, such as climbing. Housing cats in upper-level cages (not floor level) can allow the cat to feel elevated as well.

Litter pan:

The litter pan should be relatively large, ideally about 1.5 times longer than the cat so that he or she can turn around comfortably (Guy et al., 2014). Most cats prefer unscented, fine-grained, deep litter so that they can dig and bury their feces. Feces and soiled litter should be removed twice daily, and the pan should be washed weekly with mild soap. Cats do not like to eat and sleep near elimination areas, so the litter pan should be placed as far away from feeding and resting areas as possible within the cage.

The pan should be placed in the front half of the cage, next to the litter pan in the adjacent cage (Figure 1). Such careful placement is suggested for two reasons. First, putting the litter pans adjacent to each other separates the resting area of one cat from the elimination area of the cat in the adjacent cage. Second, cats spend relatively little time utilizing the litter pan and prefer to rest in the rear of the cage. Therefore, placement of the pan in the front of the cage is recommended, since this tends to be the area the cat is least likely to value for other essential behaviors, such as feeding and resting.

Food and water:

The type and brand of food should be consistent and offered at the same time each day. Clean water should be available at all times. Offering small meals multiple times a day is ideal to reflect the feeding patterns of free-roaming cats as well as to provide additional opportunities for interaction with the cats. In our experience, many cats do not like to have their food mixed, so wet and dry food should be presented in separate bowls.

Bedding:

Cats seem to prefer soft resting substrates, such as pillows or fleece beds, in warm areas, such as safely heated beds or sunny windows. Because most cats prefer familiar bedding, change it only when it is soiled rather than daily. Even in a hospital setting, we recommend spot cleaning of cages. This is perceived as less threatening to the cat, eliminates the need for removing the cat from the cage for cleaning, and leaves familiar odors in the cage environment. Bedding may have the additional benefit of increasing traction and comfort on cage floors (Crouse et al., 1995).

Scratching Opportunities:

Scratching is a behavior cats use to mark territory. It also assists in shedding the outer layers of the claw; that may be pleasurable as well as necessary, as even declawed cats continue to display the behavior. Providing a scratching pad, such as the Stretch & Scratch or a cardboard box, allows them to exhibit a natural behavior in an appropriate manner and may also provide an outlet for frustration and activity. Most cats seem to prefer a vertical orientation of the scratcher (Moesta, 2012) but others may prefer a horizontally angled scratching area (Landsberg, 1991). Different types and textures of scratching materials should be offered to permit the cat to express its preferences.

Toys:

Cats should be offered a variety of toys that allow for behaviors such as biting, throwing, and chasing. Commercially available puzzle feeders, plush and feather toys, as well as pingpong balls, are viable options. Toys enable cats to exercise and provide an outlet for frustration. Rotating toys or offering new ones weekly prevents boredom and results in increased object play (De Monte and Le Pape, 1997). In a shelter, this will allow potential adopters to view cats engaging in friendly, playful behaviors that have been reported as important considerations in adoption.

Conclusion

Modifying the environment to improve cat welfare can potentially lead to reduced distress, improvements in health, better adoption outcomes, and more robust experimental results. Identifying distress in caged cats and modifying their environments to better match their needs can help them cope more effectively with stressors they may experience while housed in cages.

References

- Carlstead, K., Brown, J.L., Strawn, W., 1993. Behavioral and physiological correlates of stress in laboratory cats. *Applied Animal Behaviour Science* 38, 143-158.
- Crouse, S.J., Atwill, E.R., Lagana, M., Houpt, K.A., 1995. Soft surfaces: a factor in feline psychological well-being. *Contemporary topics in laboratory animal science/American Association for Laboratory Animal Science* 34, 94-97.
- De Monte, M., Le Pape, G., 1997. Behavioural effects of cage enrichment in single-caged adult cats. *Animal Welfare* 6, 53-66.
- Gourkow, N., Fraser, D., 2006. The effect of housing and handling practices on the welfare, behaviour and selection of domestic cats (*Felis sylvestris catus*) by adopters in an animal shelter. *Animal Welfare* 15, 371-377.
- Guy, N.C., Hopson, M., Vanderstichel, R., 2014. Litterbox size preference in domestic cats (*Felis catus*). *Journal of Veterinary Behavior: Clinical Applications and Research* 9, 78-82.
- Kry, K., Casey, R., 2007. The effect of hiding enrichment on stress levels and behaviour of domestic cats (*Felis sylvestris catus*) in a shelter setting and the implications for adoption potential. *Animal Welfare* 16, 375-383.
- Landsberg, G.M., 1991. Feline scratching and destruction and the effects of declawing. *Veterinary Clinics of North America Small Animal Practice* 2, 265-279.



Landsberg, G.M., Hunthausen, W.L., Ackerman, L.J., 2012. Behavior Problems of the Dog and Cat. 3 ed. Elsevier Health Sciences.

Moesta, A., 2012. Feline scratching of furniture: Impact, owner attempts to prevent it and attitudes towards declawing: a survey of cat owners and veterinarians, The University of Georgia.

Morgan, K.N., Tromborg C.T., 2007. Sources of stress in captivity. *Applied Animal Behaviour Science* 102, 262-302.

Poole, T., 1997. Happy animals make good science. *Laboratory Animals* 31, 116-124.

Rochlitz, I., 2013. Feline welfare issues. The domestic cat: the biology of its behaviour, 207-226.

Rochlitz, I., Podberscek, A.L., Broom, D.M., 1998. Welfare of cats in a quarantine cattery. *Veterinary Record* 143, 35-39.

Stella, J., Croney, C., Buffington, T., 2013. Effects of stressors on the behavior and physiology of domestic cats. *Applied Animal Behaviour Science* 143, 157-163.

Stella, J., Croney, C., & Buffington, T., 2014. Environmental factors that affect the behavior and welfare of domestic cats (*Felis silvestris catus*) housed in cages. *Applied Animal Behaviour Science*, 160, 94-105.

Weiss, J.M., 1970. Somatic effects of predictable and unpredictable shock. *Psychosomatic Medicine* 32, 397-408.